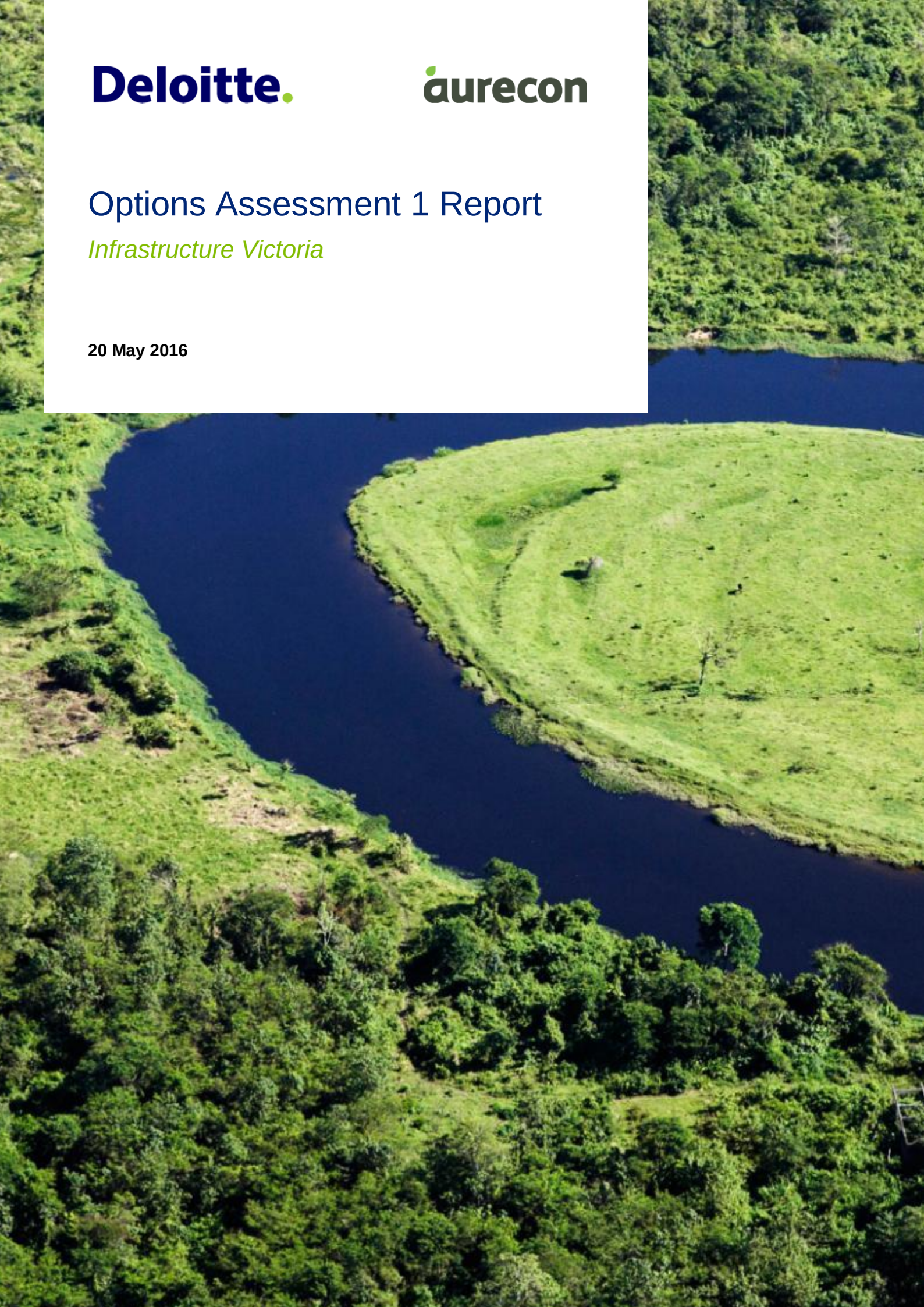
Deloitte.

aurecon

# Options Assessment 1 Report

*Infrastructure Victoria*

**20 May 2016**



# Executive Summary

This report summarises preliminary analysis undertaken to support the development of options which Infrastructure Victoria will use to support the development of a 30 year infrastructure strategy. Deloitte and Aurecon were engaged to undertake a high level analysis of a number of proposed options that respond to Infrastructure Victoria's separately identified draft needs and objectives. The draft needs and objectives are currently the subject of consultation and are outlined in the Infrastructure Victoria *Laying the Foundations Paper* available on the Infrastructure Victoria website www.infrastructurevictoria.com.au

The analysis contained in this document investigates the options associated with the 10 different draft objectives and 25 aligned draft needs. Based on these defined objectives and needs, workshop sessions were held producing in excess of 200 possible options to help address each of the 25 identified needs. Each one of these options has been analysed to assess its high level whole of life cost and asses it against a set of metrics, with the initial results provided in this report.

The purpose of this report is to enable Infrastructure Victoria to undertake an initial refinement of the draft options to eliminate those options that have a high cost and a low contribution to the agreed metrics. The remaining options will be considered further as part of "triple bottom line" assessments and stakeholder engagement that are not part of this analysis.

The draft options are wide and varied in scope, cost, time needs and implementation requirements. They affect all parts of society; the public, private and not for profit sectors and can be implemented in a number of different ways; through regulatory or policy change, modification of existing infrastructure, delivery of new infrastructure or just a different approach to operation.

It is recognised that the draft objectives, needs and subsequent options are likely to change over the duration of the process and that this report responds to the draft objectives and needs as defined in the Infrastructure Victoria paper '*Laying the Foundations*'.

### Limitations of the Report

The analysis undertaken in this report is desktop based and has been prepared based on information that is publicly available. In assessing the options and interventions we acknowledge and understand that there is likely to be additional information available that could help influence future thinking. Therefore, the proposed options are an initial starting point and are subject to change as alternate views and information is identified. It is the intention that this work is one of the platforms for further engagement and refinement of Victoria's infrastructure needs as Infrastructure Victoria progresses its 30 year infrastructure strategy development.

# Contents

# Introduction

Draft Objectives and Needs have been defined by Infrastructure Victoria in their *Laying the Foundations* paper (see below). Deloitte and Aurecon, working in close conjunction with Infrastructure Victoria have developed a range of options (via a series of workshops) that respond to the draft objectives and needs as identified at the time of writing this report. The purpose of this report is to define the cost and contribution to a defined metric/s of each of the options provided, to enable Infrastructure Victoria to undertake an initial shortlisting and to engage with a range of key stakeholders. It is acknowledged that further review and assessment of the options is likely to be required, at the time that the draft objectives and needs are confirmed following further consultation.

### Summary of draft objectives and needs

| Draft Objective | Draft Needs |
|---|---|
| 1. Respond to population growth and change. | A. Address infrastructure deficits in high-growth areas.<br>B. Manage increasing demands on health infrastructure.<br>C. Provide access to high-quality school facilities. |
| 2. Support healthy, safe and vibrant communities. | A. Enable physical activity through infrastructure and urban design.<br>B. Provide good public spaces where communities can come together.<br>C. Strengthen access to cultural infrastructure.<br>D. Maximise positive impacts on amenity and wellbeing from infrastructure. |
| 3. Reduce disadvantage. | A. Improve accessibility for people with disabilities and/or mobility challenges through infrastructure.<br>B. Address housing affordability challenges with better social housing.<br>C. Support changing approaches to social service and justice delivery through infrastructure. |
| 4. Enable workforce participation. | A. Provide access to the diversity of employment opportunities offered by the central city.<br>B. Provide better links to non-central city employment centres.<br>C. Improve access to early childhood care facilities. |
| 5. Lift Victoria's productivity. | A. Improve the efficiency of freight supply chains through infrastructure.<br>B. Move people to and from airports more efficiently. |
| 6. Support Victoria's changing, globally integrated economy. | A. Boost tourism through infrastructure provision.<br>B. Enable the growth of a highly skilled, digitally connected workforce through infrastructure. |
| 7. Promote sustainable production and consumption. | A. Improve rural and regional water security.<br>B. Manage pressures on landfill and waste recovery facilities. |
| 8. Protect and enhance natural environments. | A. Help preserve natural environments and minimise biodiversity loss through infrastructure.<br>B. Improve the health of waterways through infrastructure. |
| 9. Support climate change mitigation and adaptation. | A. Smooth the adjustment to a carbon-constrained world through infrastructure.<br>B. Adapt infrastructure to changing climate conditions. |
| 10. Build resilience to shocks. | A. Improve the resilience of critical infrastructure to disruptive events.<br>B. Address infrastructure-related emergency response challenges. |

The development of the proposed options is ongoing. This document is a snapshot in time based on the draft objectives and needs that are subject to further analysis and consultation. It will also enable the shortlisting of options for further detailed investigation and analysis.

A number of the draft options are linked to meeting more than one need and/or objective. This is identified by the reference numbers within the report which will be the same for options within different objectives and needs.

# Analysis

The proposed options have been assessed using a standardised methodology. This includes; determining the type of strategic intervention and the whole of life cost range.

Each option has been benchmarked against identified metrics specific to each need to be able to draw a comparison between the overall effectiveness of each option so as to determine a contribution ranking. This ranking will then aid in a selection process of the options deemed as the most effective to contributing to the required metric.

The information to undertake this analysis has been sourced from the public domain as well as information from various relevant government departments, existing business cases, research papers and journal articles and also relevant examples of similar projects in other jurisdictions.

Note that this is a high level analysis which does not investigate any of the options in depth but rather provides the initial assessment to enable Infrastructure Victoria to remove options that are both high in whole of life cost and do not sufficiently contribute to meeting the defined metric.

The basis for which the options have been assessed is outlined below.

### Type of Strategic Intervention

Each of the options has been assigned a strategic intervention category based on the type of intervention and how it may be implemented. These are summarised in the table overleaf. Each of the option's 'strategic intervention' type is listed immediately after the heading of each option within the report.

| | | Changing behaviour | Better use | New/expanded assets |
|---|---|---|---|---|
| **Better use solutions** | Economic charging | Y | | |
| | Influencing behaviour through information | Y | | |
| | Technological innovations | Y | Y | |
| **Regulatory amendments** | Competition regulation | Y | Y | |
| | Land use and planning controls | Y | Y | |
| | Licensing | Y | Y | |
| | Safety and environmental standards | Y | | |
| | Industrial relations | | Y | |
| **Governance reform** | Public service delivery and approval processes | | Y | |
| | Coordination processes | | Y | |
| | Contractual processes | | Y | |
| | Industrial relations | | Y | |
| | Funding agreements | | Y | |
| **Capacity investment** | Refurbishment of existing assets | | Y | |
| | Incremental expansion of existing assets | | Y | Y |
| | New greenfield asset | | | Y |

## Certainty of evidence rating

Evidence has been sourced primarily from the public domain as well as from relevant government departments where available in relation to each option. The available information has been assessed in terms of its relevance and how accurate the current information is if that option was to be implemented today. A ranking as per the table below has been assigned to each option based on this assessment.

The sources of the evidence used for the assessment of each option have been provided in the appendix.

| | |
|---|---|
| **High**  | Full business case, Regulatory Impact Statement or policy proposal including impact assessment (must be relatively recent and include a strong level of confidence in the assumptions within). |
| **Medium**  | Preliminary business case or Feasibility Study (must be relatively recent and a strong level of confidence in the assumptions within). |
| **Low**  | Policy or project proposals and information discovered during the options generation process. |

### Whole of life cost range

Each option has been assigned an estimated whole of life cost range (based on a 30 year lifespan) as if it was implemented in 2017, for capital intensive options a simplifying assumption has been made that there is an initial 5 year construction phase and 25 years of operation. Whilst it would not be possible for all options to be implemented immediately, this enables all options to be assessed on an equal basis. The cost ranges are shown in the table below.

| Whole of life cost range |
|---|
| < $100 million |
| $100 million - $500 million |
| $500 million - $1 billion |
| $1 billion -$5 billion |
| $5 billion -$10 billion |
| > $10 billion |

### Contribution ranking

Each option has been assessed against its ability to demonstrate a contribution to improving the metrics. The table below shows the Contributions considered.

| | |
|---|---|
| **Negative/very low** | The proposed option is unlikely to have a positive effect, or may even negatively impact, on the metric/s. |
| **Low** | The proposed option will only have a low effect or marginal effect on the metric/s. |
| **Moderate** | The proposed option is anticipated to have a moderate effect in addressing the metric/s. |
| **Significant** | The proposed option is deemed to have the potential for a significant impact on the defined metrics. |

# Draft Objective 1 - Respond to Population Growth and Change

## Draft Need 1A: Address Infrastructure deficits in high-growth areas

Many areas in Melbourne, particularly where housing is more affordable and population growing strongly, are less well serviced by infrastructure. In recent years, both a Parliamentary Inquiry and Victorian Auditor-General report found that there is a significant infrastructure backlog in growth and peri-urban communities. As government cannot provide the same level of infrastructure to all locations in the state, more innovative approaches are required. This includes understanding the role of the planning system in facilitating this growth.

If the state continues to accommodate more people in these areas over the next 30 years, there will be greater demand for new infrastructure such as schools and extending public transport networks. The Plan Melbourne refresh discussion paper canvasses a shift to accommodate more dwellings in established areas (70 per cent of the total required), greater than current projections. This could have significant implications for infrastructure by leveraging existing services and reducing pressure on government finances.

### Metrics

Metric 1 – Reduction in the supply and demand mismatch (gap) of infrastructure and services. High-growth municipalities only.
Metric 2 – Reduction in the average distance to core infrastructure (health, transport, education, justice). High-growth municipalities only.

### Options

The table below lists the options considered for this Draft Need

| Reference Number | Option Name |
|---|---|
| 1.3.1 | Urban development in established areas |
| 1.3.3 | Centralised planning scheme |
| 1.3.4 | Online liveability infrastructure platform |
| 1.3.7 | Access to services through technology and ICT |
| 1.3.8 | Local bus service standards |
| 1.3.11 | Melton rail extension |
| 1.3.12 | Wallan rail electrification |
| 1.3.14 | Wollert rail extension |
| 1.3.15 | Clyde rail extension |
| 1.3.16 | Wyndham Vale to Werribee rail extension |
| 4.12.4 | Arterial road network employment centre enhancements |
| 1.3.17 | Northern Health Facilities Expansion |

The graph on the following page plots each option's contribution versus cost.

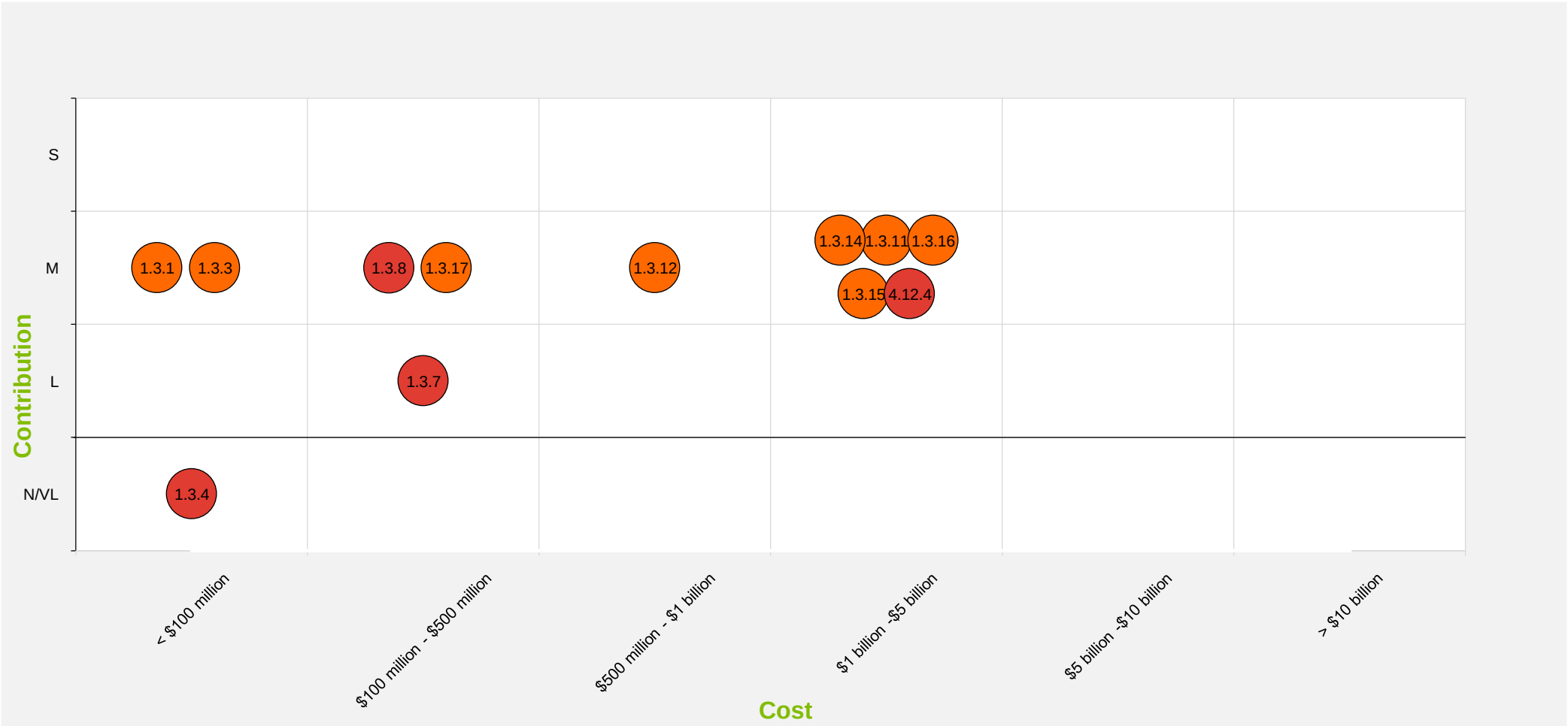



**Figure 1: Need 1A matrix**

## Draft Option – Urban development in established areas

### Strategic Intervention: Better use > Regulatory amendments

**Reference: 1.3.1/UDC**

Encourage population to specific areas where there is existing or planned infrastructure. This results from clear planning requirements that contain / direct all development both within Melbourne's urban growth boundary and to specific designated areas. This is a broad scale State and Council response to controlling development.

This option would include requiring areas that are rich with existing infrastructure (existing activity centres, health facilities, open space, public transport etc.) to apply residential or other enabling zoning that can facilitate residential intensification. This would reduce (or slow) the need to build new infrastructure in greenfield growth areas and would leverage the existing infrastructure in areas that can accommodate growth. This would be a land use and planning control change and housing targets for local government areas or sub regions would likely be required. In addition, incentives may be required to encourage established areas to accommodate growth.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | This option is a policy/regulatory change only with no capital works required. Whole of life cost estimations include consultation, implementation and management. |
| **Overall Contribution** | Moderate | This policy will lead to a reduction in the mismatch between supply and demand for infrastructure and services. It will also better match the location of population growth with the location of existing services, hence decreasing average travel distance. |

## Draft Option - Centralised planning scheme

### Strategic Intervention: Better use > Public service delivery and approval processes

**Reference: 1.3.3/CPS1**

Deliver a centralised planning scheme and aligned governance controlled and delivered by a central authority (or through further empowering the Metropolitan Planning Authority) with greater authority to make decisions for the Central City/Greater Melbourne. Responsibility would be shifted from the LGAs to help with sequencing and development of community infrastructure and coordination of social services.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | This option is a policy/regulatory change only with no capital works required. Whole of life cost estimations include consultation, implementation and management. |

| | | |
|---|---|---|
| **Overall Contribution** | Moderate | This policy will lead to a reduction in the mismatch between supply and demand for infrastructure and services. It will also better match the location of population growth with the location of existing services, hence decreasing average travel distance. Western Australia is a good case study for this, in terms of their centralised control of subdivisions. |

## Draft Option - Online liveability infrastructure platform

### Strategic Intervention: Changing behaviour > Influencing behaviour through information

**Reference: 1.3.4/OLI**

Deliver an online platform that provides residents and visitors to Victoria a listing of recreational spaces, libraries, social infrastructure and health facilities. Include information regarding cycle paths, walkways, organised sport events, ability to transport bicycles via the train network, and so forth, is likely to encourage additional usage. The platform would link with public transport websites to identify mode and journey options. There is an opportunity to make key linkages to transport infrastructure part of the platform.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | This option is a policy/regulatory change only with no capital works required. Whole of life cost estimations include consultation, implementation and management. |
| **Overall Contribution** | Negative/very low | The implementation of this option will have a minimal impact on the usage, supply and demand patterns for visitors and some residents in the short term. Longer term, as the transport behaviour patterns of Victorian residents change, higher levels of public transport usage may be observed. |

## Draft Option - Access to services through technology and ICT

### Strategic Intervention: New/expanded assets > Incremental expansion of existing assets

**Reference 1.3.7/AST**

Identification of options to improve service delivery, specifically utilising ICT and technology. The benefit is that this would not require users to travel. This includes providing centralised online information hubs and/or potential new service delivery models.

As both public and private services continue to move to online delivery models there will need to be supporting ICT infrastructure to aid these services.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $100 million - $500 million | The cost to implement this option is based on policy changes and the rollout of various initiatives for business by the Victorian Government with some major capital works required.<br><br>In implementing the Victorian ICT plan, the Government will invest more than $85 million to deliver new initiatives while continuing to support ongoing activities identified by the Victorian ICT sector as being of benefit to local businesses. NBN Broadband rollout to continue in stages, which is funded by the Federal Government (order of $36 billion over 8 years). This will likely have significant flow on effects to private industry and infrastructure usage in the long term.<br><br>Initiatives and some isolated but major capital works required to ensure growth areas have comparable ICT infrastructure access as inner metropolitan area. Therefore whole of life costs are to include consultation, implementation and management for initiatives, but also construction and operating costs. |
| **Overall Contribution** | Low | NBN and better ICT will make connectivity easier, decreasing the need to travel for some core services. By increasing connectivity there will be a reduction in the need to travel by some public and private enterprises, and therefore a reduced demand for transport infrastructure in particular. However while core infrastructure such as health, education and justice will likely gain efficiency benefits from new ICT infrastructure, it is unlikely to reduce the average distance to access these services. |

## Draft Option - Local bus service standards

### Strategic Intervention: Better use > Coordination processes

**Reference 1.3.8/LBS**

Implement minimal local bus service levels of 20 minute frequency, 7 days a week, from at least 6 am to 9 pm within 800 metres from a premium or connector bus services for all growth area residents. This includes the introduction of connector services from Werribee to Wyndham Vale Station, Mt Ridley to Craigieburn Railway Station, Epping North to Epping Station, Mernda to University Hill via South Morang station, and a north-south service between the Cranbourne and Pakenham lines. These extensions support the provision of local area access to shops, services and jobs. This will have benefits in terms of social inclusion as well as reduced congestion.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $100 million - $500 million | The estimated cost range has been based on existing similar examples such as those outlined in the document; Managing Growth – Infrastructure for Melbourne's Outer Suburbs which outlines the following public transport upgrades for the outer suburbs and have been allocated indicative capital costs.<br>– $15 million for new bus infrastructure.<br>– A further $85 million in operating spending to improve bus networks, mostly in Melbourne's growth areas. These will be improved by adding more routes, expanding others, restoring services and fixing missing links.<br>Assuming operating costs of 3% of capital expenditure per year for 25 years this provides a whole of life costing in the order of $100-500 million. |
| **Overall Contribution** | Moderate | The implementation of this option will moderately contribute to reduction in supply and demand, due to the increased number of services. It will also improve accessibility to core infrastructure but will not reduce the average distance to the infrastructure. |

## Draft Option - Melton rail electrification

### Strategic Intervention: New/expanded assets > Incremental expansion of existing assets

**Reference 1.3.11/MRE1**

Extension of the electrified suburban rail network from Sunshine to Melton including the duplication of tracks between Deer Park and Melton and quadruplication of tracks between Sunshine and Deer Park. The works will provide additional capacity on the Ballarat line and increase the frequency of services to the greater Melton growth area. Extension of the electrified suburban rail network from Sunshine to Melton, including the quadruplication of tracks between Sunshine and Deer Park. The works will also include the removal of three level crossings on the Ballarat line between Sunshine and Deer Park West. This option will provide additional capacity on the Ballarat line and increase the frequency of services to the greater Melton growth area. It will also support improved reliability and capacity on the Bendigo and Geelong lines. This will allow more people from Melton and other regional areas to access jobs and services in the centre of the city.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion - $5 billion | Based on the evidence available the estimated cost for construction of this option is $1.3 billion. This estimation is guided by the Developing Transport Infrastructure and Services for Population Growth Areas, Victorian Auditor- |

| | | |
|---|---|---|
| | | General's Office Report, August 2013 and PTV's December 2012 rail plan which provides background to the proposed implementation of this option.<br><br>Assuming operating costs of 3% of capital expenditure for 25 years this provides a whole of life costing in the range of $1-5 billion. |
| **Overall Contribution** | Moderate | This option would reduce the mismatch between supply and demand, due to the provision of new infrastructure to a growth corridor and improving accessibility to Melbourne CBD. This option would not reduce the average distance to core infrastructure. |

## Draft Option - Wallan rail electrification

### Strategic Intervention: New/expanded assets > Incremental expansion of existing assets

**Reference 1.3.12/WRE1**

Extend the electrified metropolitan rail network to Wallan. The new electrified section will utilise the Upfield Line with the reinstatement of tracks from Upfield to Somerton and a new track pair from Roxburgh Park to Craigieburn along with electrification works between Upfield and Wallan. This extension to the electrified network will give greater access to the new growth areas in Melbourne's north through additional services. It will enable more efficient access to central Melbourne and support access to jobs and services.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $500 million - $1 billion | No published data has been found on the cost of this proposed rail extension; however estimates would make this most comparable to the Sunbury electrification (capital expenditure $270 million) if constructed.<br><br>Assuming operating costs of 3% of capital expenditure for 25 years this provides a whole of life costing in the range of $500 million - $1 billion. |
| **Overall Contribution** | Moderate | This option would reduce the mismatch between supply and demand, due to the provision of new infrastructure in a growth corridor and improving accessibility to Melbourne CBD. This option would not reduce the average distance to core infrastructure. |

## Draft Option - Wollert rail extension

### Strategic Intervention: New/expanded assets > Incremental expansion of existing assets

**Reference 1.3.14/WRE2**

Extend the electrified metropolitan rail network to Wollert. The new electrified section would extend from Lalor to Wollert as a spur line off the South Morang Line. This extension to the

electrified network will give greater access to the new growth areas in Melbourne's north through additional services and new stations. It will enable more efficient access to central Melbourne and support access to jobs and services.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion -$5 billion | The estimated cost range has been based on existing studies and requests for funding for the implementation of this option. The City of Whittlesea has previously asked the State Government to fund the extension of the train line from Lalor Station to Epping North and Wollert with an expected cost of approximately $600 million.<br><br>Assuming operating costs of 3% of capital expenditure for 25 years this provides a whole of life costing in the range of $1-5 billion. |
| **Overall Contribution** | Moderate | This option would reduce the mismatch between supply and demand, due to the provision of new infrastructure to a growth corridor and improving accessibility to Melbourne CBD. This option would not reduce the average distance to core infrastructure. |

## Draft Option - Clyde rail extension

### Strategic Intervention: New/expanded assets > Incremental expansion of existing assets

**Reference 1.3.15/CRE**

Extend the metropolitan rail network to Clyde from the current terminus at Cranbourne in Melbourne's south east. The works will include grade separations with existing roads and new stabling and maintenance facilitates. This extension to the network will give better access to the new growth areas in the Shire of Casey. It will enable more efficient access to central Melbourne and support potential future extensions of the network in the south east.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion -$5 billion | The cost estimate for the implementation of this option has been assumed to be comparable to the Mernda rail extension due to the limited information available regarding costings and scope of works in the public domain.<br><br>Assuming operating costs of 3% of capital expenditure for 25 years this provides a whole of life costing in the range of $1-5 billion. |

| | | |
|---|---|---|
| **Overall Contribution** | Moderate | This option would reduce the mismatch between supply and demand, due to the provision of new infrastructure to a growth corridor and improving accessibility to Melbourne CBD. This option would not reduce the average distance to core infrastructure. |

## Draft Option - Wyndham Vale to Werribee rail extension

### Strategic Intervention: New/expanded assets > Incremental expansion of existing assets

**Reference 1.3.16/WVW**

Extend metropolitan rail network between Wyndham Vale and Werribee. The extension will accommodate future growth in Werribee West and provide a direct rail-rail interchange for passengers travelling between the Geelong and Werribee lines. This option will give greater access to the new growth areas in Melbourne's west through additional services and new stations. It will enable more efficient access to central Melbourne and support access to jobs and services.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion -$5 billion | No publically available information on costings has been found. Assume cost estimate is comparable to Mernda. According to the PTV Network Development Plan, the extension will also include a new stabling and maintenance facility at Wyndham Vale.<br><br>Assuming operating costs of 3% of capital expenditure for 25 years this provides a whole of life costing in the range of $1-5 billion. |
| **Overall Contribution** | Moderate | This option would reduce the mismatch between supply and demand, due to the provision of new infrastructure to a growth corridor and improving accessibility to Melbourne CBD. This option would not reduce the average distance to core infrastructure. |

## Draft Option - Arterial road network employment centre enhancements

### Strategic Intervention: Capacity investment > New greenfield asset

**Reference 4.12.4/ARN**

Improve the road network surrounding major employment centres to meet growing demand, such as the Westall Road extension from Princes Highway to Monash Freeway to improve connectivity and support the Monash employment centre. Delivery also a grid-like road network in the western suburbs (with emphasis on connecting residents to Sunshine and Werribee employment centres), with design prioritisation given to public transport.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion -$5 billion | The overall cost of this option is highly dependent on the scale of implementation, but based on current funded projects a cost of implementation is expected to be conservatively in the range of $1-5 billion. An initial scoping study is likely to cost < $10 million to coordinate and examine the feasibility and potential improvement projects across the five employment precincts.<br><br>Currently, VicRoads is delivering a series of road improvements for the East Werribee Employment Precinct at a cost of $71 million. If projects of a similar scale were rolled out across the other four employment centres, this could cost in the region of $300 million in capital expenditure.<br><br>Operational expenditure over a 30 year period could be in the region of $30 million in present value. This assumes:<br><br>- 200 lane kilometres of road to maintain<br>- CPI 2.5%<br>- discount factor 7%<br>- 30 year period<br>- average maintenance cost of $8,518 per lane kilometre (from VicRoads annual report).<br><br>Indications are that projects such as the 2.8 kilometre Westall Road Extension may cost approximately $90 million. If two such projects were developed in each employment centre, this has the potential for whole of life cost projections for this element in the region of $1 billion. |
| **Overall Contribution** | Moderate | The implementation of this initiative would not reduce the supply and demand mismatch of infrastructure and services or reduce the average distance, but improves accessibility to core infrastructure. |

## Draft Option - Northern Health Facilities Expansion

### Strategic Intervention: New/expanded assets > Incremental expansion of existing assets

**Reference 1.3.17/NHE**

Provide health facilities to the Melbourne Northern sub-region to provide access to health services in this high growth region.

This option requires further development to determine the specific location and mix of health services required in the region. This option includes for the provision of a tertiary hospital and additional community health services in the region. Demand for the existing Northern Hospital's emergency department and elective surgery is expected to increase significantly by 2018. A project to provide a 32-bed ward above two "shell" floors was funded in the 2013-14 state budget. This option is to provide facilities in addition to this project.

The whole of life cost includes the cost to refurbish or provide new facilities and maintain the facilities, but excludes the costs of health service delivery.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $100 million - $500 million | Before the election, the Coalition committed to a $98 million expansion of the hospital which was not matched by Labor. The expansion would have provided 12 extra intensive care beds, 64 new general ward beds and two new operating theatres as part of a "south tower" currently under construction. Cost estimates include an increase in operating costs for 30 years.<br><br>The project's $29 million first stage – a 32-bed ward above two "shell" floors – was funded in the 2013-14 state budget. |
| **Overall Contribution** | Moderate | The option will significantly reduce the distance to tertiary level health infrastructure for some residents of the northern suburbs of Melbourne. This is a significant infrastructure gap in the Northern region. |

## Draft Need 1B: Manage increasing demands on health infrastructure

Victoria's demographic shifts are experienced in different places in different ways. Some regional areas are experiencing a rise in the number of people aged over 65, while some areas are experiencing a mini baby boom. Victoria's health infrastructure (such as hospitals) needs to respond to these different demands over the next 30 years. Factors that need to be considered for an elderly population cohort are the increasing prevalence of lifestyle and chronic diseases associated with longer lifespans, as well as the preference to 'age in place' (at home). Conversely, a younger population cohort will place increasing demands on women's and children's hospitals and on maternal and child health services.

These demographic changes are expected to place greater pressure on health infrastructure and expenditure. Commonwealth expenditure is predicted to rise from 4.1 per cent to 7 per cent as a share of national GDP by 2059-60. At a state and territory government level, this will be reflected in an increase from 2.4 per cent to 3.8 per cent of GDP during this time. Adaptability of infrastructure will be important as will integrated thinking between technology, health services and buildings.

### Metrics

Metric 1 – Reduction in total real annual health expenditure per capita in Victoria.
Metric 2 – Improvements in:

a) the average time to clear waiting lists – that is, the number of patients on the waiting list divided by the number of patients removed from the waiting list, expressed in months;
b) the percentage of people treated within a clinically appropriate time;
c) the average waiting time from referral to first consultation in outpatient clinics.

### Options

The table below lists the options considered for this Draft Need

| Reference Number | Option Name |
|---|---|
| 1.1.1 | Health education programs |
| 1.1.2 | Health care delivery role change |
| 1.1.4 | Health and aged care private sector involvement |
| 1.1.5 | Preventative health care awareness |
| 1.1.7 | Health care decentralised delivery model |
| 1.1.9 | Health care smart facilities |
| 1.1.10 | Health infrastructure coordinated planning |
| 1.1.11 | Health care patient subsidised travel |
| 1.1.12 | Health and aged care repurposing of facilities |
| 1.1.13 | Aged care and mental health investment |

The graph on the following page plots each option's Contribution versus Cost.


**Figure 2: Need 1B matrix**

## Draft Option - Health education programs

### Strategic Intervention: Changing behaviour > Influencing behaviour through better information

**Reference 1.1.1/HEP**

Deliver preventative health education programs targeted at the 15-25 years old age group. The implementation of this option aims to improve the number of people living healthy lifestyles, to in turn reduce the number of people needing to access the health system.

Education would be delivered through school programs (road show tours) and targeted advertising campaigns at this specific demographic group. These campaigns would provide focus around preventative health care and general healthy living.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | Based on the cost of previous advertising campaigns such as the federally funded government healthy lifestyle advertising campaign 'Get Moving' which focussed on TV advertisements at a cost $6 million in 2006 it is expected the implementation of this option will be less than $100 million. |
| **Overall Contribution** | Moderate | The implementation of this option aims to improve the number of people living healthy lifestyles, to in turn reduce the number of people needing to access the health system.<br><br>Health Education will provide a Moderate reduction in annual health expenditure by helping to reduce the number of people affected by 'lifestyle' diseases.<br><br>Education won't directly impact waiting list times but is likely to have indirect positive impacts by reducing the number of people on waiting lists in the first place. |

## Draft Option - Health care delivery role change

### Strategic Intervention: Better use > Regulatory amendment

**Reference 1.1.2/HCD**

Shift health service delivery from traditional sources to nurses, pharmacists and allied health professionals to reduce the demand on GP's and hospitals.

The role of state and federal government will be:

- to influence the relevant medical bodies and create a rethink around what services the various trained medical professionals are able to deliver;
- to determine the numbers of adequately trained people who could provide this increase in services; and

- determine the impact this would have on existing health care service such as infrastructure and funding mechanisms.

This option is a policy and/or regulatory change only, with no capital works required. Whole of life cost estimations include consultation, implementation and management.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | This option is a policy and/or regulatory change only with no capital works required. Whole of life cost estimations include consultation, implementation and management. |
| **Overall Contribution** | Moderate | There is no hard evidence to support that the implementation of this option will reduce health expenditure. Rather it will transfer the spend to other practitioners and will improve service levels and provision of service to the public.<br><br>This option will facilitate an increase in the supply of primary care resources and will have a moderate contribution on the percentage of patients treated within a clinically appropriate time. |

## Draft Option - Health and aged care private sector involvement

### Strategic Intervention: Better use, new/expanded assets > Regulatory amendment

**Reference 1.1.4/HAP**

Increase the involvement of the private sector in the provision of health infrastructure through regulatory reform and structured health service delivery planning.

Private sector involvement could range from simply the provision and maintenance of infrastructure through to full health service delivery. Better integration of public and private health services will be required to support this option, so that the patient experiences the health system as one system.

This option is a policy and/or regulatory change only with no capital works required. Whole of life cost estimations include consultation, implementation and management.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | High | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | This option is a policy and/or regulatory change only with no capital works required. Whole of life cost estimations include consultation, implementation and management. |
| **Overall Contribution** | Low | The implementation of this option will not contribute to the reduction in health expenditure per capita in Victoria.<br><br>In terms of impacting waitlist times the provision of private healthcare services has historically not |

| | | |
|---|---|---|
| | | been accessible to those accessing the public system (and subject to waitlists) due to pricing barriers, thus not reducing current waitlist times. If public patients are able to be treated through the private system to make use of available capacity this is expected to have a direct positive impact on reducing waitlist times. There have been studies undertaken in Canada (a similar healthcare system to Australia) that supports the notion that pushing more people to private healthcare won't necessarily reduce waitlist times in the public system. |

## Draft Option - Preventative health care awareness

### Strategic Intervention: Changing behaviour > Influencing behaviour through information

**Reference 1.1.5/PHC**

Invest in technology that supports preventative health, for example remote health monitoring, self-monitoring equipment and electronic patient records.
Increased access to information will allow patients to more proactively manage their own health issues and in turn reduce the number of people needing to access the health system.

This option is a combination of policy and/or regulatory change and capital works through investment in ICT. Whole of life cost estimations include consultation, implementation and management. Due to the varied nature of the possible intervention/s the cost is likely to be highly variable.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $100 million - $500 million | This option is a combination of policy and/or regulatory change and capital works through investment in ICT.<br><br>Whole of life cost estimations include consultation, implementation and management. Due to the varied nature of the possible intervention/s the cost is likely to be highly variable. |
| **Overall Contribution** | Moderate | There is much debate in the area around the costs benefits of spending in the preventative health area to reduce further downstream costs on the health system. Evidence has often been used to provide view to both sides of the argument. Economically though it is generally accepted that a focus on preventative health provides for a more productive society.<br><br>This initiative won't directly impact waiting list times but is likely to have indirect positive impacts by reducing the number of people on waiting lists in the first place. |

## Draft Option - Health care decentralised delivery model

### Strategic Intervention: Number of complementary interventions

**Reference 1.1.7/HCD2**

Adopt a new health care model focused on offering decentralised community based care to better respond to the increased geographic spread of the population and the chronic health issues associated with an ageing population.

This option is a policy and/or regulatory change and also allows for the associated capital costs to provide and maintain purpose built facilities to deliver the new model of care.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | High | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $5 billion - $10 billion | The scope of work required to fully implement a decentralised health model is highly varied dependent on the services to be provided and the capital requirements to repurpose facilities. Based on the capital costs associated with recent hospital developments and redevelopments (Bendigo, Geelong, Royal Children's Hospital) the whole of life costing is estimated in the region of $5-10 billion. |
| **Overall Contribution** | Low | There are many examples where this option has been implemented (or those in transition) within Europe (UK, Finland, Norway, Denmark). The argument for decentralisation is that it creates more agile and more efficient health providers to get better value for money. There are numerous studies which provide positives and negatives to these high level ideas. The cost issues are predominantly around geographic spread and the need to provide services to a population in areas where there isn't critical mass for full provision. On this basis, the implementation of this option won't have a significant impact on reducing net health expenditure per capita but will create a more efficient service provision.<br><br>No direct evidence has been found on the likely impact on waitlist times from decentralised healthcare. |

## Draft Option - Health care smart facilities

### Strategic Intervention: Incremental expansion of existing assets, new greenfield assets > Capacity investment

**Reference 1.1.9/HCS**

Invest in the renewal of health infrastructure to remain fit for purpose and support innovations in technology and models of care.

Demand for public hospitals will continue to increase at a faster rate than funding for additional capacity. As noted in the Travis Review, the best way to sustainably increase the capacity of the health system in Victoria is through innovation, rather than just simply building bigger hospitals

and doing more of the same.

This option is not specific to any one facility but is targeted at the entire health and aged care system portfolio and how renewal of these assets is managed.
The whole of life cost includes the cost to refurbish or expand facilities and maintain the facilities, but excludes the costs of health service delivery.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | High | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion - $5 billion | This option is not specific to any one facility but is targeted at the entire health and aged care system portfolio and how renewal of these assets is managed. Due to the size of this scope it is expected capital and maintenance costs over a 30 year whole of life period will be $1-5 billion. To best manage this cost long term asset management planning is required to be able to foresee when and what type of repurposing of facilities is required. |
| **Overall Contribution** | Moderate | This option will not directly reduce health care expenditure per capita in Victoria but rather change the way in which services are provided.<br><br>Dependent on advancement in technology this may provide the opportunity for more services to be provided outside of today's points of care.<br><br>Evidence shows the increase in utilisation and throughput of patients using the same amount of healthcare infrastructure is achievable via advances in technology and innovation in service provision. This in turn should help achieve a reduction in waitlist times by increasing the throughput of patients within the system. |

## Draft Option - Health infrastructure coordinated planning

### Strategic Intervention: Better use > Coordination processes

**Reference 1.1.10/HIC**

Develop a costed 20 year health infrastructure strategy guided by a systems approach to service planning that responds to forecast population growth and incorporates all components of the health system. The infrastructure strategy would cover:

- public and private systems;
- all levels of care including primary, secondary & tertiary services;
- health, aged care, community health & mental health facilities;
- facilities, high cost medical equipment and clinical ICT systems;
- forecast population change including localised decline and increase and ageing;
- adoption of new models of care and technology.

The option covers the cost of initially developing the strategy and continuing to refresh the strategy on a regular basis. The cost does not include the funding of items identified in the strategy.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $100 million - $500 million | This intervention would involve an improved and streamlined Asset management planning process to be administered. Over a 30 year period the need to coordinate health planning is expected to cost in the region of $200 million in running costs and management. |
| **Overall Contribution** | Low | The implementation of this option would identify operating efficiencies and provide a low contribution to the reduction in total annual health expenditure per capita.<br><br>This will not necessarily directly impact the costs of providing service to patients but will influence the infrastructure costs attributed to providing these services. Similarly this initiative won't directly impact waiting list times but is likely to help with better forecasting and management of the assets and future needs. |

## Draft Option - Health care patient subsidised travel

### Strategic Intervention: Changing behaviour > Economic charging

**Reference 1.1.11/ HCP**

Provide subsidised travel to people in regional communities to enable them to access health services that cannot efficiently be provided in their local community.

The cost of this option allows for the provision of transport utilising existing transport systems including taxis and public transport services.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $100 million - $500 million | Based on the current Victorian Patient Transport Assistance Scheme which is supported by the Victorian Government at a cost of approximately $4 million per annum it is estimated a 30 year whole of life costing for an expanded service will be in the region of $100-$500 million. |
| **Overall Contribution** | Moderate | The implementation of this option would not contribute significantly to the reduction in health expenditure with the cost of subsidising travel being offset by the money saved from reducing the number of services available in rural areas.<br><br>This initiative is unlikely to directly impact waiting list times, although it will have an effect on the percentage of people treated within a clinically appropriate timeframe. Clinically appropriate |

| | | |
|---|---|---|
| | | timeframes are the time within which medical care is provided that is deemed acceptable for a certain ailment; access to appropriate services is a key driver of this. Waiting list times are the time a patient is required to wait to access medical care for an ailment that is deemed non urgent.<br><br>The access to services is heavily impacted on geographic spread of the population in Victoria and the location of where health services are available. Appropriate medical transport (be it by road or air) is required to ensure people in remote regional areas are treated in acceptable timeframes. |

## Draft Option - Health and aged care repurposing of facilities

### Strategic Intervention: Capacity investment > Refurbishment of existing assets

**Reference 1.1.12/HAC**

There is underutilised capacity in existing infrastructure that could be released. This includes the relocation of health service points of care to reflect demand, utilising new or existing facilities and redirecting recurrent funding as required. This option aims to align facilities and funding in locations where there is unmet demand through collaboration, relocation of recurrent funding and in some cases undertaking capital investment to repurpose/make fit for purpose existing infrastructure.

In 2015, the State Government allocated initial funds through the "Beds Rescue fund" to address the problem of unused capacity in Victorian hospitals. This option proposes continuing this work more broadly across the entire health system and continuing to reposition points of care as population demographics alter in the future. The cost includes the cost to refurbish or provide new facilities and maintain the facilities, but excludes the costs of health service delivery.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | High | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion - $5 billion | This option is not specific to any one facility but is targeted at the entire health and aged care system portfolio and how renewal of these assets is managed. Due to the size of this scope it is expected capital and maintenance costs over a 30 year whole of life period will be $1-5 billion. To best manage this cost long term asset management planning is required to be able to foresee when and what type of repurposing of facilities is required. |
| **Overall Contribution** | Moderate | The repurposing of facilities will not directly reduce health care expenditure per capita in Victoria but rather change the way in which services are provided and the throughput of the number of patients in the system.<br><br>Evidence shows the increase in utilisation and throughput of patients using the same amount of healthcare infrastructure due to advances in |

| | | |
|---|---|---|
| | | technology and innovation in service provision.<br><br>Improvement and refurbishment of existing assets will allow for new technologies and relevant points of care to be created in existing infrastructure. By having facilities relevant to today's care requirements there should be a positive impact on waitlist times by improving the throughput of patients in the system. |

## Draft Option - Aged care and mental health investment

### Strategic Intervention: New/expanded assets - Refurbishment of existing assets, incremental expansion of existing assets, new greenfield assets

**Reference 1.1.13/ACM**

Respond to the growing need for residential aged care and mental health facilities by firstly supporting people to remain in their homes and when this is not possible providing new purpose built facilities. The private sector is a significant provider of mental health and aged care residential facilities and it is anticipated that the majority of this infrastructure would be provided by the private sector.

The whole of life cost includes the provision and maintenance of the equipment and facilities, but excludes the costs of health service delivery.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | High | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | > $10 billion | This cost range has been estimated based on existing research which shows that in 2015 it was estimated that by 2031 Victoria will require another 35,370 residential aged care places, requiring an estimated $9 billion of capital investment. Thus over a 30 whole of life costing period the total estimated cost of implementation will exceed $10 billion. |
| **Overall Contribution** | Moderate | Evidence suggests that in the UK, for every £1 spent on such services to support older people, hospitals save £1.20 in spending on emergency beds indicating a reduction in total real annual health expenditure.<br><br>Adequate investment in aged care (and the ability for medical service to be delivered in care) and mental health facilities will help to reduce the burden on the overall hospital system for treating aged care patients having a positive impact on use of resources and wait time required to access care. |

## Draft Need 1C: Provide access to high quality school facilities

Demand for new schools is predominantly driven by population growth. This is particularly acute in the growth areas with the Victorian Government identifying a need for over 50 new schools in the next five to six years across the government and non-government school sectors.

While independent and Catholic schools may relieve some of the pressure, there will still be significant pressure on government to meet this demand. More generally, population growth as a whole is expected to be a major driver of asset investment in the education sector for at least the next 15-20 years. This demand challenge, however, is not evenly spread.

A decline in enrolments and oversupply in some areas have led to spare capacity, particularly in regional areas. There are also major shifts underway – digital technology is increasingly incorporated into the classroom. Victorians will also likely see a shift over the next 30 years towards lifelong learning and tailored curriculums (through data analytics) being driven by a global education marketplace.

### Metrics

Metric 1 – Reduction in the supply and demand mismatch (gap) of public school places by local government area (DET).

### Options

The table below lists the options considered for this Draft Need

| Reference Number | Option Name |
|---|---|
| 1.2.1 | School out of zone enrolment |
| 1.2.3 | School shortages |
| 1.2.4 | Schools with low performance |
| 1.2.6 | School campus utilisation |
| 1.2.7 | School resource sharing through technology |
| 1.2.8 | School regional level maintenance contracts |
| 1.2.9 | School sector-wide planning information |
| 1.2.10 | School infrastructure funding certainty |

The graph on the following page plots each option's Contribution verses Cost


**Figure 3: Need 1C matrix**

## Draft Option - School out of zone enrolment

### Strategic Intervention: Better use > Public Service delivery and approval processes

**Reference 1.2.1/SOO**

Current government legislation "School of Choice" makes it difficult for the Department of Education and Training network to be flexible to localised demand spikes and perceived difference in quality of schools.

A review of the legislation, policy and enforcement of school zone boundaries will assist managing capacity and planning issues. There is a need for a more rigorous process to define zones.

Sometimes when schools are located near to a perceived “high performing” school adjacent schools can have spare capacity for additional students but they are not perceived as a school of choice. Where zoning is not relevant some school demand could be improved through the provision of better information about local school performance. This would enable parents to make a more informed choice and to potentially improve enrolments in schools that have capacity for additional students.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | This option is a policy change only with no capital works required. Whole of life cost estimations include consultation, implementation and management. |
| **Overall Contribution** | Moderate | The implementation of this option with its resultant assertion of control over the public school system enrolment process will assist with the management of capacity. |

## Draft Option - School shortages

### Strategic Intervention: Number of complementary interventions

**Reference 1.2.3/SSS**

Department of Education and Training (DET) must ensure that every school aged student can access a school. Population growth will mean existing schools will need to accommodate additional students and new schools will need to be built. DET has relatively sophisticated forecasting tools for demand modelling.

It is challenging task to deliver schools in a timely way, sometimes existing schools are overcrowded. This option identifies potential changes in the way schools are planned and delivered that could achieve efficiencies and savings, including:

- purchase of smaller school sites
- constructing vertical models
- vertical portable relocated classrooms for use in periods of peak enrolments
- more shared planning, and use of community infrastructure such as integrated sports fields and other Council facilities on schools sites
- sharing the cost of building and maintenance
- involvement of the private sector through public private partnerships (PPPs).

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion - $5 billion | This option is a combination of policy and capital works. The policy changes with regard to updated school design requirements would have a minimal implementation cost. To deliver the estimated 50 schools required would have an estimated capital cost of acquisition of land at $15 million per site multiplied by 50 schools of $750 million. Adding in capital and overheads for infrastructure delivery of $25 million per school and overheads $5 million adds another $30 million per school or $1.5 billion for the estimated 50 schools. Thus total implementation costs for capital outlay is in the order of $2.25 billion plus ongoing operational costs placing it in the range of $1-5 billion. |
| **Overall Contribution** | Significant | Delivering new schools and targeting growth corridors would have a significant contribution to the metric. The flexibility of facilities to accommodate other uses will also contribute to the reduction of excess school facilities. |

## Draft Option - Schools with low performance

### Strategic Intervention: Better use > Public Service delivery and approval processes

**Reference 1.2.4/SLP**

Continued Department level intervention to improve the desirability of low performing Victorian government schools, through such ongoing programs as, the School Improvement Framework.

If neighbouring school is high quality and in high demand, implementation of local region campus/precinct approach to lift entire precinct to higher performance level by learning from high performing school (Hub and spoke style). In turn this would improve the ability of the network to meet demand by reducing the demand on high performing schools and reduce excess space.

Delivery of secondary infrastructure opportunities in order to share resources, teaching, and sports facilities under a campus/precinct approach.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | As this option will be focussed on specific low performing schools in areas where significant improvement can be made it is expected to be achievable with a whole of life costing of less than $100 million.<br><br>This assumes 30-40 schools identified with the programme implemented initially at a cost of approximately $500,000 per school with ongoing support over the life of the program. |

| | | |
|---|---|---|
| **Overall Contribution** | Moderate | The implementation of this option will help to spread demand and facilitate improved utilisation of existing permanent assets. This in turn would reduce capacity pressure on high performing schools. |

## Draft Option - School campus utilisation

**Strategic Intervention: Better use > Public Service delivery and approval processes**

**Better use > Industrial relations**

**Reference 1.2.6/SCU1**

Stagger the delivery of streams of education within the same asset (i.e. different start and finish times). This policy could be immediately rolled out to areas where demand exceeds supply and no additional relocatable buildings can be accommodated. Minor infrastructure refurbishment anticipated to accommodate policy change.

Policy can also be rolled out to schools where relocatable buildings are affected due to demand pressures. It is not anticipated that this policy is rolled out across entire network, but planning for inter-school events will need to be carefully considered.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $100 million - $500 million | The costing of this option is based on the upgrade of facilities and additional maintenance costs for increased utilisation. This is estimated at $0.25 million upfront capital costs and $0.1 million per school ongoing maintenance and operational costs. Based on a Phase 1 rollout in the Western Melbourne & North Eastern Melbourne regions it provides a whole of life costing over a 30 year period of approximately $400 million. |
| **Overall Contribution** | Low | The implementation of this option will contribute to the mismatch in supply and demand with schools doubling service provision without substantial infrastructure investment. The uptake of this option though would be limited by the alignment between working hours for parents and students and access to public transport particularly in the regions. |

## Draft Option - School resource sharing through technology

**Strategic Intervention: Number of complementary interventions**

**Reference 1.2.7/SRS**

Utilising technology changes to give students access to greater choice of subjects (i.e. Specialist Maths) by sharing resources and curriculum across schools.

This policy can be rolled out across the school network, including collaboration with Catholic and independent assets. A strong focus to be placed on regional schools, in particular those with low enrolment numbers

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $500 million - $1 billion | This option will require a capital injection to fund ICT infrastructure in Non-Government Schools with the requirement of resourcing sharing to be implemented statewide. Based on capital requirements and the implementation and management of the policy change it is estimated the whole of life 30 year cost range will be $500 million-$1 billion. The whole of life cost includes IT upgrades for students in remote locations. |
| **Overall Contribution** | Significant | This option would facilitate increases in the supply of public school places by local government area due to the removal of spatial restrictions. |

## Draft Option - School regional level maintenance contracts

**Strategic Intervention: Better use > Coordination processes, contractual processes**

**Changing behaviour > Influencing behaviour through information**

**Reference 1.2.8/SRM1**

Devolve management for regional maintenance and cleaning contracts to individual schools. Schools would be encouraged to work together at a regional level to find value-for-money in these contracts.

Under the devolved model, individual schools engage in maintenance and cleaning contracts. Economies of scale could be employed at a region level to have tighter control over these costs. Procurement practices will be led by Department, but work/contract package boundaries negotiated on a regional and local level facilitated by the Department.

The department to provide oversight and guidance to efficient procurement and best practices across the sector.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | > $10 billion | The 30 year whole of life costing for this option is based on an annual maintenance spend of 2% of Asset Replacement Value (ARV) = $270 million (2015). Multiplying this out using 3% over 30 years gives a totally costing in the range of $12 billion.<br><br>It should be noted, Government currently funds 0.7% of ARV and the high whole of life costs for this option are associated with funding maintenance at industry benchmarks (2% of ARV). |
| **Overall Contribution** | Low | Improving maintenance standards and increasing funding to service the contract will improve overall asset health but will not increase/decrease the capacity of the portfolio. The improvement of asset health may attract additional students that have chosen not to attend a school based on the |

| | | |
|---|---|---|
| | | facilities but the likeliness of this occurring is not certain. |

## Draft Option - School sector-wide planning information

### Strategic Intervention: Number of complementary interventions

**Reference 1.2.9/SSW**

The ability to effectively plan new infrastructure is hampered by the limited information available on private sector assets. Regulation providing access to these records would allow a more holistic view to be undertaken.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | This option is a policy change only with no capital works required. Whole of life cost estimations include consultation, implementation and management. |
| **Overall Contribution** | Low | The implementation of this option this would not alter the market share from current levels. |

## Draft Option - School infrastructure funding certainty

### Strategic Intervention: Better use > Funding Agreements

**Reference 1.2.10/SIF**

Deliver effective long term capital and maintenance funding for schools by removing school maintenance expenditure from short term budget cycles. This would allow for long term maintenance contracts to be established.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | For the implementation of this option existing information from DET commissioned PricewaterhouseCoopers reports indicate maintenance and capital funding at 4% of ARV over 30 years exceeds $10 billion. The actual implementation cost of this option is low |
| **Overall Contribution** | Moderate | This option has potential to drive moderate contribution to meeting the need. As planning information for new schools already exists it would be a very low cost option to require this to be published, and this would likely remove ad hoc decision making about investment in schools to some degree. |

# Draft Objective 2 - Support healthy, safe and vibrant communities

## Draft Need 2A: Enable physical activity through infrastructure and urban design

Obesity and physical inactivity play a significant role in the incidence of chronic disease in Victoria. Unaddressed, these risk factors will pose a significant drain on Victoria's health system over the next 30 years along with the other costs associated with poorer productivity and wellbeing.

Infrastructure is one way to encourage greater levels of activity and participation. This includes cycling paths, sporting facilities and open spaces for walking and exercise. Community design can also play an important role, in part through proximity of housing to services. A particular challenge is the health and wellbeing of Victorian children. Some key indicators show that children are walking to school less and being driven more. In 2013, approximately half of all Victorian children aged 5–12 were always driven to school. Only one in four children in school years 5, 8 and 11 met the recommended amount of physical activity on all days of the week, with children in rural areas more likely to meet guidelines than children in metropolitan areas.

### Metrics

Metric 1 – Increase in the percentage of adult population engaged in adequate physical exercise (Surveys of the Victorian population undertaken by DHHS and other representative organisations).
Metric 2 - Increase in the percentage of child population engaged in adequate physical exercise (Surveys of the Victorian population undertaken by DHHS and other representative organisations).

### Options

The table below lists the options considered for this Draft Need

| Reference Number | Option Name |
|---|---|
| 2.4.1 | Active lifestyle infrastructure regulation |
| 2.4.2 | Active lifestyle infrastructure provision |
| 2.4.3 | Bicycle and walking path separation |
| 2.4.4 | Bicycle and walking path expansion and improvement |
| 2.4.5 | Bicycle and walking path data capture |
| 1.3.4 | Online liveability infrastructure platform |
| 2.4.7 | Integrated shared use community and recreation facilities |
| 2.4.8 | Bicycle and vehicle accident fault allocation |

The graph on the following page plots each option's Contribution verses Cost.


**Figure 4: Need 2A matrix**

## Draft Option - Active lifestyle infrastructure regulation

### Strategic Intervention: Changing behaviour > Land use and planning controls

**Reference 2.4.1/ALR**

Planning regulation changes to require the principles of 'active design' in new communities, incorporated through the stipulation of minimum requirements (and existing community retrofit where possible). This would be particularly through the provision of cycle way, parks and pedestrian infrastructure.

Regulations should require the creation of happy and healthy communities which enable and promote active lifestyles. This planning regulation could be based on provisions in the Heart Foundation "Healthy Space & Places" provision, or the "Creating heart healthy communities".

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | This option is a policy change only with no capital works required. Whole of life cost estimations include consultation, implementation and management. |
| **Overall Contribution** | Moderate | Statistics gained from places which have implemented active design such as NYC and major centres in Europe provide a direct link to an increase in active lifestyle in areas where people are able to walk/ride to access services. |

## Draft Option - Active lifestyle infrastructure provision

### Strategic Intervention: Better use > Refurbishment of existing assets

### New/expanded assets > Incremental expansion of existing assets

**Reference 2.4.2/ALP**

Making improvements to the amenity/attractiveness and activation of public spaces to improve opportunities for walking and cycling. This would include:

- Bicycle and equipment lockers at all metro and major regional train stations
- Locker rooms and shower facilities at convenient locations through the city and suburbs (Fitzroy, South Yarra, employment centres etc.) to encourage cycle or walking transportation
- Include bicycle racks on trams and buses
- Infrastructure that supports exercising- including public toilets, weather protection, water bubblers etc.

This would be based on setting new statewide standards and rolling them out across the State.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | High | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $100 million - $500 million | This option has a wide and varied scope for the injection of capital funds in to a variety of different projects. The estimated whole of life cost range has been drawn from existing projects such as the |

| | | |
|---|---|---|
| | | construction of 'Parkiteer' bike cages at a cost of approximately $100,000 per facility holding 26 bikes, currently 84 facilities exist in Victoria. Based on this figure full implementation to the whole train network in Victoria and construction, development and maintenance of new parkiteer facilities as well as proposed associated change room facilities are estimated to cost in the region of $70-$80 million over a 30 year time frame.<br><br>Further urban development of public spaces, etc. is expected to push the whole of cost range >$100 million. An example of funding for these initiatives is the NYC Department of Transport which allocates 1% of its annual budget to the public plazas programme, approximately USD$7 million per annum to create new public spaces from disused land and road space. |
| **Overall Contribution** | Moderate | The provision of secure places for the public to store their bikes will have a moderate contribution to increasing physical exercise levels. |

## Draft Option - Bicycle and walking path separation

### Strategic Intervention: Better use > Refurbishment of existing assets

**Reference 2.4.3/BWP3**

Alter existing road, bike and walkway infrastructure to separate bicycle and pedestrian usage. In some places this may require widening of paths or provision of additional footpath or bikeway infrastructure. Research suggests that infrastructure that provides some level of separation from other users (pedestrian/car) would make cycling safer and attract additional users to regular cycling ("the next 10%").

This option would prioritise, in the first instance, to facilitate improved access to employment centres and the central city.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | High | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion - $5 billion | The estimated cost range has been determined by assuming 50% of the current 2000km of roads in metropolitan Melbourne where VicRoads and local government make provision for cycling are to be separated. Based on an approximate cost of $1 million per km the overall 30 year cost to implement will be in excess of $1 billion.<br><br>This cost estimation is reinforced by recent on road separation projects such as the estimated cost of 5km of separated bike lanes on St Kilda Road coming in at $12 million and separated bike lanes were installed at a cost of $2.4 million on La Trobe Street from Spencer St to Victoria St (approximately 2km). Infrastructure Australia has also determined that constructing the Inner Sydney Regional Bike Network consisting of 284 |

| | | |
|---|---|---|
| | | kilometres would cost $185 million in 2013 dollars. |
| **Overall Contribution** | Moderate | Evidence suggests the implementation of this option significantly contributes to the percentage of the population engaged in physical exercise. This is largely attributed to the provision of safe infrastructure. |

## Draft Option - Bicycle and walking path expansion and improvement

### Strategic Intervention: New/expanded assets > Incremental expansion of existing assets

**Reference 2.4.4/BWP2**

Expansion of the biking and walking paths network particularly where there are missing links to increase opportunities for active transport. There are many areas in Melbourne which do not have footpaths. These should be prioritised and developed. Possible creation of new bike and pedestrian paths through new level crossing project which includes fixed bike lanes could expand bike ways through dedicated on road bicycle priory lanes although separated bike ways are preferable. Improvements to the surfaces of bike paths and walkways also delivered. Deliver based on a strategic assessment "missing links" in the network.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | High | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $500 million - $1 billion | The cost of implementing this option is through a focus on the completion of the Principal Bicycle Network in Melbourne in its current form as refreshed in 2012 and also on Bicycle Priority Routes.<br><br>Infrastructure Australia determined the Inner Sydney Regional Bike Network consisting of 284 kilometres would cost $185 million in 2013 dollars. Based on a similar (but slightly larger) network size the total capital cost is expected to be in the region of $300-$400 million. The most recent capital injection to cycling infrastructure in Victoria was $70 million to create more than 10 kilometres of new trails, bridges, separated lanes and other improvements. |
| **Overall Contribution** | Moderate | Similar to 2.4.3 studies have proven that the increase in available infrastructure influences the take up of cycling and walking, improving levels of physical exercise that may not have been undertaken otherwise. |

## Draft Option - Bicycle and walking path data capture

### Strategic Intervention: Better use > Technology innovations

**Reference 2.4.5/BWP1**

Realise better asset investment and maintenance decisions based on usage information. VicRoads currently has 32 fixed bicycle loop counters enabling them to monitor various cycling routes in Melbourne and surrounds. This data enables trends to be observed and seasonal changes in patronage.

It is recognised though that the collection of data will help to influence the allocation of funding bicycle and walking paths in areas where it will have the most benefit in meeting these metrics i.e. it will have an indirect affect through the implementation of other options.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | There is currently a number of means in which data on cyclists and pedestrians is captured, through fixed loops, census' and surveys and physical road side counts. It is acknowledged that none of these methods capture the true volume of people using these methods of transport as they are very location and time of day specific.<br><br>The cost range for this option has been determined based on an increase in current data collection methods and the implementation of future technologies for data capture such as connecting on a more real time basis with people who use cycling and walking as a primary form of travel. |
| **Overall Contribution** | Low | This intervention has been assessed as low against both metrics as collection of data won't directly influence an increased percentage of the population being engaged in exercise. Collection of data in itself won't increase the percentage of adults and children engaged in exercise; hence the direct contribution is deemed as low.<br><br>It is recognised though that the collection of data will help to influence the allocation of funding to areas where it will have the most benefit in meeting these metrics i.e. it will have an indirect affect through the implementation of other options.<br><br>There is currently a cycling census undertaken by Bicycle Victoria which is used to influence spending on key bicycle routes.<br><br>VicRoads currently has 32 fixed bicycle loop counters enabling them to monitor various cycling routes in Melbourne and surrounds. This data enables trends to be observed and seasonal changes in patronage. |

## Draft Option - Online liveability infrastructure platform

### Strategic Intervention: Changing behaviour > Influencing behaviour through information

**Reference 1.3.4/OLI**

Deliver an online platform that provides residents and visitors to Victoria a listing of recreational spaces, libraries, social infrastructure and health facilities. Include information regarding cycle paths, walkways, organised sport events, ability to transport bicycles via the train network, and so forth, is likely to encourage additional usage. The platform would link with public transport

websites to identify mode and journey options. There is an opportunity to make key linkages to transport infrastructure part of the platform.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | Due to the broad range of information already generally being available through council websites and local tourism authorities the main costs associated with this initiative would be the creation of a single point of reference (website) and advertising to get penetration in the market thus the expected cost estimation for implementation is less than $100 million. |
| **Overall Contribution** | Low | The accessibility and ease of use for information regarding services available will influence the use of those services.<br><br>Though it is still deemed that the online initiative alone will not materially increase the percentage of the population (adult or child) engaged in physical exercise. |

## Draft Option - Integrated shared use community and recreation facilities

### Strategic Intervention: Better use > Coordination processes

**Reference 2.4.7/RFC**

This option would improve coordination and governance processes to drive integrated facilities for arts, sporting and recreation activities in multi-purpose, shared-use facilities.

There is need for state and local government to work collaboratively to develop integrated facilities that deliver more efficient outcomes for the community. The focus would be, for example, to improve access and shared use school facilities, sports facilities, community arts and other community facilities. The redevelopment of North Melbourne's sporting and recreation centre in Arden Street provides an example of how this can be done successfully. This example demonstrates how elite sport, community recreation facilities and services to support the pathways to work for disadvantaged young people can all be delivered through one integrated facility.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $500 million - $1 billion | Co-location policies have been in place within Victoria as part of the DET's development guidelines for 5+ years. This option looks at further developing the co-location of facilities not just within schools but also other community facilities.<br><br>The estimated cost range is dependent on the number of facilities to be constructed over a 30 year timeframe which will be dependent on the scope of co-location required and the population to be serviced. Based on existing similar projects |

| | | |
|---|---|---|
| | | the estimated cost to build an indoor swimming pool facility is in the region of $1.2-$1.5 million, similarly for an individual gymnasium facility. On a larger scale a recent example of this policy at work was the redevelopment of the North Melbourne Recreation Centre which was done at a cost of $16 million. This facility is managed by the City of Melbourne and has a number of tenants including the North Melbourne Football Club (AFL), Fencing Victoria and health facilities open to public use.<br><br>If 100 of these facilities (pools/gyms, etc. mixed between schools and other community centres) were to be built within Victoria over a 30 year period including maintenance and operational costs the total capital cost is estimated in the $500 million to $1 billion range. |
| **Overall Contribution** | Moderate | By making use of the co-location of facilities it would increase the access possibilities for people to modern day facilities and encourage use where otherwise there may have been barriers preventing people from undertaking physical exercise due to a lack of access to appropriate facilities.<br><br>The redevelopment of the North Melbourne Recreation Centre is a prime example of this approach in action. |

## Draft Option - Bicycle and vehicle accident fault allocation

### Strategic Intervention: Changing behaviour > Safety and environmental standards

**Reference 2.4.8/BVA**

Change current regulations and legislation to that similar in a number of European countries where drivers/vehicles are assumed to be at fault in all accidents with bicycles unless fault can be proved otherwise. The changes would put the emphasis on the drivers of vehicles and be clearer on their responsibilities.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | This option is a policy change only with no capital works required. Whole of life cost estimations include consultation, implementation and management. |
| **Overall Contribution** | Low | Studies have revealed that the 'perception' of safety definitely has an impact on the take up of cycling. The implementation of regulation change is therefore expected to have some effect on the take up of cycling by adults and increased exercise levels. |

| | | |
|---|---|---|
| | | There is some myth associated with the strict liability in the Netherlands (and other European countries); the driver isn't always at fault. Rather needs to provide proof that they did not cause the accident. The responsibility is on the driver to prove they are innocent with a presumption of cause in the case of an accident. |

## Draft Need 2B: Provide good public spaces where communities can come together

With many people living in, or moving to, denser, inner Melbourne suburbs quality public spaces has been recognised as central to the wellbeing of our communities. However, as Victoria's population grows over the next 30 years, access to these spaces will come under pressure. In particular, generally across Melbourne available open spaces like parks are shrinking with population growth. In contrast, some areas in regional Victoria have public spaces, such as community halls that are no longer fit for purpose due to inadequate maintenance or inaccessibility.

Public spaces are important for a number of reasons such as fostering social cohesion (understood as willingness of people to socialise and engage around common interests). These spaces also provide opportunity to exercise or participate in sports or recreational activities, while providing environmental benefits such as supporting biodiversity. For these reasons it is appropriate to consider it public infrastructure. The levels of social cohesion varies across Victoria – as a proxy, the percentage of (adult) population who participated in citizen engagement activities was 47.5 per cent in metropolitan Melbourne compared to 58.9 per cent in regional areas.

### Metrics

Metric 1 – Increase in the proportion of a LGA classified as an open, civic or public space, % of total area of LGA.
Metric 2 - Increase in the use of open, civic or public space.

### Options

The table below lists the options considered for this Draft Need

| Reference Number | Option Name |
|---|---|
| 1.3.4 | Online liveability infrastructure platform |
| 2.5.1 | Community space statewide event planning |
| 2.5.2 | Community and public space utilisation regulation |
| 2.5.5 | Community space refurbishment or rationalisation |
| 2.5.6 | Community space shared use agreements |
| 2.5.7 | Community space financial planning |

The graph on the following page plots each option's Contribution verses Cost.

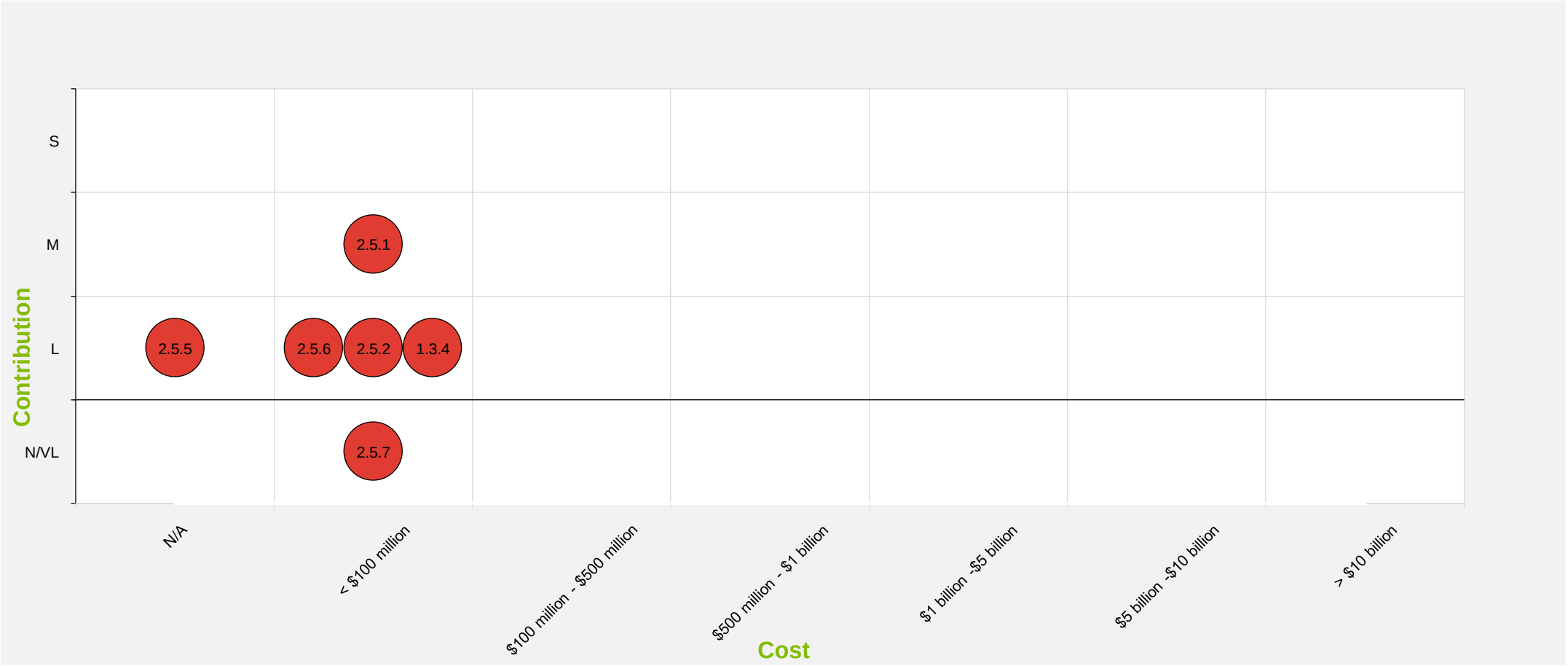



**Figure 5: Need 2B matrix**

## Draft Option - Online liveability infrastructure platform

### Strategic Intervention: Changing behaviour > Influencing behaviour through information

**Reference 1.3.4/OLI**

This option involves the delivery of an online platform that provides residents and visitors to Victoria a listing of recreational spaces, libraries, social infrastructure and health facilities. It would include information regarding cycle paths, walkways, organised sport events, ability to transport bicycles via the train network, and so forth, and is likely to encourage additional usage of these services. The platform would link with existing public transport websites to identify mode and journey options. There is an opportunity to make key linkages to transport infrastructure part of the platform.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | Due to the broad range of information already generally being available through council websites and local tourism authorities the main costs associated with this initiative would be the creation of a single point of reference (website) and advertising to get penetration in the market thus the expected cost estimation for implementation is less than $100 million. |
| **Overall Contribution** | Low | This option will not impact the proportion of an LGA classified as open, civic or public space. However, it may increase the utilisation of public spaces through highlighting available facilities and methods of accessing them. |

## Draft Option - Community space statewide event planning

### Strategic Intervention: Changing behaviour > Influencing behaviour through information

**Reference 2.5.1/CSS2**

There are many community and public spaces across Victoria, which could be better utilised. This options proposes the development of a local annual community activities calendar for public spaces, ensuring the events align with the needs and demographic of the local areas residents.

For example, some LGAs have older age profiles, while others are experiencing a mini-baby boom. While it should be acknowledged many local councils do this already as a part of their ongoing operation, this option is about making this approach systematic across all Victorian councils.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | This option is a policy/regulation change only with no capital works required. Whole of life cost estimations include consultation, implementation and management. |
| **Overall Contribution** | Moderate | The implementation of this option will not increase the volume of open, civic or public space available, but it will ensure that existing public |

| | | |
|---|---|---|
| | | space is better utilised. It is contended that greater transparency over the availability of public space will assist in boosting utilisation rates, by encouraging local communities and businesses to leverage existing assets. |

## Draft Option - Community and public space utilisation regulation

**Strategic Intervention: Better use > Land use planning and controls**

**Reference 2.5.2/CSU**

This option seeks to improve the utilisation of community or public spaces through both financial and planning regulations. The program would target existing underutilised public spaces and seek to increase their use through changes to standardise and streamline permit process to allow for:

- installation of community infrastructure;
- hosting/programming activities and events; or
- use by not-for profits.

This would include the identification of underutilised spaces, which could be used for community or informal active recreation spaces. For example freeway under crofts refurbished as skate parks or vacant upper level floor spaces for delivery of community services. Better use of public and community spaces has an added benefit of activating underutilised spaces and reducing opportunity for anti-social behaviour.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | This option is a policy/regulation change only with no capital works required. Whole of life cost estimations include consultation, implementation and management. |
| **Overall Contribution** | Low | The current approvals permit process for using public spaces for events and activities is highly fragmented, varying across local councils. Depending on the scope of the regulatory change, the implementation of this option may increase the proportion of an LGA that could be classified as an open, civic or public space. The utilisation of public space may also be increased through streamlining of the approvals process across councils. |

## Draft Option - Community space refurbishment or rationalisation

**Strategic Intervention: Better use > Refurbishment of existing assets**
**New/expanded assets > Incremental expansion of existing assets**

**Reference 2.5.5/CSR**

Many existing community facilities are no longer fit for purpose, or meeting community expectation. This option proposes a refurbishment or rationalisation of public community spaces across Victoria which are no longer fit-for-purpose or meeting community need.

Targeted investment would be based on assessment of existing spaces comparing utilisation levels with the standard of the facilities to best meet community needs.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | N/A | The cost of this initiative will be highly dependent on the accessibility and quality of existing local council data, the volume and type of assets to be refurbished and the extent of refurbishment required. |
| **Overall Contribution** | Low | This option will not increase the volume of space classified as public space. However, it may increase the proportion of public space used, depending on the existing condition and utilisation levels. |

## Draft Option - Community space shared use agreements

### Strategic Intervention: Better use > Coordination processes

**Reference 2.5.6/CSS1**

This option is about improved resources and governance processes to enable the establishment of standardised shared-use agreements between different agencies and associations across Victoria to share community spaces and facilities. This option would operate similarly to shared-use agreements for school facilities, but would be expanded to encompass recreation, sporting, community arts and community infrastructure.

While the existing agreements are predominantly held by school principals, it is envisaged these could be between different councils, service providers, not –for -profits and associations. Shared use agreements are most successful when the governance for new or refurbished facilities is established early to jointly plan and design for integrated shared use. This can be supported by experienced brokers who can facilitate these agreements.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | This option is a policy/regulation change only with no capital works required. Whole of life cost estimations include consultation, implementation and management. |
| **Overall Contribution** | Low | This option will not increase the proportion of an LGA classified as open, civic or public space. However, it may improve the utilisation of existing assets by encouraging further use during current periods of low demand.<br><br>Take-up of this option remains dependent on the asset's owning entities, whom currently have the option of sub-leasing / implementing shared use arrangements of assets e.g. various entities, such as schools, currently make their assets available to various community organisations through individually negotiated agreements. Incentives may be required to increase the volume of space made available for public use. |

## Draft Option - Community space financial planning

### Strategic Intervention: Better use > Coordination processes, contractual processes

**Reference 2.5.7/CSF**

Provide best-practice guidance to local government on public space and facility cost planning, specifically in reference to linking capital expenditure and operating expenditure, thereby improving the cost-recovery of ongoing asset operation.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | A review of public space and facility cost planning should be commissioned to inform a suite of best practice guidelines that will assist councils to assess the level of capital expenditure that should be invested into an initiative based on estimated ongoing operating expenditure levels. |
| **Overall Contribution** | Negative/very low | The implementation of this option is unlikely to alter the volume of open, civic or public space in the short term. It may even decrease the volume of new infrastructure developed over the medium to long term as it will encourage councils to reconsider the costs associated with infrastructure development. |

## Draft Need 2C: Strengthen access to cultural infrastructure

Access to museums, galleries and other cultural infrastructure is an important part of the success of Victoria, and particularly Melbourne's much-valued liveability. Victoria has a diverse offering of major events throughout the year, with Melbourne recognised as the cultural capital of Australia.

Victoria's regional cities have developed rich cultural offerings, with Bendigo Art Gallery one of the standouts. While individual assets may not be considered large, when viewed as a network their coverage is significant. There is also a broad range of cultural facilities that supports local communities– including the performing arts. The location of these facilities and the level of engagement with the community and visitors are important considerations.

Access to arts, other cultural facilities and major events plays an important role in contributing to a sense of community, as well as stimulating tourism. The state's cultural venues represent a significant tourism asset, with ten million visitors attending Victoria's state-owned arts and culture institutions. These facilities and associated events can foster creativeness, which is a key enabler in transitioning to a services-based economy.

### Metrics

Metric 1 – Increase in the percentage of Victorians attending a cultural venue or digital cultural experience/event per annum.
Metric 2 - Increase in the percentage of interstate and international visitors attending a cultural venue or event per annum.

### Options

The table below lists the options considered for this Draft Need

| Reference Number | Option Name |
|---|---|
| 2.7.1 | Cultural experience digital platform |
| 2.7.2 | Cultural programme statewide coordination |
| 2.7.3 | Cultural artefact acceptance policies |
| 2.7.8 | Cultural collection storage |
| 2.7.5 | Cultural venue utilisation regulation |
| 2.7.6 | Cultural venue pricing regime |
| 2.7.7 | Melbourne Cultural precinct connectivity |
| 2.7.9 | Contemporary art gallery of Victoria |

The graph on the following page plots each option's Contribution verses Cost.

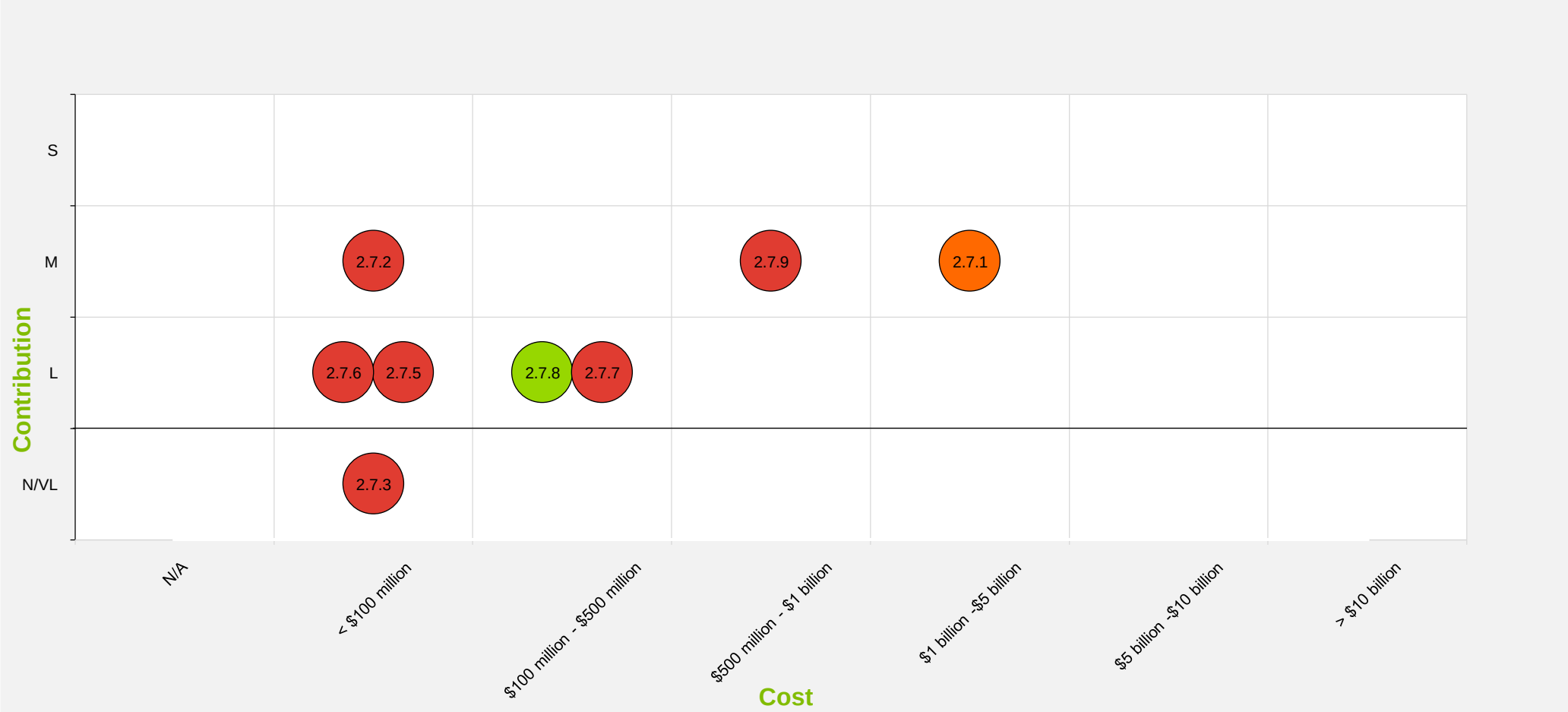



**Figure 6: Need 2C matrix**

## Draft Option - Cultural experience digital platform

### Strategic Intervention: Changing behaviour > Technological innovation

**Reference 2.7.1/CED**

Create a digital platform, used by all state government cultural venues, to broaden local and visitor access to Victoria's State Collection, cultural exhibitions and events, removing geographic location as a barrier.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion -$5 billion | The cost to digitise collections is impacted by a range of factors including volume, format, equipment used and the quality of desired outputs. Digitisation requires a financial investment, from the initial scanning of the art work to the ongoing digital image storage costs.<br><br>The above cost estimate is based on an extrapolation of the proportion of Victoria's collection still to be digitised based on figures released by the Victorian Auditor-General's Office in 2012. Cost estimates are based on a report released by the Collections Trust in 2010 which broke down costs by item type.<br><br>However, it is important to note that this is a base cost estimate only. There are an increasing number of ways to digitise cultural collections including the creation of virtual galleries and the generation of various methods of interacting with the artwork itself. |
| **Overall Contribution** | Moderate | Victorian Auditor-General's Office's review of Victoria's collection management practices highlighted the importance of digitising Victoria's cultural collections to make them more accessible via online channels.<br><br>The implementation of this option will increase the accessibility of art collections in Victoria and in turn the number of digital visitors will increase. |

## Draft Option - Cultural programme statewide coordination

### Strategic Intervention: Better use > Coordination processes

**Reference 2.7.2/CPS2**

Entities to coordinate Victorian cultural event programming between Melbourne and regional cultural venues - creating a complementary and consistent experience of Victoria.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |

| | | |
|---|---|---|
| **Whole of Life Cost Range** | < $100 million | It is assumed that an existing body, such as Creative Victoria, would undertake to coordinate across metropolitan and regional cultural peak bodies, as well as State tourism peak bodies to create a coordinated cultural program across the state that also supports Victoria's broader strategy to increase tourism to the State. A small increase in FTE may be required to support this function.<br><br>This option is a policy/regulation change only with no capital works required. Whole of life cost estimations include consultation, implementation and management. |
| **Overall Contribution** | Moderate | Through its Creative Industries Taskforce Report, Creative Victoria has identified the importance of developing a comprehensive cultural tourism attraction campaign and information pack to showcase the breadth of, and encourage visitation to, cultural attractions across the state. This will act to both advertise the State as a travel destination of choice and to increase awareness of events occurring across the State, particularly across Regional Victoria.<br><br>The benefits of strengthening the coordination function across metropolitan and regional Victoria to strengthen the State's service offering is recognised across a number of sectors, particularly tourism. In its report, Unlocking Victorian Tourism: An Inquiry into Victoria's tourism industry, the Victorian Competition and Efficiency Commission (2011) noted that 'poor cooperation and coordination...can constrain Victoria's tourism destinations from realising their full potential...the quality of cooperative structures and cultures are important for tourism destinations to develop and meet growing competition'. This 'total experience' creates a competitive advantage. |

## Draft Option - Cultural artefact acceptance policies

### Strategic Intervention: Better use > Coordination processes

**Reference 2.7.3/CAA**

Acceptance of cultural artefacts via bequest to be considered in line with future storage requirements.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | This assumes that a review of galleries acceptance policies is undertaken and that a policy is proposed. This would be rolled out by entities at their own cost. |

| | | |
|---|---|---|
| | | This option is a policy/regulation change only with no capital works required. Whole of life cost estimations include consultation, implementation and management. |
| **Overall Contribution** | Negative/very low | Whilst the implementation of this option is likely to ease storage capacity constraints, it is unlikely to impact visitor numbers to Victoria's galleries. |

## Draft Option - Cultural collection storage

### Strategic Intervention: New/expanded assets > Incremental expansion of existing assets

**Reference 2.7.8/CCS**

Expand storage capacity of the State's Cultural Collection to accommodate increase in cultural artefacts and works and meet ongoing occupational and safety requirements.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | High | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $100 million - $500 million | Based on Collections Storage Victoria's 2014 Business Case Submission to Arts Victoria the estimated total cost of its preferred storage option equated to $215.5 million. Therefore, an alternative storage model proposed should not exceed this. |
| **Overall Contribution** | Low | Storage capacity indirectly impacts on Victorian galleries' ability to attract visitors by limiting their ability to acquire new works or to correctly store and preserve their current collections. The implementation of this option doesn't directly contribute to the assessment metrics but storage space (or lack of it) impacts on a galleries ability to appropriately procure and store art work. |

## Draft Option - Cultural venue utilisation regulation

### Strategic Intervention: Better use > Land use planning and controls

**Reference 2.7.5/CVU**

Increase the usage of public spaces for exhibitions or cultural collections, increasing the number of cultural collections that can be showcased outside of the gallery environment to increase access and viewing.

In some aspects this may be regulatory amendments, but in others it can relate to finding opportunities where spaces can be reconfigured as exhibition spaces.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |

| | | |
|---|---|---|
| **Whole of Life Cost Range** | < $100 million | It is assumed that a review of current permit approvals processes will be commissioned and that a revised permit approvals process will be developed. It is expected that councils implement the revised process and any capital expenditure costs for reconfiguration at their own cost.<br><br>Whole of life cost estimations include consultation, implementation and management. |
| **Overall Contribution** | Low | The current approvals permit process for using public spaces for events and activities is highly fragmented, varying across local councils. This may inhibit investment if entities are seeking to implement an initiative that sits across multiple councils. It is estimated that other spaces, such as upper level floor space, are also underutilised due to the current regulatory environment.<br><br>Regulatory reform may increase the proportion of space within an LGA that could be used for cultural works and events. Utilisation of public space may be increased through streamlining the approvals process across councils. |

## Draft Option - Cultural venue pricing regime

### Strategic Intervention: Better use > Funding agreements

**Reference 2.7.6/CVP**

Introduce new pricing structures at Melbourne and regional cultural venues that appropriately balance public access versus long term operator cost recovery. This may include demand and time-based pricing and membership packages.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | This assumes that a review of cultural venues' pricing strategies is undertaken and that a new pricing structure is proposed. This would be rolled out by entities at their own cost.<br><br>This option is a policy/regulation change only with no capital works required. Whole of life cost estimations include consultation, implementation and management. |
| **Overall Contribution** | Low | Access to many of Victoria's galleries is free, with visitors only expected to pay for headline exhibitions. A revised pricing structure is unlikely to increase visitor numbers to Victorian galleries if an increase in ticket prices results. However, it may impact the number of visitors to the galleries' online collections. A reduction in ticket prices should be carefully assessed against the ongoing revenue requirements of the galleries. |

## Draft Option – Melbourne Cultural precinct connectivity

### Strategic Intervention: New/expanded assets > Incremental expansion of existing assets

**Reference 2.7.7/CPC**

Improve the integration between Melbourne's sporting and cultural precincts through the creation of a pedestrian walkway between Domain Gardens, South Melbourne, The Yarra River, Federation Square and Birrarung Marr. The path would also include space for cyclists.

This option would increase access between the two key precincts and would also maximise opportunities to activate the public spaces throughout the entire precinct during events and between event peak periods.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $100 million - $500 million | In 2008, the State Government put forward a proposal to develop the Arts Precinct that would link the cultural centres south of the Yarra River through walkways, cafes and bars stretching from the Arts Centre, along Sturt Street to the Malthouse Theatre. |
| **Overall Contribution** | Low | The Melbourne Arts Precinct Blueprint (2014) recognises that to 'create a 'vibrant and connected precinct' we need to seamlessly integrate with the rest of the city...this means building or enhancing links to the Domain Gardens, South Melbourne, the Yarra River and beyond to the CBD, Federation Square, Birrarung Marr and even the Sports Precinct'. This also means building and enhancing connections that encourage 'walking, pedalling, commuting, socialising and moving around the area'. The Blueprint estimates that this is likely to increase the number of visitors to the precinct.<br><br>Improved connections may increase the vibrancy of the arts precinct. However, the impact to attendance at events has not yet been assessed. |

## Draft Option - Contemporary art gallery of Victoria

### Strategic Intervention: New/expanded asset > New greenfield asset

**Reference 2.7.9/CAG**

Build a contemporary art gallery in inner Melbourne which enables easy access and links with Melbourne's cultural precinct.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $500 million - $1 billion | The cost range for the implementation of this option has been based on the reported costs to |

| | | |
|---|---|---|
| | | build and operate MONA in Hobart, Tasmania. It is estimated that it cost approximately $75 million to build, $8 million a year to operate and contains $30 million worth of art. |
| **Overall Contribution** | Moderate | Contemporary art galleries in other Australian jurisdictions have been highly successful in attracting additional visitors, although success has varied widely across galleries. The number of visitors that would be attracted to a new Melbourne contemporary art gallery is uncertain and will be highly dependent on the quality of the experience. These contribution ratings assume that a new Melbourne contemporary art gallery would attract similar levels of interest as some of the country's most popular contemporary art galleries. |

## Draft Need 2D: Maximise positive impacts on amenity and wellbeing from infrastructure

Ultimately a growing population results in higher levels of activity in and around our communities. This can mean greater economic activity, access to services and vibrancy, but it can also result in less desirable impacts, in part from the development and operation of infrastructure. For example, a growing freight task can disproportionately impact residents close to ports. These impacts also manifest as developments move closer to, or are encroached upon, by infrastructure such as landfill facilities. Also infrastructure which can support farmers' ability to operate, particularly in peri-urban and growth areas, may also be relevant.

Examples include noise or air pollution, which can have health implications. Infrastructure such as environmental monitoring equipment can play a key role in understanding the intensity and severity of these impacts on the community and the environment.

### Metrics

Metric 1 – Reduction in the number of households impacted by infrastructure - specifically freight, public transport, road, landfill, energy generation - causing noise and air pollution above acceptable thresholds.

### Options

The table below lists the options considered for this Draft Need

| Reference Number | Option Name |
|---|---|
| 2.6.2 | Heavy vehicle road use regulation enforcement |
| 2.6.4 | HPFV network completion |
| 2.6.6 | Alternative energy vehicles |
| 2.6.7 | CityLink to Western Ring road connection |
| 2.6.8 | Road space allocation changes |
| 2.6.9 | Transport network price regime |
| 2.6.10 | Hoddle Street/Punt Road public transport prioritisation |

The graph on the following page plots each option's Contribution verses Cost.

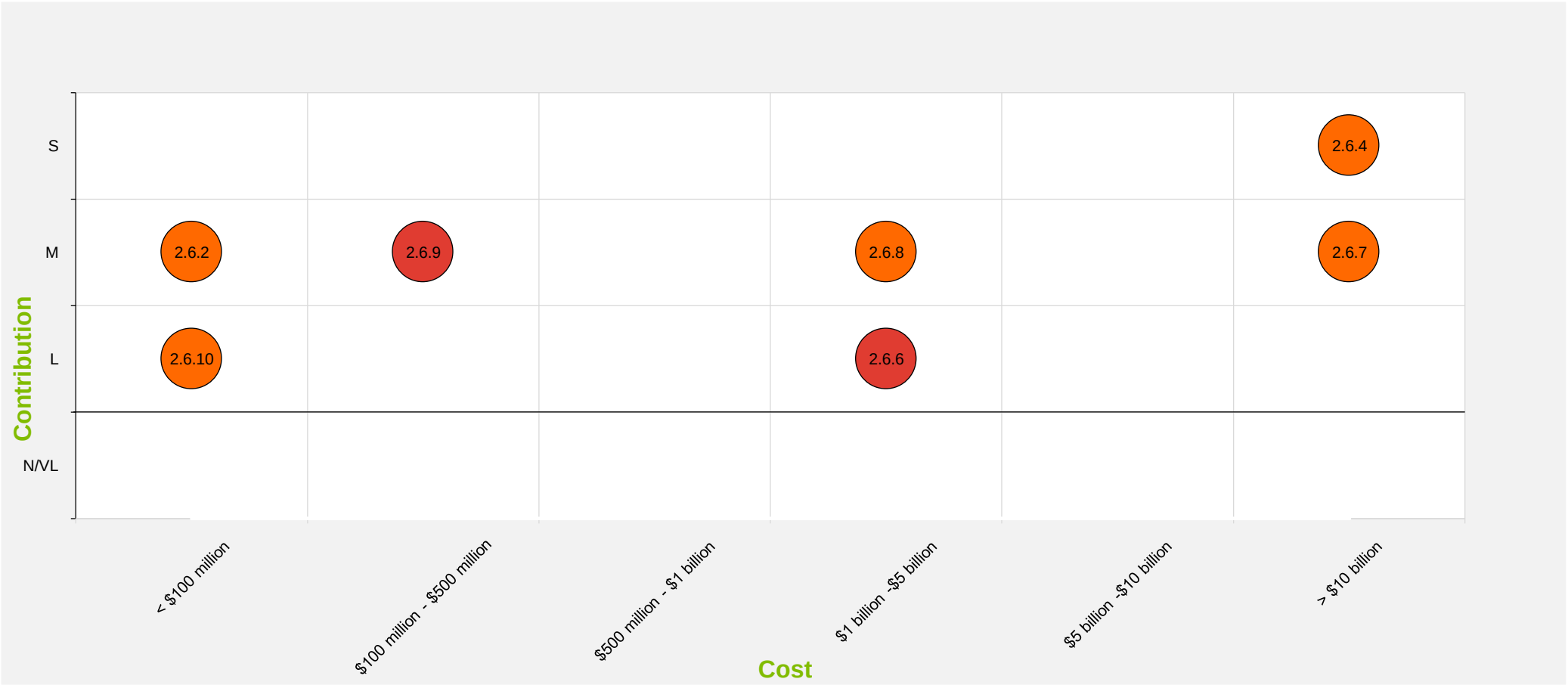



**Figure 7: Need 2D matrix**

## Draft Option - Heavy vehicle road use regulation enforcement

### Strategic Intervention: Changing behaviour > Regulatory enforcement

**Reference 2.6.2/HVR**

Increased on the ground enforcement to prevent inappropriate road use in mixed use areas. For example heavy vehicles using suburban roads which are prohibited, prohibited use of braking, exceeding vehicle emissions standards or time of day restrictions.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | It is assumed that any costs involved in increasing the number of police and/or VicRoads Transport Safety Services patrols available to attend/enforce breaches would be minimal, likely under $100 million over a 30 year period. |
| **Overall Contribution** | Moderate | The EPA's Environment Protection (Vehicle Emissions) Regulations 2013 cover 'clean air' and the 'control of noise' under the Environment Protection Act 1970. Through this regulation it is prohibited to sell a vehicle that does not comply with emission standards. The existing arrangements also enable the reporting of vehicles by the EPA, VicRoads and Victoria Police for noncompliance.<br><br>To address community concerns around safety, noise and air quality there are currently road use curfews applicable to four Victorian roads, which are heavily used by the freight industry. In addition to this, recent trials of night curfews were found to be effective in reducing truck traffic on those roads.<br><br>The implementation of this option is likely to have a moderate impact on the total number of households affected by noise and air pollution related to infrastructure although it would be highly localised to the area/corridor targeted for enforcement. |

## Draft Option - HPFV network completion

### Strategic Intervention: New/expanded assets > Refurbishment of existing assets, incremental expansion of existing assets, new greenfield asset

**Reference 2.6.4/HPF**

Deliver the statewide HPFV network in accordance with the Victorian Freight and Logistics Plan. This will allow larger vehicles access to a more comprehensive road network and will reduce overall freight vehicle kilometres and improve freight efficiency.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | > $10 billion | The Victorian Freight And Logistics Plan identifies 23 projects as key projects for the long-term metropolitan freight network. Between publication in 2013 and early 2016, a number of these projects have been commenced and some have been completed. The cost of completing the 19 outstanding projects is estimated to be in the region of between $20 and $30 billion:<br><br>– Calder Freeway (Calder Park Drive grade separation)<br>– Hume Freeway (Kalkallo to Beveridge)<br>– Tullamarine Freeway widening (Calder Freeway to airport)<br>– Growth Areas (Priority Transport Package)<br>– Western Hwy duplication (Ballarat to Stawell)<br>– Goulburn Valley Hwy (Shepparton Bypass)<br>– Stury Hwy (Mildura truck bypass)<br>– Prices Hwy West (Winchelsea to Colac)<br>– Green Triangle Freight Transport Program<br>– Goulburn Valley Hwy (Strathmerton deviation)<br>– Murray River crossings at Echuca/Swan Hill/Yarrawonga<br>– Murray Basin Transcontinental Rail Link planning study<br>– Horsham Bypass<br>– Healesville-Koo Wee Rup Road upgrade.<br><br>Where cost data is unavailable for a specific project, completed projects have been used as a proxy with costs applied on a per-kilometre basis. It is not clear for the available data whether these figures represent capital investment only, or whether they include ongoing operational and maintenance expenditure. |
| **Overall Contribution** | Significant | The road system contributes to the economic and social well-being of Victoria's residents but at the same time noise from road infrastructure can have a significant impact on the community. Whilst the road network needs to be updated to cope with future demands, the design of the network should consider limiting the noise and air pollution exposure of existing receivers and minimise the number of any new receivers exposed to road traffic noise.<br><br>Implementing this option will provide substantial opportunities to minimise noise and air pollution impacts from road users:<br><br>– incorporating advances in the development of low noise road pavement |

| | | |
|---|---|---|
| | | surfaces or noise transmission mitigation measures (such as physical barriers)<br>– limit engine and exhaust noise and pollution by influencing vehicle speeds and acceleration through road alignment design (both horizontal and vertical)<br>– supporting compatible land use next to major road corridors<br>– encouraging existing traffic commercial, public transport and private) to switch from existing roads to new roads and road corridors<br>– limiting the impact of future road traffic noise by incentivising the use of the new roads and corridors. |

## Draft Option - Alternative energy vehicles

### Strategic Intervention: Changing behaviour > Economic charging

**Reference 2.6.6/AEV**

Invest in new charging infrastructure to support the take up of electric vehicles, and incentivise individuals and companies to adopt environmentally-friendly transport.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion -$5 billion | The cost to implement this option is varied dependent on what schemes are proposed. The Victorian Government incentives could include a combination of the following:<br>– tax credits to offset the cost of purchasing or leasing a vehicle<br>– tax credits to offset the cost of installing charging equipment<br>– discounted vehicle registration fees<br>– discounted or zero state sales tax<br>– removing planning restrictions to enable charging equipment to be installed<br>– insurance discounts<br>- access to on-road priority transit lanes.<br><br>In the US, consumers have access to a federal income tax credit of $7,500 for the purchase of an electric vehicle. California has emerged as the most competitive alternate energy vehicle market in the world, offering an additional rebate of $2,500. Other countries provide price support between $1000 and $10,000.<br><br>Higgins et al's 2012 study suggested that the average uptake of electric vehicles across Victoria will be 13.5% in 2030 with no government rebate. Scenario modelling with rebates from $5,000 to $10,000 showed that a rebate is an important financial incentive to increase take-up. The $5,000 rebate for all electric vehicles up to 2030 increased market share to 19.3% at a cost of $2 |

| | | |
|---|---|---|
| | | billion and the $10,000 rebate increased market share to $25.2% at a cost of $5.6 billion. |
| **Overall Contribution** | Low | Victoria does not currently offer rebates for hybrid vehicle purchases and the private sector has not to date aggressively taken up the technology. Government has an important role to play in stimulating the take-up of alternative energy vehicles such as electric vehicles and natural gas vehicles.<br><br>Electric cars eliminate greenhouse gas emissions from vehicle use, but only if they are charged via renewable energy sources. Whilst electric cars are somewhat quieter than petrol powered cars, their take-up in the foreseeable future is not likely to be sufficient to reduce traffic noise (various estimates are placed at between 0% and 55% across Victoria). Additionally, the majority of traffic noise is related to the contract of tyres and the road surface rather than to vehicle engines.<br><br>The environmental performance of natural gas vehicles is better than petrol/diesel vehicles (although electric vehicles are the best performers).<br><br>Assuming a moderate take-up of alternative energy vehicles, a small reduction in the number of households impacted by infrastructure is expected. |

## Draft Option - CityLink to Western Ring road connection

### Strategic Intervention: New/expanded assets > New greenfield assets

**Reference 2.6.7/EWW**

Construction of the East - West (West) Link which would link the CityLink with M80. This option targets east-west links for road freight movement including in and around the Port of Melbourne.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | > $10 billion | The cost estimation for this option has been based on existing studies done for the construction of the proposed road. Based on the estimated $8-10 billion (2013 dollars) from the preliminary feasibility work, the estimated capital cost is at the top of the $5-10 billion range. Whole-of-life operating expenditure may increase this cost above $10 billion for the 30 year period. |
| **Overall Contribution** | Moderate | The western section of the project is designed to:<br><br>– separate local travel from cross-city movements by reducing the need for traffic to weave through local roads<br>– improve freight efficiency by providing a connection between the port and key industrial centres in the West |

| | | |
|---|---|---|
| | | – reduce noise and air pollution in the western suburbs by providing a freeway option for the 20,000 trucks that currently travel though residential streets<br>– contribute to urban renewal in the west by creating a safer environment for pedestrians and cyclists, improving amenity for locals, and increasing the attractiveness of these areas for new investment and development<br>– improve social participation and economic outcomes by increasing access to employment, education and other activities<br>– provide greater resilience in Melbourne's transport network.<br><br>East-West Link will need to be retrofitted into existing highly built-up residential areas so there will inevitably be some negative social and environmental impacts during both construction and ongoing operations. Impacts will include property acquisition, disruption to public spaces, amenity impacts related to construction activities and permanent visual and property value impacts. However, overall the implementation of this option is expected to be a significant net reduction in the number of households impacted by infrastructure.<br><br>Analysis for the Western Distributor project has produced modelling that shows that the Western Distributor would be close to capacity in 2031, just nine years after its scheduled completion. The analysis, by PricewaterhouseCoopers, notes the possible need for a western freeway/toll way crossing to CityLink north of the Western Distributor within 15 years. As such, there is a clear timing dimension involved in determining the contribution of this option. The option is likely to have a positive contribution in the latter half of the 30 year evaluation period. On the basis that this option has been given a moderate contribution assessment here. |

## Draft Option - Road space allocation changes

### Strategic Intervention: Better use > Land use and planning controls

**Reference 2.6.8/RSA**

Road space priority for public transport and active transport corridors into the central city and employment centres to achieve best and most efficient use of road network (separating trams and buses from other traffic).

Provide transitional spacing which promotes walking and cycling (e.g. closing certain roads in the CBD and where appropriate employment centres, to private vehicles at certain times of the day). Upgrade tram corridors in the Cities of Melbourne, Port Phillip, Yarra and Stonington to light rail standard and improve services and connections to the central city, including Parkville and the new metro rail stations.

Implement new intelligent transport systems such as dynamic overhead lane management in the

central city (including Johnston Street, Punt Road/Hoddle Street, routes to Footscray and Sunshine), and employment centres, to enable buses to travel faster and more reliably.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion -$5 billion | It is estimated the implementation of this option is likely to include the following items and associated costs:<br>– Upgrading several tram corridors to light rail standard. The Route 96 upgrade to a modern light rail network standard cost $800 million, which included the purchase of 50 low floor trams, upgrades and relocations of tram stops on the route, and redevelopment of two depots. Route 96 is 14kms, so the total cost would vary based on the length of the corridor<br>– Dynamic overhead lane management in the CBD and inner city to give priority to on-road PT.<br>PT service type and frequency are assumed to increase to accommodate growth in demand over time.<br>Pedestrianisation initiatives can each cost $10-$100 million, based on the plans in Sydney for the pedestrianisation of George St at a cost of $60 million, though further analysis is required to confirm this assessment.<br>The above costing range is heavily driven by the large cost of tram corridor upgrades. While specific costings are not publicly available, if only the lane and traffic light management sub-option was undertaken, the cost would be expected to be <$100 million (subject to confirmation from VicRoads). |
| **Overall Contribution** | Moderate | Interventions to reallocate road space are generally designed to increase traffic throughput, however they can also be designed to increase public amenity by incentivising modes that generate less noise and air pollution. The ability of this option to achieve a demonstrable change in this metric will be heavily dependent on design, and will always need to be conditioned by the context in which it is set. This metric could potentially lead to trade-offs with other metrics (for example if car parking is removed from kerbsides, the increase in vehicular traffic could lead to greater noise and air pollution - however there is also some evidence that appropriate and well-considered design can leave motorists unaffected by the provision of priority lanes for cyclists.<br>Road space designs that prioritise cycling and walking would also lead to increased urban |

| | | |
|---|---|---|
| | | amenity, and thereby reduce the impact of infrastructure on households. However, the scope for this impact to be greater than moderate is considered unlikely - as the road space design would need to generate a very large switch in modes away from private and freight vehicle road use for this to have a significant impact on this metric.<br><br>Ultimately, a nuanced and carefully designed road space allocation assessment along a smaller number of strategic corridors – including assessment of mode switching and total transport capacity – may uncover some optimal, small scale designs that increase total amenity without strongly negative impacts on total capacity. Further site-specific analysis is needed. The contribution score has been assessed as "moderate" on the basis that the effects of this option will be localised, and it will not be appropriate on all road corridors. |

## Draft Option - Transport network price regime

### Strategic Intervention: Changing behaviour > Economic charging

**Reference 2.6.9/TNP**

Overall pricing review to manage demand for peak/non-peak times across the entire transport network to achieve a number of objectives:

- achieve most efficient use of assets
- spread the peak/traffic volume
- encourage public transport use (including optimising most affordable public transport - buses)
- capture true cost of transport types - particularly private vehicle use
- encourage less car use to the central city and major employment centres
- incentivise heavy vehicle use of roads during determined times.
- reduce travel time and improve travel time reliability for private vehicles and freight.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $100 million - $500 million | A truly transformative road pricing system would be coordinated with the Commonwealth, given the need to harmonise with Commonwealth taxes and to better manage interstate fleet movements.<br><br>An initial scoping study or business case with a cost of < $10 million is likely to be required. The cost of implementing a comprehensive road pricing regime is circa $400 million, based on international examples.<br><br>Alternatively, a localised cordon system which relies on gantries with centralised ICT infrastructure is expected to be less than $100 million. Administrative costs are likely to be up to |

| | | |
|---|---|---|
| | | an additional $100 million.<br><br>It is important to note that given the breadth of possible solutions, the cost could move into the $500 million - $1 billion cost range. |
| **Overall Contribution** | Moderate | Pricing signals are expected to change road usage, with road users choosing the mode and route that is most cost effective. Road pricing regimes can theoretically be designed to achieve any shift in behaviour.<br><br>In practice, however, behavioural change is limited as desired outcomes may be conflicted. For example, daytime road congestion creates noise and air pollution and travel time delays. A pricing regime could better distribute the demand peaks for road infrastructure (particularly the timing and route of heavy vehicles), but this could also result in incentivised after-hours journeys which cause negative noise impacts for residents that are generally considered less desirable than daytime noise impacts.<br><br>International evidence positively supports the impacts of the implementation of similar options. It is expected that an isolated implementation of this option would have a moderate contribution to the metric. |

## Draft Option - Hoddle Street/Punt Road public transport prioritisation

### Strategic Intervention: Better use > Refurbishment of existing assets

**Reference 2.6.10/HSP1**

Prioritise public and active transport traffic flows using traffic management systems and road space allocation changes. This would be applied at the following locations:

- High Street (Route 6 Tram)
- Commercial Road (Route 72 Tram, Buses 220, 216, 219)
- Toorak Road (Route 72 Tram)
- Swan Street (Route 70 Tram)
- Bridge Road (Route 75 Tram)
- Victoria Street (Route 30, 12, 109)
- Public transport on Hoddle Street north of Victoria Street (DART services 905-908, Buses 302, 303, 304, 305, 309, 318, 350)
- Public transport on Punt Road between Alexandra Parade and Swan Street (Bus 605 and 246).

Under this option, public transport capacity would be increased on intersecting routes to accommodate growth in demand resulting from improved travel times and reliability.

Prioritising the public transport services that cross and use Hoddle Street/Punt Road allows for increased capacity and reliability that will make public transport usage more attractive. Prior to implementation, this option needs to be further investigated so that the potential impacts on north-south vehicle travel (HSP2) can be understood. It could also leverage the 'continuous flow' concepts to be trialled at four locations along Hoddle Street/Punt Road. This option is worth considering for the benefits that it can provide in a congested corridor for a very low cost.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | Both scenarios A and B have been investigated with regard to cost of implementation for this option. In the case of option A, the cost is expected to be <$100 million for the signalling implementation, including whole of life operating expenditure. For option B, the cost for the grade separation would be highly dependent on the scope of works involved, but would be estimated at $100-150 million each, placing it in the $500 million - $1 billion range for a 30 year whole of life costing. |
| **Overall Contribution** | Low | The contribution of this option has been assessed as "low" on grounds that even with east-west prioritisation, the demand for north-south travel on this corridor will remain strong, making it unlikely that urban amenity outcomes can be materially improved by increases in the generalised cost of travel along Hoddle St/Punt Rd. |

# Draft Objective 3 - Reduce disadvantage

## Draft Need 3A: Improve accessibility for people with disabilities and/or mobility challenges through infrastructure

Some members of the community experience challenges gaining access to important services, including those who use mobility, hearing or vision aids. This is often a challenge of legacy infrastructure, where such requirements were overlooked leaving a long trail of retrofitting, and associated costs. In particular, much of the public transport network does not yet meet Commonwealth Disability Discrimination Act requirements.

However, with new forms of service delivery occurring already, including through ICT, there are broader ways to facilitate greater access to key services. There is also a need to enable access to other activities that results in greater social connections and recreational opportunities. This applies to the broader wellbeing of Victorians; particularly ageing cohorts who may be retired but still have much to offer the community. As the population ages over the next 30 years, this need will become more pressing.

### Metrics

Metric 1 – Improvement in the satisfaction of the accessibility of transport and social services infrastructure of people with a disability.

### Options

The table below lists the options considered for this Draft Need

| Reference Number | Option Name |
|---|---|
| 3.8.3 | Residential facilities for people with disabilities |
| 3.8.4 | Social connection |
| 3.8.5 | Public transport vehicle accessibility |
| 3.8.6 | Public transport alternative use of taxi or hire car |

The graph on the following page plots each option's Contribution verses Cost.

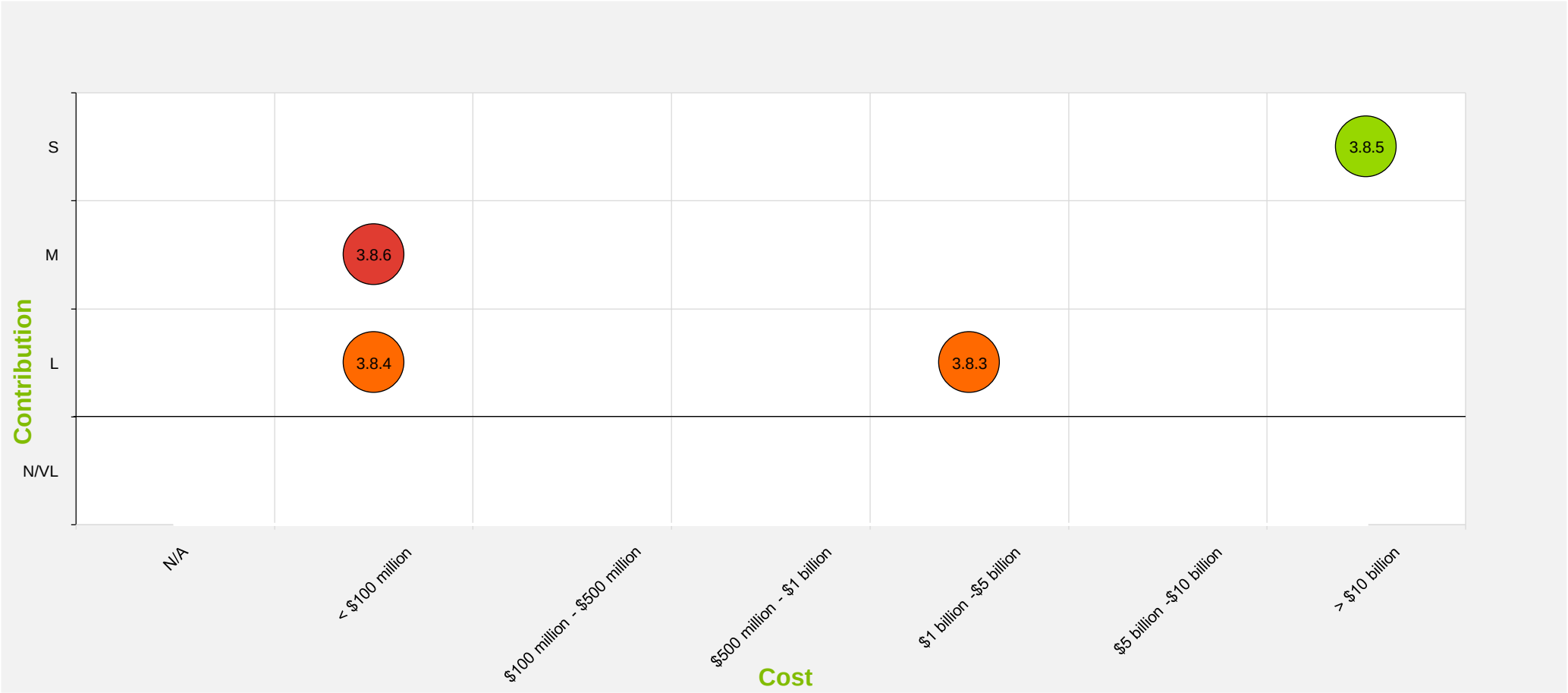



**Figure 8: Need 3A matrix**

## Draft Option - Residential facilities for people with disabilities

**Strategic Intervention: Better use > Refurbishment of existing assets**

**New/expanded assets > New greenfield asset**

**Reference 3.8.3/RFP**

Expansion of infrastructure for persons with a disability - including residential care and more accessible individual housing. Expansion is proposed through provision of enabling home care support by building modification and provision of specialised equipment where possible, or alternatively through provision of new purpose built facilities.

Aged care residential facilities are often being taken up for residential care for persons with a disability. Provide additional residential care places where required - or additional home care support and specialised equipment provision.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion -$5 billion | The cost estimation for the implementation of this option uses estimates from the Productivity Commission as to the size of the potential population requiring supported (residential) accommodation. It prioritises people aged 0-49 and uses National Disability Insurance Scheme supported accommodation indicative prices. It does not assume that additional accommodation should be built. |
| **Overall Contribution** | Low | Increasing access to residential care, particularly for young people for whom it is not appropriate to access aged care residential services, will improve satisfaction with support services. However, residential support services are likely to be only one type of service required by a person with a disability and not all people with a disability require residential services, attributing to the low contribution of this option. |

## Draft Option - Social connection

**Strategic Intervention: Changing behaviour > Land use and planning controls**

**Reference 3.8.4/SCC**

Implement planning amendments to ensure accessibility is at front of mind in the development planning of new communities and that they include principles of social connection when planning the location of disability services and residential care.

The cost estimation assumes that the relevant policy and regulatory environment is reviewed to encourage the better planning of disability services where appropriate, to increase accessibility of services, particularly in new housing developments.

This option is a policy/regulatory change only with no capital works required. Whole of life cost estimations include consultation, implementation and management.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | This option is a policy/regulatory change only with no capital works required. Whole of life cost estimations include consultation, implementation and management.<br><br>The cost estimation assumes that the relevant policy and regulatory environment is reviewed to encourage the better planning of disability services where appropriate, to increase accessibility of services, particularly in new housing developments. |
| **Overall Contribution** | Low | Improving infrastructure during the planning and design process to increase accessibility and mobility will be important. However, access to services will be largely dependent on service providers appropriately locating themselves in new communities. The implementation of this option will have a limited impact on this due to the increasingly market driven nature of disability services. |

## Draft Option - Public transport vehicle accessibility

### Strategic Intervention: Better use > Refurbishment of existing assets

**Reference 3.8.5/PTV**

Public transport assets across all modes (trains, trams, buses) require upgrades for accessibility. The Victorian State Disability Plan 2013-2016 identifies making transport infrastructure more accessible as a key priority. Although significant projects are underway, this option is the full roll-out of required upgrades across all assets and transport modes.
This option will enhance social inclusion, due to the ease with which people can travel from place to place to access employment and services.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | High | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | > $10 billion | The cost estimation for this option is based on the Governments' $800 million commitment to upgrade tram route 96 to ensure it is accessible.<br><br>To achieve full implementation of this option multiple tram lines will need to be updated. It is assumed that each tram line will require a budget approximate to the route 96 line. This is before operating costs are included. Thus it is estimated the range of $10 billion is expected to be the upper limit of investment required.<br><br>It is worth noting that currently, more than 390 tram stops on the network provide level access |

| | | |
|---|---|---|
| | | and there are more than 110 low floor trams on Melbourne's tram network, with some tram stops servicing more than 1 route. All metropolitan trains are wheelchair-accessible and more than 80% of Melbourne's bus services are wheelchair-accessible on weekdays. |
| **Overall Contribution** | Significant | Whilst the majority of Melbourne's train and bus network is accessible to people with a disability, Melbourne's tram network requires further investment to improve accessibility. This option will enhance social inclusion, due to the ease with which people can travel from place to place.<br><br>Despite significant investment, many people are unable to use public transport to get around. Providing fully accessible public transport across the network will enable people to access jobs and services from where they live. This option requires large-scale investment but has the ability to materially improve social inclusion and individual quality of life. The demand for accessible transport will grow over time with an ageing population. This option supports the benefits created through new fleet purchases such as low floor trams. |

## Draft Option - Public transport alternative use of taxi or hire car

### Strategic Intervention: Better use > Coordination processes, contractual processes

**Reference 3.8.6/PTA**

Change bus and taxi/hire car regulations to encourage alternative transport services, particularly in rural and regional areas. This option will realise initiatives to integrate local community transport and taxis with route bus services to expand access opportunities.

Through changes in regulation it will open up the ability for the private sector to provide innovative, flexible transport solutions to Victorians with a disability.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | This option is a policy/regulatory change only with no capital works required. Whole of life cost estimations include consultation, implementation and management.<br><br>The cost estimation assumes that a review of the current policy and regulatory environment is undertaken and amendments made where required to encourage alternate forms of transport, particularly in regional and rural areas. |
| **Overall Contribution** | Moderate | An inquiry conducted by the Family and Community Development Committee found that transport in regional and rural Victoria is inaccessible and infrequent. It also noted, inquiry |

| | | |
|---|---|---|
| | | participants emphasised the importance of accessible taxis as a complementary service to public transport. The implementation of this option would contribute moderately to the metric. |

## Draft Need 3B: Address housing affordability challenges with better social housing

Melbourne's rising house prices and rents present a significant challenge to the housing market over the next 30 years. The proportion of low-income households in the private rental market paying more than 30 per cent of their income for rent increased from 29 per cent in 1996 to almost 39 per cent in 2011. Less than 9 per cent of rental properties in metropolitan Melbourne are affordable to low income households, and these are predominantly in outer suburbs.

The lack of affordable housing in the private rental market is resulting in increasing distances between low income households and employment. Established areas that are closer to jobs are not accommodating population growth to the same extent as Melbourne's outer growth corridors. These factors in part have led to an increase in the number of people seeking alternatives to the private market, including public and community housing and government-subsidised housing assistance. However, the increasing demand from low income households is unlikely to result in new supply, as the income those households offer is insufficient to stimulate a private market response. Further, rising rental costs also prevent existing tenants of social and community housing from moving back into the private rental market if their circumstances improve and they no longer require high subsidy social housing.

The performance of public housing assets as an important component of affordable housing has also been called into question. In 2012, the Victorian Auditor-General considered that some properties were nearing obsolescence and that there was pressure on the waiting and transfer lists in response to demand.

### Metrics

Metric 1 – Reduction in the percentage of low-income households paying more than 30 per cent of their income towards rent.
Metric 2 - Improvement in the satisfaction of current tenants with respect to the quality of their social and community housing.

### Options

The table below lists the options considered for this Draft Need

| Reference Number | Option Name |
|---|---|
| 3.9.1 | Social housing asset refresh |
| 3.9.2 | Social housing sector regulatory amendment |
| 3.9.3 | Social housing developer incentivisation |
| 3.9.4 | Social housing utilising the defence rental model |
| 3.9.6 | Social housing "Social Rental" model |
| 3.9.7 | Social housing transition to private stock |
| 3.9.8 | Social housing tenant transfer within a community |
| 3.9.9 | Social housing stock transfer model |
| 3.9.11 | Social housing government role |
| 3.9.12 | Public housing sector regulatory amendment |
| 3.9.13 | Social and affordable housing delivery Fund and incentives |
| 3.9.14 | Public housing regeneration |

The graph on the following page plots each option's Contribution verses Cost.


**Figure 9: Need 3B matrix**

## Draft Option - Social housing asset refresh

### Strategic Intervention: Better use > Funding agreements

### New/expanded assets > New greenfield asset

**Reference 3.9.1/SHA**

A significant proportion of government owned assets are nearly obsolete, others are in poor A significant proportion of government owned assets are nearly obsolete, others are in poor condition. This option would seek to refresh assets through sale of old assets and investment in better purpose built accommodation apartments.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion -$5 billion | The estimated cost range is based on the replacement of 10,000 properties that are reaching obsolescence in Victoria at the estimated price of $220,000 per property results in a total in the order of $2.2 billion. The estimated price range also includes nominal funding to develop an asset strategy, repare asset management plans and monitor the implementation and management of the plans.<br><br>This estimate does not account for the land sales revenue. For surplus land further analysis of the Victorian Government Landholding Policy and Guidelines will be required, as well as policy changes to allow the revenue to return to DHHS rather than Treasury. |
| **Overall Contribution** | Moderate | This option will have little success on increasing supply of affordable housing, as the initiative targets social housing existing stock. However, a capital refresh of existing public housing stock will have a significant contribution to the satisfaction of current public housing tenants, with the provision of new assets without permanent relocation of tenants. |

## Draft Option - Social housing sector regulatory amendment

### Strategic Intervention: Changing behaviour > Land use and planning controls

**Reference 3.9.2/SHS1**

Amend the Victoria Planning Provisions to make the Minister for Planning the responsible authority for selected social housing. This would require the provision of social housing in strategic urban renewal precincts and other significant change areas.

This will be achieved through the Identification of opportunities for the inclusion, where appropriate, of social housing prior to the commencement of formal structure and plan for urban renewal precincts and proposed rezoning of such land, including costs and benefits

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | This option is a policy/regulatory change only with no capital works required. Whole of life cost estimations include consultation, implementation and management. |
| **Overall Contribution** | Low | Facilitating the provision of land in growth corridors and urban renewal areas for social housing will have no impact on the reduction of households paying more than 50 per cent of their income towards rent.<br><br>The implementation of this option in isolation will have a low contribution to the satisfaction of current tenants as it does not apply to existing social housing stock. If it is assumed current tenants will relocate to the new developments, there will be a moderate contribution to current social housing tenant satisfaction. Due to improved accessibility to employment and central hubs. |

## Draft Option - Social housing developer incentivisation

### Strategic Intervention: Changing behaviour > Land use and planning controls

**Reference 3.9.3/SHD2**

Incentivise private developers to sell or lease apartment stock for social housing through rental assistance and social equity bonds. Social / affordable housing under this option will require the Government's AAA rating with a guarantee of payment, combined with investors and service provider(s).

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $5 billion -$10 billion | The assessment of the estimated cost for the implementation of this option takes in to account several factors. Social / affordable housing under this option will require the Government's AAA rating with a guarantee of payment, combined with investors and service provider(s). A portion of the Government savings realised from the successful delivery of social housing would fund the ROI to the investors and service provider.<br><br>To estimate the cost of delivery it is assumed that 20% of the required 80,000 properties by 2030 would be supplied under social equity bonds. With the average development cost consisting of $220,000 for building works plus $166,000 land resulting in a total dwelling supply cost of $386,000 per unit in 2016 NPV. The net recurrent |

| | | |
|---|---|---|
| | | cost per dwelling (ICA) commencing from year 7 is estimated to be $5,639 with an inflation rate of 4% over the whole of life 30 year costing period with a ROI of 5%. Excluded from the whole of life costing is the operating deficit identified in the Infrastructure Capability Assessments (ICA).<br><br>Thus the total estimated cost of implementation of this option is in the order of $7 billion. |
| **Overall Contribution** | Low | The implementation of this option in isolation will have a low contribution to the satisfaction of current tenants as it does not apply to existing social housing stock. If it is assumed current tenants will relocate to new dwellings, current tenant satisfaction will increase.<br><br>This option will have little success on increasing supply of affordable housing, as the initiative targets social housing. |

## Draft Option - Social housing utilising the defence rental model

### Strategic Intervention: Better use > Contractual processes

**Reference 3.9.4/SHD1**

The Australian defence housing model sees Defence Housing Australia (DHA) sell properties to private investors under a sale and leaseback arrangement, whereby the leases are for a particular community group (returned service men and women). Applying this model for social housing would enable available non-government apartment and housing stock to be leveraged.

The Government benefits through savings resulting from a more efficient allocation of resources, getting people into a home and putting people back on their feet. The option could include potential for tenants to buy out their property (like a leased car) over time, on the condition that they can only sell back to the facility.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | This option is an administrative change only with no capital works required. Whole of life cost estimations include consultation, implementation and management.<br><br>The 2014 Defence Housing Australia annual report states the organisation has run at a profit from 2012 - 2014. On this basis, the estimated whole of life costs would be low and attributed to establishment of an operating structure for the model. |
| **Overall Contribution** | Low | This option will have little success on increasing supply of affordable housing, as the initiative targets social housing.<br><br>The implementation of this model would significantly increase the availability of social |

| | | |
|---|---|---|
| | | housing stock and with the mechanism for tenants to purchase properties, tenant satisfaction is likely to increase.<br><br>Due to the significant change in operating models, it is anticipated the establishment and implementation lead time would be moderate. |

## Draft Option - Social housing "Social Rental" model

**Strategic Intervention: Better use > Coordination processes, contractual processes**

**Reference 3.9.6/SHS2**

There are a number of underutilised assets around the community that the government could unlock through policy and regulatory change to unlock social housing capacity and better coordinate social housing.

This option would enable the offer of incentives to landlords who rent their property under the social housing rental scheme. It would require the education of the public and landlords on benefit of social rental model and the increased capacity of housing associations to match those in need and act as real estate agencies.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | This option is an administrative change only with no capital works required. Whole of life cost estimations include consultation, implementation and management. Funding will be required for government reform and management of the process. Existing commonwealth funding is available under the National Rental Affordability Scheme. The operating costs of the model could be transfer to housing associations if capacity is increased and there are incentives. |
| **Overall Contribution** | Moderate | This option would significantly increase current social and community housing tenants' satisfaction with their property and address the supply and demand mismatch in social housing stock.<br><br>This option will have little success on increasing supply of affordable housing, as the initiative targets social housing. |

## Draft Option - Social housing transition to private stock

**Strategic Intervention: Better use > Coordination processes, contractual processes**

**Reference 3.9.7/SHP2**

Provision of assistance through training services to individuals in social housing to enable them to gain employment to move to affordable housing and the private rental market.

This would free up capacity within the social housing system for those with different needs. Housing Vic promote and assist tenants with training and employment but this is not targeted to capacity building to access non-government market.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $100 million - $500 million | The 30 year whole of life costing of this option is based on the requirement for Government to sustain the program. In 2014-15 Government allocated $50 million for the TAFE back to work fund. Due to the reduced number of social and affordable housing tenants an estimate of $5 million per annum has been allocated which results in a whole of life 30 year costing in the order of $150-200 million. |
| **Overall Contribution** | Low | This option offers tenants the opportunity to upskill and may have an indirect impact on the metrics but there is little certainty this will occur. |

## Draft Option - Social housing tenant transfer within a community

**Strategic Intervention: Better use > Coordination processes, contractual processes**

**Reference 3.9.8/SHT**

Enable existing tenants to move into different housing within the community that meets their needs, to maintain the continuity of service. Currently social / community housing has long waiting lists and a poor asset base. Many apartments have the wrong configuration (5 bedroom houses instead of 1-2 bedroom apartments). Enabling movement of families into different stock within a community as they change size would enable more efficient utilisation of housing assets while ensuring stability in terms of staying in a familiar locality.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | High | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | This option is an administrative change only with no capital works required. Whole of life cost estimations include consultation, implementation and management.<br><br>The prioritisation of regenerating public housing estates and the capital refresh of existing facilities will facilitate the reconfiguration of social housing stock and the whole of life costs are calculated under these options. Due to the existing relocation program, the whole of life costs for this option are estimated to be low. |
| **Overall Contribution** | Moderate | This option will have little success on increasing supply of affordable housing, as the initiative targets social housing.<br><br>The satisfaction of current social housing tenants will significantly improve with the implementation |

| | | |
|---|---|---|
| | | of this option. |

## Draft Option - Social housing stock transfer model

**Strategic Intervention: Better use > Coordination processes, contractual processes**

**Reference 3.9.9/SHS3**

Stock transfer of existing assets to enable non-government sector to operate and manage the facilities.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $100 million - $500 million | The existing reforms being implemented in Australia can be utilised to implement this option and broaden the number of organisations with the capability and capacity to implement this option. Depending on the contractual frameworks for transfer of stock to the non-government sector the capital revenue received for the housing stock can be held in escrow and expended on asset renewal, maintenance and service delivery. This is the reason for the low estimated whole of life 30 year costs. |
| **Overall Contribution** | Low | This option will have little success on increasing supply of affordable housing, as the initiative targets social housing.<br><br>A significant contribution is achievable to current tenant satisfaction with contractual mechanisms to improve the quality of the housing stock for existing tenants. |

## Draft Option - Social housing government role

**Strategic Intervention: Better use > Coordination processes, contractual processes**

**Reference 3.9.11/SHG**

This option would see the government role to focus on preventing sufficient supply of social housing and as broker rather than as a provider and property manager. In short, this would be a shift from a provider of social housing to a regulator. Non-profit organisations (housing associations) and applicable charities would then become the service delivery / manager / operator of social housing. This could in turn stimulate private finance with housing associations & charities.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $100 million - $500 million | This option is predominantly a policy/administrative change only with no capital works required. Whole of life cost estimations include consultation, implementation and |

| | | |
|---|---|---|
| | | management.<br><br>Funding will be required for government reform in conjunction with existing funding for subsidies which pushes the whole of life 30 year cost estimation in excess of $100 million. |
| **Overall Contribution** | Low | This option will have little success on increasing supply of affordable housing, as the initiative targets social housing. The transfer of roles to the party best suited to manage them would see an increase in current tenant satisfaction, due to service levels and improved efficiencies in resource allocation. |

## Draft Option - Public housing sector regulatory amendment

### Strategic Intervention: Regulatory Amendments

**Reference 3.9.12/AHR**

This option would deliver more public housing, especially within areas suitable for high and medium density housing close to transport and commercial facilities, through the following planning provision amendments:

- the provision of affordable or social housing components as decision criteria for development assessment; and
- application of a VicSmart process to affordable and social housing projects to reduce landholding costs.

Introducing mechanisms to ensure that when public housing is provided it remains that for the long term.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | This option is a policy/regulatory change only with no capital works required. Whole of life cost estimations include consultation, implementation and management.<br><br>Management and implementation fees would be required for the Government reform elements of this option. On the basis of DHA, a Defence Housing model would require establishment fees but could be run at a profit. The attraction of private financing could be achieved under a similar approach to option 3.9.11 and would see minimal costs to Government |
| **Overall Contribution** | Moderate | This option would moderately reduce the number of households paying more than 50 per cent of their income on rent with the provision of additional affordable housing.<br><br>This option will have little success on improving the satisfaction of current tenants, as the initiative targets affordable housing. |

## Draft Option - Social and affordable housing delivery Fund and incentives

### Strategic Intervention: New/expanded assets > New greenfield asset

**Reference 3.9.13/SAH**

Develop and implement a planning policy and appropriate planning provisions requiring a share of new construction to be affordable to people with low and moderate incomes (inclusionary zoning), and grants to developers for public improvements (incentive zoning) including:

- reducing car parking requirements;
- shortened and guaranteed timeframes for assessment of planning permit applications providing affordable and/or social housing, as well as limiting and even removing third party appeal rights to minimise time delays in decisions;
- removing unnecessary planning obstacles to smaller scale infill housing programs such as accessory or ancillary units (e.g. granny flats, secondary suites) or laneway units;
- establishing a Melbourne Affordable Housing Fund.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion -$5 billion | The cost estimation for the implementation of this option has been calculated on the basis of the NSW social housing fund where it is deemed a $1 billion investment would be comparable for similar outcomes. The actual policy reform would be estimated to be <$10 million for implementation and management over the 30 year whole of life costing period. |
| **Overall Contribution** | Moderate | The contribution to metric 1 would be moderate with the provision of additional affordable housing. It is not deemed the contribution to metric 2 would be high as the metric applies to current tenants and this option proposes to deliver new social and affordable housing. |

## Draft Option - Public housing regeneration

### Strategic Intervention: Better use > Refurbishment of existing assets

**Reference 3.9.14/PHR**

This option would focus on the redevelopment of Melbourne's older high rise housing estates to provide greater opportunities for community managed housing and private affordable housing.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion -$5 billion | The cost estimation for the implementation of this option is based on an ARV of the existing portfolio in excess of $1 billion. Thus the estimated cost results from a Maintenance/Capital investment |

| | | |
|---|---|---|
| | | cost implemented on investment of 40% of ARV over the 30 year whole of life costing period. |
| **Overall Contribution** | Moderate | The contribution to current tenants' satisfaction levels would be moderate with the improvement of current public housing stock. Metric 1 is not applicable as without the provision of additional affordable housing it is expected the implementation of this option will no impact on the reduction in households paying more than 50 per cent of their income on rent. |

## Draft Need 3C: Support changing approaches to social service and justice delivery through infrastructure

There are a number of important social and justice services provided by government. The assets that support these services are varied, from over-the-counter service centres to specialist facilities. These assets can suffer from problems such as poor condition, poor functional fit and sub-optimal location. These problems can undermine service delivery.

This tendency to rely upon fixed assets has meant that services are unable to adapt to changing community needs. For example, there is growing complexity in the crimes police need to respond to, and a growing expectation about how rapid this response will be. In particular, there is an increasing focus on non-street crimes, such as family violence. This challenges existing approaches and changes the way police are expected to engage with the community.

Improving social service and justice delivery must not be constrained by the existing asset base or delivery approach to best meet community needs over the next 30 years. Work on the East Werribee Justice Precinct – which could include a court, police station, community legal centre or other services – is an example of an emerging approach in this area. Also developments in technology and ICT are likely to make connections between government and citizens more targeted and efficient, which could render current services and their related assets redundant.

### Metrics

Metric 1 – Improvement in service delivery outcomes for social and justice services provided by government.

### Options

The table below lists the options considered for this Draft Need

| Reference Number | Option Name |
|---|---|
| 3.10.2 | Justice colocation of services |
| 3.10.3 | Justice case management system |
| 3.10.4 | Mobile police and justice workforce |
| 3.10.6 | Supreme Court upgrade |

The graph on the following page plots each option's Contribution verses Cost.

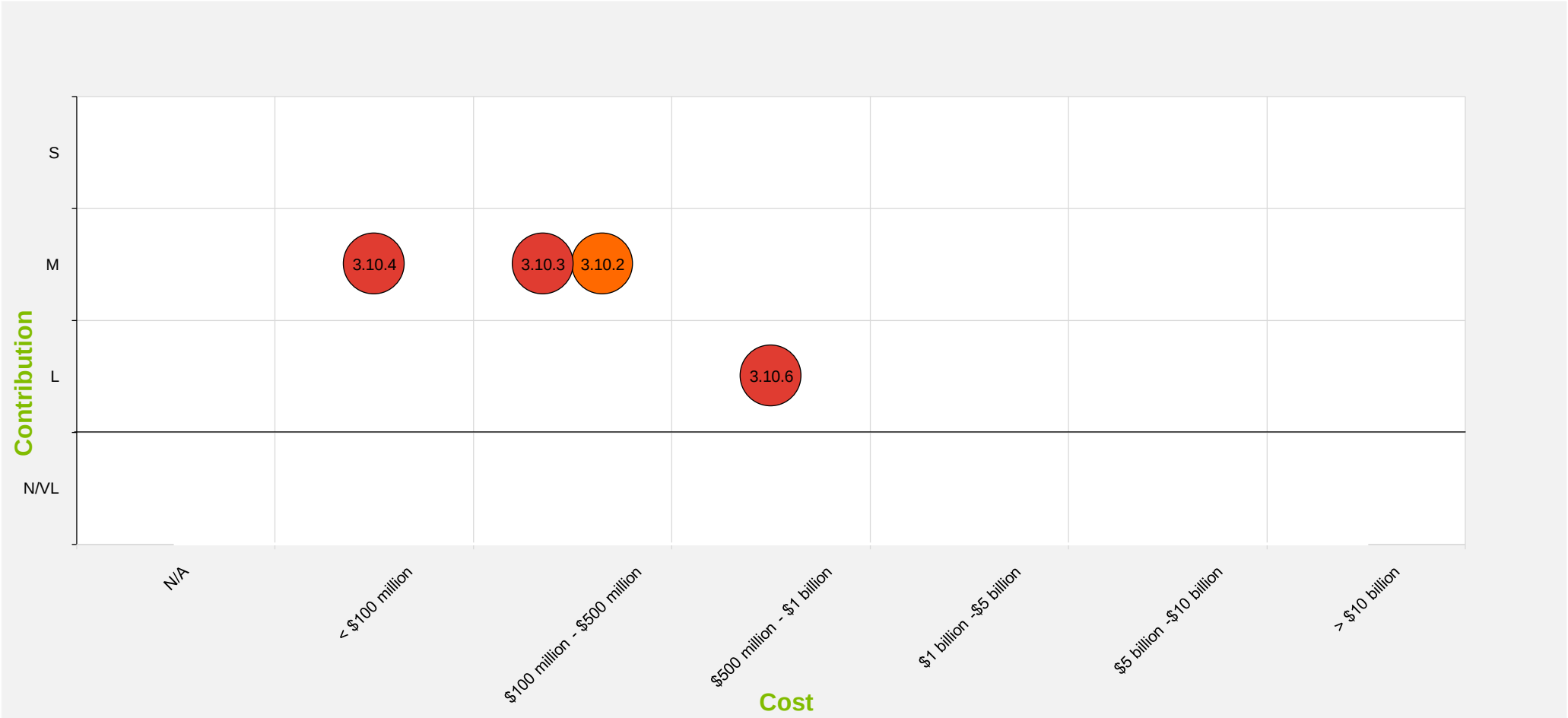



**Figure 10: Need 3C matrix**

## Draft Option - Justice co-location of services

### Strategic Intervention: Capacity Investment - Incremental expansion of existing assets / New greenfield asset

**Reference 3.10.2/JCS**

Consolidate/co-locate services delivered by the justice sector (and where applicable the health and human services sector) to support a coordinated and coherent client service model and an improved use of capital assets, e.g. courts, police stations and community legal centres), This would increase access to a similar client base and, where possible to reduce demand on the justice and human services sectors, through increasing access to prevention.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $100 million - $500 million | Whole-of life-costs have been estimated based on the level of funding awarded to the Neighbourhood Justice Centre through the State Budget. This has been extended over a 30 year period and only represents the costs associated with one centre. In addition, funding has been added to support the development of a masterplan. Sufficient provision exists in the cost estimate to include some capital expenditure costs if required. |
| **Overall Contribution** | Moderate | Co-location of social and justice services would moderately improve the service delivery outcomes for users. This is supported by the successful implementation of a similar service here in Victoria. |

## Draft Option - Justice case management system

### Strategic Intervention: Better Use Solutions - Technological innovations

**Reference 3.10.3/CSC**

Roll out of a case management system across Victorian court jurisdictions to integrate and standardise document management, and to create one view of the client. This would provide a solid base for broader information / data sharing across other entities within the justice system through a secure gateway, to support improved client services and targeting of justice service initiatives.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $100 million - $500 million | The cost estimation for this option is based on previous funding allocated towards the Integrated Case Management System. In the 2005–2006 State Budget $45 million was allocated to the Integrated Case Management System program, which began in July 2005 as a four-year program. |

| | | |
|---|---|---|
| | | The budget allocated $32 million for capital and $13 million for operational expenses (Victorian Auditor-General's Office 2009). Based on a 30 year whole of life costing it is estimated this will just push the total cost slightly in excess of $100 million. |
| **Overall Contribution** | Moderate | The implementation of a court services case management system would have a moderate contribution to improving service delivery outcomes for social and justice services. This would be achieved by improvements to the efficiency of current manual or hardcopy based processes. |

## Draft Option - Mobile police and justice workforce

### Strategic Intervention: Better Use Solutions - Technological innovations

**Reference 3.10.4/MPW**

Support a mobile police workforce through rolling out ICT and other related infrastructure with less dependence on police stations allowing more police members to be out in the community. This includes progressing from Mobile Data Terminals in police vehicles to mobile devices in police hands, providing single point access and logon to advanced, integrated information systems. This should be done along with reform of Victoria Police's core ICT systems. This option could then be rolled out more broadly in the justice sector, such as the Sheriff's office. The use of technology such as video conferencing can also help deliver justice services in underserviced areas.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | The above assessment is based on the budget reportedly spent by SA Police on a number of these initiatives. Local media reported that it cost the South Australian Government over $2.6 million to rollout 150 devices mobile fingerprint scanners, plus an additional $800,000 for the necessary software. It was also estimated that $1.6 million was required to purchase 350 tablet computers for use by officers on the road (The Advertiser, SA Police rollout of 150 mobile fingerprint scanners awaiting passing on new laws, February 13 2014). There is sufficient provision included in the estimate to cater for the variation of unit volume that may exist due to the variation in the size of the forces across South Australia and Victoria.<br><br>These figures do not take into account the costs associated with a wholesale renewal of technology over this time period as the technology described above is likely to be considered obsolete prior to the conclusion of the 30 year time estimates. |

| | | |
|---|---|---|
| | | Figures exclude the costs associated with upgrading existing systems i.e. LEAP and Interpose to ensure that they are fit for purpose, if they do not have the current capacity to support mobile technology requirements. |
| **Overall Contribution** | Moderate | The implementation of this option will decrease the amount of administration and travel time required by the police force, in turn, this time can be utilised on other service delivery tasks which will improve outcomes for the sector. |

## Draft Option - Supreme Court upgrade

### Strategic Intervention: New/expanded assets > Incremental expansion of existing assets

**Reference 3.10.6/SCU2**

The development of a new or refurbished Supreme Court facility to increase the number of court rooms and appropriate improved facilities and technologies.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $500 million - $1 billion | A new Brisbane Supreme Court and District Court building was completed in 2012 at a cost of $570 million. The building is one of the largest court buildings in Australia, with over 60,000 square metres of floor space spread over 19 floors, including 45 court rooms. |
| **Overall Contribution** | Low | In 2013-14 over 10% of pending Supreme Court cases had been pending for more than 12 months. The operational environment of the existing facility is outmoded and reduces the efficiency of Supreme Court operations.<br><br>The Supreme Court is looking to increase the number of commercial cases that it hears. Therefore, the Commercial and Equity Division of the Trial Division will be restructured into an enlarged Commercial Court, increasing demand.<br><br>The contribution is low in relation to the specific metric of improving service delivery outcomes for all social and justice services provided by government. |

# Draft Objective 4 - Enable workforce participation

## Draft Need 4A: Provide access to the diversity of employment opportunities offered by the central city

Victoria's high productivity industries are typically knowledge-intensive sectors such as professional, financial and educational services. These industries are particularly concentrated in the central city for the benefits of drawing on deep labour pools. The continued attractiveness for knowledge-intensive sectors to locate in Melbourne will in part be driven by increasing access to skilled workers.

It is anticipated that the transport system will need to provide for growing demand for central city travel from all parts of Melbourne, with capacity constraints being most pronounced in Melbourne's west and north growth areas. The number of jobs in Melbourne's west and north has not kept pace with the number of residents. Accordingly, people travel outside of the sub region for work, often to the central city, and this is expected to increase as the population in these sub regions grow. In particular, the rapid expansion of the west has put pressure on existing transport infrastructure, which is exacerbated by more workers in these areas accessing the central city for employment. In contrast, the growth areas in the south-east of Melbourne are less reliant on the central city for job opportunities given their proximity to other employment centres including Dandenong and Monash.

Under a range of population and employment scenarios the transport system will not meet the demand for these trips to and from the central city into the future. Transport and planning initiatives such as Melbourne Metro, the Western Distributor and the emerging East Werribee employment cluster are important, but will not address this need completely, and certainly not without other initiatives (including ICT to support greater work flexibility and efficiency improvements to the transport network) over the next 30 years.

Access between Melbourne's central city and major regional centres (particularly Ballarat, Bendigo and Geelong) is also important in enabling greater workforce participation and lifting productivity.

### Metrics

Metric 1 – Reduction in the supply and demand mismatch (gap) of the transport system to accommodate journeys into the central city.

### Options

The table below lists the options considered for this Draft Need

| Reference Number | Option Name |
|---|---|
| 2.6.8 | Road space allocation changes |
| 2.6.9 | Transport network price regime |
| 4.11.1 | Central city job cap |
| 4.11.2 | Increased Telecommuting |
| 4.11.3 | Rail signals and fleet upgrade |
| 4.11.4 | High capacity trains - 7 car |
| 4.11.5 | High capacity trains - 10 car |
| 4.11.6 | Train platform utilisation |
| 4.11.7 | Tram and train fleet modifications |
| 4.11.8 | Transport network information centralisation |
| 4.11.9 | Car parking management |
| 4.11.10 | Doncaster heavy rail line |

| | |
|---|---|
| 4.11.11 | Doncaster tram service |
| 4.11.12 | Doncaster bus improvement |
| 4.11.13 | Strategic transit oriented development corridors |
| 4.11.14 | Geelong rail electrification |
| 4.11.15 | Bendigo rail full metropolitan separation |
| 4.11.16 | Geelong and Werribee rail upgrade |
| 4.11.17 | Rowville heavy rail line |
| 4.11.18 | Central city tram network extension |
| 4.11.19 | Melbourne Metro - Stage 2 |
| 4.11.20 | New underground metro rail system |
| 4.11.21 | City loop reconfiguration |
| 4.11.22 | Bicycle highways through the central city |
| 4.11.23 | Water taxis/buses/ferries to the central city |
| 4.11.24 | Cross city road tunnel |
| 2.6.10 | Hoddle Street/Punt Road public transport prioritisation |
| 4.11.26 | Hoddle Street / Punt Road Traffic Management Systems |
| 4.11.27 | Regional rail eastern corridor dedicated rail track |
| 2.6.7 | CityLink to Western Ring road connection |
| 4.11.28 | Eastern Freeway to CityLink connection |
| 4.11.30 | Regional Rail electrification |
| 4.11.31 | Geelong fast rail |
| 4.11.32 | Public transport timetabling |
| 4.11.33 | Employment outside central city incentivisation |
| 1.3.11 | Melton rail extension |
| 1.3.12 | Wallan rail electrification |
| 1.3.14 | Wollert rail extension |
| 1.3.15 | Clyde rail extension |
| 1.3.16 | Wyndham Vale to Werribee rail extension |
| 4.11.35 | Advanced Traffic Management |

The graph on the following page plots each option's Contribution verses Cost.

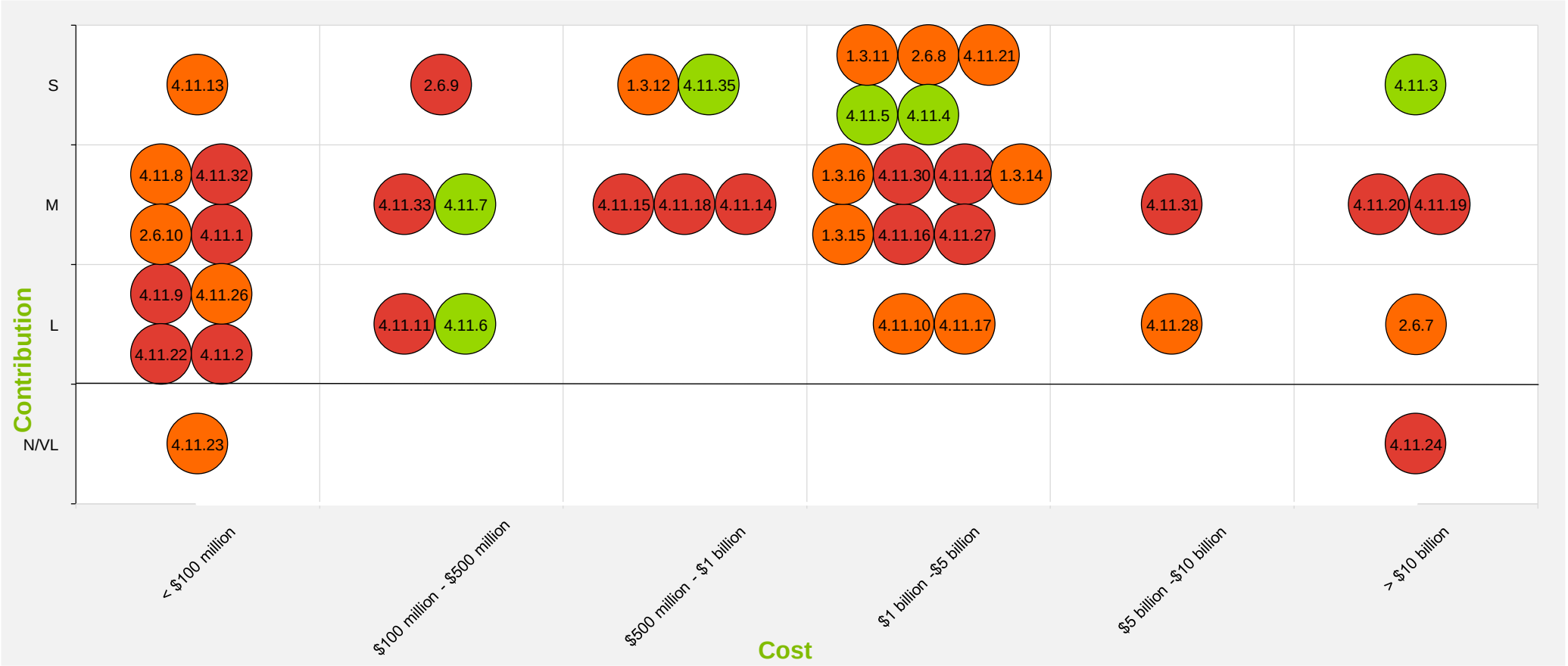



**Figure 11: Need 4A matrix**

## Draft Option - Road space allocation changes

### Strategic Intervention: Better use > Land use and planning controls

**Reference 2.6.8/RSA**

Road space priority for public transport and active transport corridors into the central city and employment centres to achieve best and most efficient use of road network (separating trams and buses from other traffic).

Provide transitional spacing which promotes walking and cycling (e.g. closing certain roads in the CBD and where appropriate employment centres, to private vehicles at certain times of the day). Upgrade tram corridors in the Cities of Melbourne, Port Phillip, Yarra and Stonington to light rail standard and improve services and connections to the central city, including Parkville and the new metro rail stations.

Implement new intelligent transport systems such as dynamic overhead lane management in the central city (including Johnston Street, Punt Road/Hoddle Street, routes to Footscray and Sunshine), and employment centres, to enable buses to travel faster and more reliably.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion -$5 billion | It is estimated the implementation of this option is likely to include the following items and associated costs:<br><br>- Upgrading several tram corridors to light rail standard. The Route 96 upgrade to a modern light rail network standard cost $800 million, which included the purchase of 50 low floor trams, upgrades and relocations of tram stops on the route, and redevelopment of two depots. Route 96 is 14kms, so the total cost would vary based on the length of the corridor<br><br>- Dynamic overhead lane management in the CBD and inner city to give priority to on-road PT.<br><br>PT service type and frequency are assumed to increase to accommodate growth in demand over time.<br><br>Pedestrianisation initiatives can each cost $10-$100 million, based on the plans in Sydney for the pedestrianisation of George St at a cost of $60 million, though further analysis is required to confirm this assessment.<br><br>The above costing range is heavily driven by the large cost of tram corridor upgrades. While specific costings are not publicly available, if only the lane and traffic light management sub-option was undertaken, the cost would be expected to be <$100 million (subject to confirmation from VicRoads). |
| **Overall Contribution** | Significant | The success of such road space allocation interventions are heavily dependent on their |

| | | |
|---|---|---|
| | | design, and will always need to be conditioned by the context in which it is set.<br><br>However, even if a well-thought out intervention drove an increase in cycling mode share, the impact on total transport capacity may not be significant if it led to reductions or slowdown in private car travel.<br><br>Ultimately, a nuanced and carefully designed road space allocation assessment along a smaller number of strategic corridors – including assessment of mode switching and total transport capacity – may uncover some optimal, small scale designs that increase total capacity significantly. On this basis, the contribution of this option to the assessment metric is significant. |

## Draft Option - Transport network price regime

### Strategic Intervention: Changing behaviour > Economic charging

**Reference 2.6.9/TNP**

Overall pricing review to manage demand for peak/non-peak times across the entire transport network to achieve a number of objectives:

- achieve most efficient use of assets
- spread the peak/traffic volume
- encourage public transport use (including optimising most affordable public transport - buses)
- capture true cost of transport types - particularly private vehicle use
- encourage less car use to the central city and major employment centres
- incentivise heavy vehicle use of roads during determined times.
- reduce travel time and improve travel time reliability for private vehicles and freight.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $100 million - $500 million | A truly transformative road pricing system would be coordinated with the Commonwealth, given the need to harmonise with Commonwealth taxes and to better manage interstate fleet movements.<br><br>An initial scoping study or business case with a cost of < $10 million is likely to be required. The cost of implementing a comprehensive road pricing regime is circa $400 million, based on international examples.<br><br>Alternatively, a localised cordon system which relies on gantries with centralised ICT infrastructure is expected to be less than $100 million. Administrative costs are likely to be up to an additional $100 million.<br><br>It is important to note that given the breadth of possible solutions, the cost could move into the |

| | | |
|---|---|---|
| | | $500 million - $1 billion cost range. |
| **Overall Contribution** | Significant | While precise impacts are very difficult to anticipate, the experience in other cities suggests that the contribution of this option would be significant. It would allow for centrally controlled spreading of peak period travel, reducing average journey times into and out of the CBD.<br><br>While this would certainly be expected to reduce road congestion by spreading traffic to the shoulder periods, the overall contribution is highly uncertain given the existing constraints on PT capacity to absorb additional patronage and the myriad design nuances, such as time-of-day-pricing design (and the interaction of the design of the road and PT pricing schemes) and the difficulty in anticipating demand responses.<br><br>London's congestion charge saw a 30% reduction in congestion, 2-5% fewer accidents.<br><br>Singapore's congestion charge saw a 40% reduction in congestion.<br><br>Stockholm's congestion charge saw a 19% reduction in congestion, and 5-10% fewer accidents. |

## Draft Option - Central city job cap

### Strategic Intervention: Better use > Land use and planning controls

**Reference 4.11.1/CCJ**

This option would “Cap" number of jobs available in central city and re-focus this growth within national employment centres as well as Geelong (as Victoria's second city) and other regional centres. The cap could be set as a target for the Central area. This option could be achieved through the following examples:

- Requiring new government offices to locate outside the central city;
- Land use planning controls that restrict development of new commercial developments in the central city;
- Transport pricing to disincentive access to the central city.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | The estimated cost range to implement this option has been assigned on the basis that the cost is limited to the administration and enforcement of regulations. Given how little analysis has been done to support this option, it is important to note the potential wider costs that may result when the highly productive jobs in the CBD are limited and replaced by jobs in employment clusters where productivity effects such as agglomeration are |

| | | |
|---|---|---|
| | | less prevalent. |
| **Overall Contribution** | Moderate | By definition, an externally enforced cap on the supply of jobs in the CBD will lower the demand for CBD travel and contribute to this metric.<br><br>However, given that the problem is not the existing demand for travel but rather the projected demand for travel and its mismatch with supply, this option is considered to have only a moderate contribution.<br><br>Despite this moderate contribution assessment, this policy is not recommended without significant further analysis, given its expected negative unintended consequences. |

## Draft Option - Increased Telecommuting

### Strategic Intervention: Better use > Coordination processes

**Reference 4.11.2/ITT**

Facilitate telecommuting by providing CBD businesses with financial incentives to keep employees working from home and thus reducing demand on the transport network.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | This option is predominantly an administrative change only with no capital works required. Whole of life cost estimations include consultation, implementation and management. Ultimately the design of a scheme would determine the total cost, and the scheme could be designed to provide financial incentives for teleworking in excess of $100 million, although such a design is considered unlikely given the potential. |
| **Overall Contribution** | Low | Given that there is a market at work to govern the situations in which telecommuting makes financial sense, the costs of teleworking (e.g. in terms of lost productivity, such as through reduced access to special materials and equipment, or lower frequency of face-to-face meetings) would need to be assessed and offset against the value of the benefits from greater transport system capacity. The high cost of office rents in the CBD mean that employers already have every incentive to allow teleworking where feasible. |

## Draft Option - Rail signals and fleet upgrade

### Strategic Intervention: Better use > Incremental expansion of existing assets

**Reference 4.11.3/RSF**

Upgrade signalling system across the entire metropolitan train network to accommodate more trains on existing network. Complemented by purchase of new, high capacity trains and associated infrastructure upgrades to allow more services to run (e.g. power upgrades).

The option would create the capacity for trains to run at up to two minute frequencies along all rail corridors. This additional capacity would allow for the running of additional services across the rail network.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | High | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | > $10 billion | The estimated whole of life costing for the implementation of this option is based on existing cost studies that have been undertaken in to specific parts of the metropolitan network. The estimated cost to rollout HCS on the Cranbourne-Pakenham corridor, including the cost of the signalling infrastructure, operating expenditure over 20 years, 25 new trains, four level crossings and three station upgrades, was $5.2 billion. The signalling costs alone are estimated at approximately $500 million for the Cranbourne-Pakenham corridor. Scaling that up these estimates across the entire metropolitan network suggests the cost is likely to be greater than $10 billion. |
| **Overall Contribution** | Significant | The impact of this option on rail system capacity would be significant. It would create the capacity for trains to run at up to two minute frequencies along all rail corridors in delivered in concert with other works on some corridors.<br><br>However, the application of the technology to Melbourne's rail system is yet to be proven, with the current trial on the Sandringham corridor ongoing and not due for completion until 2020. |

## Draft Option - High capacity trains - 7 car

### Strategic Intervention: Better use > Incremental expansion of existing assets

**Reference 4.11.4/HCT3**

Procurement of 7 car high capacity metro trains for the metropolitan network. This option will include associated minor upgrades to track and stations and the upgrade and electrification of the existing line from Frankston to Baxter where the stabling and maintenance will be located.

This will increase the capacity of the network and enable the movement of growing numbers of

transport users to access the central city area.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | High | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion -$5 billion | The estimated cost to implement this option is unclear as there is limited information on the number of existing train stations that can accommodate 7 car train lengths. It is possible that no platform lengthening would be required if passengers were informed about which carriages they need to alight from.<br><br>The cost assessment above assumes that no platform lengthening is undertaken, and is based on the cost of $1.3 billion for the Government's recent order of 37 High Capacity Metro Trains (plus stabling), which are seven cars in length and will come onto the network in late 2018. According to the Melbourne Metro Stage 1 Business Case and the Trains, Trams, Jobs 2015-2025 – Victorian Rolling Stock Strategy, it is estimated that 100 HCMTs are needed to allow for the retirement of the oldest Comeng trains by the middle of the 2020s. There is also likely to be some minor station and track upgrades involved, are covered within the cost range provided here. |
| **Overall Contribution** | Significant | HCMTs will cater for an average load of up to 1100 people, which is greater than the existing capacity of 798 for the fleet that it will replace. The implementation of this option will significantly contribute to the supply and demand mismatch. |

## Draft Option - High capacity trains - 10 car

### Strategic Intervention: Better use > Incremental expansion of existing assets

**Reference 4.11.5/HCT2**

Procurement of 10 car high capacity metro trains for the metropolitan network. The works would include associated upgrades to power, stabling yards, platform and other ancillary assets. Significant works would be required on the network to accommodate 10 car trains and a potential roll out across the network would need to be staged and prioritised to those corridors experiencing the most significant capacity constraints. This will increase the capacity of the network and enable the movement of growing numbers of transport users to access the central city area.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | High | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion -$5 billion | This assessment of the estimated cost to implement this option would be incremental to the costing of $1.3 billion for the Government's recent order of 37 High Capacity (seven car) Metro Trains (plus stabling), which will come onto the |

| | | |
|---|---|---|
| | | network in late 2018. The cost for this option is not expected to arise until the mid-2020s, once the first generation of HCMTs have replaced the older Comeng trains and are themselves reaching capacity. It is assumed that the adoption of these trains into the Melbourne fleet will require some stations to increase station platform length. As such, the cost is likely to be in the $1-5 billion range provided above. Based on the costing above it could be estimated that each extension from a 7-car to a 10-car would be approximately $15m. The Melbourne Metro business case suggests a total of approximately 70 7-car sets to service the Sunbury-Dandenong corridor. |
| **Overall Contribution** | Significant | This will increase train capacity to 1570 persons, an increase of more than a third when compared with the capacity of the 7 car HCMTs that will commence operation on the Melbourne metro network in late 2018. This would add significantly to the Sunbury-Dandenong corridor capacity. |

## Draft Option - Train platform utilisation

### Strategic Intervention: Better use > Incremental expansion of existing assets

**Reference 4.11.6/TPU**

Encouraging more even use of train platforms when boarding and alighting to boost train capacity. Increase canopy cover on platforms to encourage passengers to move further down the platform instead of creating localised crowding. This would smooth the passenger load along the length of the train and reduce over-crowding. It would also contribute to reducing dwell time at stations for crowded services improving service reliability and performance.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | High | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $100 million - $500 million | The estimated whole of life cost to implement this option has been based on past completed projects of a similar nature. The cost to install canopies at Richmond station in 2015 cost $7.3 million, across all five of the station's island platforms.<br><br>Using an average cost of $728,000 per platform, the identified cost range of $100-$500 million would enable between 137 and 687 canopies to be built. There are currently 218 metropolitan train stations in Melbourne so a $500 million budget would mean 3 canopies per station on average. It is acknowledged that not all platforms lack canopies (for example the newly upgraded Richmond Station), however other stations may only have partial coverage (e.g. at Camberwell Station the majority of Platforms 1 and 2 are sheltered whereas much of Platform 3 is not). |

| | | |
|---|---|---|
| **Overall Contribution** | Low | Providing greater shelter at train platforms will assist in a more even spread of passengers along the platforms, and thus more even loading of train carriages. This may mean that more passengers are able to access their chosen train service, decreasing the gap between supply and demand. However, this impact is expected to be small because it is likely that passengers will prepared to minimise the effects of inclement weather (e.g. bring a hat or umbrella) if the alternative is to miss their desired service. |

## Draft Option - Tram and train fleet modifications

### Strategic Intervention: Better use > Incremental expansion of existing assets

**Reference 4.11.7/TTF**

Improve train and tram capacity, including modifying existing train and tram fleets through reconfiguring seating arrangements. Some work has already commenced on the train network which could be expanded and rolled out more aggressively across the fleet. Option includes delivery of 50 new low-floor, high capacity trams and removing seats from rail carriages. The increased carrying capacity of tram and train services enables greater numbers of people to access employment and services during peak times.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | High | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $100 - $500 million | The cost to implement this option through the removing of seats and reconfiguring of carriage interiors to accommodate more standing passengers could be achieved at relatively low cost. It is likely to be towards the lower end of this range according to PTV. |
| **Overall Contribution** | Moderate | Melbourne has amongst the highest "seats per square metre" of any major city in the world (1.24 currently in Melbourne compared with 0.88 in London and 0.71 in Hong Kong, and even 0.9 in Perth). Lowering this ratio would contribute moderately to the reduction in supply and demand mismatch. It represents a relatively low cost way to achieve a 900 load standard with no reduction in dwell time performance.<br><br>Metro has been reported in the media as quoting 10% increases in capacity from the removal of 15 seats from each Comeng train carriage (leaving 444 seats out of the train's total capacity of 800).<br><br>It should be noted though that this option is limited by the long distances (90+ minutes) of some suburban rail lines where it would not be comfortable to commute and stand every day for that time period. |

## Draft Option - Transport network information centralisation

### Strategic Intervention: Changing behaviour > influencing behaviour through information

**Reference 4.11.8/TNI**

Roll out ICT infrastructure that provides centralised real time information across the transport network (both private and public transport) covering all modes to users that allows commuters in particular to make real time multi-modal decisions about their journey. It thereby has the potential to reduce and spread peak period demand. This will improve the comfort of services to passengers and increase the utilisation of existing transport infrastructure.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | The estimated cost to implement this option has been based on the assumption that a portal would be created to collate and centralise data already generated by public and private sector entities. Data systems would be maintained by a public sector entity, but the input would be provided by both public and private sector entities as well as transport system users in real time. |
| **Overall Contribution** | Moderate | This option has the potential to create more informed commuters, and allow them to make and revise travel decisions in real time. It thereby has the potential to reduce and spread peak period demand.<br><br>However, it is unclear whether sufficient and appropriate data is currently being captured and released to take advantage of this option. For example, applications such as the Google-owned "Waze", which relies heavily on user-generated real-time information data on traffic conditions, have failed to become mainstream. It may be that more time is needed to generate the user-base that would make these apps viable for cities in Victoria. The contribution of this option is likely to grow over time, but the growth is highly uncertain, and the role for government in expatiating this process is not clear. |

## Draft Option - Car parking management

### Strategic Intervention: Changing behaviour > Economic charging

**Reference 4.11.9/CPM**

Reduce the attractiveness of commuting by car to the CBD by using the government congestion levy to increase parking prices. Changes to pricing could be done in conjunction with regulations to limit the physical availability of car parking in the CBD in future developments.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | This option is predominantly an administrative change only with no capital works required. Whole of life cost estimations include consultation, implementation and management. |
| **Overall Contribution** | Low | This option would seek to lower car use into the CBD. The clearest effect of this policy would be to make travel to non-CBD locations quicker and more reliable. There is the potential for the CBD car commuters who stop driving to the CBD to be quickly replaced on the road network by non-CBD car users, which would limit or eliminate the overall benefits on road speeds for CBD car commuters and for on-road PT. Further analysis would be needed to discern the causes of peak travel road congestion - distinguishing CBD car commuters from cross-city (i.e. non-CBD) car commuters.<br><br>While more research is needed, CBD car commuters are also potentially quite price inelastic (i.e. unresponsive to increases in the levy). This may be a result of the number of businesses that rely on workers using private vehicles for work purposes from a CBD-based office location or cars incorporated into salary packaging arrangements.<br><br>On this basis, the contribution of this option on the assessment metric is low. |

## Draft Option - Doncaster heavy rail line

### Strategic Intervention: New/expanded assets > New greenfield asset

**Reference 4.11.10/DHR**

Construction of a new heavy rail link commencing at the current Doncaster park-and-ride facility that follows the Eastern Freeway and connects with the Clifton Hill heavy rail trunk near Collingwood station. The operation of the Doncaster Heavy Rail Service is dependent on the reallocation of capacity in the Clifton Hill Loop Line through the construction of a new tunnel from Clifton Hill via Parkville to Southern Cross Station for the South Morang – Southern Cross Line. This new rail tunnel is outlined in PTV's Network Development Plan and is treated as a separate option (Melbourne Metro 2). This region is currently serviced by the Doncaster Area Rapid Transit (DART) bus system. The construction of this rail extension would provide the first rail line to the City of Manningham and enable a fast and efficient service to the city from the Doncaster area.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion -$5 billion | The most recent PTV-commissioned feasibility study found the cost of building the recommended option from Collingwood to Doncaster Park & Ride would start at $3-$5 billion. It would cost an extra $1 billion to build a tunnel to extend it to the nearby Doncaster activity centre, which would be an optional extra that has not been included in the cost and contribution assessments here.<br><br>Further, additional capacity would need to be provided on the Clifton Hill line between Collingwood and the city to accommodate the additional trains from Doncaster. PTV's Network Development Plan identified a new rail tunnel would be required for this, which is treated as a separate option. |
| **Overall Contribution** | Low | This option would have a contribution to the reduction in the supply and demand mismatch but it is expected to be relatively low on the basis of the recent feasibility study.<br><br>The feasibility study noted that an estimated 98% of forecast patronage would be diverted from existing public transport services (modelled for 2031). The study included mode shift data that indicates that morning peak patronage would comprise: 50% of passengers who are currently Doncaster Area Rapid Transit (DART) bus users; 48% of passengers who are currently travelling on other rail services; 2% of passengers who are currently travelling by private vehicle.<br><br>With forecast daily patronage of 56,000 in 2031, that 2% translates to 1,120 passengers per day, or about 1,000 car trips per day. That's a very small pay-off in the context of the estimated cost of the line. Without generating any material mode-shift, the rail line would not lower congestion on the Eastern Freeway significantly, and the public transport services relieved of patronage by the option have sufficient capacity to accommodate growth with relatively modest upgrades over time. As such this option is expected to have a low contribution to this metric.<br><br>Even over the longer term, growth in the Doncaster area is low compared to average metropolitan growth. We do not anticipate a materially different result over the 2046 time horizon to the 2031 modelling results for this established corridor. |

## Draft Option - Doncaster tram service

### Strategic Intervention: New/expanded assets > Incremental expansion of existing assets

**Reference 4.11.11/DTS**

Extend the Route 48 tram from Balwyn Road/Doncaster Road intersection through to Doncaster. The approximately 4.5 km extension would increase public transport provision in the north east of Melbourne.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $100 million - $500 million | The estimated cost to implement this option is based on previous costing information provided in 2006 for the proposed project. |
| **Overall Contribution** | Low | No feasibility studies have looked at the likely demand for this service extension. Given the distance from the CBD, it is likely that this extension would provide an uplift in local community accessibility rather than greater CBD accessibility. The high and settled pattern of car use for Doncaster residents suggests that this is unlikely to generate significant capacity improvements. |

## Draft Option - Doncaster bus improvement

### Strategic Intervention: Better use > Contractual processes
### New/expanded assets > Incremental expansion of existing assets

**Reference 4.11.12/DBI**

Enhance Doncaster Area Rapid Transit (DART) bus services in inner Melbourne by improving the frequency and efficiency of the area's bus network through the provision of better peak hour priority for DART buses. The scope includes the construction of a bridge that will allow buses to travel from the Eastern Freeway to Victoria Parade, and a new street configuration to connect buses from Victoria Parade into the CBD, as well as incremental additional DART services. This will enable a faster and more efficient service to the city from the Doncaster area.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion -$5 billion | The cost of this would depend on the scale of additional services provided, and the extent of the capital works involved. The costing range assigned here is based on major new construction of a bridge that will allow buses to travel from the Eastern Freeway to Victoria Parade using a bridge, and a new street configuration to connect buses from Victoria Parade into the CBD, as well |

| | | |
|---|---|---|
| | | as incremental additional DART services. |
| **Overall Contribution** | Moderate | While this contribution score should be assessed cautiously given the limited evidence available, it is considered reasonable to assume that even higher DART services frequencies, in combination with the continuing bus priority lanes and signalling on the Eastern Freeway and Hoddle streets, will induced some further mode switching from car to bus for travellers in Melbourne's north-east, thereby increasing the total capacity of the Eastern Freeway and CBD access. It would also induce greater uptake of bus services travelling from further east than Doncaster. DART patronage growth has been strong since its introduction. Patronage growth in the March 2015 quarter was 8% following the changes to Zone 1 and 2 fares.<br><br>The advantage of this option over the Doncaster fixed rail options is the construction of a bridge that would facilitate travel from the freeway to the CBD. This would allow buses to travel almost unimpeded from the start to the end of journeys, and provide such a significant benefit in travel time reductions that it would be expected to induce greater mode switching than the fixed rail options. |

## Draft Option - Strategic transit oriented development corridors

### Strategic Intervention: Better use > Land use and planning controls

**Reference 4.11.13/STO**

Designate a set of strategic public transport corridors that are suited for transit oriented development, these being major radial and trunk public transport corridors that connect these employment centres, join employment centres to the central city, join employment centres to growth corridors and residential catchments or are corridors already showing strong characteristics of transit oriented development.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | While the immediate costs for implementation of transit oriented development (TOD) corridors are limited to planning scheme changes, and thus relatively small, the shift to TOD corridors may necessitate greater spending on services to provide appropriate capacity to meet the larger volume of people living in transit corridors. The cost of these additional services has not been included here. |
| **Overall Contribution** | Significant | By encouraging greater density in areas where transport options are readily available and additional transport capacity can be provided at |

| | | |
|---|---|---|
| | | relatively low cost, the impact on capacity to the CBD is expected to be significant. It will facilitate the shift to the use of highly efficient mass transit systems, and reduce commuting times relative to cities with that emphasise suburban sprawl. |

## Draft Option - Geelong rail electrification

### Strategic Intervention: New/expanded assets > Incremental expansion of existing assets

**Reference 4.11.14/GRE**

Electrification of the Geelong line and operation of high-capacity electrified rolling stock from Grovedale to improve capacity, reliability and travel times. This will enable the line to be fully integrated into the metropolitan system and create through-running opportunities for passengers to reach the wider CBD area without changing train services. This would enable greater accessibility to central city employment opportunities for the growing population in the Geelong region.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $500 million - $1 billion | The estimated costs for implementation of this option are based on other Melbourne rail electrification projects (e.g. Sunbury cost $270 million) albeit much longer, and the cost of providing new rolling stock for the line. There would also be a saving from avoidance or deferral of purchasing additional diesel rollingstock. |
| **Overall Contribution** | Moderate | Given capacity uplift provided by recent investment in Geelong services (e.g. RRL), this option is not expected to drive significant increases in capacity over the next decade. The benefits of electrification are largely in reducing train operating costs (included in the whole of life cost), rather than in allowing for greater capacity (noting that electrification will improve train speeds, but the benefits of this will be limited by headway restrictions from the quality of rail signalling). However, assuming that larger rolling stock are procured, the project will have a moderate impact on the supply of transport to the central city. |

## Draft Option - Bendigo rail full metropolitan separation

### Strategic Intervention: New/expanded assets > Incremental expansion of existing assets

**Reference 4.11.15/BRF**

Full separation of Bendigo regional services from metropolitan services between Sunbury and Sunshine by adding rail tracks to release more capacity along the corridor and improve reliability. This separation, in coordination with other projects, will enable additional rail services from Bendigo and Sunbury to enable people to access employment and services in the central city.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $500 million - $1 billion | The estimated cost range assessed for the implementation of this option has been based from similar previous projects completed within Victoria. In the 2015/16 State Budget, the final cost of the Regional Rail Link project was $3.65 billion. The RRL project incorporates additional infrastructure beyond what has been outlined as part of this option. It is estimated that the cost of duplicating nearly 27 kilometres of track kilometres between Sunshine and Sunbury (assuming double track) is around $700 million. This cost estimate is for track works only. |
| **Overall Contribution** | Moderate | The Regional Rail project separated regional lines from metropolitan lines in Melbourne's west. It has provided for the future full separation of Bendigo regional services (except Sunshine to Sunbury) from other metropolitan lines.<br><br>Adding rail tracks will release more capacity along the corridor from both Bendigo and Sunbury allowing better access to the central city and also improve corridor reliability. |

## Draft Option - Geelong and Werribee rail upgrade

### Strategic Intervention: New/expanded assets > Incremental expansion of existing assets

**Reference 4.11.16/GWR**

A new track pair from Deer Park to West Werribee via Tarneit and Wyndham Vale stations and a dedicated track pair from Deer Park Junction to Southern Cross. This will allow for full separation and provide capacity for additional metropolitan and regional services to be added to the high growth corridors. This includes improving peak hour capacity on the Werribee, Sunbury, Craigieburn and Upfield lines and the Geelong, Ballarat and Bendigo lines. This provides additional access to employment and services in the central city.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion -$5 billion | The estimated cost range assessed for the implementation of this option has been based from similar previous projects completed within Victoria. In the 2015/16 State Budget, the final cost of the Regional Rail Link project was given as $3.65 billion. This option may require additional capacity on the network east of Sunshine station, potentially provided by the Melbourne Metro 2 Option. |
| **Overall Contribution** | Moderate | The creation of the link between Deer Park to West Werribee via Tarneit and Wyndham Vale stations has completed the Regional Rail Link project. All Geelong trains currently run via Tarneit and merge with other regional trains at Deer Park Junction. A new track pair from Deer Park to West Werribee via Tarneit and Wyndham Vale stations and a dedicated track pair from Deer Park Junction to Southern Cross will allow for full separation and provide capacity for additional metropolitan and regional services.<br><br>This is expected to moderately increase the supply of transport to the central city. |

## Draft Option - Rowville heavy rail line

### Strategic Intervention: New/expanded assets > New greenfield asset

**Reference 4.11.17/RHR**

A new heavy rail line to Rowville connected at Huntingdale Station running east along the central median of North Road and Wellington Road to Stud Road, then turning north to terminate at Stud Park. The works include the construction of four stations at Monash University, Mulgrave, Waverley Park and Rowville. The operation of the Rowville Heavy Rail Line is dependent on the capacity enhancement works of the Dandenong trunk upgrades and the construction of the Melbourne Metro Rail Project. This option has the ability to reduce congestion on the Dandenong rail network and road network through passenger mode change.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion -$5 billion | The recent Rowville Rail Study Stage 2 conducted in 2013-2014 did not provide a cost estimate. The estimated cost to implement this option is based on a Knox City Council commissioned prefeasibility study from 2004 which indicated that a single track, mostly elevated line could be built from Huntingdale to Rowville for $480 million (approximately $650 million today). This seems very low relative to other recent rail costings, and obviously doesn't include inflation and cost |

| | | |
|---|---|---|
| | | escalation since 2004. Other experts have suggested the cost is more likely to be greater than $2 billion. The inclusion of whole-of-life operational expenditure would push the cost to the mid-point of the $1 billion - $5 billion range. |
| **Overall Contribution** | Low | Stage one of the Rowville Rail Study (2011-2012) determined that before a Rowville rail line could be provided, significant capacity increases to the rail network, in particular to the Dandenong rail corridor, would be required. Similarly, PTV's 2013 Network Development Plan identified the need to unlock capacity in both the centre of Melbourne's rail network and along the Dandenong corridor before a Rowville rail line could be built. The commitment to Melbourne Metro, extended high capacity metro trains and Cranbourne-Pakenham Line Upgrade are major steps forward in providing this capacity.<br><br>The feasibility study shows that the Rowville line is unlikely to provide sufficient benefits to justify its construction cost. It is projected to carry 68,000 passengers a day by 2046, which is comparable to what existing rail lines are projected to carry in the same year. However, the feasibility study says it would increase the share of all trips carried by public transport in the metropolitan area in 2046 from 12.6% to 12.7% (i.e. by just 0.1%). In addition 57% of patronage would be drawn from other rail lines. And the line would reduce the number of car trips on a typical weekday in 2046 by just 15,000. The Travel Demand Modelling technical report concluded that:<br><br>"With the assumed train operating patterns in the model, the Rowville line appears to have a marginal impact on motorised mode shares. The modelling suggests that half to two-thirds of passengers using the Rowville line will be drawn from other rail lines. The Dandenong line is likely to be the major contributor….While the Rowville line will reduce car travel to some extent, impacts on traffic congestion levels appear to be relatively minor." |

## Draft Option - Central city tram network extension

### Strategic Intervention: New/expanded assets > Incremental expansion of existing assets

**Reference 4.11.18/CCT**

Extend tram lines within the central city area including to the new redevelopment areas of E-Gate and Fisherman's Bend and the missing tram link between Dynon and Footscray. The extension to Fisherman's Bend involves an extension along Collins St to go over the Yarra River and into the Fisherman's Bend precinct along Plummer St. These extensions will provide city access to new

residents and visitors from the urban redevelopment areas and a new cross city tram link.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $500 million - $1 billion | The estimated cost to implement this option has been assessed assuming the construction of three tram links; Footscray to Docklands and City (4.6km), E-gate to City (2 km) and Fisherman's Bend to Collins Street (3 km). The cost estimate is based on 2.5% CPI, a 7% discount rate, construction cost of $15 million per kilometre, annual operating expenditure of $8 million with a present value of $142 million over a 30 year period and total capital expenditure and operating expenditure of approximately $600 million. It is likely that the scope would also require an additional crossing of the Yarra River. |
| **Overall Contribution** | Moderate | These three tram extension projects will link existing and developing areas to the wider network. Given the level of development expected at E-Gate (10,000 residents) and Fisherman's Bend (80,000 residents), the tram will provide a crucial link to the central city from those areas. |

## Draft Option - Melbourne Metro 2

### Strategic Intervention: New/expanded assets > New greenfield asset

**Reference 4.11.19/MMS**

Construction of a heavy rail connection between Clifton Hill and the CBD through to Fisherman's Bend and Newport via two new rail tunnels. The works will separate the South Morang – Southern Cross Line from the Clifton Hill group. This will provide ancillary capacity benefits to Werribee, Hurstbridge and Sunshine lines and capacity for a potential future Doncaster rail line. This new link could provide the opportunity for additional stations in the inner north and urban renewal precincts. Furthermore it will add capacity for people to access employment and social activities in the central city.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | > $10 billion | The cost estimation for the implementation of this option is based on comparison with Melbourne Metro, a comparable project. Thus the cost is considered to be in the >$10 billion range, including whole-of-life operating expenditure. |
| **Overall Contribution** | Moderate | This project will provide an additional cross-city rail option that adds capacity to the city's north and west.<br><br>Under the Network Development Plan, between Stage 2 and 3, the peak hour services on the |

| | | |
|---|---|---|
| | | Clifton Hill trunk increases from 22 to 33.<br><br>This is viewed by PTV as a project to consider from approximately 2030, depending on how demand evolves over time and in response to Melbourne Metro 1. It is not expected to deliver significant value in terms of CBD capacity before 2030, and there is an expectation that a cost-benefit analysis of this project undertaken today (which would necessarily take Melbourne Metro as given) would not justify proceeding with this project at this time, but there is likely to be justification for reserving alignment today. The western section of the tunnel would not provide value until the additional capacity generated through Melbourne Metro 1 is fully utilised. The Network Development Plan highlights the benefits of potential new inner city stations and future extensions to Fisherman's Bend and Newport. |

## Draft Option - New underground metro rail system

### Strategic Intervention: New/expanded assets > New greenfield asset

**Reference 4.11.20/NUM**

A complementary metro style subway systems in the central city akin to those in London or New York within a 5 km radius of Flinders Street station. This option also includes the provision of new links to areas which are currently not serviced, such as Fisherman's Bend and E-gate. This subway system will provide links to currently un-serviced areas. It will also complement the existing heavy rail network to increase the connectivity of the network and the mobility of the population. This will result in a moderate increase in the supply of public transport for journeys into the central city.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | > $10 billion | Assuming an average cost of $1 billion per kilometre (based similar Melbourne Metro pricing estimates) it would potentially cost well in excess of $10 billion to provide a de-coupled underground subway system within a modest 5 km radius of Flinders Street station.<br><br>This option also includes the provision of new links to areas which are currently not serviced, such as Fisherman's Bend and E-Gate. The purchase of appropriate rolling stock would also be required as well as the requirement for new station facilities which may further increase the cost. Including 30 year maintenance and operational costs the whole of life cost would likely exceed $15 billion. |
| **Overall Contribution** | Moderate | Subway systems remove issues related to level crossings and can accommodate services with higher speed, frequency, reliability and safety. |

| | | |
|---|---|---|
| | | Shorter lines are more likely to provide a higher level of operational performance because the risk of incurring infrastructure and rolling stock delays increase with the length of a line.<br><br>This de-coupled subway system will provide links to areas currently not serviced by heavy rail, it will increase the connectivity of the network and the mobility of the inner city population. This will result in a moderate increase in the supply of public transport for journeys into the central city. |

## Draft Option - City loop reconfiguration

### Strategic Intervention: New/expanded assets > Incremental expansion of existing assets

**Reference 4.11.21/CLR**

Upgrade the Melbourne Underground Rail Loop (MURL) to increase capacity particularly on the Upfield, Craigieburn and South East rail lines. The works will include new tunnelling links, signalling upgrades and a new rail flyover. This upgrade and reconfiguration will enable additional services to be run through the MURL, support extensions to the network and allow for the creation of standalone end-to-end rail lines. This option will increase access to the city centre from across the metro region and the overall resilience of the network.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion - $5 billion | Reconfiguring the City Loop is likely to be very expensive; the Melbourne Metro Stage 1 business case suggests a cost of $2.7 billion. The Melbourne Metro Stage 1 business case also suggests that some Loop tunnels would be out of action for months at a time. The scope of this option is unclear and thus a more accurate cost estimate is difficult. |
| **Overall Contribution** | Significant | The current routing and infrastructure for lines that operate through the city loop is inefficient, wasting central area track capacity and limiting the supply of train services.<br><br>On the Craigieburn and Upfield lines, post Melbourne Metro, these constraints mean that the combined frequency of the Craigieburn and Upfield lines is restricted to approximately 24 trains per hour. Increasing the degree of segregation by reconfiguring the City Loop therefore has the ability to enhance performance. Many passengers on Burnley local services transfer to loop services at Richmond which means the link between Richmond and Flinders Street is underutilised.<br><br>The proposed reconfigured loop operation and train loadings from PTV's Network Development Plan will remove loop operations on the Northern |

| | | |
|---|---|---|
| | | and Caulfield loops, creating two new Cross-City lines. This project would significantly increase capacity by an additional 30 trains per hour in the peak direction on the Upfield (more than 18 trains per hour), Craigieburn (more than 6 trains per hour) and Burnley (more than 6 trains per hour) lines. These are some of Melbourne's most crowded lines. The full sectorisation will also enhance service reliability, provide faster cross-town journeys and enable quicker outbound services on the Burnley express line. |

## Draft Option - Bicycle highways through the central city

### Strategic Intervention: New/expanded assets > New greenfield asset

**Reference 4.11.22/BHT**

Dedicated bike lanes to facilitate better travel into and across the CBD. Grade-separation from other road users is expected to be required to some extent.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | The estimated cost for implementing this option is based on an existing proposal in line with the option outline. A consortium including Federation Square co-designer Donald Bates and Pacific Strategies director Mike Potter has costed a 1.7km Melbourne Veloway that would hover 10m above six busy intersections from Princes Bridge to Southern Cross Station, separating cyclists from vehicle traffic and pedestrians walking along the Yarra River, at $25 million. Building other link paths to inner Melbourne areas may shift the cost up to approximately $100 million. |
| **Overall Contribution** | Low | This option would be expected to have a contribution, but it would not be expected to be significant relative to the total transport task. While evidence that bicycle highways can contribute to overall transport system capacity can be found internationally - Copenhagen providing one example - the success of any intervention will be highly context dependent. The additional safety that these bicycle highways would provide would induce greater mode shift to cycling, with a commensurate increase in the total transport system capacity.<br><br>There would also be a risk that the provision of bicycle highways may draw from the existing road space that is available for cars or on-road PT, and have a negative overall impact.<br><br>Beyond the provision of dedicated cycling lanes, |

| | | |
|---|---|---|
| | | major barriers to a material uptake of cycling in Melbourne are the end of journey CBD facilities, such as change room and showers, and the safety concerns that limit its adoption across the full range of demographics and thereby limit its ability to make a significant contribution relative to the total transport task. |

## Draft Option - Water taxis/buses/ferries to the central city

**Strategic Intervention: New/expanded assets > New greenfield asset**

**Reference 4.11.23/WTB**

Utilising the bay and rivers to provide a waterborne public transport service to the CBD from points such as Portarlington, Williamstown, West Werribee and along the Yarra and Maribyrnong rivers. This would provide an alternative public transport option to people living in the growth areas of Melbourne's west and Bellarine Peninsula. The provision of this service would reduce demand on the freeway and heavy rail networks to this region enabling greater access to jobs and services in the central city.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | The estimated cost to implement this option is based on similar operations in other jurisdictions. The total cost of ferries in Sydney in 2010-11 was approximately $100 million. Given that a ferry system in Melbourne would be much smaller in scale, even with some initial capital outlays the expected cost is <$100 million. |
| **Overall Contribution** | Very-low | The 2008 Department of Transport review concluded the estimated travel time between Werribee and Melbourne was "unlikely to be comparable to the same route via public transport which can achieve travel time of around 35 minutes". Another Transport Department study in 2010 found there would not be enough passenger demand.<br><br>On this basis, the assessment metric has been deemed as a low contribution to the mismatch in supply and demand. |

## Draft Option - Cross city road tunnel

**Strategic Intervention: New/expanded assets > New greenfield asset**

**Reference 4.11.24/CCR**

Construct a cross city tunnel from the west of the city to the east of the city to reduce cross city congestion by providing a link that avoids driving through the city centre or through already congested routes around the city.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | > $10 billion | The estimated cost for the implementation of this option has been based on existing cost scenarios known from the East West Link project. Based on the depth that the tunnel would need to go to avoid the City Loop and Melbourne Metro, and the need to connect the tunnel to existing high road capacity corridors, the cost of this option is expected to be >$10 billion. |
| **Overall Contribution** | Negative/very low | Given that the existing east to west freeway options are south of the CBD (the M1 including the Burnley and Domain tunnels) and north-east of the city (the M3), and that there are proposals for the East-West Link tunnel to link the north east and west, there is a clear question of the potentially duplicative nature of a road tunnel. The question is then whether this is a potentially better option than the East West Link tunnel for connecting the city's north-east and north-west. Given that the existing alignment for the E-W Link exists, and would not require a large volume of traffic to be re-routed into a tunnel under the CBD, this option is considered to be of low contribution to transport capacity. However, given that such an option may require the re-routing of traffic from the southern and northern cross city routes into a tunnel entrance closer to the CBD, this option may even have a negative impact by creating greater road congestion. |

## Draft Option - Hoddle Street/Punt Road public transport prioritisation

### Strategic Intervention: Better use > Refurbishment of existing assets

**Reference 2.6.10/HSP1**

Prioritise public and active transport traffic flows using traffic management systems and road space allocation changes. This would be applied at the following locations:

- High Street (Route 6 Tram)
- Commercial Road (Route 72 Tram, Buses 220, 216, 219)
- Toorak Road (Route 72 Tram)
- Swan Street (Route 70 Tram)
- Bridge Road (Route 75 Tram)
- Victoria Street (Route 30, 12, 109)
- Public transport on Hoddle Street north of Victoria Street (DART services 905-908, Buses 302, 303, 304, 305, 309, 318, 350)
- Public transport on Punt Road between Alexandra Parade and Swan Street (Bus 605 and 246).

Under this option, public transport capacity would be increased on intersecting routes to accommodate growth in demand resulting from improved travel times and reliability.

Prioritising the public transport services that cross and use Hoddle Street/Punt Road allows for increased capacity and reliability that will make public transport usage more attractive. Prior to implementation, this option needs to be further investigated so that the potential impacts on north-south vehicle travel (HSP2) can be understood. It could also leverage the 'continuous flow' concepts to be trialled at four locations along Hoddle Street/Punt Road. This option is worth considering for the benefits that it can provide in a congested corridor for a very low cost.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | Both scenarios A and B have been investigated Both scenarios A and B have been investigated with regard to cost of implementation for this option. In the case of option A, the cost is expected to be <$100 million for the signalling implementation, including whole of life operating expenditure. For option B, the cost for the grade separation would be highly dependent on the scope of works involved, but would be estimated at $100-150 million each, placing it in the $500 million - $1 billion range for a 30 year whole of life costing. |
| **Overall Contribution** | Moderate | This would be expected to give priority to vehicles and PT travelling to the CBD from the inner east, and have a positive impact on transport system capacity for these travellers. However, the impact would either be negligible or negative for vehicles travelling from the outer eastern suburbs, where travel is typically undertaken using heavy rail or private car journeys.<br><br>The question is then what is the overall net impact on capacity, whether this intervention might create the additional transport supply needed to meet projected growth in demand. There is limited evidence in the public domain on which to make a clear assessment of this option. As with many other options, the specific design of the intervention will be decisive in determining the overall net impact, with a nuance design expected to perform better than a simple 'more red lights on all north south routes' approach. For example, this option may have a higher level of viability if implemented only for intersecting roads south of Victoria Parade, which would avoid the most obvious source of traffic gridlock from cars and buses clearing the end of the Eastern Freeway and entering Hoddle St on route to the CBD along Victoria Parade. Greater evidence is required to make a clear assessment of this sub-option, to better understand the function of Hoddle St/Punt Rd travel between Victoria Parade and St Kilda Junction, and how it creates capacity for travel to/from the central city. The impact of this north- |

| | | |
|---|---|---|
| | | south traffic may serve different needs (such as business travel, or travel to non-CBD employment clusters) and this trade-off would need to be assessed.<br><br>The use of 'continuous flow' road design could also be incorporated to smooth the flow of turning traffic at key intersections, such as Hoddle St/Victoria Parade.<br><br>Another alternative is a 'grade separation' scenario (which is not the scenario used in the contribution assessment above), under which the contribution would be significantly affected by construction disruption and land acquisition costs but the contribution to improving east-west traffic flow and overall transport system capacity would be much stronger.<br><br>It is clear that further investigation is needed to identify an optimal design. |

## Draft Option - Hoddle Street / Punt Road Traffic Management Systems

### Strategic Intervention: Better use > Refurbishment of existing assets

**Reference 4.11.26/HSP2**

Use traffic management systems to prioritise traffic flow along Hoddle Street/Punt Road at a number of intersections, including Dandenong Road, High Street, Commercial Road, Toorak Road, Alexandra Avenue, Swan Street, Bridge Road, Victoria Street, Johnston Street, and Queens Parade.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | The estimated cost for the implementation of this option is dependent on the scope and scale of implementation. Undertaking the scope outline in (A) it is estimated the cost for this would be <$100 million for the signalling option, including whole of life operating costs. Alternatively, or in conjunction with (A), option (B) is estimated to cost for the grade separation option and would be highly dependent on the scope of works involved, but would be estimated at $100-150 million each, placing the overall implementation in the $500 million - $1 billion range. |
| **Overall Contribution** | Low | Many obvious actions have already been implemented (e.g. traffic light signalling has been improved) or is expected to be implemented (clearway from Alexandra Avenue to St Kilda Junction).<br><br>Under the grade separation scenario, the |

| | | |
|---|---|---|
| | | contribution would be significantly affected by construction disruption costs. |

## Draft Option - Regional rail eastern corridor dedicated rail track

**Strategic Intervention: New/expanded assets > Incremental expansion of existing assets**

**Reference 4.11.27/RRE1**

Build dedicated regional rail tracks on the Eastern corridors to separate regional and metropolitan trains. The project would remove potential conflicts between regional train services and slower metropolitan services. This will increase capacity and reliability of both the regional and metropolitan networks to encourage mode shift from car and "regional commuting". It will also allow for a moderate increase in the number of train services accessing the central city, alleviating crowding on the Dandenong line. The option will also increase the capacity for additional freight movements from the east of the state.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion -$5 billion | The estimated cost range assessed for the implementation of this option has been based from similar previous projects completed within Victoria. The Regional Rail Link project completed in Melbourne's west in 2015 cost approximately $3.65 billion. This project separated regional Ballarat, Bendigo and Geelong services from the electrified Melbourne suburban services. It is expected that a similar project to separate regional services to eastern Victoria would be in the same cost range.<br><br>However, the ability to provide dedicated tracks through the inner south east, across the CBD (linking freight services to Dynon) and conceivably involve tunnelling would lift this option into a higher cost bracket. |
| **Overall Contribution** | Moderate | This project would remove potential conflicts between regional train services and slower metropolitan services. It will also allow for a moderate increase in the number of train services accessing the central city, alleviating crowding on the Dandenong line. It is unlikely to significantly reduce journey times. |

## Draft Option - CityLink to Western Ring road connection

**Strategic Intervention: New/expanded assets > New greenfield assets**

**Reference 2.6.7/EWW**

Construction of the East - West (West) Link which would link the CityLink with M80. This option targets east-west links for road freight movement including in and around the Port of Melbourne.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | > $10 billion | The cost estimation for this option has been based on existing studies done for the construction of the proposed road. Based on the estimated $8-10 billion (2013 dollars) from the preliminary feasibility work, the estimated capital cost is at the top of the $5-10 billion range. Whole-of-life operating expenditure may increase this cost above $10 billion for the 30 year period. |
| **Overall Contribution** | Low | East West Link is a project primarily designed to facilitate cross-city travel, as opposed to direct CBD access. In September 2014 the Victorian Government stated the benefits of the Western section are:<br>– Provide capacity for around 100,000 vehicles per day.<br>– Provide a 15-20 minute time saving for travel from Geelong, Werribee, Altona and Laverton to the city and 10-15 minute savings for travellers from Ballarat, Melton and Caroline Springs.<br>– Cut 15-20 minutes off a trip from the freight precinct in Truganina to the Port of Melbourne.<br><br>However, no modelling is available to demonstrate these savings or the ability for them to be sustained in a constrained city environment. Analysis for the Western Distributor project has produced modelling that shows that the Western Distributor would be close to capacity in 2031, just nine years after its scheduled completion. The analysis, by PricewaterhouseCoopers, notes the possible need for a western freeway/toll way crossing to CityLink north of the Western Distributor within 15 years. As such, there is a clear timing dimension involved in determining the contribution of this option. The option is likely to have a positive contribution in the latter half of the 30 year evaluation period. On the basis that this option has been given a low contribution assessment here. |

## Draft Option – Eastern Freeway to CityLink connection

### Strategic Intervention: New/expanded assets > New greenfield assets

**Reference 4.11.28/EWE**

Improve road connectivity across the city from east to west. While there are a number of possible solutions (alignment, length of tunnel, number of lanes, etc.), for the purpose of an initial assessment the option is assumed to be a six lane (total) road link from the Eastern Freeway to CityLink, with a substantial amount of tunnelling. It includes capacity expansion on the Eastern Freeway and localised works to improve inner north public transport and amenity.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $5 billion -$10 billion | The cost estimation for this project is based off existing feasibility studies, business cases and tender to market which were completed for the Link. The results were that the East West (East) Link was costed at $6.8 billion in 2013. |
| **Overall Contribution** | Low | The primary focus of this project is to improve cross-city transport connectivity, rather than to directly facilitate greater access to the central city. The forecast induced demand on the Eastern Freeway would continue to meet bottlenecks at the freeway's Hoddle St exit – although it should be acknowledged that the strategic modelling for East West (East) Link indicated that traffic volumes along Hoddle St between Alexandra Parade and Victoria St would remain generally constant with and without the East West (East) Link. |

## Draft Option - Regional Rail electrification

### Strategic Intervention: Better Use > Incremental expansion of existing asset

**Reference 4.11.30/RRE2**

Electrification of passenger rail centres for rail services to Geelong, Ballarat and Bendigo to increase line capacity, reliability and travel times in order to attract greater mode shift from car and "regional commuting" from regional centres. The main benefits of electrification are cost efficiency, better rolling stock, reduced carbon emissions and improved passenger experience. Services on electrified lines are generally more reliable, more connected and have higher capacity. The expected contribution of this option to address the gap between supply and demand on the transport system is therefore expected to be moderate.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion -$5 billion | The estimated cost for the implementation of this option has been based on similar projects which have been completed previously in Victoria. The Sunbury electrification project cost around $270 million. There would need to be additional length of works Sunbury to Bendigo; Sunshine to Ballarat; Sunshine to Geelong) etc. However, there is a large amount of uncertainty so with the inclusion of rollingstock purchases; the cost range is expected to be $1 billion - $5 billion. |
| **Overall Contribution** | Moderate | The main benefits of electrification are cost efficiency, better rolling stock, reduced carbon emissions and improved passenger experience. Services on electrified lines are generally more reliable, more connected and have higher capacity. The expected contribution of this option to address the gap between supply and demand on the transport system is therefore expected to be moderate. |

## Draft Option - Geelong fast rail

### Strategic Intervention: Better Use > Incremental expansion of existing asset

**Reference 4.11.31/GFR**

Implementation of a fast rail service (less than 30mins) between Geelong and Melbourne (Southern Cross Station). Using examples from international rail operators and new technologies, this option would encourage greater mode shift from car and "regional commuting" from Geelong. This would enable greater accessibility to central city employment opportunities for the growing population in the Geelong region.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $5 billion -$10 billion | The estimated cost to implement this option has been sourced from previous studies undertaken. $4 billion was the price suggested by private firm |

| | | |
|---|---|---|
| | | Transrapid in 2008 when it proposed to the Victorian Government a high speed maglev rail line connecting Geelong with Melbourne's outer suburbs, Tullamarine and Avalon airports. Assuming this as a low-end cost, and incorporating whole-of-life operating costs, the cost is expected to be $5-10 billion. |
| **Overall Contribution** | Moderate | The project has been estimated to provide Melbourne-Geelong travel time of about 12 minutes, with travel speed of over 450 km/h between Avalon and Footscray. However, given recent significant investments in capacity for travel from Geelong (including RRL), the impact of this option is considered moderate.<br><br>The precise impacts of this option are very difficult to anticipate, given that the option would drive significant land use changes, including residential and commercial location, which may ultimately lead to it having a significant impact.<br><br>The limited supporting evidence for the proposed benefits means that this contribution assessment should be treated cautious pending further consideration. |

## Draft Option - Public transport timetabling

### Strategic Intervention: Better use > Coordination processes

**Reference 4.11.32/PTT**

Deliver timetable changes across the train system to realise all available capacity by reconfiguring peak period services to better meet patronage demand. This option would increase services on the lines to Melbourne's north and west, some of the most crowed in the network.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | To make these changes it would be necessary to remove a number of services from the city loop that would then run direct to Flinders Street Station at peak times. For example, 'base case' scenarios for the Melbourne Metro Concept of Operations (June 2013), a report which sets out the capability of the network after the Regional Rail Link Project completion, show all peak period Frankston Line services operating direct to Flinders Street and continuing on to Southern Cross Station to connect to the Werribee Line. This would be a temporary change, with Frankston services returning to the City Loop following completion of the Melbourne Metro by 2026. This report also shows approximately eight additional trains per hour from north and west Melbourne |

| | | |
|---|---|---|
| | | could be added compared with the current timetable.<br><br>There will be some operating costs for the services to run, but the necessary capital costs have already been incurred, making this a relatively low cost option for material benefit. |
| **Overall Contribution** | Moderate | Population growth has increased demand for rail services leading to major projects such as Regional Rail Link (completed in 2015). Timetable changes will allow for the maximum number of services to be provided on some of Melbourne's busiest lines, enabled by and in keeping with the planned benefits of this investment.<br><br>Every timetable change, however, inconveniences some customers. As the rail network is developed over time, planning will continue to be needed to strike a balance and to support people in changing their travel patterns. |

## Draft Option - Employment outside central city incentivisation

**Strategic Intervention: Better use > Coordination processes**

**Better use > Land use and planning controls**

**Reference 4.11.33/EOC**

Provide a suite of planning, infrastructure investment and financial incentives to encourage businesses to locate outside the central city.
Reallocate government services to better meet demand for access to job rich areas including Monash, Melbourne Airport, Latrobe and Sunshine, and future expansion in Werribee as employment grows (Ministerial Advisory Committee for the Metropolitan Planning Strategy for Melbourne recommendation).

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $100 million - $500 million | This option is a predominantly a policy/regulatory change only with no capital works required. Whole of life cost estimations include consultation, implementation and management. Major costs associated with this regulatory option would arise from enforcement. This cost range has been assigned on the basis that the cost is that of administering and enforcing regulations.<br><br>Given how little analysis has been done to support this option, it is important to note the potential wider costs that may result when the highly productive jobs in the CBD are limited and replaced by jobs in employment clusters where productivity effects such as agglomeration are less prevalent. |

| | | |
|---|---|---|
| **Overall Contribution** | Moderate | This option will raise CBD office rents and lower the demand for CBD travel, which will contribute positively to the identified metric.<br><br>Burke et al (2011) conducted modelling of an idealised employment decentralisation scenario for the year 2031 for Brisbane, to generate a set of likely travel behaviour changes. Their results suggest that planned decentralisation can improve transport system capacity and sustainability, particularly by reducing vehicle travel times, albeit after the short-term dislocations of workplace moves are resolved.<br><br>Despite this moderate contribution assessment, this policy is not recommended without significant further analysis, given an expectation of potentially significant negative unintended consequences. |

## Draft Option - Melton rail electrification

### Strategic Intervention: New/expanded assets > Incremental expansion of existing assets

**Reference 1.3.11/MRE1**

Extension of the electrified suburban rail network from Sunshine to Melton including the duplication of tracks between Deer Park and Melton and quadruplication of tracks between Sunshine and Deer Park. The works will provide additional capacity on the Ballarat line and increase the frequency of services to the greater Melton growth area. Extension of the electrified suburban rail network from Sunshine to Melton, including the quadruplication of tracks between Sunshine and Deer Park. The works will also include the removal of three level crossings on the Ballarat line between Sunshine and Deer Park West. This option will provide additional capacity on the Ballarat line and increase the frequency of services to the greater Melton growth area. It will also support improved reliability and capacity on the Bendigo and Geelong lines. This will allow more people from Melton and other regional areas to access jobs and services in the centre of the city.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion -$5 billion | Based on the evidence available the estimated cost for construction of this option is $1.3 billion. This estimation is guided by the Developing Transport Infrastructure and Services for Population Growth Areas, Victorian Auditor-General's Office Report, August 2013 and PTV's December 2012 rail plan which provides background to the proposed implementation of this option.<br><br>Assuming operating costs of 3% of capital expenditure for 25 years this provides a whole of life costing in the range of $1-5 billion. |
| **Overall Contribution** | Significant | Melton currently has a non-electrified service that runs through Melton South with 2 trains per hour |

| | | |
|---|---|---|
| | | in the peak periods.<br><br>According to PTV's 2012 Network Development Plan, Melton by 2016 will be serviced by 3 trains per hour in the peak and 2 trains per hour in the off-peak. The proposed duplication of the rail line to Melton will increase this capacity to 3 peak and 3 off-peak by 2022, and (while it is not exactly clear) electrification appears to deliver 6 peak and 3 off-peak services by 2026. This increase in capacity is expected to be required in order to meet projected growth in the Melton area, which has the second highest projected growth of any Victorian LGA (Victorian Government projections of 4.2% p.a. over 2011-2031).<br><br>The implementation of this option would have a significant contribution to the assessment metric. |

## Draft Option - Wallan rail electrification

### Strategic Intervention: New/expanded assets > Incremental expansion of existing assets

**Reference 1.3.12/WRE1**

Extend the electrified metropolitan rail network to Wallan. The new electrified section will utilise the Upfield Line with the reinstatement of tracks from Upfield to Somerton and a new track pair from Roxburgh Park to Craigieburn along with electrification works between Upfield and Wallan. This extension to the electrified network will give greater access to the new growth areas in Melbourne's north through additional services. It will enable more efficient access to central Melbourne and support access to jobs and services.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $500 million - $1 billion | No published data has been found on the cost of this proposed rail extension; however estimates would make this most comparable to the Sunbury electrification (capital expenditure $270 million) if constructed.<br><br>Assuming operating costs of 3% of capital expenditure for 25 years this provides a whole of life costing in the range of $500 million - $1 billion. |
| **Overall Contribution** | Significant | Wallan is currently connected with a V/Line service on the Seymour Line, with approximately 1 train per hour in the peak. With electrification, this would likely increase to 2 trains per hour, which would provide a significant contribution to the transport capacity through this northern corridor. Wallan is in the Mitchell Shire council, which has the fastest projected growth of any Victorian region over the period 2011-2031 per Victoria in Future (4.6 per cent). Its population growth rate is projected to rise significantly from 2021-31, coinciding with capacity constraints in |

| | | |
|---|---|---|
| | | other Melbourne LGAs. While increased supply of services to meet demand is not required in the short term it will be required in the long term to meet population growth. |

## Draft Option - Wollert rail extension

### Strategic Intervention: New/expanded assets > Incremental expansion of existing assets

**Reference 1.3.14/WRE2**

Extend the electrified metropolitan rail network to Wollert. The new electrified section would extend from Lalor to Wollert as a spur line off the South Morang Line. This extension to the electrified network will give greater access to the new growth areas in Melbourne's north through additional services and new stations. It will enable more efficient access to central Melbourne and support access to jobs and services.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion -$5 billion | The estimated cost range has been based on existing studies and requests for funding for the implementation of this option. The City of Whittlesea has previously asked the State Government to fund the extension of the train line from Lalor Station to Epping North and Wollert with an expected cost of approximately $600 million.<br><br>Assuming operating costs of 3% of capital expenditure for 25 years this provides a whole of life costing in the range of $1-5 billion. |
| **Overall Contribution** | Moderate | Fixed rail public transport is available several kilometres south of the Wollert Precinct at Epping on the South Morang line and west of the precinct at Craigieburn. Bus connections are available and can be provided in line with growth in population, or even increased above this at significantly lower cost than the Wollert rail extension. PTV did not include this rail extension in its 2012 Network Development Plan.<br><br>This project would add capacity, but the projected annual growth rate for 2011-2031 (3.5%) in Whittlesea is slightly lower than for the very fastest growing LGAs.<br><br>As with some other rail extensions to outer Melbourne LGAs, there is an unavoidable timing dimension to the potential contribution. If built today, the contribution would likely be low; in 10 years, moderate; in 20+ years, significant. On this basis, the contribution has been assessed as moderate. |

## Draft Option - Clyde rail extension

### Strategic Intervention: New/expanded assets > Incremental expansion of existing assets

**Reference 1.3.15/CRE**

Extend the metropolitan rail network to Clyde from the current terminus at Cranbourne in Melbourne's south east. The works will include grade separations with existing roads and new stabling and maintenance facilitates. This extension to the network will give better access to the new growth areas in the Shire of Casey. It will enable more efficient access to central Melbourne and support potential future extensions of the network in the south east.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion -$5 billion | The cost estimate for the implementation of this option has been assumed to be comparable to the Mernda rail extension due to the limited information available regarding costings and scope of works in the public domain.<br><br>Assuming operating costs of 3% of capital expenditure for 25 years this provides a whole of life costing in the range of $1-5 billion. |
| **Overall Contribution** | Moderate | The 2012 PTV Network Development Plan identifies the need for an extension for Clyde "probably within the next 20 years."<br><br>The Victoria in Future population projects are around 2.5% for Casey over 2011-2031, much lower than the fastest growing LGAs.<br><br>This option becomes more viable with a decision to establish a large scale commercial airport at Tooradin - the assessed contribution score does not incorporate this. |

## Draft Option - Wyndham Vale to Werribee rail extension

### Strategic Intervention: New/expanded assets > Incremental expansion of existing assets

**Reference 1.3.16/WVW**

Extend metropolitan rail network between Wyndham Vale and Werribee. The extension will accommodate future growth in Werribee West and provide a direct rail-rail interchange for passengers travelling between the Geelong and Werribee lines. This option will give greater access to the new growth areas in Melbourne's west through additional services and new stations. It will enable more efficient access to central Melbourne and support access to jobs and services.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion -$5 billion | No publically available information on costings have been found. Assume cost estimate is comparable to Mernda. According to the Network Development Plan, the extension will also include a new stabling and maintenance facility at Wyndham Vale.<br><br>Assuming operating costs of 3% of capital expenditure for 25 years this provides a whole of life costing in the range of $1-5 billion. |
| **Overall Contribution** | Moderate | The contribution here is to accommodate future growth in Werribee West. It will also provide a direct rail-rail interchange for passengers travelling between the Geelong and Werribee lines.<br><br>Much of the demand for CBD-bound travel has been delivered by RRL, but over time the gap will open up. This is a logical project to add capacity for the Wyndham region (including the Werribee activity centre), but it's not expected to be needed with the next decade. |

## Draft Option - Advanced Traffic Management

### Strategic Intervention: New/expanded assets > Incremental expansion of existing assets

**Reference 4.11.35/ATM**

Expand the use of traffic management tools (such as lane use management, access ramp signalling, CCTV and variable message signs) to manage freeway flows to achieve high levels of efficiency and reliability. The initiative would be applied progressively to the entire urban network with application triggered by congestion levels.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | High | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $500 million - $1 billion | The whole of life cost assumes a significant upgrade across Melbourne's freeway network of 100km of managed motorway.<br><br>The upgrade of the M1 freeway from Warrigal Road to Clyde Road (29.4 km) approximately $137.1 million, High St to Warrigal Rd (6.6km) approximately $19.7 million. These costs are capital only with an additional operating cost required.<br><br>As part of the 2014 NSW State Infrastructure Strategy NSW recommended a reservation of $400m for Smart Motorways investment on the M4, the Warringah Freeway and Southern Cross |

| | | |
|---|---|---|
| | | Drive General Holmes Drive (approximately 44km). |
| **Overall Contribution** | Significant | The BCR for the Warrigal Rd to Clyde Rd upgrade was 5.2.<br><br>In 2007, VicRoads commissioned Transmax to implement a coordinated ramp metering trial system on a 15 km section of the Monash Freeway (M1) It achieved the following benefits:<br><br>Safety: Accidents reduced by 30% on the motorway and 60% in the City Link Tunnel<br>Mobility: Travel time reduced by 42% during peak periods on the motorway and 48% in the tunnel<br>Efficiency: A greater than 50% increase in sustainable peak flows<br>Economic: Reduced fuel consumption and costs<br>Environmental: Daily fuel savings estimated at 16,500 litres of petrol<br>Greenhouse gas emissions reduced by 11%<br>Social: Community satisfaction through perceived improvement, reduced stress, financial savings, increased comfort, improved availability and quality of information on road networks. |

## Draft Need 4B: Provide better links to non-central city employment centres

Melbourne's transport system has developed to emphasise movements into the central city. While the central city is a significant source of economic activity, other metropolitan employment centres are also critical to the Victorian economy. Plan Melbourne identified five non-central city employment clusters in Monash, Dandenong South, Sunshine, East Werribee and Latrobe. Melbourne Airport (and the surrounding commercial and industrial activities) is also a significant employment centre. Monash has the largest concentration of employment outside the central city with close to 80,000 jobs, which is expected to increase to 145,000 in 30 years.

As recognised by Plan Melbourne, the transport system, and in particular public transport, will need to provide for growing employment in these centres. However, the legacy of a radial transport system compromises access to these employment centres compared to the central city. While some contemporary transport projects, including EastLink, and the roll-out of SmartBus, have gone some way to accommodate journeys to these centres from residential areas, these initiatives do not address this need completely, and certainly not without other initiatives over the next 30 years.

### Metrics

Metric 1 – Increase in the percentage of metropolitan Melbourne residents that can access non-central city employment centres within 30 minutes.

### Options

The table below lists the options considered for this Draft Need

| Reference Number | Option Name |
|---|---|
| 2.6.8 | Road space allocation changes |
| 2.6.9 | Transport network price regime |
| 4.12.1 | SmartBus service provision increase |
| 4.12.2 | Residential and commercial property densification |
| 4.12.3 | Mass transit network employment centre de-coupling |
| 4.12.4 | Arterial road network employment centre enhancements |
| 4.11.17 | Rowville heavy rail line |
| 4.11.13 | Strategic transit oriented development corridors |
| 1.3.8 | Local bus service standards |
| 4.11.33 | Employment outside central city incentivisation |
| 2.6.7 | CityLink to Western Ring road connection |
| 4.11.28 | Eastern Freeway to CityLink connection |
| 4.11.32 | Public transport timetabling |
| 5.2.3 | Melbourne Airport heavy rail line |
| 5.14.6 | North-East link |

The graph on the following page plots each option's Contribution verses Cost.

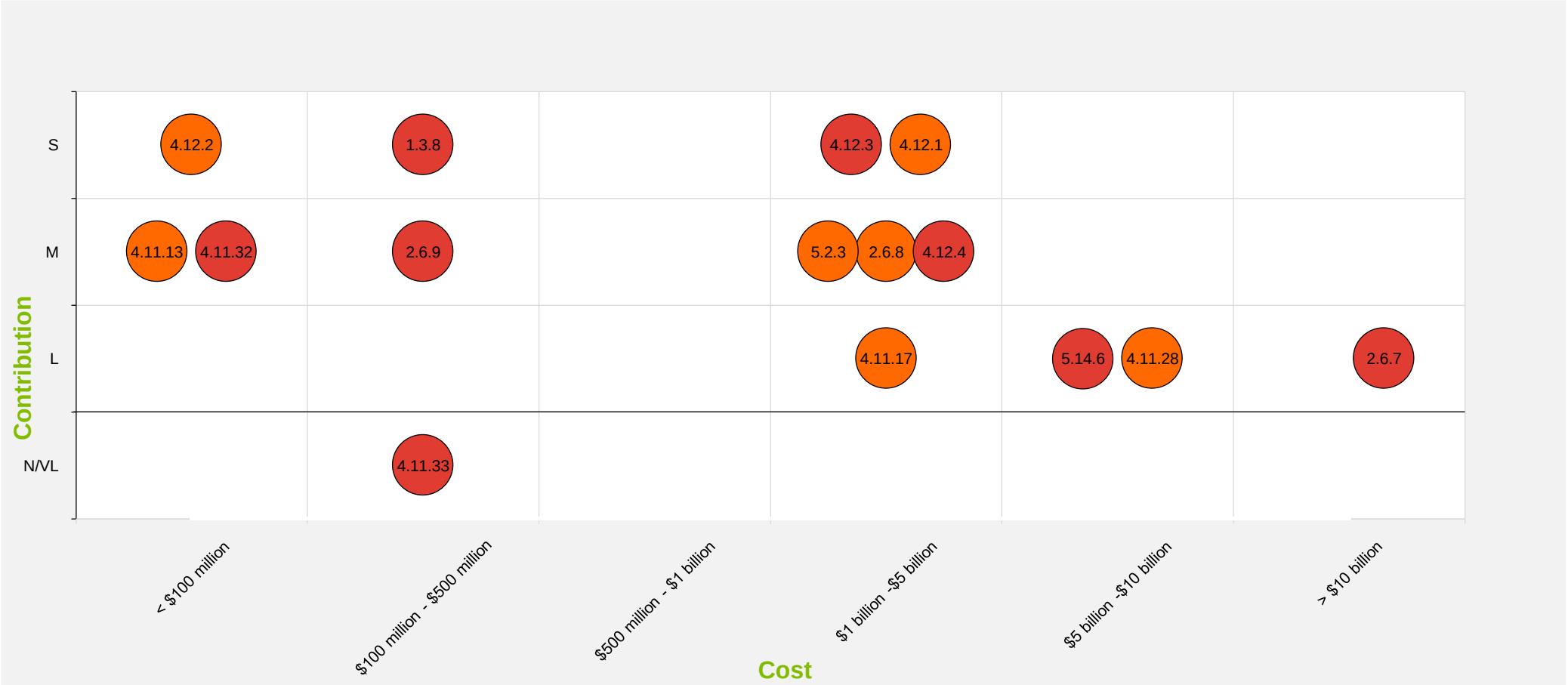



**Figure 12: Need 4B matrix**

## Draft Option - Road space allocation changes

### Strategic Intervention: Better use > Land use and planning controls

**Reference 2.6.8/RSA**

Road space priority for public transport and active transport corridors into the central city and employment centres to achieve best and most efficient use of road network (separating trams and buses from other traffic).

Provide transitional spacing which promotes walking and cycling (e.g. closing certain roads in the CBD and where appropriate employment centres, to private vehicles at certain times of the day). Upgrade tram corridors in the Cities of Melbourne, Port Phillip, Yarra and Stonington to light rail standard and improve services and connections to the central city, including Parkville and the new metro rail stations.

Implement new intelligent transport systems such as dynamic overhead lane management in the central city (including Johnston Street, Punt Road/Hoddle Street, routes to Footscray and Sunshine), and employment centres, to enable buses to travel faster and more reliably.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion -$5 billion | It is estimated the implementation of this option is likely to include the following items and associated costs:<br><br>- Upgrading several tram corridors to light rail standard. The Route 96 upgrade to a modern light rail network standard cost $800 million, which included the purchase of 50 low floor trams, upgrades and relocations of tram stops on the route, and redevelopment of two depots. Route 96 is 14kms, so the total cost would vary based on the length of the corridor<br><br>- Dynamic overhead lane management in the CBD and inner city to give priority to on-road PT<br><br>PT service type and frequency are assumed to increase to accommodate growth in demand over time.<br><br>Pedestrianisation initiatives can each cost $10-$100 million, based on the plans in Sydney for the pedestrianisation of George St at a cost of $60 million, though further analysis is required to confirm this assessment.<br><br>The above costing range is heavily driven by the large cost of tram corridor upgrades. While specific costings are not publicly available, if only the lane and traffic light management sub-option was undertaken, the cost would be expected to be <$100 million (subject to confirmation from VicRoads). |
| **Overall Contribution** | Moderate | Some road space allocation scenarios would impact positively on this metric, such as the |

| | | |
|---|---|---|
| | | removal of kerbside parking, which would create freer-flowing arterial roads and allow more cars and on-road PT to access these employment clusters within 30 minutes. The impact if the removal of kerbside parking was combined with greater cycling prioritisation (through separated parking lanes) is unclear for several reasons: 1) the limitations on potential demand for cycling to non-CBD employment clusters by given the large distances people tend to travel to reach these clusters and the fact that the 30 minutes benchmark identified this metric remains quite a long journey by bicycle, and 2) the limited ability to increase private car and public bus capacity along these corridors if kerbside parking is replaced by bicycle lanes, noting that car and bus are typically the most important modes for travel to non-CBD employment clusters. While there is literature that suggests that appropriate and well-considered road space designs can leave motorists unaffected by the provision of priority lanes for cyclists (Litman, 2013), such designs require further analysis before they can be credibly used to support a significant contribution for this metric.<br><br>In and around non-CBD employment clusters, the scope to increase the attractiveness of active transport would seem strong, but there is little evidence to suggest that it would significantly impact on this metric.<br><br>Active transport usage would be higher with higher densities in non-CBD employment clusters, and as such there is merit in combining this option with option 4.12.2.<br><br>In summary, the overall impact will be determined by the design, but there is potential for this to improve journey times to non-CBD employment areas. |

## Draft Option - Transport network price regime

### Strategic Intervention: Changing behaviour > Economic charging

**Reference 2.6.9/TNP**

Overall pricing review to manage demand for peak/non-peak times across the entire transport network to achieve a number of objectives:

- achieve most efficient use of assets
- spread the peak/traffic volume
- encourage public transport use (including optimising most affordable public transport - buses)
- capture true cost of transport types - particularly private vehicle use
- encourage less car use to the central city and major employment centres
- incentivise heavy vehicle use of roads during determined times.
- reduce travel time and improve travel time reliability for private vehicles and freight.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $100 million - $500 million | A truly transformative road pricing system would be coordinated with the Commonwealth, given the need to harmonise with Commonwealth taxes and to better manage interstate fleet movements.<br><br>An initial scoping study or business case with a cost of < $10 million is likely to be required. The cost of implementing a comprehensive road pricing regime is circa $400 million, based on international examples.<br><br>Alternatively, a localised cordon system which relies on gantries with centralised ICT infrastructure is expected to be less than $100 million. Administrative costs are likely to be up to an additional $100 million.<br><br>It is important to note that given the breadth of possible solutions, the cost could move into the $500 million - $1 billion cost range. |
| **Overall Contribution** | Moderate | Road pricing would alleviate road congestion in and around non-CBD employment clusters; however scheme design would be important. The incidence of congestion in Melbourne is such that there are 'hot' and 'cold' spots, often in close proximity to each other. Often these congestion 'hot spots' run along particular transport corridors. Given that the incidence of congestion in Melbourne, which is throughout non congestion in these clusters is relatively small and rolling out a cordon-based road charging system would be a challenge in disparate locations. A gantry scheme design that sought to lower congestion along corridors that connect employment clusters could improve access, but it is questionable whether this could bring a significant number of trips to within 30 minutes of employment clusters, given the large size of the broader Melbourne region.<br><br>To the extent that access to non-CBD employment clusters is currently constrained by PT service coverage and frequency, a cost reflective pricing scheme for PT may have a minimal or even negative contribution, depending on how it was designed.<br><br>There are added complexities that would need to be resolved, for example the feedback loop between road charging and mode switching to PT. |

## Draft Option - SmartBus service provision increase

### Strategic Intervention: Better use > Coordination processes

**Reference 4.12.1/SSP**

Expand the existing SmartBus network to connect employment centres to more residential catchments to provide a higher frequency public transport network with a focus to increase the percentage of Melbourne residents that can access non-central employment centres within 30 minutes. Providing additional SmartBus services will increase bus mode share, reducing congestion on key arterial roads/freeways as people shift from car to public transport and increasing access to non-central city employment centres.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion -$5 billion | The estimated cost to implement this option assumes provision of five new SmartBus services providing public transport services to designated employment clusters. It is based on CPI 2.5%, discount factor 7%, 30 year period, total capital cost $200 million and total annual operating expenditure $102 million with present value over 30 years of $1.8 billion. |
| **Overall Contribution** | Significant | There are currently nine SmartBus services in Melbourne, including the Doncaster Rapid Transport. SmartBus is designed to provide 'cross town' connections, running along major arterial roads to make journeys more direct. It has been suggested that additional SmartBus routes should be considered, in particular an orbital service running north-south through Melbourne's west. Better trunk bus services such as Smart Buses, particularly in middle and outer areas, coupled with improved local services could dramatically improve access to service centres, employment clusters and regional centres.<br><br>The initial SmartBus trial was highly successful with an unprecedented increase in passengers of 30-43%. State Government SmartBus initiatives on Blackburn and Springvale Roads have shown how substantial patronage increases (20-40%) flow from improved service standards in association with bus priority operation.<br><br>Providing additional SmartBus services will increase bus mode share, reducing congestion on key arterial roads/freeways as people shift from car to public transport and increasing access to non-central city employment centres. |

## Draft Option - Residential and commercial property densification

### Strategic Intervention: Better use > Land use and planning controls

**Reference 4.12.2/RCP**

Specific planning provisions to significantly increase residential density on the periphery of key employment centres, and increase density of commercial and business within these employment centres. This option would need to ensure there is sufficient land set aside for future employment growth of employment centres.

This would increase the opportunities for residents to walk and cycle to work to existing employment centres reducing travel time to work and reduce transport congestion in the central city.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | While the immediate costs for implementation of transit oriented development (TOD) corridors are limited to planning scheme changes, and thus relatively small, the shift to TOD corridors may necessitate greater spending on services to provide appropriate capacity to meet the larger volume of people living in transit corridors. The cost of these additional services has not been included here. |
| **Overall Contribution** | Significant | By increasing density of areas that are closely connected to road and rail transport corridors, the capacity of the system has the potential to increase significantly.<br><br>If residential densities were increased in and around non-CBD employment clusters, then this clearly has the potential to significantly increase their accessibility within 30 minutes.<br><br>However, the impact on accessibility times between non-CBD employment clusters may be more limited - given that higher residential densities are typically conducive to improvements in public transport usage, the relative isolation of non-CBD employment clusters means that public transport interchange would be necessary to reaching these clusters. Given this expectation that PT interchanges are a key feature of more dense urban environments, the impact of this option on 30 minute accessibility is considered moderate rather than significant.<br><br>The contribution has been assessed as significant, but further analysis is required to confirm this. |

## Draft Option - Mass transit network employment centre de-coupling

### Strategic Intervention: Capacity investment > New greenfield asset

**Reference 4.12.3/MTN**

Deliver a mass transit public transport system, tailored for each employment centre (mode, frequency, design based on employment and population growth) designed to complement the heavy rail system.

Potential examples include:

- Monash: medium rail/light rail/BRT along North/Wellington Road connecting the Sandringham, Frankston, Dandenong and possible Belgrave heavy rail lines
- Dandenong South: medium rail/light rail/BRT connecting the Frankston, Dandenong and Belgrave heavy rail lines
- La Trobe: BRT connecting the South Morang, Hurstbridge, Upfield and Craigieburn heavy rail lines
- Sunshine: BRT connecting the Werribee, Sunbury and Craigieburn heavy rail lines
- East Werribee: BRT connecting the Werribee, Sunbury and Craigieburn heavy rail lines. Providing mass transit public transport services will substantially increase public transport mode share, reducing congestion on key arterial roads/freeways as people shift from car to public transport and increasing access to non-central city employment centres.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion -$5 billion | The estimated cost to implement this option is based on building five new mass transit public transport systems. It is expected this would cost between $3 billion and $5 billion in capital and operating expenditure over a 30 year period. |
| **Overall Contribution** | Significant | Much of Melbourne's outer suburbs are poorly serviced by public transport. The initial SmartBus trial in Melbourne was highly successful with an unprecedented increase in passengers having switched from private vehicles.<br><br>A light or medium rail system is expected to encourage an even greater mode shift. A review of new light rail systems in the US and UK found up to 20% of the market previously used cars.<br><br>Providing mass transit public transport services will substantially increase public transport mode share, reducing congestion on key arterial roads/freeways as people shift from car to public transport and increasing access to non-central city employment centres. It is expected that it will significantly increase the connectivity between households and major employment centres. Another benefit will be a reduction in the reliance on radial travel through the CBD to access non-central city employment. |

## Draft Option - Arterial road network employment centre enhancements

### Strategic Intervention: Capacity investment > New greenfield asset

**Reference 4.12.4/ARN**

Improve the road network surrounding major employment centres to meet growing demand, such as the Westall Road extension from Princes Highway to Monash Freeway to improve connectivity and support the Monash employment centre. Delivery also a grid-like road network in the western suburbs (with emphasis on connecting residents to Sunshine and Werribee employment centres), with design prioritisation given to public transport.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion -$5 billion | The overall cost of this option is highly dependent on the scale of implementation, but based on current funded projects a cost of implementation is expected to be conservatively in the range of $1-5 billion. An initial scoping study is likely to cost < $10 million to coordinate and examine the feasibility and potential improvement projects across the five employment precincts.<br><br>Currently, VicRoads is delivering a series of road improvements for the East Werribee Employment Precinct at a cost of $71 million. If projects of a similar scale were rolled out across the other four employment centres, this could cost in the region of $300 million in capital expenditure.<br><br>Operational expenditure over a 30 year period could be in the region of $30 million in present value. This assumes:<br><br>- 200 lane kilometres of road to maintain<br>- CPI 2.5%<br>- discount factor 7%<br>- 30 year period<br>- average maintenance cost of $8,518 per lane kilometre (from VicRoads annual report).<br><br>Indications are that projects such as the 2.8 kilometre Westall Road Extension may cost approximately $90 million. If two such projects were developed in each employment centre, this has the potential for whole of life cost projections for this element in the region of $1 billion. |
| **Overall Contribution** | Moderate | The arterial road network provides the foundation for transport across Melbourne's suburbs. However, the existing road network creates a number of challenges.<br><br>A program of development projects will support the growth of existing and emerging job-rich areas across the metropolitan area. This needs to be |

| | | |
|---|---|---|
| | | targeted to accommodate the demand expected across Melbourne.<br><br>It is expected that an enhanced road network in and around designated employment centres would have a low impact on the number of jobs outside the central city area that are accessible within 30 minutes. |

## Draft Option - Rowville heavy rail line

### Strategic Intervention: New/expanded assets > New greenfield asset

**Reference 4.11.17/RHR**

A new heavy rail line to Rowville connected at Huntingdale Station running East along the central median of North Road and Wellington Road to Stud Road, then turning north to terminate at Stud Park. The works include the construction of four stations at Monash University, Mulgrave, Waverley Park and Rowville. The operation of the Rowville Heavy Rail Line is dependent on the capacity enhancement works of the Dandenong trunk upgrades and the construction of the Melbourne Metro Rail Project. This option has the ability to reduce congestion on the Dandenong rail network and road network through passenger mode change.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion -$5 billion | The recent Rowville Rail Study Stage 2 conducted in 2013-2014 did not provide a cost estimate. The estimated cost to implement this option is based on a Knox City Council commissioned prefeasibility study from 2004 which indicated that a single track, mostly elevated line could be built from Huntingdale to Rowville for $480 million (approximately $650 million today). This seems very low relative to other recent rail costings, and obviously doesn't include inflation and cost escalation since 2004. Other experts have suggested the cost is more likely to be greater than $2 billion. The inclusion of whole-of-life operational expenditure would push the cost to the mid-point of the $1 billion - $5 billion range. |
| **Overall Contribution** | Low | The Monash employment precinct is already accessible within 30 minutes of Rowville by car or bus.<br><br>It is expected that this option would improve access from inner Melbourne to the Monash employment centre, perhaps supporting more business interest there but not materially improving access to employment for people who are more than 30 minutes from an employment centre. |

## Draft Option - Strategic transit oriented development corridors

### Strategic Intervention: Better use > Land use and planning controls

**Reference 4.11.13/STO**

Designate a set of strategic public transport corridors that are suited for transit oriented development, these being major radial and trunk public transport corridors that connect these employment centres, join employment centres to the central city, join employment centres to growth corridors and residential catchments or are corridors already showing strong characteristics of transit oriented development.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | While the immediate costs for implementation of transit oriented development (TOD) corridors are limited to planning scheme changes, and thus relatively small, the shift to TOD corridors may necessitate greater spending on services to provide appropriate capacity to meet the larger volume of people living in transit corridors. The cost of these additional services has not been included here. |
| **Overall Contribution** | Moderate | By encouraging greater density in areas where transport options are readily available and additional transport capacity can be provided at relatively low cost, the impact on accessibility to non-CBD office locations is expected to be significant. It will facilitate the shift to the use of mass transit systems, and reduce commuting times.<br><br>However, given that higher residential densities are typically conducive to improvements in public transport usage, the relative isolation of non-CBD employment clusters means that public transport interchange would be necessary to reaching these clusters. Given this expectation that PT interchanges are a key feature of more dense urban environments, the impact of this option on 30 minute accessibility is considered moderate rather than significant. |

## Draft Option - Local bus service standards

### Strategic Intervention: Better use > Coordination processes

**Reference 1.3.8/LBS**

Provision of 20 minute local bus services in growth areas. Implement minimal local bus service levels of 20 minute frequency, 7 days a week, from at least 6 am to 9 pm within 800 metres from a premium or connector bus services for all growth area residents. This includes the introduction of connector services from Werribee to Wyndham Vale Station, Mt Ridley to Craigieburn Railway

Station, Epping North to Epping Station, Mernda to University Hill via South Morang station, and a north-south service between the Cranbourne and Pakenham lines. These extensions support the provision of local area access to shops, services and jobs. This will have benefits in terms of social inclusion as well as reduced congestion.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $100 million - $500 million | The estimated cost range has been based on existing similar examples such as those outlined in the document; Managing Growth – Infrastructure for Melbourne's Outer Suburbs which outlines the following public transport upgrades for the outer suburbs and have been allocated indicative capital costs:<br>- $15 million for new bus infrastructure.<br>- A further $85 million in operating spending to improve bus networks, mostly in Melbourne's growth areas. These will be improved by adding more routes, expanding others, restoring services and fixing missing links.<br>Assuming operating costs of 3% of capital expenditure per year for 25 years this provides a whole of life costing in the order of $100-$500 million. |
| **Overall Contribution** | Significant | Much of Melbourne's outer suburbs are poorly serviced by public transport, but the concept of a 20-minute neighbourhood requires local public transport services. Buses could play a key role in providing local area access to shops, services and jobs. An expanded local bus network would support growth of clusters and infill more broadly in the middle suburbs. This will have spin-off benefits in terms of social inclusion as well as reduced congestion. |

## Draft Option - Employment outside central city incentivisation

**Strategic Intervention: Better use > Coordination processes**

**Better use > Land use and planning controls**

**Reference 4.11.33/EOC**

Provide a suite of planning, infrastructure investment and financial incentives to encourage businesses to locate outside the central city.
Reallocate government services to better meet demand for access to job rich areas including Monash, Melbourne Airport, Latrobe and Sunshine, and future expansion in Werribee as employment grows.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $100 million - $500 million | This option is a predominantly a policy/regulatory change only with no capital works required. Whole of life cost estimations include consultation, implementation and management. Major costs associated with this regulatory option would arise from enforcement. This cost range has been assigned on the basis that the cost is that of administering and enforcing regulations.<br><br>Given how little analysis has been done to support this option, it is important to note the potential wider costs that may result when the highly productive jobs in the CBD are limited and replaced by jobs in employment clusters where productivity effects such as agglomeration are less prevalent. |
| **Overall Contribution** | Negative/very low | By definition, this option amounts to an externally enforced cap on the supply of jobs in the CBD, and will lower the demand for CBD travel and increase demand for non-CBD travel.<br><br>As a result, congestion on corridors connecting non-CBD employment clusters is expected to increase, and accessibility therefore decreased. |

## Draft Option - CityLink to Western Ring road connection

### Strategic Intervention: New/expanded assets > New greenfield assets

**Reference 2.6.7/EWW**

Construction of the East - West (West) Link which would link the CityLink with M80. This option targets east-west links for road freight movement including in and around the Port of Melbourne.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | > $10 billion | The cost estimation for this option has been based on existing studies done for the construction of the proposed road. Based on the estimated $8-10 billion (2013 dollars) from the preliminary feasibility work, the estimated capital cost is at the top of the $5-10 billion range. Whole-of-life operating expenditure may increase this cost above $10 billion for the 30 year period. |
| **Overall Contribution** | Low | It is expected that this option would improve access from inner Melbourne to both the Sunshine and East Werribee employment centres, perhaps supporting more business interest there but not materially improving access to employment for people who are more than 30 |

| | | |
|---|---|---|
| | | minutes from an employment centre, Thus a contribution rating of 'low' has been assigned. |

## Draft Option – Eastern Freeway to CityLink connection

### Strategic Intervention: New/expanded assets > New greenfield assets

**Reference 4.11.28/EWE**

Improve road connectivity across the city from east to west. While there are a number of possible solutions (alignment, length of tunnel, number of lanes, etc.), for the purpose of an initial assessment the option is assumed to be a six lane (total) road link from the Eastern Freeway to CityLink, with a substantial amount of tunnelling. It includes capacity expansion on the Eastern Freeway and localised works to improve inner north public transport and amenity.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $5 billion -$10 billion | The cost estimation for this project is based off existing feasibility studies, business cases and tender to market which were completed for the Link. The results were that the East West (East) Link was costed at $6.8 billion in 2013. |
| **Overall Contribution** | Low | It is expected that this option would improve access from inner Melbourne to eastern employment centres, perhaps supporting more business interest there but not materially improving access to employment for people who are more than 30 minutes from an employment centre, Thus a contribution rating of 'low' has been assigned. |

## Draft Option - Public transport timetabling

### Strategic Intervention: Better use > Coordination processes

**Reference 4.11.32/PTT**

Deliver timetable changes across the train system to realise all available capacity by reconfiguring peak period services to better meet patronage demand. This option would increase services on the lines to Melbourne's north and west, some of the most crowed in the network.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | To make these changes it would be necessary to remove a number of services from the city loop that would then run direct to Flinders Street Station at peak times. For example, 'base case' scenarios for the Melbourne Metro Concept of Operations (June 2013), a report which sets out the capability of the network after the Regional Rail Link Project completion, show all peak period Frankston Line services operating direct to Flinders Street and continuing on to Southern Cross Station to connect to the Werribee Line. This would be a temporary change, with Frankston services returning to the City Loop following completion of the Melbourne Metro by 2026. This report also shows approximately eight additional trains per hour from north and west Melbourne could be added compared with the current timetable.<br><br>There will be some operating costs for the services to run, but the necessary capital costs have already been incurred, making this a relatively low cost option for material benefit. |
| **Overall Contribution** | Moderate | Population growth has increased demand for rail services leading to major projects such as Regional Rail Link (completed in 2015). Timetable changes will allow for the maximum number of services to be provided on some of Melbourne's busiest lines, enabled by and in keeping with the planned benefits of this investment.<br><br>Every timetable change, however, inconveniences some customers. As the rail network is developed over time, planning will continue to be needed to strike a balance and to support people in changing their travel patterns. |

## Draft Option - Melbourne Airport heavy rail line

### Strategic Intervention: New/expanded assets > New greenfield assets

**Reference 5.2.3/MAH**

Delivery of a rail link between Melbourne (Tullamarine) Airport and the central city. The rail link would utilise the Albion East alignment and the Melbourne Metro rail tunnel to access Southern Cross Station. The new line will provide direct connectivity to the airport, with passengers able to easily access airport services via no more than one interchange in the central area of the network. It is estimated that the journey would take 25 minutes between Southern Cross Station and the airport at a frequency of 10 minutes. This new link will increase reliability of services for staff and airline passengers to Melbourne Airport and reduce congestion on the Tullamarine Airport.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion -$5 billion | The cost estimation to build the rail link from Melbourne Metro is expected to be in the order of $2-3 billion. On top of this figure, the whole-of-life cost must include operating and maintenance costs. The Parsons Brinckerhoff technical report for PTV notes that high-level operating costings were completed, but it does not provide this data.<br><br>Airport rail links in Sydney and Brisbane initially struggled to attract commuters and return a profit. Early patronage was well below expectation, but demand has grown and both rail links now return modest profits.<br><br>The airport rail links in Sydney and Brisbane were both privately financed. In 2013, it cost the Airport Link Company $20 million per year to operate Sydney Airport's rail station including staff costs and capital expenditure. |
| **Overall Contribution** | Moderate | Melbourne Airport generates commercial, employment and tourism related traffic. Strong growth is anticipated in all three areas so there is the imperative to provide connectivity which maximises the benefits associated with this growth. Access to the airport is currently heavily reliant on the Tullamarine Freeway and CityLink, and growing congestion is an increasing concern.<br><br>This option would enable travel between Melbourne Airport and the CBD within 30 minutes, thus access to employment opportunities along the rail corridor (e.g. to the employment precinct at Sunshine) or at the Tullamarine employment centre will increase. |

## Draft Option - North-East link

### Strategic Intervention: New/expanded assets > New greenfield assets

**Reference 5.14.6/NEL**

Construction of the North-East Link between the eastern freeway and the M80 to improve outer north-south links for road movement and improve travel time and reliability.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $5 billion -$10 billion | Construction of the North-East Link was estimated at $6 billion in the 2008 Victorian Transport Plan (now defunct). This includes tunnelling to preserve environmental and heritage values. It is not clear whether the $6 billion estimate is inclusive of operating expenditure, however based on data presented in the East-West Link Business Case, the net present value of operating expenditure for North-East Link is likely to be around $200 million. |
| **Overall Contribution** | Low | Northern roads have the slowest travel speeds in the morning and evening peak periods compared to other Melbourne regions, as well as the longest delays in travel time. North-East Link is a direct orbital link from the Metropolitan Ring Rd to EastLink.<br><br>Traffic modelling suggests that the North-East Link will reduce travel time and halt rat-runs through congested arterial roads in the north-eastern suburbs by removing some vehicles off congested north-south links in the inner north, such as Plenty Road and Spring St/St Georges Road.<br><br>The new Link will relieve existing Yarra River crossings and it may also encourage east-west cross regional movements via the Metropolitan Ring Road. By 2031, the North-East Link is forecast to carry 10,000 vehicles in both directions during a 2 hour peak period according to modelling undertaken by the former Department of Transport.<br><br>The predominant benefit of the linking of the Metropolitan Ring Rd to EastLink is for freight movements from the North and West to and from the South East, it has only a low contribution to linking employment centres across Melbourne. |

## Draft Need 4C: Improve access to early childhood care facilities

A barrier to workforce participation exists where early childhood facilities are not available to parents and carers wishing to return to work. These facilities span long day-care, family day-care and kindergarten services through to outside school hours care (OSHC) offered by primary schools or outsourced (e.g., Camp Australia). There is currently high demand across the state for early childhood services, with the sector more or less at capacity at all times and many assets being over-utilised. Once children reach primary school, this demand does not abate as parents rely upon OSHC to cover an eight-hour working day.

Some of the barriers to supply of facilities and services in specific locations across Victoria could include regulatory restrictions (such as those which flow through the planning system) and confusion across three tiers of government. The provision of these facilities and services is also complicated by the disparate nature of early childhood education, which operates under a variety of ownership models, including private, community and local government. However, infrastructure may play a part through sub-optimal use of the facility (e.g. sessional kindergarten instead of long-day care).

### Metrics

Metric 1 – Reduction in wait times for early childhood facilities

### Options

The table below lists the options considered for this Draft Need

| Reference Number | Option Name |
|---|---|
| 4.13.1 | School facility use for Out of School Hours Care |
| 4.13.2 | Early childhood education corporate office facilities |
| 4.13.3 | Early childhood education availability |
| 4.13.4 | Early childhood education centralised funding model |

The graph on the following page plots each option's Contribution verses Cost.

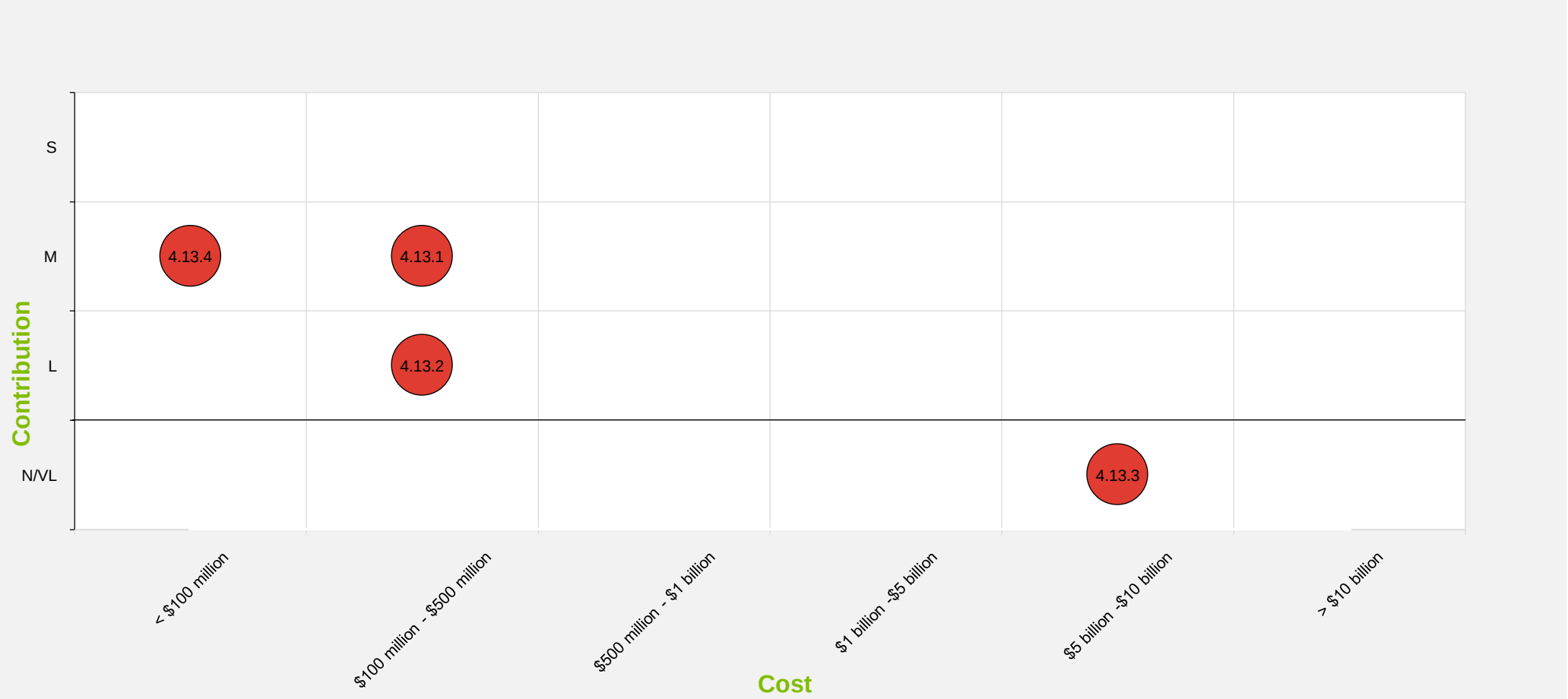



**Figure 13: Need 4C matrix**

## Draft Option - School facility use for Out of School Hours Care

### Strategic Intervention: Better use - Public Service delivery and approval processes

### Better use - Refurbishment of existing assets

**Reference 4.13.1/SFU**

This option supports the utilisation of primary school assets to improve access to out of school hours care (OSHC). Funding of conversion packages would be made available to schools for initial infrastructure investment.

Some schools have legacy infrastructure which prevents the programming of sufficient OSHC to support working parents. This option would look at retrofitting or expanding this infrastructure to enable access for broader community benefit. Increase in ongoing maintenance funding may be required to cover increased use of assets.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $100 million - $500 million | Based on existing data there is currently 35% of the schools portfolio which is over entitled (KPMG, School Maintenance Reform, 2015) and it is assumed this space can be utilised for EC facilities. The cost estimation provides for the capital upgrades & repurposing of facilities to be able to be used for these activities. Costs of implementation will be highly dependent on the number of facilities selected and the location where demand deems that further utilisation can be gained. It is assumed the facilities will be long-term leases to LGA and EC service providers. |
| **Overall Contribution** | Moderate | Currently a significant number of school facilities are under-utilised, providing an opportunity for capital upgrades and repurposing for the provision of early childhood and or out of hours school care. This implementation of this option will increase the number of early childhood facilities and provide additional capacity in the early childhood network, reducing wait times.<br><br>An indirect benefit of this option is the utilisation of existing school infrastructure. |

## Draft Option - Early childhood education corporate office facilities

### Strategic Intervention: Better use - Public Service delivery and approval processes

**Reference 4.13.2/ECE3**

Offer incentives for building owners to offer discounted rental/purchase agreements in high demand locations for accommodating early childhood education (ECE) facilities.

This would include facility purchase and construction costs to reflect locating in corporate areas. Maintenance and operational grants are also likely.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $100 million - $500 million | The cost estimation for the implementation of this option has been based on grants to cover up to 50% of facility purchase and construction costs to reflect increased costs of locating in corporate areas. Assuming grants are capped at $3 million and 50 centres are created this provides for a total capital outlay of $150 million. Maintenance and Operational grants of $150,000 per year over the 30 year working life for the 50 centres would provide the need for $225 million in operating expenditure funding. Thus a total expected cost of $375 million to implement the option. |
| **Overall Contribution** | Low | The implementation of this option will assist with the facilitation of increasing the number of early childhood facilities. This will provide additional capacity in the network and reduce wait times. |

## Draft Option - Early childhood education availability

### Strategic Intervention: Better use - Public Service delivery and approval processes

**Reference 4.13.3/ECE1**

Increasing availability of ECE services and working around primary providers work schedules.

Financial incentives exist in the form of rebates and subsidised funding for children in the year before school. This policy would be expanded to cover 2 years before school.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $5 billion -$10 billion | The cost estimation to implement this option has been calculated by assuming 75,000 students growing to 150,000 students from 15 years. Based on funding growing from $2,100 to $3,000 per student would result in 30 whole of life costing in the region of $2.3 billion (0- 15 years) + $4.6 billion (15 - 30 years) totalling $6.9 billion. |
| **Overall Contribution** | Negative/very low | It is anticipated the implementation of this option will increase demand for ECE services, thus having a negative impact on the reduction of wait times for ECE facilities.<br><br>However, this option would contribute greatly to the objective 'enable workforce participation'. |

## Draft Option - Early childhood education centralised funding model

### Strategic Intervention: Better use - Funding Agreements

**Reference 4.13.4/ECE2**

The establishment of a body to oversee funding from multiple levels of government to ensure resources are spent in the areas needed most.

The body will review of the overall capacity of the sector and undertake demand projections to inform where funding investments should be targeted as well as driving incentives for private investment.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | <$100 million | It is estimated to implement this option will require the establishment of a government body to oversee funding and provide demand projections. |
| **Overall Contribution** | Moderate | This option would provide greater oversight of the early childhood education sub-sector, assisting with provision, resource efficiencies and increasing capacity of the system. It could also target funding to areas of greatest need. |

# Draft Objective 5 - Lift Victoria's productivity

## Draft Need 5A: Improve the efficiency of freight supply chains through infrastructure

As the Victorian economy grows, trade is expected to increase as will the number of goods that need to be moved around the state. Freight volumes across Victoria are expected to increase markedly over the next 30 years, however, a number of factors may influence the level of demand, such as a consumer shift from goods to services. Reducing the cost of freight handling, storage and transport or improving reliability of supply chains will increase productivity in the coming years. For example, as nearly all of this freight is moved on roads, efficiency benefits are expected from the commitment to the Western Distributor and improved access to the Port of Melbourne. Business is also looking to technology as a key driver of supply chain efficiency.

The Port of Melbourne and the regional commercial ports are gateways for freight catchments extending throughout metropolitan Melbourne, regional Victoria and well into southern NSW, SA and Tasmania. In addition, airfreight is playing an increasing role in facilitating Victoria's trade, particularly for high-value, time-sensitive commodities (such as fresh produce bound for growing Asian markets). Victoria's ports have sufficient capacity to meet forecast demand for some time to come and by world standards are operating efficiently. However, it is important that additional port capacity is available when required in future, particularly for key trades such as containerised imports and exports, bulk liquid imports and regional exports. In the longer term, as the Port of Melbourne meets its maximum capacity, a second container port may be needed. Opportunities to expand existing or establish new facilities are limited, so careful planning is needed with long lead times. Constraining capacity at key gateways would have significant adverse impacts with both direct and indirect effects on the economy.

### Metrics

Metric 1 – Reduction in the cost of the total freight task (origin to destination).

### Options

The table below lists the options considered for this Draft Need

| Reference Number | Option Name |
|---|---|
| 2.6.9 | Transport network price regime |
| 5.14.1 | Port of Melbourne to metropolitan container shuttle |
| 2.6.4 | HPFV network completion |
| 5.14.2 | Freight precinct land use |
| 5.14.3 | Webb Dock freight rail access |
| 5.14.6 | North-East Link |
| 2.6.7 | CityLink to Western Ring road connection |
| 4.11.28 | Eastern Freeway to CityLink connection |
| 5.14.7 | Melbourne Airport new road link |
| 5.2.7 | Outer Metropolitan Ring Road |
| 5.14.8 | Melbourne to Brisbane freight rail line |
| 5.14.10 | Driverless Freight Vehicles |

The graph on the following page plots each option's Contribution verses Cost.


**Figure 14: Need 5A matrix**

## Draft Option - Transport network price regime

### Strategic Intervention: Changing behaviour > Economic charging

**Reference 2.6.9/TNP**

Overall pricing review to manage demand for peak/non-peak times across the entire transport network to achieve a number of objectives:

- achieve most efficient use of assets
- spread the peak/traffic volume
- encourage public transport use (including optimising most affordable public transport - buses)
- capture true cost of transport types - particularly private vehicle use
- encourage less car use to the central city and major employment centres
- incentivise heavy vehicle use of roads during determined times.
- reduce travel time and improve travel time reliability for private vehicles and freight.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $100 million - $500 million | A truly transformative road pricing system would be coordinated with the Commonwealth, given the need to harmonise with Commonwealth taxes and to better manage interstate fleet movements.<br><br>An initial scoping study or business case with a cost of < $10 million is likely to be required. The cost of implementing a comprehensive road pricing regime is circa $400 million, based on international examples.<br><br>Alternatively, a localised cordon system which relies on gantries with centralised ICT infrastructure is expected to be less than $100 million. Administrative costs are likely to be up to an additional $100 million.<br><br>It is important to note that given the breadth of possible solutions, the cost could move into the $500 million - $1 billion cost range. |
| **Overall Contribution** | Moderate | Australia's current model of heavy vehicle cost recovery attributes costs to vehicle classes and operates on a network wide scale. A different freight pricing model could provide cost reflective user charges which recover the cost of maintenance to asset managers. Pricing signals are expected to change road usage, with freight operators choosing the vehicle, load and route that are most cost effective. Given the existing freight task, the effect would be reduced road maintenance costs; however if charges are based on impact rates then charge rates for trucks that run on high quality, heavily trafficked roads will be low. These are often the routes that compete with rail so the impact on modal choice may be small |

| | | |
|---|---|---|
| | | or even negative.<br><br>By implementing demand based pricing structures it is expected to have a positive effect on road congestion by spreading demand. This will lead to further cost reductions in freight delivery on the time based savings delivered through reduced congestion at peak times. Due to the ever increasing freight demand levels and need for some goods to be delivered at specific times demand based pricing at peak times may have a marginal impact and just add cost to freight deliveries.<br><br>International examples highlight the merits of different road pricing mechanisms:<br><br>- Cordon pricing and congestion charges in Sweden have successfully reduced urban congestion (~20%) and encouraged greater public transport use.<br>- Network charges in Netherlands have ensured full cost recovery for infrastructure and strong demand management (~15%) by monitoring road use based on a combination of distance, mass and location.<br>- Heavy vehicle charging in Germany targets the heaviest contributors to road damage (~7%).<br>- Variable toll charges in Singapore are used as a demand management tool to improve traffic speeds (~20%). |

## Draft Option - Port of Melbourne to metropolitan container shuttle

### Strategic Intervention: New/expanded assets > incremental expansion of existing assets

**Reference 5.14.1/PMM**

This option would implement a port-rail shuttle to move international containers from the Port of Melbourne to hubs across the Melbourne metropolitan area.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | High | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $500m - $1b | The cost estimation for this option is based on the Government contributing $58 million (including $38 million from Commonwealth) towards assets and project facilitation. The private sector would contribute assets, operate the system and take the business and operational risk. Annual operation costs have been estimated at $20 million (+/- 50%) which would be covered by the private sector. |
| **Overall Contribution** | Low | The Port-Rail Shuttle connecting the Port of Melbourne with metropolitan intermodal terminals was an identified strategy in the Victorian Freight And Logistics Plan. Port of Melbourne |

| | | |
|---|---|---|
| | | Corporation's modelling in 2010 indicates that it could:<br>– reduce truck distance travelled by up to 35%<br>– reduce the number of trucks entering/exiting the port each day by up to 48% (~ 3,500 trucks)<br>– reduce transport costs by up approximately 10%.<br><br>As port related traffic makes up just 0.16% of all motor vehicle trips in Melbourne the Port-Rail Shuttle is likely to only affect local road freight traffic around the port. The 2011 Metropolitan<br><br>Intermodal System – Road Concept of Operations report by the then Department of Transport (now DEDJTR) found that the project will have minimal impact on the network as a whole.<br><br>It is anticipated that a Port-Rail Shuttle system at the Port of Melbourne would respond to:<br>– Rapid growth in container trade and associated congestion around the Port of Melbourne<br>– Reduced efficiency in the container supply chain arising from this growth, thus reducing Victoria's competitiveness.\|<br><br>Its success will rely on volume (critical mass) to ensure the commercial viability and competitiveness of rail over road.<br><br>Port-Rail Shuttles are already well-established in Sydney and Perth. |

## Draft Option - HPFV network completion

### Strategic Intervention: New/expanded assets > Refurbishment of existing assets, incremental expansion of existing assets, new greenfield asset

**Reference 2.6.4/HPF**

Deliver the statewide HPFV network in accordance with the Victorian Freight And Logistics Plan. This will allow larger vehicles access to a more comprehensive road network and will reduce overall freight vehicle kilometres and improve freight efficiency.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | > $10 billion | The Victorian Freight And Logistics Plan identifies 23 projects as key projects for the long-term metropolitan freight network. Between publication in 2013 and early 2016, a number of these projects have been commenced and some have been completed. The cost of completing the 19 outstanding projects is estimated to be in the |

| | | |
|---|---|---|
| | | region of between $20 and $30 billion:<br>– Calder Freeway (Calder Park Drive grade separation)<br>– Hume Freeway (Kalkallo to Beveridge)<br>– Tullamarine Freeway widening (Calder Freeway to airport)<br>– Growth Areas (Priority Transport Package)<br>– Western Hwy duplication (Ballarat to Stawell)<br>– Goulburn Valley Hwy (Shepparton Bypass)<br>– Stury Hwy (Mildura truck bypass)<br>– Prices Hwy West (Winchelsea to Colac)<br>– Green Triangle Freight Transport Program<br>– Goulburn Valley Hwy (Strathmerton deviation)<br>– Murray River crossings at Echuca/Swan Hill/Yarrawonga<br>– Murray Basin Transcontinental Rail Link planning study<br>– Horsham Bypass<br>– Healesville-Koo Wee Rup Road upgrade.<br><br>Where cost data is unavailable for a specific project, completed projects have been used as a proxy with costs applied on a per-kilometre basis. It is not clear for the available data whether these figures represent capital investment only, or whether they include ongoing operational and maintenance expenditure. |
| **Overall Contribution** | Significant | High Productivity Freight Vehicles (HPFV) increase productivity because fewer vehicles are required to perform the freight task. Modelling and economic assessment undertaken for the Victorian Freight And Logistics Plan indicate a strong positive benefit cost ratio for investment in links on the Principle Freight Network to enable access for HPFVs.<br><br>The completion of these key projects is expected to have a significant impact on supply chains across Victoria. Allowing larger vehicles access to a more comprehensive road network will reduce overall freight vehicle kilometres and improve freight efficiency. Upgrading key links (either via duplication or upgrades to freeway standard) will reduce overall travel times and improve the reliability of freight movements, thus reducing the cost of moving freight. |

## Draft Option - Freight precinct land use

### Strategic Intervention: Changing behaviour > Land use and planning controls

**Reference 5.14.2/FPL**

This option would ensure appropriately zoned land is available for freight and logistic activities around key freight infrastructure. Freight network modelling has shown that co-locating freight distribution centres with key infrastructure improves freight network efficiency and reliability. This option includes land purchases or compensation for rezoning (e.g. from farm land to industrial land) and the development of freight terminals and intermodal terminals.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | High | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $500 million - $1 billion | The cost estimation for this option is based on a number of factors. Ensuring that appropriately zoned land is available for freight and logistics activities will require planning in coordination with local councils which is expected to cost less than $100 million.<br><br>Land purchases or compensation for rezoning (e.g. from farm land to industrial land) may be required to achieve this option. It is estimated that this could cost between $500 million and $1.3 billion, with a median cost of around $900 million. This estimate is based on:<br><br>- the development of WIFT and BIFT at 220 hectares each (based on the size of Moorebank, Chullora and Yennora in NSW)<br>- the development of two MIS terminal (Lyndhurst/Dandenong South and Somerton) at 180 hectares each (based on current size of Lyndhurst terminal)<br>- the development of a second container port at Hastings with 2000 hectares of SUZ1 land<br>- land value ranging between $15 and $80 per square metre depending on proximity to the central city.<br><br>Thus it is expected the expected whole of life cost over the 30 year period will be in the order of $1 billion. |
| **Overall Contribution** | Significant | Industrial land needs a buffer (commercial or land) as it is preferable that it does not exist near sensitive uses (e.g. accommodation or school buildings). It is vital that appropriately zoned land is strategically preserved for projected growth in freight and logistics activities. This is an identified direction under the Victorian Freight and Logistics Plan.<br><br>As an example, the land surrounding the Port of Hastings has been reserved for port related uses since the late 1960s. This means that this option |

| | | |
|---|---|---|
| | | is still open for future container port operations. Similarly, last was reserved around what is now East Link many years in advance of the project to protect it from inappropriate development.<br><br>The Victorian Government is currently reviewing the urban growth boundary, which means considering land for development near the airport. It will be important to protect the airport from the adverse effects of incremental urban encroachment under or towards the airport's flight paths as it has the potential to impact the airport's operations and undermine the curfew free status of the airport. Melbourne Airport's airspace is also protected under the Airports Act.<br><br>If this land is not set aside now, inevitable urban encroachment will force the relocation of freight and logistics activities to sub-optimal locations which are further away from their suppliers and/or customers. This will severely increase the cost of moving the freight task due to:<br><br>- significantly decreased network efficiency<br>- significantly decreased reliability<br>- significantly increased travel times.<br><br>Concentrating production and logistics activities has the added effect of reducing the overall impact of these industries on the wider community. |

## Draft Option - Webb Dock freight rail access

### Strategic Intervention: New/expanded assets > New greenfield assets

**Reference 5.14.3/WDF**

Improve rail access to Webb Dock to manage the growth in container capacity and reduce the number of freight vehicles kilometres.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $100 million - $500 million | The estimation for the cost of implementing this option is based on the new rail alignment requiring the re-opening of the previously closed rail line in addition to a new bridge or tunnel crossing of the Yarra River.<br><br>Based on benchmarking work Aurecon has previously undertaken on a container port in Port Phillip Bay (not publicly available), the cost is expected to be in the middle of this range. |
| **Overall Contribution** | Low | There is wide support for the re-opening of the Webb Dock rail link from stakeholders and industry as it will substantially increase the Port's |

| | | |
|---|---|---|
| | | capacity to move freight by rail, at the same time reducing the number of freight vehicle kilometres.<br><br>However, a rail connection is unlikely to be commercially viable for the early stages of container terminal development at Webb Dock so it could initially only service interstate and regional export rail freight.<br><br>The timing of the reconnection should be consistent with trade demand and the longer term development of Webb Dock for international containers. It is estimated that the rail line would remove 3,500 daily truck trips from the port in the longer term.<br><br>The main benefits of the Webb Dock rail link will be improved traffic congestion and the ability to expand the container handling capacity of the Port of Melbourne. The effects of this project are therefore localised and it is unlikely to significantly improve the reliability and length of freight travel times (and thus overall transport costs) over the entire Victorian network. |

## Draft Option - North-East link

### Strategic Intervention: New/expanded assets > New greenfield assets

**Reference 5.14.6/NEL**

Construction of the North-East Link between the eastern freeway and the M80 to improve outer north-south links for road freight movement and improve travel time and reliability.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $5 billion -$10 billion | Construction of the North-East Link was estimated at $6 billion in the 2008 Victorian Transport Plan (now defunct). This includes tunnelling to preserve environmental and heritage values. It is not clear whether the $6 billion estimate is inclusive of operating expenditure, however based on data presented in the East-West Link Business Case, the net present value of operating expenditure for North-East Link is likely to be around $200 million. |
| **Overall Contribution** | Moderate | Northern roads have the slowest travel speeds in the morning and evening peak periods compared to other Melbourne regions, as well as the longest delays in travel time. North-East Link is a direct orbital link from the Metropolitan Ring Rd to EastLink.<br><br>The new Link will improve access between the potential Beveridge Interstate Rail Terminal and industrial areas in Bayswater, Clayton and |

| | | |
|---|---|---|
| | | Dandenong and between the Melbourne Wholesale Fruit Vegetable & Flower Market and the productive food areas of the South East of Victoria.<br><br>Traffic modelling suggests that the North-East Link will reduce travel time and halt rat-runs through congested arterial roads in the north-eastern suburbs by removing significant numbers of vehicles off congested north-south links in the inner north, such as Plenty Road and Spring St/St Georges Road.<br><br>The new Link will relieve existing Yarra River crossings and it may also encourage east-west cross regional movements via the Metropolitan Ring Road. By 2031, the North-East Link is forecast to carry 10,000 vehicles in both directions during a 2 hour peak period according to modelling undertaken by the former Department of Transport. |

## Draft Option - CityLink to Western Ring road connection

### Strategic Intervention: New/expanded assets > New greenfield assets

**Reference 2.6.7/EWW**

Construction of the East - West (West) Link which would link the CityLink with M80. This option targets east-west links for road freight movement including in and around the Port of Melbourne.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | > $10 billion | The cost estimation for this option has been The cost estimation for this option has been based on existing studies done for the construction of the proposed road. Based on the estimated $8-10 billion (2013 dollars) from the preliminary feasibility work, the estimated cost is at the top of the $5-10 billion range. Whole-of-life operating expenditure may increase this cost above $10 billion for the 30 year period. |
| **Overall Contribution** | Moderate | Freight in Melbourne is generally concentrated in an industrial belt to the west and manufacturing hubs to the east. The western section of the East-West Link will provide an alternative to the West Gate Bridge and the planned Western Distributor, connecting the western suburbs to the Port of Melbourne. In September 2014 the Victorian Government stated the benefits of the Western section are:<br><br>- capacity for around 100,000 vehicles/day<br>- a 15-20 minute time saving for travel from Geelong, Werribee, Altona and Laverton to the city |

| | | |
|---|---|---|
| | | - a 10-15 minute saving for travel from Ballarat, Melton and Caroline Springs to the city<br>- a 15-20 minute time saving between the Truganina freight precinct and the Port of Melbourne.<br><br>Greater east-west connectivity will enable a range of supply chain improvements and efficiencies and thus reduce supply chain costs because the cost of transport is so strongly related to travel time.<br><br>Analysis for the Western Distributor project has produced modelling that shows that the Western Distributor would be close to capacity in 2031, just nine years after its scheduled completion. The analysis, by PricewaterhouseCoopers, notes the possible need for a western freeway crossing to CityLink north of the Western Distributor within 15 years. |

## Draft Option – Eastern Freeway to CityLink connection

### Strategic Intervention: New/expanded assets > New greenfield assets

**Reference 4.11.28/EWE**

Improve road connectivity across the city from east to west. While there are a number of possible solutions (alignment, length of tunnel, number of lanes, etc.), for the purpose of an initial assessment the option is assumed to be a six lane (total) road link from the Eastern Freeway to CityLink, with a substantial amount of tunnelling. It includes capacity expansion on the Eastern Freeway and localised works to improve inner north public transport and amenity.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $5 billion -$10 billion | The cost estimation for this project is based off existing feasibility studies, business cases and tender to market which were completed for the Link. The results were that the East West (East) Link was costed at $6.8 billion in 2013. |

| | | |
|---|---|---|
| **Overall Contribution** | Moderate | The primary focus of this project is to improve cross-city transport connectivity. Greater east-west connectivity will enable a range of supply chain improvements and efficiencies and thus reduce supply chain costs.<br><br>Freight in Melbourne is generally concentrated in an industrial belt to the West and manufacturing hubs to the East. This new cross-city link will reduce reliance on the M1 corridor, providing greater flexibility and reliability to the freight industry and removing freight traffic from congested arterial roads onto the freeway network. It could also release additional capacity for the freight industry on the M1 by removing non-freight traffic, and provide enhanced access to the airport from the east.<br><br>The economic benefits of the project estimated in the business case for the freight sector are largely centred on $360 million of benefits via freight travel time savings. In addition the project is expected to result in $192 million of benefit via improved reliability in travel times (all vehicles - breakdown between light and heavy vehicles is not provided) and $651 million of benefits via reduced vehicle operating costs (all vehicles - breakdown between light and heavy vehicles is not provided).<br><br>Based on this analysis, the project is expected to have a moderate impact on the total cost of moving freight; however the Victorian Auditor-General's 2015 review of the 2013 business case found that it "did not clearly establish the need for the investment through a robust analysis of the costs, benefits and risks of reasonable options." This review found there was limited consideration in the business case of induced demand and that it is likely that the business case overestimates benefits and gives false confidence about the capacity of the project and the surrounding roads to cope with future traffic flows. On balance, the contribution rating is assessed as "moderate". |

## Draft Option - Melbourne Airport new road link

### Strategic Intervention: New/expanded assets > New greenfield assets

**Reference 5.14.7/MAN**

New road connection from the M80 to the west of Tullamarine airport connecting to the freight precinct, improving travel times and reliability for road freight vehicles.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $100 million - $500 million | The cost estimation for the implementation of this option is based on the recent Melbourne Airport, Airport Drive upgrade which cost $100 million and was opened in mid-2015. A new link from the M80 to the Melbourne Airport Business Park is likely to require similar funding.<br><br>Thus it is expected the whole of life 30 year cost estimation will be in the low $100 millions when operating costs are taken in to account. |
| **Overall Contribution** | Low | Melbourne Airport is an important freight hub in Victoria and Australia, and internationally. It operates 24 hours a day, seven days a week and currently processes over 250,000 tonnes of international air freight per annum.<br><br>Airport Drive, opened in 2015, currently provides more direct and congestion free access to Melbourne Airport Business Park and the airport for vehicles using the M80 Ring Road from the north-east and the west.<br><br>A new road connection from the M80 to the west of Melbourne Airport is unlikely to offer significant travel time and reliability benefits over the existing Airport Drive link, which has the capacity to be expanded to six lanes in the future. Additional investment beyond the scope of this option in the road network around the Tullamarine airport would likely provide additional benefits. |

## Draft Option - Outer Metropolitan Ring Road

### Strategic Intervention: New/expanded assets > New greenfield assets

**Reference 5.2.7/OMR**

Construction of the outer metropolitan ring road to improve cross-Melbourne freight vehicle access and connections to the north and east from key freight precincts in the west.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | > $10 billion | The OMR/E6 corridor is expected to be a 70 kilometre, high-speed freeway standard road and high standard rail corridor in the median. As cost data is unavailable, a cost estimate of $22 billion for the road component has been derived by applying the average cost per kilometre of the Peninsula Link project. The rail component is expected to cost in the range of $400 - $500 |

| | | |
|---|---|---|
| | | million to build.<br><br>The construction of the 23 kilometre E6 road is expected to cost an additional $375 million based on VicRoads estimates in 2013.<br><br>Based on data presented in the East-West Link Business case operating expenditure over a 30 year period is likely to be in the region of $2 billion. |
| **Overall Contribution** | Significant | The corridor will link freight and people in Melbourne's west and north, creating road and rail links between Werribee, Melton, Craigieburn/Mickleham, Beveridge/ Wallan and Epping/Thomastown. Once complete, it will serve international transport hubs; better link residential and employment growth areas to the north and west of Melbourne; and provide for the development of employment corridors around Werribee, Melton and Mickleham and in precincts around Melbourne and Avalon airports.<br><br>The corridor will also improve freight movements throughout regional Victoria, by linking the nationally significant Princes (west), Western, Calder and Hume Freeways. Interstate and intrastate rail freight will also use the corridor. |

## Draft Option - Melbourne to Brisbane freight rail line

### Strategic Intervention: New/expanded assets > New greenfield assets

**Reference 5.14.8/MBF**

Construction of a high performance and direct interstate freight rail corridor between Melbourne and Brisbane, which would also link south-east Queensland with Perth and Adelaide (via Parkes).

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $100 million - $500 million | Inland Rail will use the existing interstate rail line through Victoria. The project is expected to cost $10.7 billion with construction to take 10 years. As part of the 2016 Federal Budget, funding of $594 million was announced for ARTC to continue pre-construction works and due diligence activities. Assuming operations commence in 2020 the NPV of capital cost is around $2 billion (in $2010) and the NPV of operating costs is around $75 million. This is over the period to 2070.<br><br>60 per cent of funding is to be spent in Queensland because of extensive upgrading to existing track. Comparing the proportion of track length in Victoria to that in New South Wales, it is |

| | | |
|---|---|---|
| | | estimated that the NPV of total whole-of-life cost for the Victorian section is around $250 million (in $2015). |
| **Overall Contribution** | Significant | Inland Rail will address the growing freight task by helping to move freight transport off the congested road network. It will provide a reliable road-competitive solution to the freight task and enable the commercial and social benefits of rail to be leveraged to meet Australia's long-term freight task.<br><br>The project will reduce supply chain costs (including reducing rail costs by $10 per tonne), improve access to/from regional markets and save freight travel times (reducing rail transit time to under 24 hours). It will also increase the reliability of north-south rail travel and it is expected to open up opportunities to move grain and coal and other heavy commodities for which rail is currently not an economically viable mode of transport.<br><br>Modelling estimates that when pick-up and delivery costs are incorporated into the Inland Rail door-to-door price, the price of freight carried on Inland Rail is estimated to be 52.2% of that applying to road transport. This is based on expected road freight costs due to fuel and labour cost movements.<br><br>Other economic benefits modelled (for operations commencing in 2020) include the following present value impacts:<br><br>- operating cost savings for rail users of $1.2 billion<br>- value of time savings for rail users of $364 million<br>- improved reliability for rail users of $274 million<br>- net economic benefit of induced freight for producers of $42 million. |

## Draft Option - Driverless Freight Vehicles

### Strategic Intervention: Better Use >Technological Innovations

**Reference 5.14.10/DFV**

Support the deployment of driverless freight vehicles, including facilitating trials of driverless technologies such as vehicle platooning.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | <$100 million | A small catalytic intervention by government to try and incentivise industry to undertake the trials and |

| | | |
|---|---|---|
| | | also get public acceptance of the new technology potentially including an education and marketing campaign. |
| **Overall Contribution** | Moderate | Studies by the North American Council for Freight Efficiency and US trucking fleet C.R. England have found the front truck consumed 4.5 per cent less fuel during its journey, while the rear truck saved 10 per cent when platooning. Fuel is a significant input cost (approximately 30-40% of operating cost) to the freight task and a 5-10% saving would have a material impact on the cost of delivering the freight task. |

## Draft Need 5B: Move people to and from airports more efficiently

Victoria's airports are a significant aspect of the tourism sector and also play an important role supporting our globally integrated, knowledge-based economy. In addition, they operate as significant logistic and employment centres.

Melbourne's Tullamarine Airport is Australia's largest curfew-free major international airport, and is the second busiest airport by passenger numbers in Australia. By 2033, Melbourne Airport projects passenger numbers to double, with a significant number of these travelling for business rather than leisure. Avalon Airport, strategically located close to the M1 (Princes Highway), rail and sea, plays an important role as Melbourne's second airport, providing good access from Melbourne's west as well as Geelong. Avalon is not constrained airside or landside.

To compete globally and remain attractive for international investment, efficient movement of people to and through these spaces is imperative. For example, access to Tullamarine Airport is heavily reliant on the CityLink-Tullamarine corridor, which is one of the most heavily used in Melbourne, carrying 210,000 vehicles a day in its busiest section – a number forecast to rise to 235,000 by 2031. The capacity of this road impacts the provision of services by SkyBus and taxis. Access to Tullamarine Airport will benefit from the CityLink-Tullamarine Widening; however, this project does not address access issues facing our gateways completely, and is not sufficient to support growth over the next 30 years.

### Metrics

Metric 1 – Increase in the percentage of journeys to/from the airport that can access Tullamarine or Avalon (or third airport) airport within an hour by public transport and/or road.
Metric 2 - Reduction in the travel time (and increase in the reliability) of trips between Melbourne Airport and the central city.

### Options

The table below lists the options considered for this Draft Need

| Reference Number | Option Name |
|---|---|
| 5.2.1 | Melbourne Airport bus dedicated road priority |
| 5.2.2 | Melbourne Airport metropolitan public transport connections |
| 5.2.3 | Melbourne Airport heavy rail line |
| 2.6.7 | CityLink to Western Ring road connection |
| 4.11.28 | Eastern Freeway to CityLink connection |
| 5.2.7 | Outer Metropolitan Ring Road |
| 2.6.9 | Transport network price regime |

The graph on the following page plots each option's Contribution verses Cost.

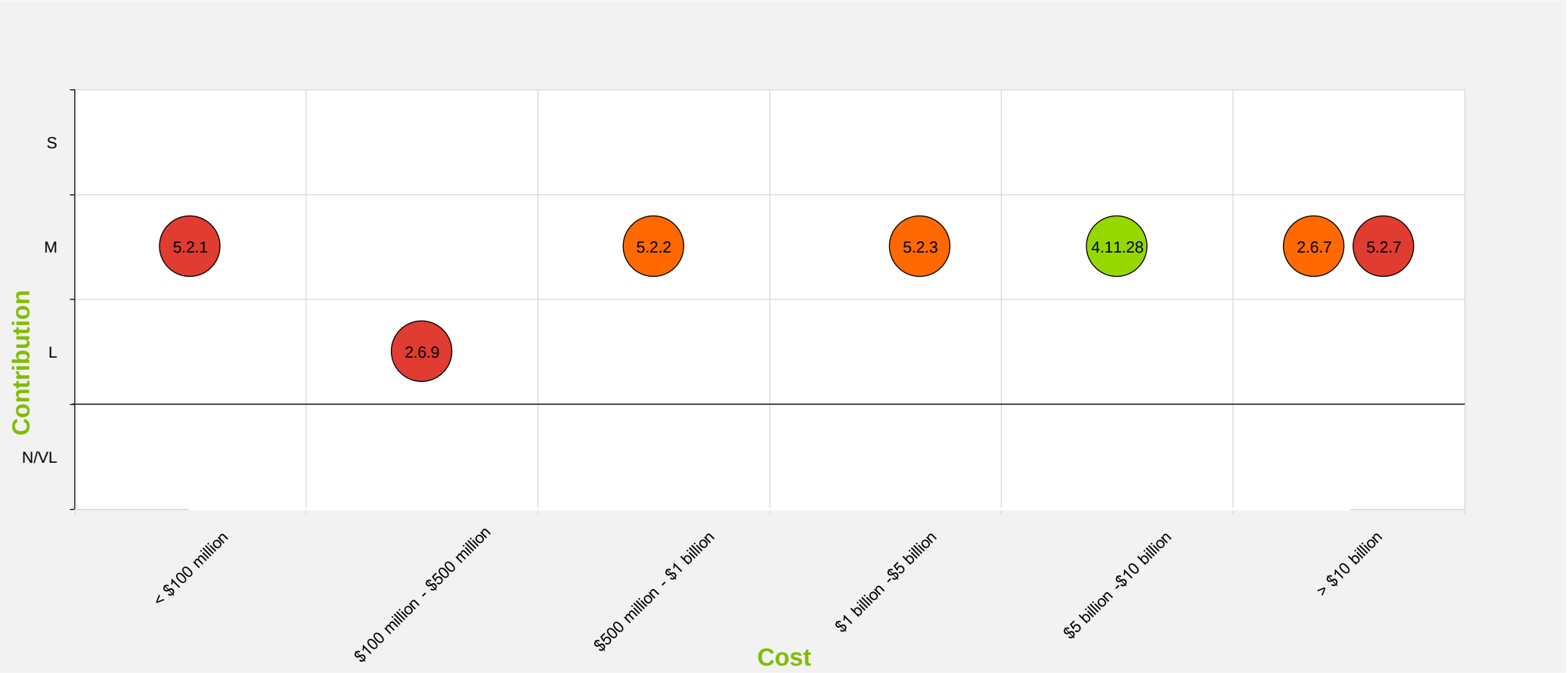



**Figure 15: Need 5B matrix**

## Draft Option - Melbourne Airport bus dedicated road priority

### Strategic Intervention: Better use > Incremental change to existing assets

**Reference 5.2.1/MAB**

Dedicated on road priority for SkyBus for the entire journey between Southern Cross station and Melbourne Airport. Interventions would include a dedicated bus lane and b-light traffic light priority where necessary.

This solution would enable the service to bypass freeway congestion and run efficient services every 2-3 minutes during peak times with a reliable 20 minute journey time. Improved priority is a requirement for SkyBus to maintain optimal performance and increase its mode share.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | <$100 million | Cost is estimated based on the conditions that will exist post the CityLink Tullamarine Freeway widening. Post the widening, the emergency lane will be available for all traffic and will therefore not be available for SkyBus exclusively. The managed motorway operations will limit the volume of traffic entering the system, and in theory, traffic flow should not break down. Therefore, SkyBus should operate more reliably to time and not need an exclusive lane. The only infrastructure requirements for SkyBus are therefore dedicated freeway entry and exit ramps and any other arterial road requirements. |
| **Overall Contribution** | Moderate | Visitors to Melbourne Airport are expected to hit 60 million per year by 2060. Access to Melbourne Airport is entirely road based and dependent on the Tullamarine Freeway and Melrose Drive. More than half of the trips to Melbourne Airport originate outside the metropolitan region and passengers are increasingly switching to mass transit options (i.e. SkyBus or other bus services) to access the airport. As the primary mass transit mode for airport users, SkyBus presents the most viable option for accommodating the significant rise in public transport patronage.<br><br>SkyBus currently run services with 10 minute headway, providing access for around 7-10 per cent of airport users. In free-flow conditions, access from Melbourne Airport to the city can be achieved in less than 20 minutes along the Tullamarine Freeway. However, SkyBus has recorded delays of 39 minutes (i.e. total journey time of 59 minutes) in peak periods, driven by insufficient separation from private vehicles. Although a priority express lane is in operation on CityLink, it is not enforced.<br><br>Provision of some additional works to complement the CityLink Tullamarine Freeway widening would improve both travel time and reliability particularly in peak periods. This solution would enable the service to bypass freeway congestion and run |

| | | |
|---|---|---|
| | | efficient services every 2-3 minutes during peak times with a reliable 20 minute journey time. Improved priority is a requirement for SkyBus to maintain optimal performance and increase its mode share. In the longer-term, this medium-term solution could be complemented or replaced by a rail link. |

## Draft Option - Melbourne Airport metropolitan public transport connections

### Strategic Intervention: Better use > Incremental change to existing assets

**Reference 5.2.2/MAM**

An expansion of SmartBus services to Tullamarine Airport to improve public transport access from suburban catchments to complement access from the CBD via SkyBus. Currently there is only one SmartBus connection to the airport (from the East via Broadmeadows). There is an opportunity to provide additional SmartBus services from the West, East and South under this option. Providing additional public transport bus services to the airport is likely to increase bus mode share, reduce congestion on key arterial roads/freeways and increase access.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $500million - $1 billion | This cost estimation for the implementation of this option assumes:<br>- provision of three new SmartBus services to Melbourne Airport (from the west, east and south) CPI 2.5%<br>- total capital cost $50 million<br>- total annual operating expenditure of approximately $30 million. |
| **Overall Contribution** | Moderate | Current public bus services to and from Melbourne Airport are limited:<br>- SmartBus Route 901 to Frankston<br>- Routes 478, 479 and 482 to Airport West Shopping Centre.<br><br>There are additional private bus services originating in regional centres. Bus services represented only 12 per cent of trips in 2013 and there is considerable scope to expand the bus network servicing Melbourne Airport, assisting in reducing congestion but also improving access for the west, east, south and regional centres.<br><br>SmartBus is designed to provide 'cross town' connections, running along major arterial roads to make journeys more direct. It has been suggested that:<br>- the SmartBus Route 902 service (Chelsea to Airport West Shopping Centre) should be extended to Melbourne Airport to strengthen the airport's connectivity to Melbourne's outer east and south |

| | | |
|---|---|---|
| | | - the introduction of additional SmartBus routes should be considered, in particular an orbital service running north-south through Melbourne's west.<br><br>Providing additional public transport bus services to the airport is likely to increase bus mode share, reducing congestion on key arterial roads/freeways and increasing access. Negotiation with Melbourne Airport Corporation would be required to ensure airport access. |

## Draft Option - Melbourne Airport heavy rail line

### Strategic Intervention: New/expanded assets > New greenfield assets

**Reference 5.2.3/MAH**

Delivery of a rail link between Melbourne (Tullamarine) Airport and the central city. The rail link would utilise the Albion East alignment and the Melbourne Metro rail tunnel to access Southern Cross Station. The new line will provide direct connectivity to the airport, with passengers able to easily access airport services via no more than one interchange in the central area of the network. It is estimated that the journey would take 25 minutes between Southern Cross Station and the airport at a frequency of 10 minutes. This new link will increase reliability of services for staff and airline passengers to Melbourne Airport and reduce congestion on the Tullamarine Airport.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion -$5 billion | The cost estimation to build the rail link from the Melbourne Metro business case is expected to be in the order of $2-3 billion. On top of this figure, the whole-of-life cost includes operating and maintenance costs. The Parsons Brinckerhoff technical report for PTV notes that high-level operating costings were completed, but it does not provide this data.<br><br>Airport rail links in Sydney and Brisbane initially struggled to attract commuters and return a profit. Early patronage was well below expectation, but demand has grown and both rail links now return modest profits.<br><br>The airport rail links in Sydney and Brisbane were both privately financed. In 2013, it cost the Airport Link Company $20 million per year to operate Sydney Airport's rail station including staff costs and capital expenditure. |
| **Overall Contribution** | Moderate | A new line to Melbourne Airport is identified in PTV's Network Development Plan. It is reliant on the completion of the Melbourne Metro rail tunnel project which is currently in the planning and design phase.<br><br>The new line will provide direct connectivity to the airport, with passengers able to easily access |

| | | |
|---|---|---|
| | | airport services via no more than one interchange. It is estimated that the journey would take 25 minutes between Southern Cross Station and the airport at a frequency of 10 minutes. This journey would be faster than SkyBus during peak periods, but slower during off-peak periods as the preferred alignment is not direct. SkyBus has recorded delays of 39 minutes in peak periods, driven by insufficient separation from private vehicles which will improve in the short term with the completion of the CityLink Tullamarine Freeway widening project. |

## Draft Option - CityLink to Western Ring road connection

### Strategic Intervention: New/expanded assets > New greenfield assets

**Reference 2.6.7/EWW**

Construction of the East - West (West) Link which would link the CityLink with M80. This option targets east-west links for road freight movement including in and around the Port of Melbourne.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | > $10 billion | The cost estimation for this option has been based on existing studies done for the construction of the proposed road. Based on the estimated $8-10 billion (2013 dollars) from the preliminary feasibility work, the estimated capital cost is at the top of the $5-10 billion range. Whole-of-life operating expenditure may increase this cost above $10 billion for the 30 year period. |
| **Overall Contribution** | Moderate | The western section of the East-West Link will provide an alternative to the West Gate Bridge and Western Distributor, connecting the Western suburbs to the Port of Melbourne.<br><br>With regard to journeys accessing Melbourne airport, Avalon airport and the CBD, the project is expected to generally reduce congestion and travel times across the network.<br><br>Analysis for the Western Distributor project has produced modelling that shows that the Western Distributor would be close to capacity in 2031, just nine years after its scheduled completion. The analysis, by PricewaterhouseCoopers, notes the possible need for a western freeway/toll way crossing to CityLink north of the Western Distributor within 15 years. As such, there is a clear timing dimension involved in determining the contribution of this option. The option is likely to have a positive contribution in the latter half of the 30 year evaluation period. On the basis that this option has been given a moderate contribution assessment here. |

## Draft Option – Eastern Freeway to CityLink connection

### Strategic Intervention: New/expanded assets > New greenfield assets

**Reference 4.11.28/EWE**

Improve road connectivity across the city from east to west. While there are a number of possible solutions (alignment, length of tunnel, number of lanes, etc.), for the purpose of an initial assessment the option is assumed to be a six lane (total) road link from the Eastern Freeway to CityLink, with a substantial amount of tunnelling. It includes capacity expansion on the Eastern Freeway and localised works to improve inner north public transport and amenity.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | High | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $5 billion -$10 billion | The cost estimation for this project is based off existing feasibility studies, business cases and tender to market which were completed for the Link. The results were that the East West (East) Link was costed at $6.8 billion in 2013. |
| **Overall Contribution** | Moderate | The primary focus of this project is to improve cross-city transport connectivity, and in so doing facilitate greater access to and from the Eastern Suburbs to Melbourne Airport.<br><br>Melbourne Airport generates commercial, employment and tourism related traffic. Strong growth is anticipated in all three areas so there is the imperative to provide connectivity which maximises the benefits associated with this growth. Access to the airport is currently heavily reliant on the Tullamarine Freeway and CityLink, growing congestion is an increasing concern. The project would have an impact on travel times and trip reliability, in particular for those trips originating in the eastern suburbs as access is currently limited to the M1 or M3 routes.<br><br>The Victorian Auditor-General's 2015 review of the 2013 business case found that it "did not clearly establish the need for the investment through a robust analysis of the costs, benefits and risks of reasonable options."<br><br>This review found there was limited consideration in the business case of induced demand and that it is likely that the business case overestimates benefits and gives false confidence about the capacity of the project and the surrounding roads to cope with future traffic flows. |

## Draft Option - Outer Metropolitan Ring Road

### Strategic Intervention: New/expanded assets > New greenfield assets

**Reference 5.2.7/OMR**

Construction of the outer metropolitan ring road to improve cross-Melbourne freight vehicle access and connections to the north and east from key freight precincts in the west.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | > $10 billion | The OMR/E6 corridor is expected to be a 70 kilometre, high-speed freeway standard road and high standard rail corridor in the median. As cost data is unavailable, a cost estimate of $22 billion for the road component has been derived by applying the average cost per kilometre of the Peninsula Link project. The rail component is expected to cost in the region of $412 million to build.<br><br>The construction of the 23 kilometre E6 road is expected to cost an additional $375 million and the 10 kilometre (approximately) Melbourne Airport link is expected to cost an additional $150 million (approximately) based on VicRoads estimates in 2013.<br><br>Based on data presented in the East-West Link Business case operating expenditure over a 30 year period is likely to be in the region of $2 billion. |
| **Overall Contribution** | Moderate | Melbourne Airport Link relies on the completion of the Outer Metropolitan Ring Road/E6 project. It links the OMR with Melbourne Airport.<br><br>The OMR/E6 link is not expected to generate significant improvement to access to Melbourne or Avalon Airport. However, the Melbourne Airport Link freeway connection will provide improved connections between future intermodal freight activities to the north and south west of Melbourne and the airport. It will also provide better access to the airport from existing and proposed residential development to the north and west.<br><br>The Melbourne Airport Link would provide an alternative high-standard route, linking the northern industrial areas and the potential Donnybrook Beveridge Intermodal Rail Freight Terminal with the airport as well as the proposed Western Intermodal Rail Freight Terminal and Avalon Airport and industrial areas to the south. The project significantly relies on the OMR for |

| | | |
|---|---|---|
| | | justification.<br><br>VicRoad's 2014 information update notes that the link meets objectives:<br><br>- effectively links the Outer Metropolitan Ring Transport Corridor to Melbourne Airport and employment in Metropolitan Melbourne ("Very Well")<br>- supports economic performance for the local and regional economy ("Well")<br>- improves the safety and functionality of the road network for all road users ("Well").<br><br>AECOM's 2013 transport modelling report notes that all options (with and without Bulla Bypass) tested operate within capacity in 2046, although some options will experience delays during peak periods. Substantial reductions in travel time (approximately 40 minutes) are expected between Sunbury and the Airport in 2046 with much smaller travel time reductions are forecast between Sunbury and the CBD. The project is expected to generate $600 million+ in travel time savings and nearly $200 million in vehicle operating cost savings (for both light and heavy vehicles) over the period 2023-2054. The majority of the benefits accrue to non-work car travellers as they represent most of the vehicle traffic. Trucks and in-work vehicle traffic account for a significant portion of the travel time savings compared to their share of total traffic as the value of time for in-work travel is significantly higher than non-work travel. |

## Draft Option - Transport network price regime

### Strategic Intervention: Changing behaviour > Economic charging

**Reference 2.6.9/TNP**

Overall pricing review to manage demand for peak/non-peak times across the entire transport network to achieve a number of objectives:

- achieve most efficient use of assets
- spread the peak/traffic volume
- encourage public transport use (including optimising most affordable public transport - buses)
- capture true cost of transport types - particularly private vehicle use
- encourage less car use to the central city and major employment centres
- incentivise heavy vehicle use of roads during determined times.
- reduce travel time and improve travel time reliability for private vehicles and freight.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |

| | | |
|---|---|---|
| **Whole of Life Cost Range** | $100 million - $500 million | A truly transformative road pricing system would be coordinated with the Commonwealth, given the need to harmonise with Commonwealth taxes and to better manage interstate fleet movements.<br><br>An initial scoping study or business case with a cost of < $10 million is likely to be required. The cost of implementing a comprehensive road pricing regime is circa $400 million, based on international examples.<br><br>Alternatively, a localised cordon system which relies on gantries with centralised ICT infrastructure is expected to be less than $100 million. Administrative costs are likely to be up to an additional $100 million.<br><br>It is important to note that given the breadth of possible solutions, the cost could move into the $500 million - $1 billion cost range. |
| **Overall Contribution** | Low | A different transport pricing model could provide cost reflective user charges which recover the cost of maintenance to asset managers. Pricing signals are expected to change road usage, with users choosing the mode and route that is most cost effective.<br><br>Demand for access to airports is relatively inelastic so a new pricing regime is more likely to change users' modes rather than to change the demand profile, so potentially this option may not have a significant effect on travel times and trip reliability.<br><br>However, international examples highlight the merits of different road pricing mechanisms:<br><br>- Cordon pricing and congestion charges in Sweden have successfully reduced urban congestion (~20%) and encouraged greater public transport use.<br>- Variable toll charges in Singapore are used as a demand management tool to improve traffic speeds (~20%).<br><br>Access to Melbourne Airport is already partially tolled (on the CityLink portion). A correctly designed pricing regime could therefore potentially have a moderate impact on congestion and route choice across the Victorian network. |

# Draft Objective 6 - Support Victoria's changing, globally integrated economy

## Draft Need 6A: Boost tourism through infrastructure provision

Victoria's natural and cultural assets make it an attractive destination for visitors, particularly Asia's growing middle class. However, there is a perception that stagnating growth in international tourism, particularly to regional Victoria, has been exacerbated by a lack of supporting infrastructure.

Visitors, however, are not limited to international tourists. They can also include Victorian residents and businesses visiting regional areas for services, events and facilities. An example is firms hosting a conference at a regional venue, stimulating investment in the local economy. Given the significant growth in visits to Victoria for business purposes, there is an opportunity to make sure Melbourne and regional Victoria are well positioned to respond to this demand. This is where infrastructure could support increased visitor spending and strengthen the state's tourism industry. This could include the connections between regional cities, which improve access to nearby markets, to ancillary infrastructure in the tourism sector that enhances the attractiveness of Victoria's national parks and state forests. Infrastructure has a role to play in enhancing the attractiveness of these areas for tourism, thus encouraging private sector investment and job creation.

### Metrics

Metric 1 – Increase in the number of overnight visitors and average visitor spend for visits to Melbourne, broken by origin and type.
Metric 2 - Increase in the number of overnight visitors and average visitor spend for visits to regional Victoria, broken by origin and type.

### Options

The table below lists the options considered for this Draft Need

| Reference Number | Option Name |
|---|---|
| 6.16.1 | Tourism event promotion coordination |
| 6.16.2 | National park private sector development leisure tenure |
| 6.16.3 | Tourism projects in state-significant zones approval process |
| 6.16.4 | Tourism market-led proposals |
| 6.16.5 | Event coordination statewide |
| 6.16.6 | Regional tourism investment prospectus |
| 6.16.7 | National park public infrastructure provision |

The graph on the following page plots each option's Contribution verses Cost.

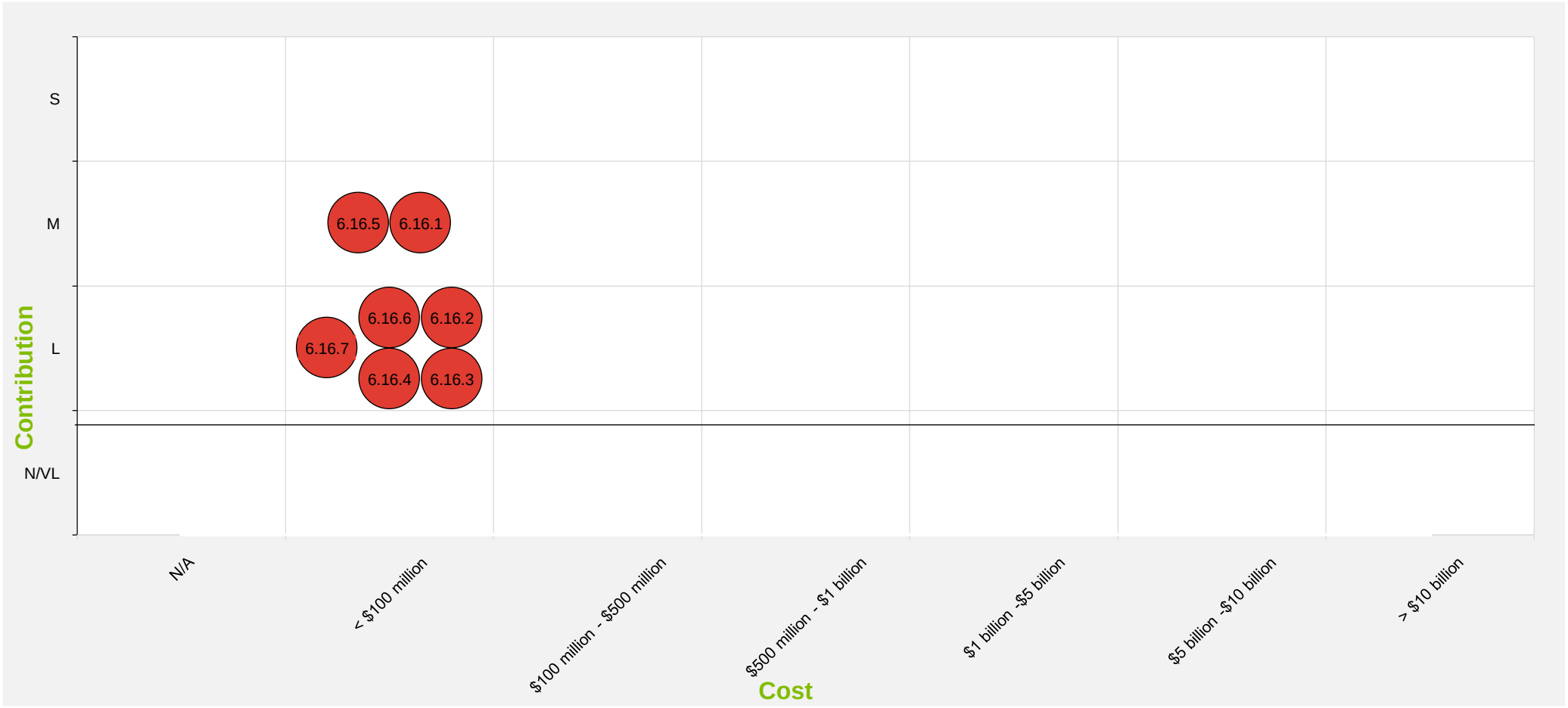



**Figure 16: Need 6A matrix**

## Draft Option - Tourism event promotion coordination

### Strategic Intervention: Better use - coordination processes

**Reference 6.16.1/TEP**

Strengthen the coordination of marketing between public authorities, such as Visit Victoria and the Melbourne Convention and Exhibition Centre, ensuring that events held at Victorian tourism attractions are promoted through the appropriate channels to growing tourism markets (such as China) to maximise asset utilisation.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | This option is a policy/regulatory change only with no capital works required. Whole of life cost estimations include consultation, implementation and management.<br><br>It is assumed that an existing body, such as Visit Victoria, would undertake the coordination across metropolitan and regional tourism peak bodies, as well as other bodies i.e. cultural peak bodies, to create a coordinated tourism event program across the state. A small increase in FTE may be required to support this function. There may also be scope to leverage the existing Australian Tourism Data Warehouse. |
| **Overall Contribution** | Moderate | In its report, Unlocking Victorian Tourism: An Inquiry into Victoria's tourism industry, the Victorian Competition and Efficiency Commission (2011) noted that 'poor cooperation and coordination...can constrain Victoria's tourism destinations from realising their full potential...the quality of cooperative structures and cultures are important for tourism destinations to develop and meet growing competition'. This 'total experience' creates a competitive advantage as 'as the tourist's experience usually extends well beyond what is offered by any single firm or locality in Victoria'. |

## Draft Option - National park private sector development leisure tenure

### Strategic Intervention: Better use - land use planning and controls

**Reference 6.16.2/NPP3**

Amend the Victorian National Parks Act 1975 to extend the current length of lease available for private sector development from 21 years to 99 years. A lease of 99 years increases the commercial viability of large-scale private sector developments and is required to attract sufficient quality tourism investment in and surrounding Victoria's national park land.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | This option is a policy/regulatory change only with no capital works required. Whole of life cost estimations include consultation, implementation and management.<br><br>It is assumed that the National Parks Act 19751 would be amended to allow leases to be granted for terms of up to 99 years for purposes consistent with the Act. |
| **Overall Contribution** | Low | Prior Deloitte research has identified that lease term is a key determinant of the commercial viability of a tourism investment among other factors which include: high capital and operating costs, high planning controls and regulation as well as unique risks such as developing a tourism product in an often untested market. Investors evaluate the commercial viability of investing in protected land such as national parks based on the return that they expect to realise (over time). The rate of return should be sufficient to compensate for the unique risks and often high capital and operating costs required to develop and run a destination tourism product in a national park. High costs are driven by various factors including a remote and often difficult natural landscape for construction, limited enabling infrastructure and considerable levels of regulation to ensure environmental values are maintained. The minimum length of lease term varies depending on the asset type. However, modelling shows that an asset such as a luxury lodge is unlikely to produce a minimum acceptable investor return (commercial return of 15%) unless the lease is of 50 years duration or greater.<br><br>Failure to create conditions conducive to appropriate levels of investment in Victoria's natural tourism assets, such as commercially acceptable lease tenure, can leave their full socioeconomic potential unrealised. This will not directly impact the number of visitors to the State. However, it is likely to improve infrastructure assets through encouraging investment over the long term, indirectly increasing the number of visitors to the State. |

## Draft Option - Tourism projects in state-significant zones approval process

### Strategic Intervention: Better use - land use planning and controls

**Reference 6.16.3/TPS**

Amend Victoria's State Planning Framework, governed by the Planning and Environment Act 1987, to include the approval of Victorian tourism projects under State Significant Precinct Zones. This will support fast-tracking of approvals for regional and iconic tourism developments.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | This option is a policy/regulatory change only with no capital works required. Whole of life cost estimations include consultation, implementation and management.<br><br>It is assumed that a review of current approval processes would be commissioned and a revised approval process developed. Additional costs may be incurred to support the implementation of the revised approvals process. |
| **Overall Contribution** | Low | A review conducted by the Victorian Competition and Efficiency Commission (VECE) in 2011 found that "unclear or overly complex approval processes and overly stringent conditions on proposed developments, can discourage investment by increasing unnecessary uncertainty and costs". Previously, concerns have been raised regarding the complexity and length of the approval process. This will not directly impact the number of visitors to the State. However, it is likely to improve infrastructure assets through encouraging investment over the long term, indirectly increasing the number of visitors to the State. |

## Draft Option - Tourism market-led proposals

### Strategic Intervention: Better use - land use planning and controls

**Reference 6.16.4/TML**

Replicate Victoria's market-led proposal to develop a specific tourism market-led proposal process that assesses 'significant ' tourism development proposals in regional areas. This intervention complements a strategy identified in Victoria's Regional Statement 2015 which identifies a plan to develop a contestable pipeline of the ten most significant regional tourism projects to fully realise the economic potential of iconic assets.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | This option is a policy/regulatory change only with no capital works required. Whole of life cost estimations include consultation, implementation and management.<br><br>It is assumed that the development of a tourism market-led proposal process would be commissioned and that this would be administered by an existing body such as the Department of Treasury and Finance. A small increase in FTE may be required to support this function. |
| **Overall Contribution** | Low | The implementation of this option may encourage the private sector to propose a project or service which enhances Victoria's tourism offering, particularly in regional Victoria. It may also enable the sector to focus limited resources on a number of projects that will attain the greatest return-on-investment. However, depending on the geographical spread of project investment, benefits generated are likely to be localised, rather than impacting regional Victoria more generally. |

## Draft Option - Event coordination statewide

### Strategic Intervention: Better use - coordination processes

**Reference 6.16.5/ECS**

Strengthen governance arrangements between Creative Victoria, Visit Victoria and Sport and Recreation Victoria in relation to the co-ordination of Victoria's cultural, entertainment, sporting and tourism calendar. This coordination extends to both Melbourne and regional Victoria, improving utilisation at venues in traditionally off-peak periods such as winter.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | This option is a policy/regulatory change only with no capital works required. Whole of life cost estimations include consultation, implementation and management.<br><br>It is assumed that an existing body, such as Visit Victoria, would undertake to coordinate across metropolitan and regional tourism peak bodies, as well as other bodies i.e. cultural peak bodies, to create a coordinated tourism event calendar. A small increase in FTE may be required to support this function. |

| | | |
|---|---|---|
| **Overall Contribution** | Moderate | In the Victoria Tourism Industry Council's and Victoria Events Industry Council's Victoria's Tourism and Events Industry Strategy 2020 (2010), a range of industry benefits to be obtained through the management and coordination of event calendars were identified. These included:<br>– Enhanced coordination to identify and address gaps.<br>– Shared expertise across the industry, including enhanced collaboration between the events and tourism sectors.<br>– Enhanced skills and labour sharing between events to overcome current challenges.<br><br>This would contribute to an improved visitor experience and an opportunity to lift the profile of regional events through careful programming. |

## Draft Option - Regional tourism investment prospectus

### Strategic Intervention: New/expanded assets - new greenfield asset

**Reference 6.16.6/RTI**

Develop and publish a Victorian regional tourism investment prospectus - outlining the strengths and opportunities for tourism infrastructure investment in regional Victoria. This includes investment in tourism attraction infrastructure, tourism products and services and supporting tourism infrastructure (such as accommodation, complementary food and shopping amenities) in regional Victoria.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | The cost of implementing this option is based on the assumption that investment opportunities are collated, published and actively marketed. Costs will vary based on the campaign but are expected to be under $100 million. |
| **Overall Contribution** | Low | Prior Deloitte research has identified that Chinese investors in particular, when presented with a tourism investment opportunity, typically want to invest in a 'packaged solution' – meaning a 'developer ready' or 'operator ready' tourism investment opportunity to increase certainty and simplicity. A Victorian regional tourism prospectus assists to clearly outline investment package options that are either developer or operator ready. This will not directly impact the number of visitors to the State. However, it is likely to improve infrastructure assets through encouraging investment over the long term, indirectly increasing the number of visitors to the State. |

## Draft Option - National park public infrastructure provision

### Strategic Intervention: New/expanded assets - incremental expansion of existing assets

**Reference 6.16.7/NPP4**

Amend relevant regulation to encourage investment in appropriate public infrastructure - including accommodation, walking trails, seating and public toilets in national parks areas to enhance and deliver a unique visitor experience of Victoria's natural assets.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | This option is a policy/regulatory change only with no capital works required. Whole of life cost estimations include consultation, implementation and management. |
| **Overall Contribution** | Low | Due to the general location of national parks, improved national park infrastructure is unlikely to impact visitor numbers to metropolitan Melbourne. However, it may increase the volume of tourists to regional Victoria. Visitor numbers to regional Victoria resulting from a revised regulatory and policy environment have not yet been projected by the tourism industry. |

## Draft Need 6B: Enable the growth of a highly skilled, digitally connected workforce through infrastructure

Employers are seeking a greater number of technologically mobile workers with high levels of education as the state moves to a globally integrated, knowledge-based economy.

As Victoria's economy becomes increasingly globally integrated, businesses will require a workforce that can leverage robust ICT infrastructure. For example, high bandwidth, resilient and secure networks across Victoria can provide the capability for video conferencing and real-time document sharing on mobile platforms with international customers and clients.

The expectations of employers, combined with the push for lifelong learning, are resulting in a growing demand in the tertiary sector, including higher and vocational education. This is putting pressure on the infrastructure that supports these services. To continue to support workforce participation and provide employers with the skilled workforce they need, Victoria will need to ensure its TAFE and Dual Sector University assets are flexible and technology driven to respond to these demands. For example, there is variation in the condition of assets in Victoria's TAFE sector, with a third of the assets considered to be in a good condition, a third are average and the remaining third are poor. Of these, some are surplus or underutilised. The condition of the asset base needs to be considered in the context of changes to the funding arrangements for the sector over the past five years and underutilisation of the assets.

### Metrics

Metric 1 – Reduction in the supply and demand mismatch (gap) of vocational education/skills/training required by Victorian industries.

### Options

The table below lists the options considered for this Draft Need

| Reference Number | Option Name |
|---|---|
| 6.17.1 | School and Tertiary Education cooperation |
| 6.17.2 | TAFE asset market driven partnerships and funding |
| 6.17.3 | Education Precincts linking the education sector and private sector |
| 6.17.4 | Vocational Education long term funding certainty |

The graph on the following page plots each option's Contribution verses Cost.

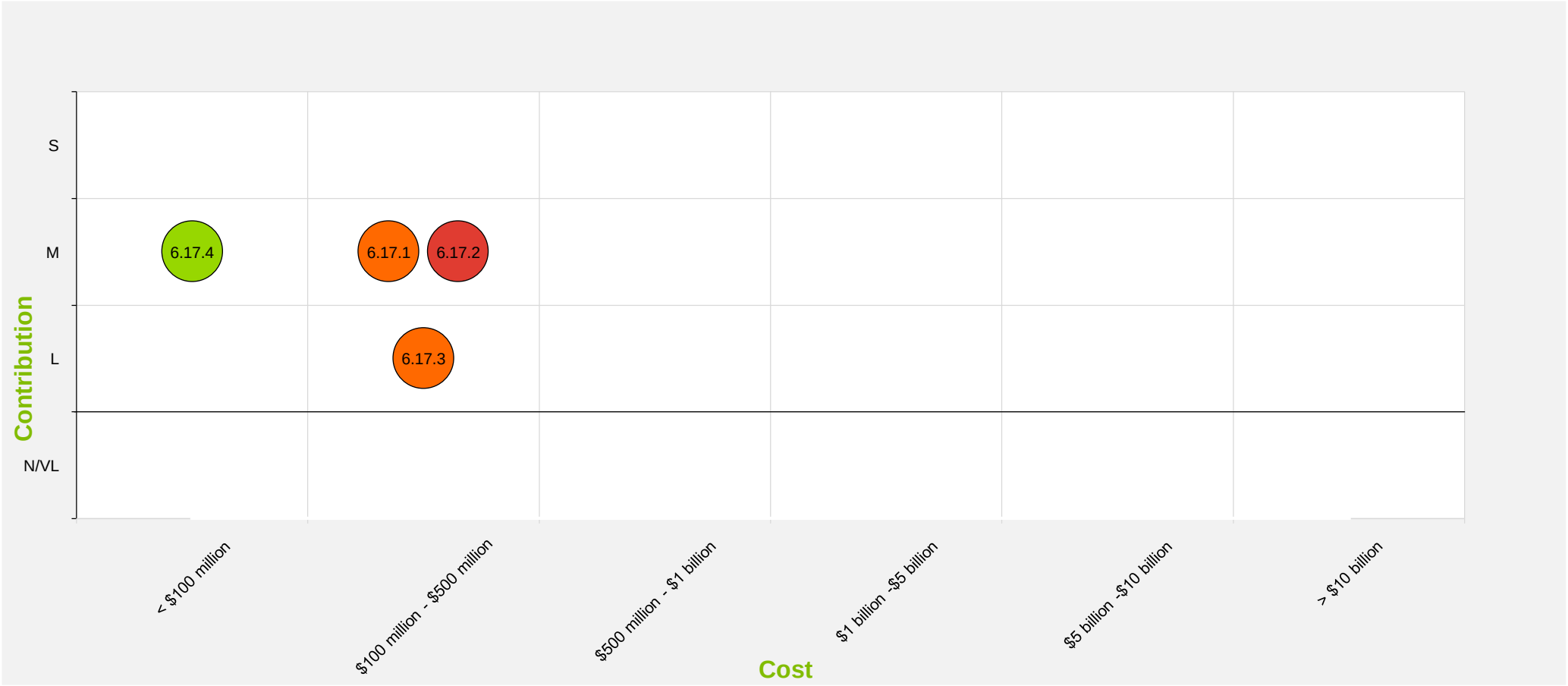



**Figure 17: Need 6B matrix**

## Draft Option - School and Tertiary Education cooperation

**Strategic Intervention: Changing behaviour - Influencing behaviour through information**
**Changing behaviour\Better use - Competition Regulation**
**Contractual Process**

**Reference 6.17.1/STE**

Encourage partnerships between schools and tertiary education providers to facilitate the sharing of infrastructure through specific educational programs, strengthening pathways for school students to transition to tertiary education.

It is worth noting that the Commonwealth and State governments are currently encouraging such partnerships through the Trade Training Centres and Tech Schools programs. Certainty of ongoing operational expenditure to support the maintenance of purpose built assets, in addition to funding for capital works, will provide added incentive.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $100million - $500 million | The estimated whole of life 30 year costing for this option is based on the Commonwealth capital funding invested from 2008-2017 in the sector. Based on this figure the maintenance funding required for facilities is expected to be approximately $10-15 million per annum. Further, some maintenance funding would need to be provided for Technical Schools.<br><br>Note: This costing excludes additional capital funding for the provision of additional facilities and is based on existing provisions. |
| **Overall Contribution** | Moderate | The provision of vocational studies at school age facilitates an earlier introduction to vocational education/skills/training and is likely to moderately contribute to the reduction in the supply and demand mismatch. |

## Draft Option - TAFE asset market driven partnerships and funding

**Strategic Intervention: Changing behaviour - Influencing behaviour through information**
**Changing behaviour\Better use - Competition Regulation**

**Reference 6.17.2/TAF**

Encourage partnerships between schools and tertiary education providers to facilitate the sharing of infrastructure through specific educational programs, strengthening pathways for school students to transition to tertiary education. It is worth noting that the Commonwealth and State governments are currently encouraging such partnerships through the Trade Training Centres and Tech Schools programs.
Certainty of ongoing operational expenditure to support the maintenance of purpose built assets, in addition to funding for capital works, will provide added incentive.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $100 million - $500 million | Current maintenance funding levels as inferred from the TAFE Reform Panel findings are estimated at 1.0% of asset replacement value. It is proposed that this would be increased marginally each year over the 30 year period. |
| **Overall Contribution** | Moderate | The separation of asset management and maintenance funding for TAFE's and dual-sector universities (entities) from market driven funding, will ensure Victorian State Government assets are adequately funded and maintained. If the funding agreements with the entities outline the necessary asset management and maintenance activities to align with educational service demand, the implementation of this option will moderately contribute to the assessment metric. |

## Draft Option - Education Precincts linking the education sector and private sector

### Strategic Intervention: Changing behaviour - Influencing behaviour through information

**Reference 6.17.3/SEP**

Establishment of new education precincts that brings sectors together, driven by private sector demand for increased collaboration with education sector. This has been demonstrated with the innovation precinct's like Carlton Connect or South East Melbourne Innovation Partnership. This option would create specialised precincts designed to bring firms, research institutions, technology experts and business service providers together to bolster innovation.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $100 million - $500 million | The implementation of this option is based on the provision of 3 x $50 million grants every 10 years providing for a total whole of life 30 year cost in the region of $450 million. |
| **Overall Contribution** | Low | This option facilitates Victorian industries to supply the vocational education/training/skills that are in greatest industry demand. This will significantly contribute to the mismatch in supply of educational services that meet industry demands but will not meet student driven demand, attributing to the moderate contribution to the metric. |

## Draft Option - Vocational Education long term funding certainty

### Strategic Intervention: Better use - Public Service delivery and approval processes

### Better use - Funding Agreements

**Reference 6.17.4/VEL**

Provide certainly to the Vocational Education sector by removing funding from short-term budget cycles. This would enable strategic and long term planning and investment of TAFE assets. TAFE Asset Management Plans should be prepared in a more timely way to support strategic planning. This would significantly reduce the supply and demand mismatch across the TAFE educational offerings.

TAFE assets would benefit from strategic long term planning and investment, short term budget and election cycles impact the ability for effective long term maintenance funding and asset replacement investment.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | High | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | This option is a policy/regulatory change only with no capital works required. Whole of life cost estimations include consultation, implementation and management. The estimated cost is based on the preparation of the long-term strategic planning and investment plan ~<$1 million. Seeking approval of the plan will involve minimal costs. |
| **Overall Contribution** | Moderate | Strategic planning supported by funding certainty would contribute to the reduction in the supply and demand mismatch across the TAFE educational offerings. Due to the current governance framework of the TAFE sector, the Department of Education and Training would be required to lead and prepare strategic planning across the asset base. |

# Draft Objective 7 - Promote sustainable production and consumption

## Draft Need 7A: Improve rural and regional water security

Victoria's history of drought makes us acutely aware of how important it is to manage this resource sustainably. Water management needs to balance needs of the environment and mitigate the environmental impact of use. This issue is most acute in the rural and regional context.

In regional centres this results in towns with water supply challenges and vulnerability to climate variability. In rural Victoria, many communities are reliant on water for irrigation purposes and this places high demand on the available resource, with environmental flows needed to ensure the health of waterways. In the north of the state, all water is fully allocated and tradeable. Victoria's open channel irrigation systems lose generally around 30 per cent of the total water volume through leakages and inefficiencies in the flow. This is a significant loss and will only be compounded as certain parts of Victoria, such as the north-west, continue to be affected by drought.

### Metrics

Metric 1 – Reduction in the percentage of rural and regional population who have water insecurity (high level water restrictions) of less than 95 years in 100.

### Options

The table below lists the options considered for this Draft Need

| Reference Number | Option Name |
|---|---|
| 7.18.3 | Recycled treated wastewater for drinking |
| 7.18.8 | Recycled treated wastewater for non-potable agricultural use |
| 7.18.9 | Wonthaggi desalination plant expansion |

The graph on the following page plots each option's Contribution verses Cost.

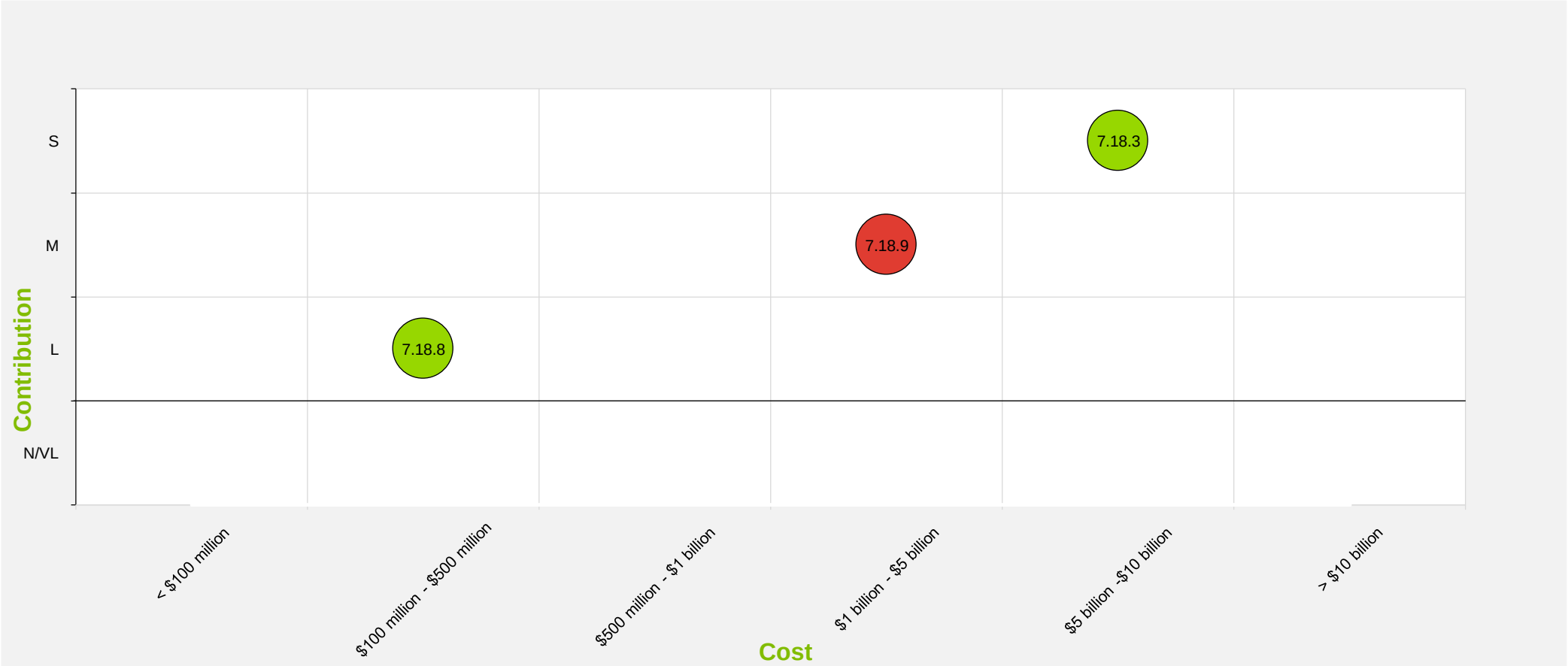



**Figure 18: Need 7A matrix**

## Draft Option - Recycled treated wastewater for drinking

**Strategic Intervention: Capacity investment: This could be in the form of new greenfield asset or an expansion of an existing asset augmented to an existing wastewater treatment plant.**

**Reference 7.18.3/RWW**

Increasing the use of recycled wastewater for non-potable household use through purple pipe schemes in new and existing estates.

Most water corporations across Victoria have the ability to or already generate wastewater treated to a quality suitable for non-potable (non-drinking) purposes. This option considers how to increase the usage of this water at the household level. Increasing the use of treated wastewater would reduce pressure on mains water supply particularly during dry periods.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | High | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $5 billion -$10 billion | The cost estimation for the implementation of this option is based on the cost of the new infrastructure, operational costs and costs to ensure health standards are continuously met. For a comparative project the Victorian Desalination Project in Victoria cost around 5.7 billion, with costs expected to be on par for the implementation of this option. |
| **Overall Contribution** | Significant | Cities with limited water resources are considering indirect potable re-use (IPR) as a feasible option for the sustainable management of water because it is a water supply alternative not dependent on rainfall and it is possible to achieve high quality recycled water in compliance with drinking water standards and guidelines. IPR has the potential to make a significant contribution to urban water resources needs but a cautious approach is required to manage the health risk associated with recycled water for drinking. |

## Draft Option - Recycled treated wastewater for non-potable agricultural use

**Strategic Intervention: Better use - Incremental expansion of existing assets**

**Reference 7.18.8/TWR**

Increase recycled wastewater usage for agricultural purposes. This option considers greater use of recycled wastewater for food production activities. Although recycling is currently part of operations at the Eastern and Western treatment plants, there is capacity for further uptake if viable use is identified. For example, a pipeline to take recycled water from the Eastern Treatment Plant to the Bunyip area in Melbourne's south east has the potential to transform dryland agriculture to higher value irrigated agriculture.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | High | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $100 million - $500 million | The implementation of this option would require ongoing upgrades to the capacity of some of Victoria's recycled water plants (as identified in the ICA report). Better use of the existing infrastructure in place could see this option progress with minimal costs. Based on existing projects to upgrade water facilities it is estimated the cost range will be in the order of $100-500 million. |
| **Overall Contribution** | Low | Using recycled treated waste water in urban areas for agricultural purposes will have low impacts on water security. It will ensure that food production can continue in drought but for a small urban based part of the overall production task. In NSW there are several waste water treatment plants at a primary and tertiary level, as in Melbourne such as Werribee Irrigation District. |

## Draft Option - Wonthaggi desalination plant expansion

### Strategic Intervention: New/expanded assets > Incremental expansion of existing assets

**Reference 7.18.9/WDP**

Expand the capacity of the Wonthaggi Desalination Plant.

There is potential for the capacity of the Wonthaggi desalination plant to be increased to provide a greater water security.

The plant can currently deliver up to 150 megalitres of desalinated water but was constructed to allow for up to 200 megalitres of water.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion - $5 billion | Current estimated operating costs are $200 million per annum; this could be reasonably extrapolated to $250-300 million per year particularly as electricity costs increase. This means that operating costs, assuming 15 years as the expansion does not come into operation until 2031 could increase by between $750 million - $1.5 billion.<br><br>The entire infrastructure has been designed and constructed for 200GL capacity except the plant, which was designed and constructed for 150GL but to be expandable to 200GL if required. Original construction costs were $4 billion. Estimates of the cost of expansion are not available publicly, however it is reasonable to assume that this would be less than $2 billion. |

| | | |
|---|---|---|
| | | Therefore the whole of life cost range most appropriate is $1-$5 billion. |
| **Overall Contribution** | Moderate | As Victoria's and particularly Melbourne's population grows there is going to be significant pressure on our water catchments and existing supplies. Expansion of the desalination plant will help to mitigate the risk of water shortages across Melbourne. |

## Draft Need 7B: Manage pressures on landfill and waste recovery facilities

Waste is an outcome of human development. Despite increasing rates of recycling across Victoria, growth in population and industries will mean more waste. Current trends indicate that total waste generation could almost double over the next 30 years. Furthermore, the composition of this waste is changing due to different products and manufacturing processes.

While there is capacity to meet landfill demand for the next 10 years, there are increasing pressures on landfills and resource recovery centres. Though Victoria recovers two-thirds of its waste, there are efforts to grow this share by encouraging markets in recovered resources and leveraging technology. Recovering more waste will improve the sustainability of the state's production and consumption by reducing reliance on resources. Despite increases in resource recovery and reductions in per capita waste generation, demand for landfill is likely to exceed capacity over the medium to longer term, underlining the importance of protecting existing infrastructure and integrated land use planning for future sites. And without reduction in the generation of waste entering the system, pressure on existing waste infrastructure will occur sooner.

### Metrics

Metric 1 – Reduction in the forecast supply and demand mismatch (gap) of landfill and waste recovery.

### Options

The table below lists the options considered for this Draft Need

| Reference Number | Option Name |
|---|---|
| 7.19.1 | Landfill waste levy increase |
| 7.19.2 | Household waste disposal fees |
| 7.19.3 | Recycled material usage in building construction |
| 7.19.4 | Waste landfill site land buffers |
| 7.19.5 | Landfill site consolidation |
| 7.19.8 | E-waste Services |

The graph on the following page plots each option's Contribution verses Cost.

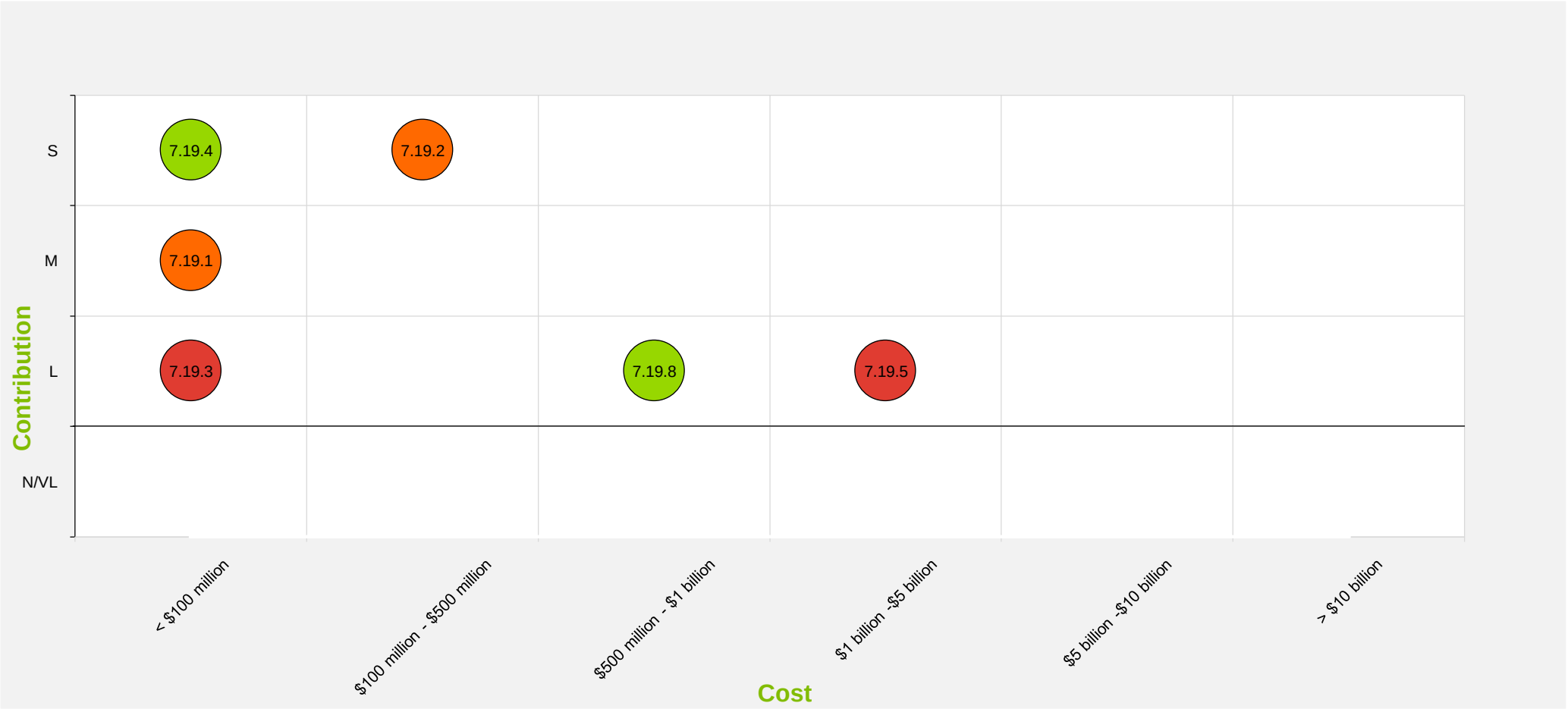



**Figure 19: Need 7B matrix**

## Draft Option - Landfill waste levy increase

### Strategic Intervention: Better use - Economic charging

**Reference 7.19.1/LLI**

Increasing landfill levy charges to reduce waste and promote recycling.
Government policy can be used to increase the landfill levy and encourage behavioural change. This would lower the generation of waste (through higher prices for waste disposal) and increase resource recovery.

The landfill Levy has the potential to increase the competitiveness of alternative recycling and waste recovery options when compared with technologies such as Mechanical Biological Treatment (MBT) and Energy from Waste (EfW) plants.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | This option is a policy/regulatory change only with no capital works required. Whole of life cost estimations include consultation, implementation and management. No direct asset or infrastructure cost as this is a pricing mechanism, thus this initiative is expected to have a minimal cost impact to the State Government. |
| **Overall Contribution** | Moderate | Although there has been a direct correlation between increases to the landfill levy and increases in resource recovery, recent trends suggest that this effect could now be capping off.<br><br>However, this could lead to the following externalities:<br><br>All levies collected to date have accrued in the Sustainability Fund with some going out to various agencies. The Sustainability Fund has now grown to between $600 - $700 million with ministerial discussion occurring on how to best utilise the funds. Increasing the levy would seem unjustified from an economic perspective and it is highly likely that there will be significant push back from local councils and industry. |

## Draft Option - Household waste disposal fees

### Strategic Intervention: Better use - Economic charging

**Reference 7.19.2/HWD**

Revision of waste disposal fees to better reflect the amount of waste generated by individual households.

There is potential for charging mechanisms to be more direct to end users and for price signals or incentives to reduce waste to be better utilised.
The current charging mechanism is for a fixed fee per household irrespective of the amount of

waste generated. Unbundling waste fees (i.e. charging by weight or when bin is full) could lead to less waste being generated at the source and could also lead to behavioural changes.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $100 million - $500 million | The cost for the implementation of this option is estimated based on the approximate 2.2 million households in Victoria. Assuming that each bin can be retrofitted at $60/bin and $2000/truck (assuming approximately 1,500 trucks in Victoria) the physical infrastructure would cost around $130 - $140 million. In addition, IT systems and personnel would need to be put in place to manage this. With an allowance of $60 million for IT the cost of the initiative is estimated to be in the order of $200-$250 million for the whole of life costing of the 30 year period. |
| **Overall Contribution** | Significant | Studies show that in municipalities with a weight based system, residual waste generation per households could be halved and total waste generation could be reduced by 30% (Eunomia Research and Consulting). However, this could lead to the following externalities:<br>- Illegal dumping: Unit pricing (and particularly weight-based charging) provides a financial incentive to illegally dispose of waste.<br>- Recovering expenses: Since unit pricing offers a variable rate to residents, the potential exists for uneven cash flow that could make it harder to operate a unit pricing program.<br>- Administrative costs: Establishing weight-based charging rates, billing residents, and collecting payments under a unit pricing program will increase Council's administrative costs.<br>- Perception of increased costs to residents: While a unit pricing program offers residents greater control over the cost of collecting their waste, they can be seen as a rate increase.<br>- Difficult for multi-unit dwellings: Extending direct waste reduction incentives to residents of multi-family housing can present a significant challenge. Since waste generated by MUD's (multi-unit dwellings) typically is combined in a central location for collection, distinguishing the amounts of waste generated by individual households, in order to charge accordingly, can be very difficult.<br>- Alternative option could be to offer the consumer variable rates based on collection requirements i.e. provide lower costs to people who have smaller bins. |

## Draft Option - Recycled material usage in building construction

### Strategic Intervention: Changing behaviour - Safety and environmental standards

**Reference 7.19.3/RMU**

This option would amend the green building rating scheme to make the incorporation of recycled materials mandatory, to create stronger market drivers for using recycled products in new construction.

The green building council (who manage the voluntary green building rating scheme "Green Star") and the Infrastructure Sustainability Council of Australia have already incorporated optional requirements into their rating schemes, however there is a tendency to not target the materials credits as the criteria is either too expensive to meet or difficult to meet from a functionality perspective. Making these requirements mandatory would increase the acceptance of the material credits and create stronger market drivers for recycled products.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | This option is a policy/regulatory change only with no capital works required. Whole of life cost estimations include consultation, implementation and management. |
| **Overall Contribution** | Low | Steel, concrete and wood are the primary construction materials within the sector. Steel manufacturers already operate at worlds' best practice and the credit is a generally targeted in all buildings seeking a 5-star rating or higher. Making the concrete credit mandatory is not practical as there are structural strength requirements that may be impacted.<br><br>However, making these requirements mandatory could reduce the uptake of the local sustainability schemes as they would be seen as either unfeasible or impractical by the industry. Industry may prefer to use international tools such as LEED (US equivalent) as it would be easier to achieve and is globally a bigger brand in recognising sustainability. |

## Draft Option - Waste landfill site land buffers

### Strategic Intervention: Changing behaviour - Land use and planning controls

**Reference 7.19.4/FLS**

Some landfill sites are in areas of urban growth resulting in a land use conflict between residents and current landfill sites. Some of these landfills are vital to the waste management system in Victoria (particularly in metropolitan Melbourne). Currently buffer zones around landfills are closer to 500m. The suggestion is to increase these buffer distances to ensure that current landfill sites (which have quite large capacities to meet needs well into the future) are not prematurely closed down with additional (potentially expensive) sites further from urban areas needing to be sourced to avoid the conflict.

In addition, review of the location of landfill sites is required to ensure future capacity is assured, taking into account transport links and travel distances as well as potential land use conflicts.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | High | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | This option is a policy/regulatory change only with no capital works required. Whole of life cost estimations include consultation, implementation and management. Requires increased control and regulation surrounding planning approval in areas surrounding existing and greenfield waste infrastructure. Specific analysis on the number of existing sites that have insufficient buffer, therefore requiring land acquisition, has not been undertaken. If significant land acquisition was required then the whole of life cost would likely exceed $100 million. |
| **Overall Contribution** | Significant | Planning encroachment is the single biggest factor impacting the long term landfill capacity. The continued encroachment on landfills is decreasing available air space. To ensure that there isn't a short fall in the future supply of key waste infrastructure; buffer zones around these assets need to be maintained.<br><br>The potential negative impacts of this include:<br><br>– High value land close to city centres will not be developed.<br><br>– Requires state level planning, taking away the regional planning from the local government. |

## Draft Option - Landfill site consolidation

### Strategic Intervention: Better use - Coordination processes

**Reference 7.19.5/LOC**

Consolidating the number of landfill sites in Victoria.
The strategic direction of the waste management industry is to consolidate the number of landfills within Victoria (reduce the number landfills by decommissioning smaller landfills). Consolidating landfills could lead to efficiency across the network through economies of scale and higher standards of environmental operations.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion -$5 billion | The estimated cost for the implementation of this option has been guided by Sustainability Victoria who predicts that up to $5 billion dollars will be required over the next 30 years. The implementation would require significant investment in land remediation for closed landfills. |

| | | |
|---|---|---|
| | | This is already required at all closed landfills, but fast tracking the closure would front load the expenses. In addition, to achieve the desired effects of improved environmental management, further investment in infrastructure may be required. |
| **Overall Contribution** | Low | Initiative is intended to improve operations from an environmental quality perspective. Link to improved resource efficiency is unclear.<br><br>This option will most likely increase collection cost (vehicles will need to drive further) and investment in extra collection infrastructure (more time spent travelling reduces pick-up time). |

## Draft Option - E-waste Services

### Strategic Intervention: New/expanded assets - new greenfield asset

**Reference 7.19.8/EWS**

Government investment in E waste management infrastructure. All reprocessing and material recovery facilities in Victoria are privately owned and operated. In recent years, following drops in commodity prices, private sector investment in waste management facilities has decreased. This also means investment in new technology within the waste and resource recovery sector has dropped.

To stimulate the market, there is potential for the government and private sector operators to develop infrastructure to process problematic waste streams such as E-waste.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | High | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $500 million - $1 billion | The estimated cost to implement this option has been based on the assumption that Victoria was to increase the rate of e-waste recycling for all types of e-waste. It is estimated it would cost between $14 million per annum (assuming it cost $1000 per tonne to treat) with a compound growth rate of 4-5% to implement this change. Thus in total, it would cost in the order of $675 million whole of life over 30 years to deal with all of Victoria's e-waste. |
| **Overall Contribution** | Low | Proposal adds additional capacity, does not utilise existing capacity within the network. Although it would help increasing the recovery rate across the state, it would not help better utilise existing assets. |

# Draft Objective 8 - Protect and enhance natural environments

## Draft Need 8A: Help preserve natural environments and minimise biodiversity loss through infrastructure

Victoria's national parks and other protected areas such as state parks seek to conserve biodiversity and natural environments. These healthy ecosystems also provide 'ecosystem services' such as water catchment and filtration, as well as economic benefits – many regional tourism offerings showcase the state's natural assets and generate jobs in tourism. More generally, these environments are part of what makes Victoria unique and are part of our culture, including our indigenous heritage.

Pressure on these areas is expected to increase, including through demand for increased visits. Parks Victoria report 37.8 million visits to national parks in 2014-2015, above total park projected demand. This could have negative consequences for the biodiversity in these areas and the proper functioning of these natural environments.

Physical built assets can aid in the creation, protection and monitoring of biodiversity and the natural environment. Such infrastructure includes fishways, biodiversity tunnels and fencing for feral pests. It also includes facilities that minimise impact, such as suspended ramps over grasslands.

### Metrics

Metric 1 – Improvement in habitat hectare results for Victoria's national parks and other protected areas.

### Options

The table below lists the options considered for this Draft Need

| Reference Number | Option Name |
|---|---|
| 8.20.1 | National park pricing and expenditure regime |
| 8.20.2 | Habitat corridor link expansion and improvement |
| 8.20.3 | National park private management |
| 8.20.4 | Riparian fence investment |

The graph on the following page plots each option's Contribution verses Cost.

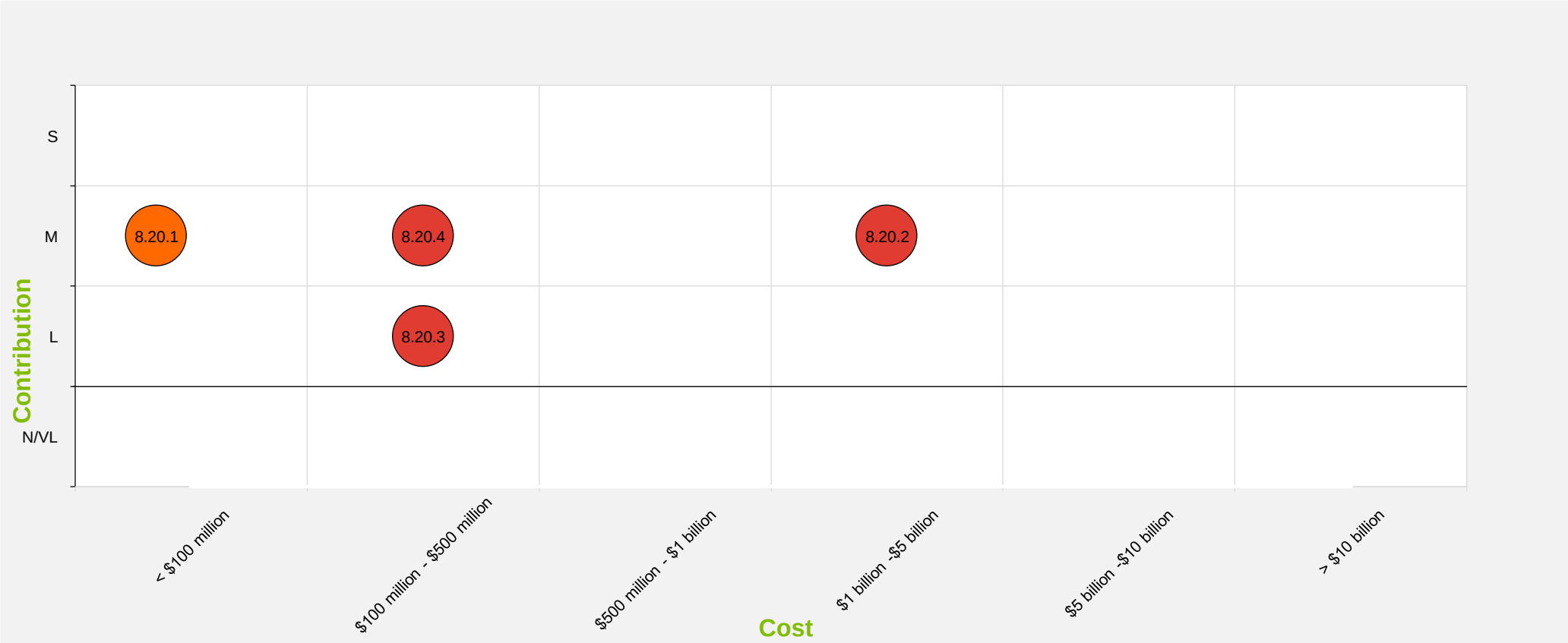



**Figure 20: Need 8A matrix**

## Draft Option - National park pricing and expenditure regime

### Strategic Intervention: Better use - economic charging

**Reference 8.20.1/NPP1**

The establishment of a pricing regime for parks would determine the necessary balance between the upgrade and maintenance and the revenue requirement which could come from park fees or other means. This would assist in prioritising the maintenance of national parks infrastructure which is in need of repair, but also serve to set prices to manage visitor demand.

At its most extreme, very high pricing for national park access could severely restrict visitor numbers and allow for significant revegetation, but is expected to require Parks Victoria to increase investment in enforcement activity. Technological solutions might exist to reduce enforcement costs. Areas subject to very high pricing might be rotated over a several-year long cycle to balance tourist access with environmental goals.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | This option is a policy/regulatory change only with no capital works required. Whole of life cost estimations include consultation, implementation and management. |
| **Overall Contribution** | Moderate | Camping and accommodation fees have not increased significantly in the ten years from 2004 to 2013 with fees increasing in most years by the Treasurer's rate. At present, the total annual cost of delivering camping and accommodation facilities and services within Victoria's national and other parks is estimated to average $17.8 million over the next ten years. However, only $6.5 million is currently collected in revenue from user fees and charges. The estimated shortfall of $11.3 million is neither fair nor sustainable. Therefore, increasing the fees would be a viable option for improving habitat hectare results and closing the funding gap required to maintain and protect facilities within national parks. However, this could lead to an increase in illegal access causing more damage to the environment or reduced tourist numbers. |

## Draft Option - Habitat corridor link expansion and improvement

### Strategic Intervention: Capacity investment - incremental expansion of existing assets

**Reference 8.20.2/HCL**

Habitat areas are often poorly linked. This can cause significant impacts on the migration of key species. This option would require the mapping out of an integrated plan for Victoria's natural environment to frame priorities for improved links/corridors between areas. These habitat links would then be developed, and/or secured, through employing a range of mechanisms including planning overlays, land acquisition, corridor boundary fencing, riparian fencing, revegetation and private land covenants.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion -$5 billion | The estimated cost of implementing this option has been based on a number of different projects, including:<br><br>- Acquisition of land and construction of environmental infrastructure<br>- To achieve western grasslands reserve, land acquisition of private land is required (potentially costing several hundred million dollars)<br>- 400 frog ponds would be priced on a case by case basis, but could average $400,000 depending on size quality and maintenance<br>- Habitat corridors can be set aside through the urban planning processes, however there maintenance and management will require on-going maintenance.<br><br>All of these projects combined push the estimated cost range over the 30 year whole of life costing period to in excess of $1 billion, based predominantly on land acquisition costs. |
| **Overall Contribution** | Moderate | The implementation of this option will have a direct impact on migratory animals and moderately contribute to the assessment metric. It would be necessary to further investigate and high-light priority areas, potentially increasing the contribution. |

## Draft Option - National park private management

### Strategic Intervention: Governance reform - funding agreements

**Reference 8.20.3/NPP2**

This option would serve to provide financial incentives to private park managers (in a concessional/contractor type arrangement) to ensure that environmental outcomes are achieved.

This would require the establishment of measurable performance targets to result in more efficient methods for achieving environmental and biodiversity outcomes.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $100 million - $500 million | The cost for the implementation of this option will vary depending on the scale. A small scale trial for a national park could be done within the region of $10 - $40 million dollars. Whilst if done on a larger scale, the costs would exceed $100 million dollars, but this cost would be offset by the reduction in spending for government controlled service that would be reduced. |

| | | |
|---|---|---|
| **Overall Contribution** | Low | There is very limited evidence to suggest that privately owned national parks can improve habitat quality, attributing to the low contribution of this option against the metric. |

## Draft Option - Riparian fence investment

### Strategic Intervention: Capacity investment - incremental expansion of existing assets

**Reference 8.20.4/RFI**

Invest in Riparian fences to prevent stock access into rivers and associated damage caused by erosion, defecation, vegetation damage and sedimentation.
Damage from unrestricted livestock access, especially by cows, diminishes waterway health. Riparian damage has significant consequences for biodiversity given the importance of water and waterway health to species flourishing, providing habitats for wildlife, food for fish, shade to maintain water temperatures, and roots to control erosion. Riparian zones are also natural wildlife corridors, playing a valuable role in assisting migration of endangered species to safe habitats and as a seed back for endangered flora. This would require a policy or planning mechanism to ensure sensitive waterways are fenced off, banks are established and/or other management mechanisms are employed.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $100 million - $500 million | The costing of this option has been based on the approximately 50,000km of actively managed rivers and 13,000 of this has been classed as high priority in Victoria. Assuming a cost of $1,500/km for mesh wire fencing, it would cost approximately $39 million dollars in capital cost to protect all of the high priority areas. In addition, if 4% of the capital budget is allowed for maintenance every year $46.8 million dollars would be required over 30 years to sustain the infrastructure.<br><br>In addition, an allowance for artificial water sources will also be required. Assuming it costs $2000/water source and one is placed every 500M, a further $85.8 million will be required. In total, to protect all of the high priority waterways it could cost up to $170 million dollars over the whole of life 30 year costing period. |
| **Overall Contribution** | Moderate | The implementation of this option will certainly assist to improve waterways quality and improving the overall habitat within National Parks. However, this is dependent on the installation location of the riparian fencing. For example, upstream riparian fencing should be prioritised over downstream riparian fencing if the primary objective is to protect national parks. |

## Draft Need 8B: Improve the health of rivers and streams through infrastructure

In 2010, an assessment of river condition by the Victorian Government found only 12 per cent in excellent condition, 11 per cent in good condition, 43 per cent in moderate condition, 19 per cent in poor condition and 13 per cent in very poor condition.

There are a number of significant threats to waterway health in Victoria. This includes river contaminants that put water quality at risk, but also other factors such as pesticides, heavy metals and temperature which affect water quality at local and regional levels. Water salinity is a critical issue for lowland inland waters and while Victoria has some naturally occurring saline areas, most salinity has been caused by native vegetation clearing or excess irrigation. Storm water flows also play a major role in eroding urban waterways and damaging ecological health.

It is important that storm water runoff is managed in a way that mitigates damage to waterway health. The ability of water infrastructure, including storm water drainage, to deal with the impacts on Victoria's waterways is important, as is understanding how infrastructure contributes to poor waterway health.

### Metrics

Metric 1 – Increase in the percentage of Victoria's river length in good or excellent condition.

### Options

The table below lists the options considered for this Draft Need

| Reference Number | Option Name |
|---|---|
| 8.21.1 | River and waterways natural flow regimes |
| 8.20.4 | Riparian fence investment |
| 8.21.3 | Waterway infrastructure to remove pollutants |

The graph on the following page plots each option's Contribution verses Cost.

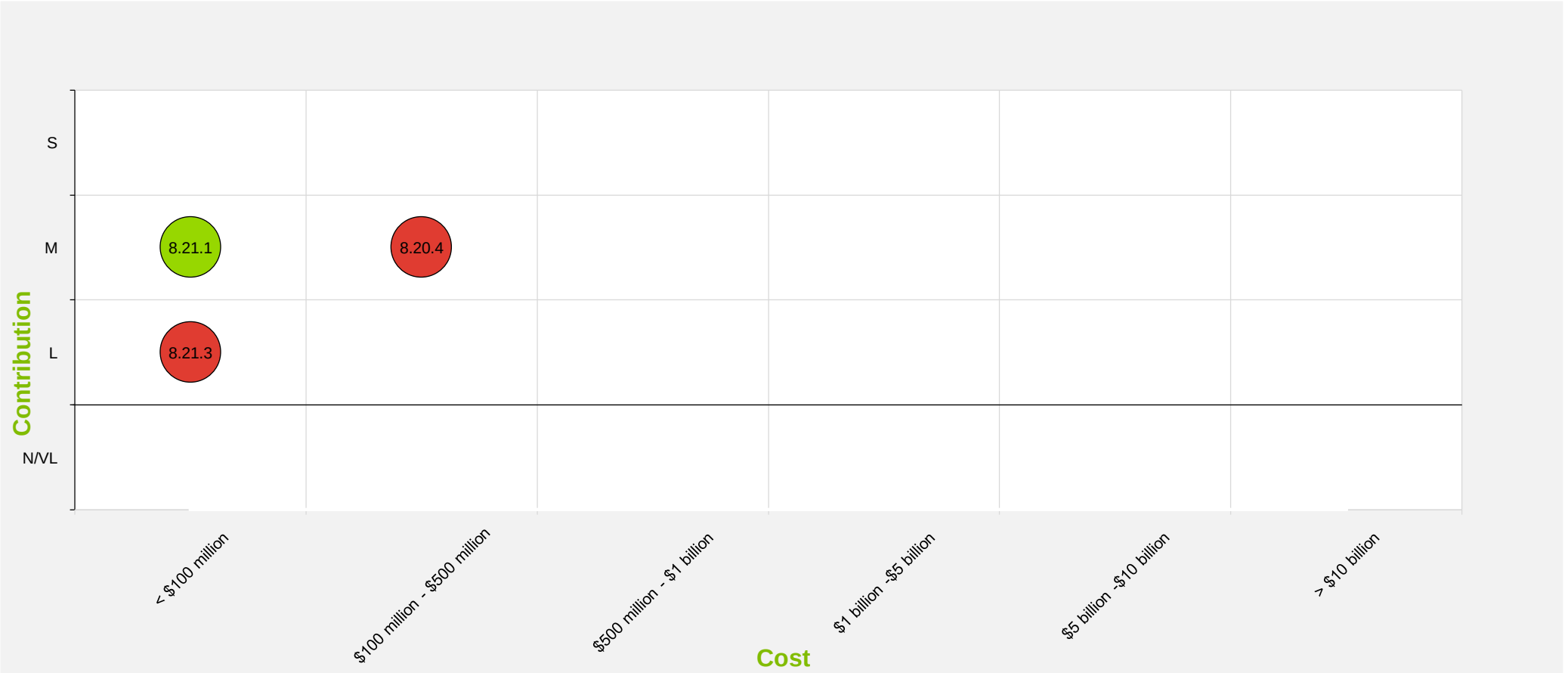



**Figure 21: Need 8B matrix**

## Draft Option - River and waterways natural flow regimes

### Strategic Intervention: Regulatory: Licensing

**Reference 8.21.1/RWN**

Assessing opportunities to improve environmental outcomes for example through passing flows. Water businesses in Victoria that are responsible for water extraction provide passing flows for the environment from offtake structures. This option would examine opportunities to improve environmental outcomes including the timing of flows. This intervention would need to consider impacts on all water entitlement holders

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | High | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | This option is a policy/regulatory change only with no capital works required. Whole of life cost estimations include consultation, implementation and management. |
| **Overall Contribution** | Moderate | River Health data from Melbourne Water shows that re-establishing natural river flows contribute positively to the overall condition rating of a river. Key contributors to this would derive from the beneficial impacts on ecosystem health and restored balance. According to Melbourne Water, flow and habitat management works aim to improve the condition to a minimum moderate standard. |

## Draft Option - Riparian fence investment

### Strategic Intervention: Capacity investment - incremental expansion of existing assets

**Reference 8.20.4/RFI**

Invest in Riparian fences to prevent stock access into rivers and associated damage caused by erosion, defecation, vegetation damage and sedimentation.

Damage from unrestricted livestock access, especially by cows, diminishes waterway health. Riparian damage has significant consequences for biodiversity given the importance of water and waterway health to species flourishing, providing habitats for wildlife, food for fish, shade to maintain water temperatures, and roots to control erosion. Riparian zones are also natural wildlife corridors, playing a valuable role in assisting migration of endangered species to safe habitats and as a seed back for endangered flora. This would require a policy or planning mechanism to ensure sensitive waterways are fenced off, banks are established and/or other management mechanisms are employed.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $100 million - $500 million | The costing of this option has been based on the approximately 50,000km of actively managed rivers and 13,000 of this has been classed as high priority in Victoria. Assuming a cost of $1,500/km for mesh wire fencing, it would cost approximately |

| | | |
|---|---|---|
| | | $39 million dollars in capital cost to protect all of the high priority areas. In addition, if 4% of the capital budget is allowed for maintenance every year $46.8 million dollars would be required over 30 years to sustain the infrastructure.<br><br>In addition, an allowance for artificial water sources will also be required. Assuming it costs $2000/water source and one is placed every 500M, a further $85.8 million will be required. In total, to protect all of the high priority waterways it could cost up to $170 million dollars over the whole of life 30 year costing period. |
| **Overall Contribution** | Moderate | The installation of riparian fencing would limit livestock access to open waterways, filter run off water and assist with erosion, all contributing to improvements in river health. |

## Draft Option - Waterway infrastructure to remove pollutants

### Strategic Intervention: Capacity investment: new assets

**Reference 8.21.3/WIR**

New pollutant/litter traps along waterways to remove pollutants from inflows will enhance river water quality.

These structures should be prioritised in locations with the greatest pollutant loads and in waterways with the highest ecological values.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | <100 million | The implementation of this option would require moderate capital investment if rolled out across the whole of Victoria. It is estimated the cost range will be at the lower end of the range provided. |
| **Overall Contribution** | Low | New infrastructure along waterways to remove pollutants is likely to increase the percentage of Victoria's river length in good or excellent condition. It will reduce the river contaminants that put water quality at risk, and limit pesticides, heavy metals and temperature which affect water quality at local and regional levels. New infrastructure such as gross pollutant traps will be likely to reduce flow and dirt pollutants in rivers. |

# Draft Objective 9 - Support climate change mitigation and adaptation

## Draft Need 9A: Smooth the adjustment to a carbon-constrained world through infrastructure

Transitioning to a carbon-constrained world will present a number of economic, social and environmental challenges and opportunities for Victoria over the next 30 years.

This change is not simply about energy supply, but about reconsidering the energy consumption of all infrastructure. There is an increasing need for greater efficiency of energy use across all sectors to offset the increasing costs to consumers and impacts on climate change. In some cases this will be a challenge, for example, many parts of the transport network are particularly reliant upon fossil fuels. However, in other sectors like waste, considering options for waste disposal that are associated with renewable energy generation could be an opportunity. Low impact production such as closed system farming may also play an important role. There are also emerging technologies in energy storage (such as Tesla batteries) and local energy grids, which will place greater power with the consumer and have the potential to transform the nature of energy production and distribution.

While there are significant brown coal reserves to meet Victoria's energy needs for the next 150 years, a number of factors (including the impact of international policies, like the global agreement in Paris) will likely result in changes to policy and demand. Coal fire-powered electricity represents 86 per cent of Victoria's energy use, however, there are a number of reasons why this reliance presents problems. First, the average age of Victorian coal-fired power stations is more than 34 years. As plants approach their end of life, either significant expenditure is required to refurbish ageing plants or replacement plants must be built. Second, the existing asset base is no longer meeting community expectations for environmental and health outcomes. Third, growing policy and technological changes, potentially facilitated by Federal Government policy or international treaties, could bring on a broadened energy mix with greater renewable energy generation. However, there are a range of existing barriers to pursuing alternative forms of energy generation in Victoria, including the configuration of the grid, which is likely to restrict large-scale renewables projects in western parts of Victoria.

### Metrics

Metric 1 – Reduction in Victoria's greenhouse gas emissions.

### Options

The table below lists the options considered for this Draft Need

| Reference Number | Option Name |
|---|---|
| 9.22.1 | Energy demand management efficiency schemes |
| 9.22.2 | Ageing coal generation asset transition |
| 9.22.3 | Wind and solar energy generation large scale investments |
| 2.6.6 | Alternative energy vehicles |
| 9.22.5 | Energy efficient development |
| 9.22.7 | Coal fired electricity plant conversion to gas fired plant |
| 9.22.8 | Community wind farms |
| 9.22.9 | Energy Storage Infrastructure |
| 9.22.10 | Energy demand management tariff reform |

The graph on the following page plots each option's Contribution verses Cost.

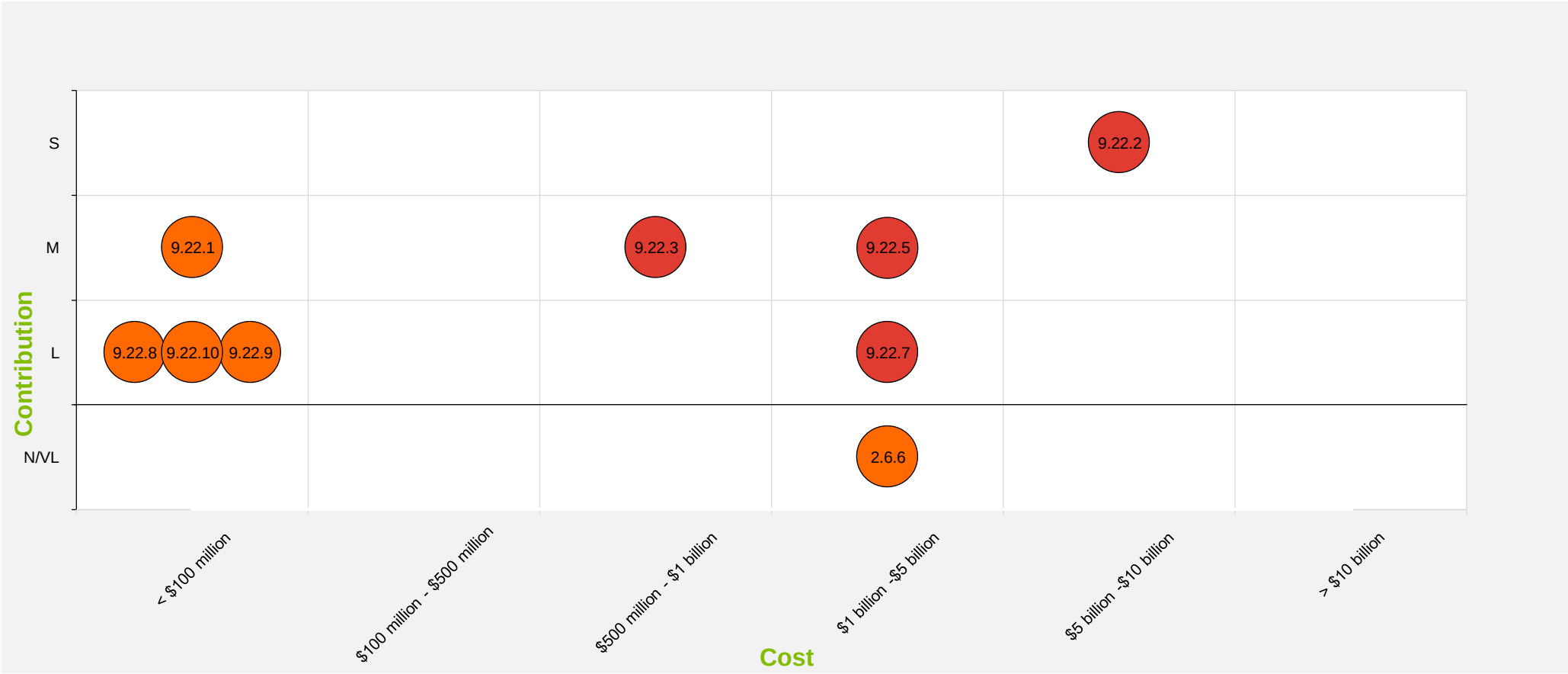



**Figure 22: Need 9A matrix**

## Draft Option - Energy demand management efficiency schemes

### Strategic Intervention: Better use > Market modifying consumer behaviour.

**Reference 9.22.1/EDM1**

Develop energy use efficiency programmes for the industrial and commercial sectors. Energy consumption can be addressed by increasing the efficiency of resource use. Schemes such as efficiency targets (VEET) have previously focused heavily on residential consumption.

This is however only a third of total consumption. Similar schemes can be developed to target improved efficiency in the industrial and commercial sectors.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | This option is predominantly a policy and administrative change only with no capital works required. Whole of life cost estimations include consultation, implementation and management. This is estimated as the cost of running the scheme only, and does not include the cost of any incentives, if applicable. |
| **Overall Contribution** | Moderate | This option will have a moderate contribution to the assessment metric, with an estimated single figure impact on demand due to 23 per cent of Victoria's energy usage being attributable to the domestic /residential sector. Current energy saving schemes target this sector and schemes targeting the remaining 77 per cent of demand would be more costly. |

## Draft Option - Ageing coal generation asset transition

### Strategic Intervention: Governance Reform > Funding Agreements

**Reference 9.22.2/ACG**

This option relates to the provision of incentives to private industry to decommission existing brown coal power plants and remove them from service. In turn to meet demand requirements other sources of generation would attract investment.

Currently nearly 90% of Victoria's electricity supply is from brown coal power stations. The Government can incentivise current brown coal power station owners and operators to direct investment towards other sources of power generation rather than life extensions and additions to ageing existing assets. Examples of incentives are a carbon tax, cap and trade, renewable investment subsidies and tender for shutdown. These interventions would allow the true cost to the environment to be reflected in energy costs due to an expected higher cost of generation than currently possible through brown coal generation.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $5 billion -$10 billion | The cost of implementing this option is based on previous market tests (tender for shutdown, etc.) |

| | | |
|---|---|---|
| | | which were undertaken within the last decade. These market tests received a very poor response and were not going to achieve the stated benefits for an appropriate cost.<br><br>This cost assessment is on the basis of decommissioning 2000MW of brown coal generation, which is approximately 25% of brown coal generating capacity within Victoria.<br><br>The cost does not include the building of any new greenfield renewable assets, only the closure of existing infrastructure and the associated costs to be paid to the private owners. |
| **Overall Contribution** | Significant | Brown coal is the single, pro-rated, largest contributing source to Victoria's greenhouse gas emissions. The retirement and removal of brown coal generation would have a significant contribution to a reduction in Victoria's greenhouse emissions. |

## Draft Option - Wind and solar energy generation large scale investments

### Strategic Intervention: Capacity investment > New greenfield asset

**Reference 9.22.3/WSE**

This option is for Government investment in wind and solar energy infrastructure. Governments (Federal or State) can use grant programs to directly intervene in the development of wind and solar energy generation assets. Grid connections are a large cost for renewable developers and can have significant impacts on the viability of any renewable project. This option considers incorporating and enhancing the role of renewable energy sources in the National interconnected grid. For example, the Victorian Grid has developed to transport energy from the fuel location (Latrobe Valley) to the load in Melbourne. Thus investment is required within areas identified for renewable energy production to enable low cost connection to the distribution grid.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $500 million - $1 billion | The estimated cost to implement this option is based on the requirement to subsidise the revenue stream only to the extent of any gap between Large-scale Generation Certificates (LGC) and guaranteed value. The cost estimation is based on LGC value for 30 years on 1000MW of renewables. 1000MW would displace approximately one sixth of Victoria's high carbon output generation which is considered a moderate change. Value shown is based on a renewable energy certificate value of $50/MWh and a guarantee value of $80/MWh subsidy i.e. a funded gap of $30/MWh (no discounting included). Thus over the 30 year whole of life costing of the scheme it is expected to cost in the region of $1 billion. |

| | | |
|---|---|---|
| **Overall Contribution** | Moderate | Brown coal is the single, pro-rated, largest contributing source to Victoria's greenhouse gas emissions. The implementation of this option is proportional to the cost / scale of investment.<br><br>This assessment is based on decommissioning 1000MW of brown coal generation, which is about 13% of brown coal generating capacity. |

## Draft Option - Alternative energy vehicles

**Strategic Intervention: Capacity Investment > Incremental expansion of existing assets**

**Changing behaviour > Incentives**

**Reference 2.6.6/AEV**

Feasibility studies into the economic viability of electric vehicles have found that the plug-in electric vehicle market in NSW is both economically and financially viable, even though the economic and financial returns accrue over the longer term. Higher levels of charging infrastructure are expected to significantly increase the take-up of plug-in electric vehicles and market viability.

Without some government intervention, it is difficult to see a rapid implementation of charging facilities at service stations which have strong incentives to stick to petroleum and diesel markets.

Initiative to be supported by government incentives to be provided for individuals and companies who adopt environmentally friendly transport (e.g. hybrid courier vehicles are provided cheaper registration).

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion -$5 billion | The cost to implement this option is varied dependent on what schemes are proposed. The Victorian Government incentives could include a combination of the following:<br><br>- tax credits to offset the cost of purchasing or leasing a vehicle<br>- tax credits to offset the cost of installing charging equipment<br>- discounted vehicle registration fees<br>- discounted or zero state sales tax<br>- removing planning restrictions to enable charging equipment to be installed<br>- insurance discounts<br>- access to on-road priority transit lanes.<br><br>In the US, consumers have access to a federal income tax credit of $7,500 for the purchase of an electric vehicle. California has emerged as the most competitive alternate energy vehicle market in the world, offering an additional rebate of $2,500. Other countries provide price support between $1000 and $10,000. |

| | | |
|---|---|---|
| | | Higgins et al's 2012 study suggested that the average uptake of electric vehicles across Victoria will be 13.5% in 2030 with no government rebate. Scenario modelling with rebates from $5,000 to $10,000 showed that a rebate is an important financial incentive to increase take-up. The $5,000 rebate for all electric vehicles up to 2030 increased market share to 19.3% at a cost of $2 billion and the $10,000 rebate increased market share to $25.2% at a cost of $5.6 billion. |
| **Overall Contribution** | Negative/very low | The overall impact of this option if implemented would be negative. This is on the basis that Victorian electric energy remains sourced from brown coal. Running Co2 emissions from a diesel car and an electric car charged from brown coal supplied electricity, is approximately the same measured emissions. |

## Draft Option - Energy efficient development

**Strategic Intervention: Better use > Regulatory Reform**

**Capacity investment > Refurbishment of Existing assets**

**Reference 9.22.5/ EED**

Government instigate regulatory reform to the building regulations to improve energy efficiency across existing and new stock.

Potentially starting with government stock, developing a program to upgrade the energy rating of existing housing stock built prior to the 5 and 6 star energy rating requirement. The average star rating of pre-2005 homes is 2 stars or less; increasing this rating to 5 stars could reduce energy use by more than 30 per cent. Pre-2005 built homes in Victoria comprise over 85% of stock.

The delivery model would necessarily need to begin small, starting with either government stock or a pilot of 1000-5000 residential homes. A subsidised or free program of improving the energy efficiency of those who are most vulnerable to extreme temperatures and energy price rises could be implemented as it has been overseas.

Changes to building regulations for new developments to include items such as double glazing to windows, increased minimum insulation standards and better detailing and construction standards to minimise heat and cooling losses caused by poor shading and leaky buildings. Checking compliance (which is currently a major problem) could be greatly improved by requiring blower door pressure testing of buildings and thermal imaging of external facades.

This would apply to residential properties, large scale residential developments and commercial buildings improving efficiency and reducing demand, and increasing resilience. Require greater use of solar energy in all new developments and protection of solar rights for those who have invested in solar energy. Improvements in the energy efficiency of the heating, cooling systems and hot water systems to be required.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion -$5 | The cost range assessment is based on the cost of implementing energy efficiency regulations and |

| | | |
|---|---|---|
| | billion | then undertaking compliance checks using blower door testing and thermography which is expected it could be administered and run for < 50 million. Subsidising the cost of building efficiency improvements depends on how many you want to improve. For an average three-bedroom house you could install insulation from $2500 to $4500 and a blower door test and thermography is about $800-$1000 per house which would come down with volume. With an estimate of 1 million existing houses in Victoria the cost to undertake the modifications mentioned above would be in the order of $5 billion. |
| **Overall Contribution** | Moderate | The implementation of this option has a moderate contribution to the assessment metric. In addition to reducing carbon emissions, this option provides many benefits including, increasing the resilience of communities to extreme weather events resulting from climate change, improved health and comfort levels of occupants, reduction is usage costs. |

## Draft Option - Coal fired electricity plant conversion to gas fired plant

### Strategic Intervention: Capacity investment > Refurbishment of existing assets

**Reference 9.22.7/CFE**

Government subsidised or funded research on converting coal fired electricity plants to gas fired plants.
This option can promote carbon capture technologies. Gasifying brown coal for gas generation appears to be technically feasible but has failed to achieve commercial feasibility in the past.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion -$5 billion | The estimated cost to implement this option is based on the requirement for research grants and one 500MW IDGCCGT. |
| **Overall Contribution** | Low | The implementation of this option would have a moderate contribution, relative to the estimated cost.<br><br>This assessment is based on decommissioning 500MW of brown coal generation, which is approximately 7% of brown coal generating capacity. |

## Draft Option - Community wind farms

### Strategic Intervention: Better use > Regulatory reform and incentives

**Reference 9.22.8/CWF**

The development of a legislative framework by the Government to assist community wind farm projects to obtain planning approvals.

This framework can include planning, contract and procurement assistance to assist community teams to develop wind farm projects. With this assistance more small scale community developed wind farms could be progressed.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | This option is a policy/regulatory change only with no capital works required. Whole of life cost estimations include consultation, implementation and management and is based on funding for a 2 year trial period and 5 successful schemes. |
| **Overall Contribution** | Low | Relative to the estimated cost, the implementation of this option would have a low contribution to the metric.<br><br>This assessment is based on 10 MW generated per site for a 2 year period and 5 successful schemes totalling a generation of 50 MW. This would displace approximately 0.6 per cent of Victoria's current brown coal generating capacity. |

## Draft Option - Energy Storage Infrastructure

### Strategic Intervention: Capacity investment > Refurbishment of existing asset

**Reference 9.22.9/ESI**

This option is focussed on developing energy storage investment strategies to enable more efficient use of renewable energy sources during peak demand periods. Better use of energy storage infrastructure could be achieved by shifting and smoothing the demand peaks and troughs. For example, demand peaks occur when Photo Voltaic (PV) output is at its minimum during periods of darkness reducing its effectiveness in displacing the use of brown coal during these peak periods.

Additionally, implementation of new and different methods of storage (large scale batteries (power generator), small scale batteries (single house), Hydro Pump, Compressed Air, Hydrogen, Molten Salts) would allow better use of renewables. At this stage the majority of these storage options for large scale implementation are not cost effective against cheaper brown coal power generation which is likely to affect the overall contribution to reducing carbon emissions.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | This option is predominantly a policy and administrative change only with no capital works required. Whole of life cost estimations include consultation, implementation and management. This is estimated as the cost of running the scheme only, and does not include the cost of any incentives, if applicable. |
| **Overall Contribution** | Low | The implementation of this option would provide significant benefits to the network costs, as storage solutions allow for more efficient management of network peaks. This option would also benefit the use of renewables such as PV or wind, when the source is unavailable (e.g. night for PV). However due to the current cost of large scale storage non-renewable energy is still required for peak demand energy delivery and thus will not have a large effect on CO2 emission reduction. |

## Draft Option - Energy demand management tariff reform

### Strategic Intervention: Better use > Regulatory reform

**Reference 9.22.10/EDM2**

This option relates to regulatory reform to allow changing energy tariff structures to target peak energy use and total energy use. Peak and off peak pricing can for example be used to change usage patterns and achieve better use of infrastructure. Sample interventions are greater efficiency rebate incentive schemes focusing on larger users, gas users, and tariff changes. Due to approximately 75% of power generation being consumed by large scale industry increasing pricing may have negative effects on business costs. It is also not possible for energy use and demand to reach a zero point and thus charging more will reach an equilibrium point where by energy use cannot reduce further unless that use cease to exist.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | This option is a policy/regulatory change only with no capital works required. Whole of life cost estimations include consultation, implementation and management and is the cost for setting up pricing structure only. |
| **Overall Contribution** | Low | This option is already in use through the ability of smart meters to allow for differential pricing based on peak/non-peak. This option has had a small impact on the demand of energy but is close to reaching a point of reduced effectiveness due to supply charges not based on use. If users have the ability to be flexible in their usage times, it has the potential to flatten the demand profile over any given period. This will be beneficial to facilitate |

| | | |
|---|---|---|
| | | increases in renewable energy sources but is unlikely to provide a large contribution to the reduction of greenhouse gas emissions in Victoria. |

## Draft Need 9B: Adapt infrastructure to changing climate conditions

The risk of higher temperatures, sea level rises and increasing droughts will impact infrastructure in a number of ways. Some industries may be forced to fundamentally change. For example, the agriculture industry will be particularly exposed as farms in the north of Victoria may need to change what they produce over the decades to come.

High temperatures may increase the costs of maintenance and replacement of infrastructure. Some infrastructure will need significant modification and some sectors will need to change the services they provide. Coastal protection may require investment to address the associated risks with sea level rise. For example, the Barwon South West region is forecast to come under pressure from rising sea levels and storms. Some roads may need to be relocated or protected by new infrastructure.

Urban heat may also become a significant compounding risk. The City of Melbourne's Urban Landscape Adaptation Program in 2010 and its Urban Forest Strategy 2012-2032 respond to this threat, seeking to protect people, businesses, trees and other environmental assets by doubling tree canopy cover, creating street permeability and water-sensitive design.

### Metrics

Metric 1 – Improvement in the ability of major infrastructure in the agriculture, water, energy, ICT and transport sectors to adapt to increased temperatures, decreased rainfall, and rising sea-levels.

### Options

The table below lists the options considered for this Draft Need

| Reference Number | Option Name |
|---|---|
| 9.22.5 | Energy efficient development |
| 2.4.4 | Bicycle and walking path expansion and improvement |
| 1.1.3 | Connected active cities |
| 9.23.3 | Urban Forest |
| 2.6.6 | Alternative energy vehicles |

The graph on the following page plots each option's Contribution verses Cost.


**Figure 23: Need 9B matrix**

## Draft Option - Energy efficient development

**Strategic Intervention: Better use > Regulatory Reform**

**Capacity investment > Refurbishment of Existing assets**

**Reference 9.22.5/EED**

Government instigate regulatory reform to the building regulations to improve energy efficiency across existing and new stock.

Potentially starting with government stock, developing a program to upgrade the energy rating of existing housing stock built prior to the 5 and 6 star energy rating requirement.

The average star rating of pre-2005 homes is 2 stars or less; increasing this rating to 5 stars could reduce energy use by more than 30 per cent. Pre-2005 built homes in Victoria comprise over 85% of stock.

The delivery model would necessarily need to begin small, starting with either government stock or a pilot of 1000-5000 residential homes.

Changes to building regulations for new developments to include items such as double glazed to windows and minimum insulation standards. Compliance could include, Pressure testing of buildings and Thermal imaging of buildings to ensure compliance with insulating buildings against losses. This would apply to residential properties, large scale residential developments and commercial buildings improving efficiency and reducing demand. Require greater use of solar energy in all new developments.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | High | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion -$5 billion | The cost range assessment is based on the cost of implementing energy efficiency regulations and then undertaking compliance checks using blower door testing and thermography which is expected it could be administered and run for < 50 million. Subsidising the cost of building efficiency improvements depends on how many you want to improve. For an average three-bedroom house you could install insulation from $2500 to $4500 and a blower door test and thermography is about $800-$1000 per house which would come down with volume. With an estimate of 1 million existing houses in Victoria the cost to undertake the modifications mentioned above would be in the order of $5 billion. |
| **Overall Contribution** | Significant | The implementation of this option will significantly improve the housing stocks ability to adapt to changes in temperatures. In a climate affected future, homes with higher level of insulations and double glazing will mean that temperatures within homes will be easier to maintain. |

## Draft Option - Bicycle and walking path expansion and improvement

### Strategic Intervention: New/expanded assets > Incremental expansion of existing assets

**Reference 2.4.4/BWP2**

Expansion of the biking and walking paths network particularly where there are missing links to increase opportunities for active transport. There are many areas in Melbourne which do not have footpaths. These should be prioritised and developed. Possible creation of new bike and pedestrian paths through new level crossing project which includes fixed bike lanes; could expand bike ways through dedicated on road bicycle priory lanes although separated bike ways are preferable. Improvements to the surfaces of bike paths and walkways also delivered. Deliver based on a strategic assessment "missing links" in the network.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $500 million - $1 billion | The cost of implementing this option is through a focus on the completion of the Principal Bicycle Network in Melbourne in its current form as refreshed in 2012 and also on Bicycle Priority Routes.<br><br>Infrastructure Australia determined the Inner Sydney Regional Bike Network consisting of 284 kilometres would cost $185 million in 2013 dollars. Based on a similar (but slightly larger) network size the total capital cost is expected to be in the region of $300-$400 million. The most recent capital injection to cycling infrastructure in Victoria was $70 million to create more than 10 kilometres of new trails, bridges, separated lanes and other improvements. |
| **Overall Contribution** | Low | Although the proposed solution will help Victorian's reduce their total carbon emissions, it cannot be concluded that the proposed initiative will help Victorian's adapt to an altered climate in the future.<br><br>The proposed initiative must be viewed from a global context on carbon emissions and projected temperature increases.<br><br>An indirect benefit may be that in the event of infrastructure failure caused by climate related events, the proposed solution will offer an alternative form of transport - reducing the impact. |

## Draft Option - Connected active cities

### Strategic Intervention: Better use > Regulatory amendment

**Reference 1.1.3/CAC**

Encourage development of Healthy Communities through policies and initiatives to support them (e.g. planning schemes, incentives and awareness).

Delivery of 20 minute neighbourhoods outlined in the Plan Melbourne to improve active lifestyles.

Incentivise delivery of infrastructure that places services in the community that encourage preventative health (e.g. check-up centres in shopping centres).

Incentivise placement of facilities to reduce risk behaviours (e.g. enable accessibility to fresh food rather than unhealthy fast food, limiting alcohol consumption access).

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | This option is a policy change only with no capital works required. Whole of life cost estimations include consultation, implementation and management. |
| **Overall Contribution** | Low | The proposed solution would act as mitigation measure for climate change, but it does not meet the need which is more focused around adapting to the impacts of climate change.<br><br>Although the proposed solution will help Victorian's reduce their total carbon emissions, it cannot be concluded that the proposed initiative will help Victorian's adapt to an altered climate in the future.<br><br>The proposed initiative must be viewed from a global context on carbon emissions and projected temperature increases.<br><br>An indirect benefit may be that in the event of infrastructure failure caused by climate related events, the proposed solution will offer an alternative form of transport - reducing the impact. |

## Draft Option - Urban Forest

### Strategic Intervention: New/expanded assets > Incremental expansion of existing assets

**Reference 9.23.3/UFF**

This option would establish a standard and supportive regulatory change to require local councils in specified areas to develop stronger street canopies to reduce the heat island effect and encourage walking in high density areas.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | <$100 million | The option is to implement a new standard through regulation |
| **Overall Contribution** | Low | Evidence in the Melbourne CBD suggests that this option is most effective in high density areas. The impact in other parts of Melbourne is unlikely to be as significant. As population and density increase so will the contribution of this option. |

## Draft Option - Alternative energy vehicles

**Strategic Intervention: Capacity Investment > Incremental expansion of existing assets**

**Changing behaviour > Incentives**

**Reference 2.6.6/AEV**

Feasibility studies into the economic viability of electric vehicles have found that the plug-in electric vehicle market in NSW is both economically and financially viable, even though the economic and financial returns accrue over the longer term. Higher levels of charging infrastructure are expected to significantly increase the take-up of plug-in electric vehicles and market viability.

Without some government intervention, it is difficult to see a rapid implementation of charging facilities at service stations which have strong incentives to stick to petroleum and diesel markets.

Initiative to be supported by government incentives to be provided for individuals and companies who adopt environmentally friendly transport (e.g. hybrid courier vehicles are provided cheaper registration).

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $1 billion -$5 billion | The cost to implement this option is varied dependent on what schemes are proposed. The Victorian Government incentives could include a combination of the following:<br>– tax credits to offset the cost of purchasing or leasing a vehicle<br>– tax credits to offset the cost of installing charging equipment<br>– discounted vehicle registration fees<br>– discounted or zero state sales tax<br>– removing planning restrictions to enable charging equipment to be installed<br>– insurance discounts<br>– access to on-road priority transit lanes.<br><br>In the US, consumers have access to a federal income tax credit of $7,500 for the purchase of an electric vehicle. California has emerged as the most competitive alternate energy vehicle market in the world, offering an additional rebate of |

| | | |
|---|---|---|
| | | $2,500. Other countries provide price support between $1000 and $10,000.<br><br>Higgins et al's 2012 study suggested that the average uptake of electric vehicles across Victoria will be 13.5% in 2030 with no government rebate. Scenario modelling with rebates from $5,000 to $10,000 showed that a rebate is an important financial incentive to increase take-up. The $5,000 rebate for all electric vehicles up to 2030 increased market share to 19.3% at a cost of $2 billion and the $10,000 rebate increased market share to $25.2% at a cost of $5.6 billion. |
| **Overall Contribution** | Low | The overall impact of this option if implemented would be low if Victorian electric energy remains sourced from brown coal. Running Co2 emissions from a diesel car and an electric car charged from brown coal supplied electricity, is approximately the same measured emissions. It is expected that over the next 30 years that brown coal electricity generation will be phased out therefore increasing the contribution of alternative energy vehicles. |

# Draft Objective 10 - Build resilience to shocks

## Draft Need 10A: Improve the resilience of critical infrastructure to disruptive events

Extreme events including extreme weather, pandemics, terrorism and technology disruptions or other damaging events such as power outages or failure of key transport infrastructure (eg train lines or freeways), can have serious implications for the social and economic wellbeing of the state.

High-risk areas require protection and greater resilience against the impacts of extreme events, including rural and regional communities exposed to fire risk. There are also critical assets, for example the proximity of Victoria's ICT data centres in central Melbourne, which, if they were compromised by an event in the central city, could significantly affect a number of sectors and consumers.

Over the next 30 years, Victoria's infrastructure will need to become increasingly resilient in an environment where the propensity and severity of extreme events are likely to increase, and where other damaging events can cause major disruption and economic loss. These events will have financial, social and health implications for Victorian communities and, unless managed, a disproportionate impact on some of the state's most vulnerable people.

### Metrics

Metric 1 – Improvement in the risk rating (including level of a system's resilience) of key economic infrastructure. .

### Options

The table below lists the options considered for this Draft Need

| Reference Number | Option Name |
|---|---|
| 10.24.1 | Data centre location diversification |
| 10.24.2 | Fuel reserve regulation |
| 10.24.3 | Critical asset centralised risk management |
| 10.24.4 | Western and eastern treatment plant resilience |
| 10.24.7 | Infrastructure resilience assessment test |

The graph on the following page plots each option's Contribution verses Cost.

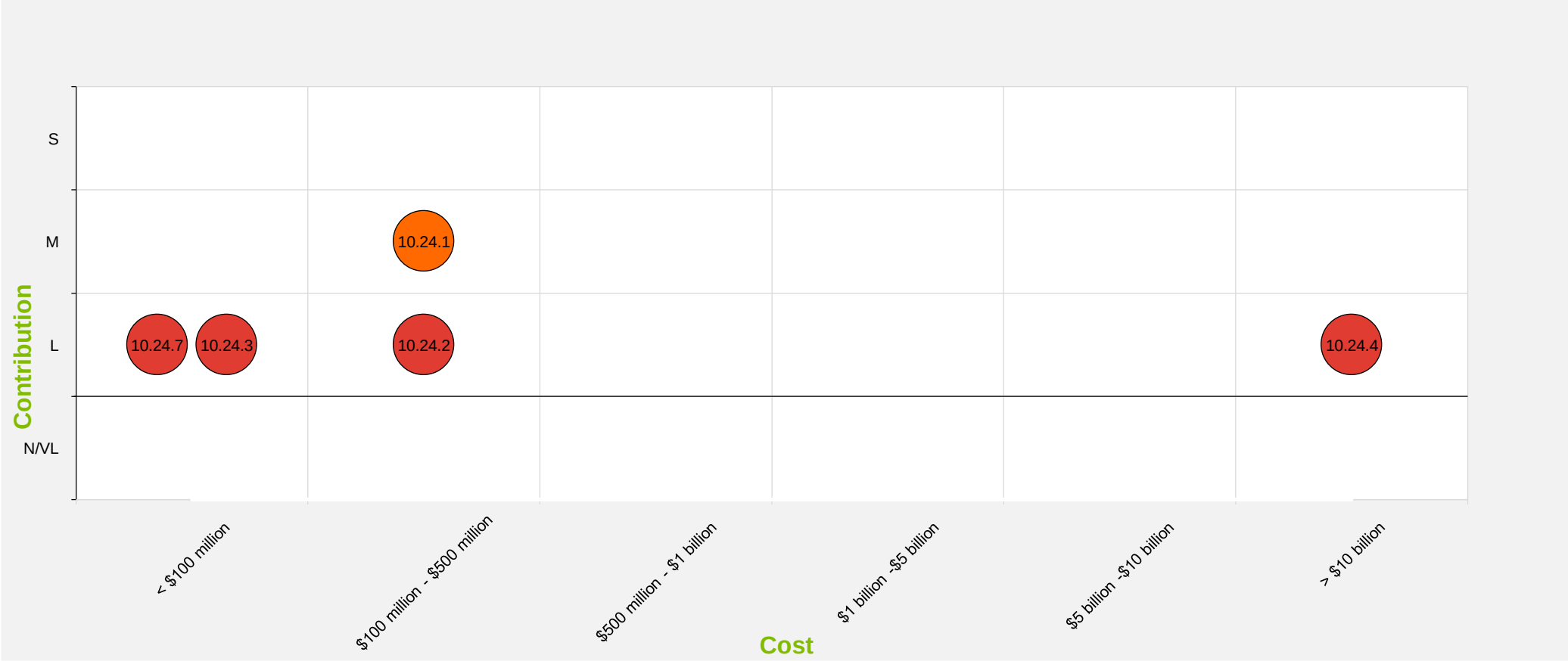



**Figure 24: Need 10A matrix**

## Draft Option - Data centre location diversification

### Strategic Intervention: Better use - refurbishment of existing assets

**Reference 10.24.1/DCD**

Relocate data centres where appropriate away from central Melbourne to ensure that there is sufficient locational separation between primary and secondary data centres to reduce risk exposure.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $100 million - $500 million | The estimated cost range for the implementation of this option has been sourced from the construction of similar facilities previously. Equinix opened a 105,000 square metre facility in Port Melbourne in 2015 at a cost of $US 60 million. Based on this figure the specified range allows for additional data centres and facility operational costs over a whole of life 30 year period. |
| **Overall Contribution** | Moderate | Relocating data centres to ensure sufficient separation will reduce exposure to extreme events. However the highest risk to data centres is digital susceptibility which generally cannot be controlled by location. |

## Draft Option - Fuel reserve regulation

### Strategic Intervention: Changing behaviour - regulation

**Reference 10.24.2/FRR**

The Government introducing requirements to hold minimal fuel reserves.
There are currently no Victorian regulations ensuring minimum fuel reserves for the State meet international standards for fuel reserves. This option proposes to lift requirements to this standard. The Government can analyse supply side vulnerabilities with respect to shipping, ports, refineries and domestic distribution and, where warranted, conduct an appropriate level of contingency planning.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | $100 million - $500 million | The implementation of this option is predominantly through a policy change; however it may require some infrastructure to increase storage capacity.<br><br>A number of storage and refining facilities have been closed recently in Australia; therefore existing infrastructure may be a able to support a minimum reserve requirement to some extent. If public infrastructure is needed to implement this policy, then construction costs are in the range of $95 million - $195 million per storage facility depending on storage type. (Australia's |

| | | |
|---|---|---|
| | | Emergency Liquid Fuel Stockholding Update 2013: Oil Storage Options & Costs). |
| **Overall Contribution** | Low | Increased resilience in event of a fuel supply shortage. However fuel storage calculations do not take into account the significant volume of stock on the water (about 2-3 weeks) owned by local companies, with the majority of this stock in Australian waters and the rest in secure shipping routes. Flexible, resilient, and reliable supply chains from diverse supply sources also ensure there is no heightened risk for domestic fuel markets or fuel users at current storage levels. |

## Draft Option - Critical asset centralised risk management

### Strategic Intervention: Changing behaviour - regulation

**Reference 10.24.3/CAR**

Development of a centralised approach to risk management for critical assets, including a list of critical State infrastructure and a centralised risk mitigation strategy.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | This option is a policy change only with no capital works required. Whole of life cost estimations include consultation, implementation and management. |
| **Overall Contribution** | Low | This option will increase planning and risk mitigation of the State's critical infrastructure, by centralising control and decision making. However, it is more likely to increase efficiency of asset management rather than build greater resilience across all services. |

## Draft Option - Western and eastern treatment plant resilience

### Strategic Intervention: Better use - incremental expansion of existing assets

**Reference 10.24.4/WET**

Improving the resilience of the Western and Eastern wastewater treatment plants to major operational disruptions.

Much of Melbourne is only connected to either the Western treatment plant or the Eastern treatment plant therefore a failure or shock to one would result in large population groups without wastewater treatment facilities. This intervention proposes to improve the resilience of the treatment plants by providing the necessary protection to the plant itself and by augmenting the pipe network to allow more of Victoria's population to be connected to both sites.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | > $10 billion | Using existing projects as a guide the estimated cost to implement this option is in excess of $10 billion. The Eastern Treatment Plant Upgrades recently completed ranged from $159 million - $418 million whilst the Western Treatment Plant Treatment Capacity Augmentation project currently in progress has a capital cost of $280 million.<br><br>Similarly recent network connection projects have ranged from $10 million to $100 million depending on scale and complexity, and would be required in numerous locations to implement this option. |
| **Overall Contribution** | Low | This option will increase the resilience of Victoria's existing plants, however not to the extent of delivering a new facility. Also the biggest identified risk to water treatment is upstream infrastructure, not necessarily the plants themselves.<br><br>A connection between the two plants enabling transfer of sewerage for treatment would not be viable, as neither plant has capacity to support such a connection without substantial investment (circa > $10 billion). Substantial upgrades to the system have also been undertaken to ensure system detention capacity can cope with an outage at one of the plants. |

## Draft Option - Infrastructure resilience assessment test

### Strategic Intervention: Changing behaviour - regulation

**Reference 10.24.7/IRA**

Develop an Infrastructure resilience assessment test which requires that proposals for new major capital works are subject to modelling that indicates, through siting, design, specifications and construction, the infrastructure will be able to withstand a range of major shocks and/or the likely effects of climate change (particularly sea level rise).

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | This option is a policy change only with no capital works required. Whole of life cost estimations include consultation, implementation and management. |
| **Overall Contribution** | Low | Will only be applicable to new infrastructure once the regulation is implemented. Therefore resilience would take a number of years to build after the policy change. Impact will be low in the short term and gradually increase into the medium |

| | | |
|---|---|---|
| | | and long term. However overall this only builds resilience against natural climate events which already occurs for the majority of new infrastructure. |

## Draft Need 10B: Address infrastructure related emergency response challenges

Victoria's emergency response network encompasses a range of services from ambulance, fire and law enforcement. Significant steps have already been taken towards the coordination of emergency response, overseeing an all-hazard, all-agency approach. This coordinated approach looks beyond the traditional bounds of the assets that constitute the sector, and considers their best use.

The unpredictable nature of these emergencies, such as their scale, means Victoria must have systems that can effectively respond and are resilient under varying circumstances. Infrastructure both plays a key role in communications for an emergency, particularly through ICT, and in facilitating the response, such as tram-separated roads being utilised by emergency vehicles.

The challenges are also varied depending on the location. High and increasing densities in the central city pose a very different challenge in responding to a major emergency, compared to regional areas where the distance between physical assets and the affected area is often more relevant. Greater community resilience, including through the building design, will provide an opportunity to manage emergencies.

### Metrics

Metric 1 – Reduction in the loss of life and property from emergencies.

.

### Options

The table below lists the options considered for this Draft Need

| Reference Number | Option Name |
|---|---|
| 10.24.3 | Critical asset centralised risk management |
| 10.25.1 | Emergency management services co-location |
| 10.25.2 | Emergency traffic management |

The graph on the following page plots each option's Contribution verses Cost.

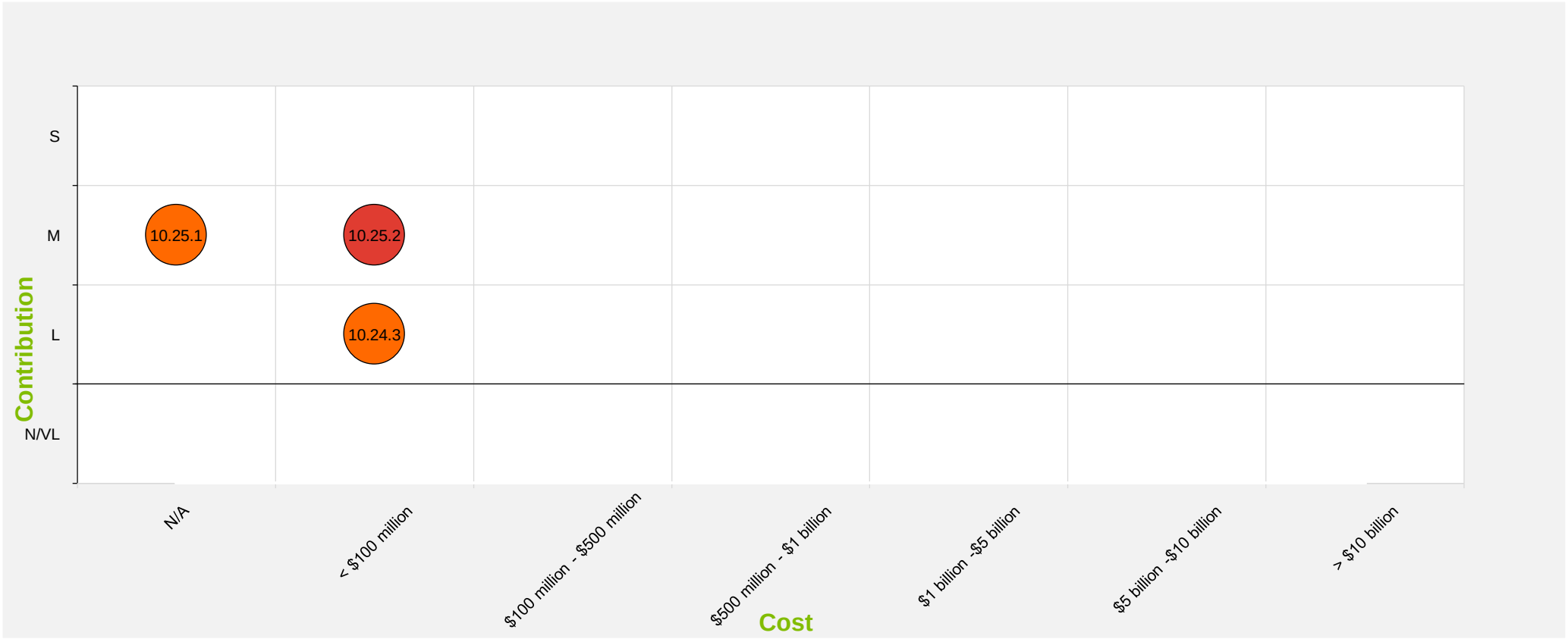



**Figure 25: Need 10B matrix**

## Draft Option - Critical asset centralised risk management

### Strategic Intervention: Changing behaviour - regulation

**Reference 10.24.3/CAR**

Development of a centralised approach to risk management for critical assets, including a list of critical State infrastructure and a centralised risk mitigation strategy.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | This option is a policy change only with no capital works required. Whole of life cost estimations include consultation, implementation and management. |
| **Overall Contribution** | Low | More could be done to support the centralised infrastructure planning of emergency management services. Currently, Emergency Management Victoria provides significant support to the Metropolitan Fire Brigade, Country Fire Authority, Victoria State Emergency Services Authority and the Emergency Services Telecommunications Authority. Considerable benefits have been identified by co-locating services and integrating infrastructure where practicable to boost the interoperability and resilience of the sector. This indirectly leads to a reduction in the loss of life and property from emergencies as a result of an improved service delivery. |

## Draft Option - Emergency management services co-location

### Strategic Intervention: Capacity Investment - Incremental expansion of existing assets / New greenfield asset

**Reference 10.25.1/EMS**

Co-locate emergency management services to support a coordinated and coherent client service model and an improved use of capital assets e.g. co-location of VICSES with the CFA. This also includes building the interoperability of the sector e.g. standardising equipment, processes and training across the sector to build resilience.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Medium | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | N/A | The costs associated with this initiative will vary significantly based on the scale of co-location deemed appropriate, the extent to which current assets can be used or refurbished and the volume of new assets required. |
| **Overall Contribution** | Moderate | As part of its Victorian Emergency Management Strategic Action Plan 2015-2018, Emergency Management Victoria has recognised the |

| | | |
|---|---|---|
| | | importance of developing a formalised integrated emergency management service delivery model. As well as contributing towards a more relevant, effective and efficient service delivery model, creating interoperable systems, assets and services will also improve the sector's value for money proposition.<br><br>To deliver on this, Emergency Management Victoria has outlined a number of key steps to achieving a more integrated emergency management services sector including:<br><br>1. Review the emergency management sector's current service delivery models and methods.<br>2. Develop or draw on existing common service policy, practices, principles, workflows and platforms to develop principles and standards that guide service delivery approaches across all hazards.<br>3. Develop or draw on existing common definitions in terminology, symbology and data. Implement across all phases of emergency management to enhance inter-operability via a common operating picture.<br>4. Develop and implement an investment plan that identifies shared procurement and co-location opportunities and future investment requirements across all asset types and capital infrastructure.<br>5. Enhance systems and platforms to deliver integrated services to improve connectivity and interoperability between first responders, support services and the community.<br><br>Considerable benefits have been identified by co-locating services and integrating infrastructure where practicable to boost the interoperability and resilience of the sector. This indirectly leads to a reduction in the loss of life and property from emergencies as a result of an improved service delivery. |

## Draft Option - Emergency traffic management

### Strategic Intervention: Better Use Solutions - Technological innovations

**Reference 10.25.2/ETM**

Introduce new technology that enables emergency management services to control the flow of traffic to improve emergency response times. Emergency Vehicle Priority (EVP) is a technology that enables emergency vehicles to automatically trigger traffic light sequences to change along the most direct route when responding to an emergency call.

| | Rating | Description |
|---|---|---|
| **Certainty of Evidence** | Low | Refer to the appendix for a list of sources. |
| **Whole of Life Cost Range** | < $100 million | The above cost estimate is based on the Queensland Government's investment of $13.5 million in this technology. The Emergency Vehicle Priority project will be rolled out across major centres in Queensland and will fit out approximately 1000 additional emergency services vehicles with the technology.<br><br>The cost associated with rolling this initiative out across Victoria will vary based on where it is rolled out and the traffic conditions and intersection configurations of each of the chosen locations.<br><br>Costings provided by the Queensland Government do not specify whether this includes whole of life costs associated with the technology. However, it is assumed that ongoing operating costs will be relatively low i.e. system upgrades and replacement of a limited number of units as required. Sufficient provision exists within the current estimate to cater for this. |
| **Overall Contribution** | Moderate | The Queensland Government has implemented the Emergency Vehicle Priority (EVP) solution, a dynamic ITS solution that automatically interrupts normal traffic signal operations, providing a green traffic signal to emergency vehicles in advance of their arrival at an intersection to reduce emergency vehicle travel times<br><br>Ambulance and fire engines are fitted with technology to trigger the traffic light sequences. The system uses computer-aided dispatch, GPS and traffic management information to determine the location of the emergency vehicle and the time taken to reach the next set of traffic lights. Once the emergency vehicle has passed, the traffic lights will return to normal sequence.<br><br>At the time of the program's evaluation, there were 51 signalised intersections that were emergency vehicle priority (EVP)-enabled within the Gold Coast area. There were also 61 GPS-equipped ambulances and 10 of them were further equipped with EVPS units. The evaluation identified that when compared with the without-EVPS cases, the average normalised travel time for EVPS-equipped vehicles in the study area was reduced by 16.9%. When comparing the travel time data between without-EVPS and with-EVPS and a validated intervention cases, a further travel time reduction, 26.08%, was identified. As a result, the technology is now being rolled out across the rest of Queensland. There are almost 300 emergency vehicles and 800 locations throughout Townsville, Bundaberg, Sunshine |

| | | |
|---|---|---|
| | | Coast, Brisbane and Gold Coast fitted with the EVP technology. |

# Appendix

## 1A Address infrastructure deficits in high growth areas

| Option | Urban development in established areas |
|---|---|
| Reference | 1.3.1 |
| Option Code | UDC |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Government planning documents, for example:<br>- Department of Environment, Land, Water & Planning - Activity Centre Guidelines<br>- LGA local planning laws<br>- Managing Growth - Infrastructure for Melbourne's outer suburbs<br>- Planning and Environment Act 1987<br>- Urban Development Program 2015<br>- Plan Melbourne |
| Evidence source(s) | **Plan Melbourne Review 2015 \|** Ministerial Advisory Committee Report June 2015, Initiative 2.2.5 (recs 2.2.5-1 to 2.2.5-4). http://www.dtpli.vic.gov.au/planning/plans-and-policies/urban-development-program |
| Commentary on certainty | The Melton Pilot Program is underway which will help inform future infrastructure planning. This will provide a guide to the Type of Evidence and increase certainty. |

| Option | Centralised planning scheme |
|---|---|
| Reference | 1.3.3 |
| Option Code | CPS1 |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Introduction to the Western Australian Planning Scheme |
| Evidence source(s) | **West Australian Planning Commission** http://www.planning.wa.gov.au/dop_pub_pdf/intro_to_planning_system.pdf |
| Commentary on certainty | The Western Australian planning system has some differences from Victoria, reflecting a stronger degree of centralised control at the State level. Key differences are:<br>- The retention of the Western Australian Planning Commission as a special purpose authority responsible for statutory and strategic planning at the state level;<br>- A system of statutory region schemes which provide for effective coordination of planning (because local schemes must be consistent with region schemes), a means of reserving and acquiring land for regional purposes, including special funding arrangements, and development control powers for the WAPC on matters of state and regional significance; and<br>- A centralised system of subdivision control whereby the WAPC is responsible for the determination of all subdivisions throughout the State.<br>The system of planning is underpinned by the Planning and Development Act 2005 and associated regulations which prescribe |

| | |
|---|---|
| | the functions of the Minister, the WAPC and local governments, and the statutory powers for the adoption of planning instruments and approval processes. |

| Option | Online liveability infrastructure platform |
|---|---|
| Reference | 1.3.4 |
| Option Code | OLI |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Existing websites set up to support access to services. |
| Evidence source(s) | **Existing council websites.**<br>http://www.moreland.vic.gov.au/events-recreation/<br>http://www.maribyrnong.vic.gov.au/activemaribyrnong<br>http://www.yarracity.vic.gov.au/services/recreation/ |
| Commentary on certainty | A lot of this information is already available on individual council websites. A central single website would make this information more readily accessible to the public and tourists. |

| Option | Access to services through technology and ICT |
|---|---|
| Reference | 1.3.7 |
| Option Code | AST |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Government policy and strategy documents |
| Evidence source(s) | **ICT Strategy**<br>http://www.enterprisesolutions.vic.gov.au//wp-content/uploads/2014/06/Victorian-Government-ICT-Strategy-2014-to-20151.pdf<br>**Victorian Technology Plan**<br>http://dsdbi.vic.gov.au/our-department/strategies-and-initiatives/victorias-technology-plan-for-the-future-information-and-communication-technology |
| Commentary on certainty | Technology changes will present significant future opportunities. |

| Option | Local bus service standards |
|---|---|
| Reference | 1.3.8 |
| Option Code | LBS |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Departmental research |
| Evidence source(s) | **State Government**<br>Plan Melbourne Refresh Discussion Paper (2015)<br>**Ministerial Advisory Committee**<br>Plan Melbourne 2015 Review<br>https://s3-ap-southeast-2.amazonaws.com/ehq-production-australia/45189c582e1cf1f4e6b12125a1ebef13d682729f/documents/attachments/000/028/064/original/MAC_2015_Final_Report.pdf?1445230381<br>**Australian Bureau of Statistics**<br>http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6401.0Dec%202015?OpenDocument |

| | |
|---|---|
| | **Committee for Melbourne**<br>Submission to the Victorian Competition and Efficiency Commission's Inquiry into Transport Congestion (2005) |
| Commentary on certainty | Plan Melbourne supports the implementation of minimal local bus service levels of 20-minute frequency, 7 days a week, from at least 6am to 9pm. It has referred to the expansion of bus services in all growth areas so that most residents live within 800 metres of either a premium or connector service for consideration as part of transport network planning. |

| Option | Melton rail extension |
|---|---|
| Reference | 1.3.11 |
| Option Code | MRE1 |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Strategic Plan |
| Evidence source(s) | **Public Transport Victoria Network Development Plan (NDP)**<br>http://ptv.vic.gov.au/about-ptv/ptv-data-and-reports/network-development-plan-metropolitan-rail/ |
| Commentary on certainty | Mentioned in the NDP, but no detailed information around scope of works or forecast patronage provided in the patronage forecasting documentation. |

| Option | Wallan rail electrification |
|---|---|
| Reference | 1.3.12 |
| Option Code | WRE1 |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Strategic Plan |
| Evidence source(s) | **Public Transport Victoria Network Development Plan (NDP)**<br>http://ptv.vic.gov.au/about-ptv/ptv-data-and-reports/network-development-plan-metropolitan-rail/ |
| Commentary on certainty | Mentioned in the NDP, but no detailed information around scope of works or forecast patronage provided in the patronage forecasting documentation. |

| Option | Wollert rail extension |
|---|---|
| Reference | 1.3.14 |
| Option Code | WRE2 |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Strategic Plan |
| Evidence source(s) | **Public Transport Victoria Network Development Plan (NDP)**<br>http://ptv.vic.gov.au/about-ptv/ptv-data-and-reports/network-development-plan-metropolitan-rail/<br>https://www.whittlesea.vic.gov.au/building-planning-and-transport/roads-and-transport/future-transport-needs/completing-the-heavy-rail-extension-to-epping-north-and-wollert |
| Commentary on certainty | Mentioned in the NDP, but no detailed information around scope of works or forecast patronage provided in the patronage forecasting documentation. |

| Option | Clyde rail extension |
|---|---|
| Reference | 1.3.15 |
| Option Code | CRE |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Strategic Plan |
| Evidence source(s) | **Public Transport Victoria Network Development Plan (NDP)** http://ptv.vic.gov.au/about-ptv/ptv-data-and-reports/network-development-plan-metropolitan-rail/ |
| Commentary on certainty | In 2013, as part of Public Transport Victoria's Network Development Plan for Metropolitan Rail, an extension of the Cranbourne line to Clyde was earmarked to begin in the "long-term", which would equate to at least over 20 years into the future. |

| Option | Wyndham Vale to Werribee rail extension |
|---|---|
| Reference | 1.3.16 |
| Option Code | WVW |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Strategic Plan |
| Evidence source(s) | **Public Transport Victoria Network Development Plan (NDP)** http://ptv.vic.gov.au/about-ptv/ptv-data-and-reports/network-development-plan-metropolitan-rail/ |
| Commentary on certainty | Mentioned in the NDP, but no detailed information around scope of works or forecast patronage provided in the patronage forecasting documentation. |

| Option | Arterial road network employment centre enhancements |
|---|---|
| Reference | 4.12.4 |
| Option Code | ARN |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | State Government strategic document<br>State Road Authority planning and projects<br>State Road Authority annual report |
| Evidence source(s) | **State Government**<br>Plan Melbourne (2014)<br>**VicRoads**<br>https://www.vicroads.vic.gov.au/planning-and-projects/melbourne-road-projects/east-werribee-transport-improvement-project<br>VicRoads Annual Report 14-15 |
| Commentary on certainty | Plan Melbourne identifies the need for an arterial road program with short term initiatives:<br>- complete upgrades to arterial roads in established outer suburbs and growth areas including duplication, widening and intersection and interchange upgrades<br>- establish and commence implementation of an arterial road program to serve existing and future growth areas of Melbourne<br>- investigate the reservation of land for future arterial roads and upgrades in the growth areas and outer suburbs.<br>However, this option is not well scoped and no feasibility studies have been completed. |

| | |
|---|---|
| | In 2014 VicRoads received $1.8 million over three years to plan and prepare a business case for the future construction of the Westall Road Extension. This project is currently in the early phase of planning. |

| Option | Northern Health Facilities Expansion |
|---|---|
| Reference | 1.3.17 |
| Option Code | NHE |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Strategic Plan |
| Evidence source(s) | **Northern Health Strategic Plan**<br>http://www.nh.org.au/userfiles/files/NHStrategic%20Plan%202017.pdf<br><br>**Media**<br>http://www.theage.com.au/victoria/northern-hospital-ceo-janet-compton-resigns-amid-concerns-about-networks-performance-20150810-giw355.html<br>http://www.theage.com.au/victoria/victoria-state-election-2014/conflicting-promises-worry-hospitals-20141126-11um9g.html<br><br>Further information in ICA - Health |
| Commentary on certainty | While existing health infrastructure has some capacity, it is not necessarily the right type or in the right place - this is particularly true for public hospitals.<br>Demand for the regional hospital's emergency department, already one of the state's busiest, was expected to surge from an average of 1300 patients a week in 2014 to 1700 a week by 2018.<br>Patients receiving elective surgery would increase by more than 50 per cent within the next three years, from about 14,000 patients in 2014 to 21,370 patients in 2018. |

## 1B Manage increasing demands on health infrastructure

| Option | Health education programs |
|---|---|
| Reference | 1.1.1 |
| Option Code | HEP |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Reports on evaluation of the success of the Life Be In It, Get Moving and Healthy Harold Campaigns |
| Evidence source(s) | Australian Institute of Health and Welfare data on level of obesity in certain demographics.<br>http://www.healthyactive.gov.au/internet/healthyactive/publishing.nsf/Content/CD99B2A715DB9214CA2572DC001855A8/$File/getmoving-eval-jul07.pdf<br>http://www.lifeeducation.org.au/images/WhatWeDo/LifeEduAus_EvidenceBase_April2015_FINAL2.pdf<br>Report on a diagnostic evaluation of the 'Life Be In it' campaign - prepared for the Australian Government Advertising Agency on behalf of the Department of Home Affairs the Department of Sport and Recreation<br>http://www.abs.gov.au/AUSSTATS/abs@.nsf/lookup/4704.0Chapter365Oct+2010<br>http://sydney.edu.au/news/84.html?newsstoryid=1975 |
| Commentary on certainty | The evidence at hand from historical campaigns shows that continued education schemes have been proven to influence peoples behaviours in relation to health. Strong recognition still of the Life Be In It campaign at 85%.<br>The effectiveness though is often limited to the length of the campaign and can be quickly forgotten. |

| Option | Health care delivery role change |
|---|---|
| Reference | 1.1.2 |
| Option Code | HCD |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | University Research, community consultation, reports and analysis from international jurisdictions. |
| Evidence source(s) | Evidence of further care provided by pharmacist in other jurisdictions such as the USA<br>http://www.cdc.gov/dhdsp/pubs/docs/Translational_Tools_Providers.pdf<br>https://www.chf.org.au/pdfs/chf/Summary-of-Pharma-and-PHC-Consumer-Report.pdf<br>http://www.australianprescriber.com/magazine/33/6/191/3 |
| Commentary on certainty | The evidence suggests there has been success in other jurisdictions by allowing an increase in the spread of services provided by pharmacists to reduce the burden on hospitals within the primary care system. |

| Option | Health and aged care private sector involvement |
|---|---|
| Reference | 1.1.4 |
| Option Code | HAP |
| **Certainty of evidence rating** | **High** |

| | |
|---|---|
| Type of evidence | Existing supply of aged care and medical service by private providers. |
| Evidence source(s) | http://www.ampcapital.com.au/article-detail?alias=%2Fsite-assets%2Farticles%2Fmedia-releases%2F2013%2F2013-08%2Famp-capital-to-grow-residential-aged-care-investme<br>https://www.uow.edu.au/~bmartin/dissent/documents/health/australia.html<br>http://www.vcccproject.vic.gov.au/ |
| Commentary on certainty | PPP investment in healthcare is a current reality in Victoria through successful projects such as the Victorian Comprehensive Cancer Centre (VCCC). Further to this the majority of aged care provision is supplied through facilities owned by the private and not for profit sectors. Further research in to what limits private sector investment in further construction of these facilities would enhance the understanding of government or regulatory impediments to further growth.<br>NSW have outsourced their next public hospital to the private sector - PPP for build, own AND operate, with a 25 year contract. |

| **Option** | **Preventative health care awareness** |
|---|---|
| Reference | 1.1.5 |
| Option Code | PHC |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | International Jurisdictions (UK reports), University Research |
| Evidence source(s) | https://www.healthline.com/health-news/healthy-habits-incentive-programs-070614#2<br>The evidence has come in the form of the final evaluation report of the Partnerships for Older People Projects (POPPS), 146 separate schemes run across 29 English local authority areas from 2006 to 2009. |
| Commentary on certainty | There have been a number of research papers in to the effect of preventative care to reduce the burden on the overall health system. The conclusions are that by keeping people out of secondary care (hospitals etc.) it creates a much more efficient health system by freeing up those secondary care resources for those most in need, whilst also reducing the number of people accessing them. |

| **Option** | **Health care decentralised delivery model** |
|---|---|
| Reference | 1.1.7 |
| Option Code | HCD |
| **Certainty of evidence rating** | **High** |
| Type of evidence | State Government review |
| Evidence source(s) | Travis review, digital change evidence and research<br>http://www.aihw.gov.au/australias-health/2014/health-system/ |
| Commentary on certainty | Technological change and changing population demographics enables a more decentralised model of health care. Keeping people out of hospital helps to reduce burden on the system. Changing needs will require different types of care. More likely to require decentralised community based care for ageing population and chronic disease. |

| Option | Health care smart facilities |
|---|---|
| Reference | 1.1.9 |
| Option Code | HCS |
| **Certainty of evidence rating** | **High** |
| Type of evidence | Capacity audit - Travis review; Productivity Commission report on ageing |
| Evidence source(s) | Travis Review.<br>University of NSW Built Environment - Achieving Flexible and Adaptable Healthcare Facilities.<br>PricewaterhouseCoopers - healthcare delivery of the future. Investment in smart construction, digital design and integrated city systems is predicted to grow as a result, forecast to reach over USD $300 billion per annum by 2030 (HM Government, 2013). |
| Commentary on certainty | Shifting demographics combined with research undertaken by the Travis Review, National Disability Services and other bodies suggest that additional capacity will be required to meet increasing demand and shifting demographics of future population in Victoria. Continual monitoring, auditing and research will be required to ensure investment in the right type of infrastructure. |

| Option | Health infrastructure coordinated planning |
|---|---|
| Reference | 1.1.10 |
| Option Code | HIC |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | University research |
| Evidence source(s) | Travis Review, industry and university research |
| Commentary on certainty | There is significant evidence showing that basing health planning on historic models of care will not meet future needs. More future-focussed strategic planning will be required to ensure health infrastructure that meets demands of changing and growing population. |

| Option | Health care patient subsidised travel |
|---|---|
| Reference | 1.1.11 |
| Option Code | HCP |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Victorian Patient Transport Assistance Scheme |
| Evidence source(s) | This option has been implemented in various stages throughout Victoria with the rationalisation of different health services. |
| Commentary on certainty | The current system of subsidised transport has proven to save costs in regional/remote areas. There is still mixed consensus/reports on the time it takes for patients to receive care through this method when services aren't available locally. Although a workable model, as is common in areas where services have once existed previously communities generally prefer to have access to local care options without the need to travel to centralised care providers. In cases where the services haven't existed previously they are more receptive to acceptance of the need to travel for to access these services. |

| Option | Health and aged care repurposing of facilities |
|---|---|
| Reference | 1.1.12 |
| Option Code | HAC |
| **Certainty of evidence rating** | **High** |
| Type of evidence | University and Industry Research |
| Evidence source(s) | Travis Review |
| Commentary on certainty | Historical data (presented in the Travis Review) provides the evidence |

| Option | Aged care and mental health investment |
|---|---|
| Reference | 1.1.13 |
| Option Code | ACM |
| **Certainty of evidence rating** | **High** |
| Type of evidence | University Research |
| Evidence source(s) | https://www.dss.gov.au/ageing-and-aged-care-aged-care-reform/why-is-aged-care-changing<br>http://nationalseniors.com.au/sites/default/files/Future_of_Aged_Care.pdf<br>http://lasavictoria.asn.au/news/estimated-9-billion-in-capital-needed-for-residential-aged-care/ |
| Commentary on certainty | Demographic trends and studies provide relatively strong certainty of numbers of aged care places required in the future. |

## 1C Provide access to high quality school facilities

| Option | School out of zone enrolment |
|---|---|
| Reference | 1.2.1 |
| Option Code | SOO |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Advocacy, Report commissioned by Independent School Council of Australia |
| Evidence source(s) | **Education and Training Reform Act 2006**<br>http://www.saveourschools.com.au/Research/choice-or-equity-in-education<br>http://isca.edu.au/wp-content/uploads/2011/03/PPI-Paper-2-Choice-and-Values-in-Schooling.pdf |
| Commentary on certainty | Removal or restriction on 'school of choice' will facilitate more accurate forecasting based on demographic data and student addresses.<br>Key extract "Within public schooling, the introduction of choice has often taken the form of relaxation of enrolment zones, which restricted children to attending their local school. While evidence on the benefits of introducing choice in this way into the public systems in England and Scotland was not convincing, Fitz et al (2002:8) point out that, whatever the stratifying effects of market forces and competition, the effects of catchment areas or zoning and “selection by mortgage” may have been a good deal worse”. Gibbons et al (2006/2007) acknowledge the benefits of choice in public systems in highly urbanised areas, where there is greater inter-school competition and more autonomy in governance structures." |

| Option | School shortages |
|---|---|
| Reference | 1.2.3 |
| Option Code | SSS |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Department of Education, University Research |
| Evidence source(s) | **DET**<br>http://www.education.vic.gov.au/about/programs/infrastructure/Pages/ferrars.aspx<br>http://www.education.vic.gov.au/school/principals/infrastructure/Pages/propertyrelocate.aspx<br>http://www.education.vic.gov.au/school/principals/infrastructure/pages/design.aspx<br>http://www.oecd.org/education/innovation-education/centreforeffectivelearningenvironmentscele/48224041.pdf<br>https://msd.unimelb.edu.au/sites/default/files/docs/Future%20Proofing%20Schools%20-%20Phase%203%20Research%20Reflections.pdf |
| Commentary on certainty | Victoria currently doesn't have a mandated design or materials policy but rather promotes contemporary design places with emphasis on agility and flexibility. This would facilitate the buildings being utilised for other uses with changing demographics. Stakeholder consultation and current policy regarding surplus school sites, would suggest school facilities would become surplus to educational uses with an ageing population, school facilities |

| | |
|---|---|
| | could then be utilised as community facilities.<br><br>DET is currently planning a vertical school and co-located Early Childhood facility in South Melbourne. This design is due to the constrained site. DET also have double storey relocatable buildings for constrained school sites.<br><br>Evidence suggests the use of modular construction would support the utilisation of school facilities for other uses, in response to demographic changes. This would facilitate economic capital refurbishment to respond to other uses. i.e. refurbishing a primary school to facilitate secondary learning. |

| Option | Schools with low performance |
|---|---|
| Reference | 1.2.4 |
| Option Code | SLP |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Department of Education, research |
| Evidence source(s) | **Department of Education and Training, Victoria**<br>http://educationstate.education.vic.gov.au<br>http://www.education.vic.gov.au/school/principals/management/Pages/schoolperformance.aspx<br>**Mitchell Institute**<br>http://ais.act.edu.au/wp-content/uploads/2016/03/The_shared_work_of_learning_lifting_educational_achievement_through_collaboration.pdf<br>**Grattan Institute**<br>http://grattan.edu.au/wp-content/uploads/2014/04/805-turning-around-schools.pdf |
| Commentary on certainty | Evidence suggests that through collaboration with higher performing schools lower performing schools are able to improve their educational offering. This has been evidenced in other jurisdictions through England's Networked Learning Communities and California's Bay Area School Reform Collaborative. Collaboration amongst teachers, between schools and partners in the community exists today, what is needed is a more formalised structure for the benefit to be delivered and focussed on schools which historically have underperformed relative to neighbouring schools in the area. |

| Option | School campus utilisation |
|---|---|
| Reference | 1.2.6 |
| Option Code | SCU |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Legislation amendments in NZ facilitated this model. Whereby government students attended school in the morning session and fee paying students attended classes in the afternoon session. |
| Evidence source(s) | http://www.stuff.co.nz/national/education/7844128/Double-bunked-schools-on-cards<br>http://www.ea.org.nz/christchurch-unites-save-schools/ |
| Commentary on certainty | This model was not fully implemented in NZ and there was significant public pressure for the model to not be utilised. |

| Option | School resource sharing through technology |
|---|---|
| Reference | 1.2.7 |
| Option Code | SRS |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Existing Government programs ICT & statewide curriculum. Not applicable sector-wide. |
| Evidence source(s) | No direct sources. Industry knowledge. |
| Commentary on certainty | Very little evidence to suggest resource sharing has been implemented across Government and Non-Government schools.<br>Would encounter complications with governance and willingness of Non-Government sector, especially fee paying considerations.<br>Curriculum is applicable statewide.<br>Suggest combining resource sharing with Option 1.2.4.<br>DET existing ICT infrastructure for videoconferencing.<br>Work currently not underway to apply this across Government and Non-Government Schools. Little evidence to suggest this has been applied or implemented in other jurisdictions. |

| Option | School regional level maintenance contracts |
|---|---|
| Reference | 1.2.8 |
| Option Code | SRM1 |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Victorian Auditor General's Office (VAGO) Audit, similar model currently applicable in NSW |
| Evidence source(s) | Implementation of School Infrastructure Victorian Auditor-General's Office (VAGO) 2013 |
| Commentary on certainty | In 2013 VAGO recommended completing a review evaluating PPP's for maintenance. In 2015 DET commission an evaluation of a range of procurement models for the delivery of maintenance and capital works to existing schools. The report recommended piloting a maintenance or FM services contract. No business case or impact assessment has been released publicly. |

| Option | School sector-wide planning information |
|---|---|
| Reference | 1.2.9 |
| Option Code | SSW |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | National Quality Framework - Australian Children's Education & Care Quality Authority. |
| Evidence source(s) | **Australian Children's Education & Care Quality Authority**<br>http://www.acecqa.gov.au/national-quality-framework |
| Commentary on certainty | The National Quality Framework provides a reporting platform across Australia for the Early Childhood Education & Training sub-sector. A similar platform could be developed for the schools sub-sector at a state level |

| Option | School infrastructure funding certainty |
|---|---|
| Reference | 1.2.10 |
| Option Code | SIF |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Victorian Auditor-General's Office Audit<br>Industry practice |
| Evidence source(s) | Implementation of School Infrastructure Victorian Auditor-General's Office 2013 |
| Commentary on certainty | The 2013 Victorian Auditor-General's Office report references benchmark levels of investment in the maintenance of school buildings to be 2 per cent of ARV annually. To align with industry practice, a consideration of the required capital investment is also necessary and should occur.<br><br>The impact of short term funding cycles is short term decision making. There is very little evidence to suggest long term budget cycles occur in any other jurisdictions. There have been some contractual mechanisms such as in NSW where they have established maintenance service contracts which commit funding over the life of the contract, thus removing the impact of short-term funding cycles. There are also applicable PPP contracts with funding committed for the tenure of the contract and service levels to maintain facilities. This enables longer term decision making. |

## 2A Enable physical activity through infrastructure and urban design

| Option | Active lifestyle infrastructure regulation |
|---|---|
| Reference | 2.4.1 |
| Option Code | ALR |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Research, policy guideline documents |
| Evidence source(s) | Heart Foundation, Planning Institute of Australia, Australian Local Government Association<br>https://heartfoundation.org.au/images/uploads/main/Programs/South_Australia/Creating_heart_healthy_communities.pdf<br>https://heartfoundation.org.au/images/uploads/publications/HSP-Overview.pdf |
| Commentary on certainty | The heart association and planning institute of Australia have conducted research monitoring the long term effectiveness of these policies. |

| Option | Active lifestyle infrastructure provision |
|---|---|
| Reference | 2.4.2 |
| Option Code | ALP |
| **Certainty of evidence rating** | **High** |
| Type of evidence | Research, surveys<br>Research from University of Western Australia<br>http://www.ajpmonline.org/article/S0749-3797(04)00298-3/abstract?cc=y= |
| Evidence source(s) | University of Western Australia, Centre for active design.<br>Centre for Active Design Guidelines.<br>http://www.nyc.gov/html/dot/html/pedestrians/nyc-plaza-program.shtml<br>http://atrf.info/papers/2009/2009_Martin_denHollander.pdf<br>http://www.nyc.gov/html/dot/html/pedestrians/nyc-plaza-program.shtml |
| Commentary on certainty | There is significant evidence to suggest that improving amenity of communities and spaces encourages walking, outdoor activities and active lifestyles. The provision of locker and shower facilities is widely accepted to increase and encourage active lifestyles, particularly alternative commuting. Additional research would be required to understand how the provision of bike racks on trams or buses may assist in encouraging cycling and active lifestyle. |

| Option | Bicycle and walking path separation |
|---|---|
| Reference | 2.4.3 |
| Option Code | BWP3 |
| **Certainty of evidence rating** | **High** |
| Type of evidence | University research, government research, evidence of increased cycling in cities with separated paths |
| Evidence source(s) | 1. The Government of Western Australia (1998), Conflicts on Shared Paths, Perth, Western Australia.<br>2. Moore, R L (1994), Conflict on Multiple-Use Trails: Synthesis of the Literature and State of the Practice, Federal Highway |

| | |
|---|---|
| | Administration Report No. FHWA-PD-94-031, NC, USA.<br>3. Auckland City Council (2001), Skate Auckland: Auckland City 2001 Skate Strategy, Ci4ty Design Limited and Community Planning Group Auckland City Council, Auckland, New Zealand.<br>4. Department of Transport and Main Roads, QLD, Reducing Conflict between bicycles and pedestrians.<br>5. Research from the University of Canterbury.<br>https://www.bicyclenetwork.com.au/general/policy-and-campaigns/2558/<br>https://www.bicyclenetwork.com.au/general/policy-and-campaigns/707/ |
| Commentary on certainty | Significant research has been undertaken that suggests that the separation of cyclists and pedestrians increases both the number of cyclists as well as walkers - enabling a more active community. |

| **Option** | **Bicycle and walking path expansion and improvement** |
|---|---|
| Reference | 2.4.4 |
| Option Code | BWP2 |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Research |
| Evidence source(s) | Research from the University of Canterbury<br>http://ir.canterbury.ac.nz/bitstream/handle/10092/10315/12651301_PHA%20AGM%20Aug%202014.pdf;jsessionid=B3A53F556FEF0DCF336BBFEC507DE8D5?sequence=1 |
| Commentary on certainty | Greater accessibility to safe, well-provisioned footpath and cycle-way infrastructure leads to greater use and more active lifestyles. |

| **Option** | **Bicycle and walking path data capture** |
|---|---|
| Reference | 2.4.5 |
| Option Code | BWP1 |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Network plans, research from other jurisdictions |
| Evidence source(s) | Western Australian Bicycle Network Plan 2014-2031 |
| Commentary on certainty | Having accurate information about use of an asset enables better maintenance and infrastructure planning decisions and investment. |

| **Option** | **Online liveability infrastructure platform** |
|---|---|
| Reference | 1.3.4 |
| Option Code | OLI |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Existing websites set up to support access to services. |
| Evidence source(s) | Existing council websites.<br>http://www.moreland.vic.gov.au/events-recreation/<br>http://www.maribyrnong.vic.gov.au/activemaribyrnong<br>http://www.yarracity.vic.gov.au/services/recreation/ |
| Commentary on certainty | A lot of this information is already available on individual council websites. A central single website would make this information more readily accessible to the public and tourists. |

| Option | Integrated shared use community and recreation facilities |
|---|---|
| Reference | 2.4.7 |
| Option Code | RFC |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | There are guidelines in Victoria and Tasmania to this effect already. |
| Evidence source(s) | **Department of Education, Victoria.**<br>**Department of Premier and Cabinet, Tasmania.**<br>http://www.melbourne.vic.gov.au/about-council/committees-meetings/meeting-archive/Lists/CouncilMeetingAgendaItems/Attachments/3620/FC_51_200906090500.pdf |
| Commentary on certainty | Although there are some regulations around shared facilities with education already, the implementation and incentives provided around this colocation could be improved. |

| Option | Bicycle and vehicle accident fault allocation |
|---|---|
| Reference | 2.4.8 |
| Option Code | BVA |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Research, evidence from other jurisdictions. |
| Evidence source(s) | **Parliamentary Research**<br>http://www.parliament.act.gov.au/__data/assets/pdf_file/0006/534678/05_Research-Report-on-Strict-Liability.pdf<br>**Research Paper**<br>http://www.academia.edu/13965411/The_Dutch_road_to_a_high_level_of_cycling_safety |
| Commentary on certainty | In the Netherlands, strict liability on vehicles encouraged people to move from cars to bikes, increasing mobility. |

## 2B Provide good public spaces where communities can come together

| Option | Online liveability infrastructure platform |
|---|---|
| Reference | 1.3.4 |
| Option Code | OLI |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Annual local government community satisfaction survey, Council annual reports |
| Evidence source(s) | 79 Victorian Local Councils<br>http://www.dtpli.vic.gov.au/local-government/publications-and-research/council-community-satisfaction-survey |
| Commentary on certainty | Certainty level is low given limited aggregated Council information providing evidence of need and solution. A business case or feasibility study was not publically available. |

| Option | Community space statewide event planning |
|---|---|
| Reference | 2.5.1 |
| Option Code | CSS2 |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Annual local government community satisfaction survey, Council annual reports |
| Evidence source(s) | 79 Victorian Local Councils<br>http://www.dtpli.vic.gov.au/local-government/publications-and-research/council-community-satisfaction-survey |
| Commentary on certainty | Certainty level of low given limited aggregated Council information providing evidence of need and solution. A business case or feasibility study was not publically available. |

| Option | Community and public space utilisation regulation |
|---|---|
| Reference | 2.5.2 |
| Option Code | CSU |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Council event/public space permit approvals process, public space/outdoor activities policies<br>Plan Melbourne 2015 Review |
| Evidence source(s) | Report by the Ministerial Advisory Committee - http://www.mpa.vic.gov.au/wp-content/uploads/2014/07/FBAC-Report-Number-1-October-2015.pdf<br>Schools as community spaces - http://www.education.vic.gov.au/Documents/school/principals/infrastructure/sacfpolfworkg.pdf |
| Commentary on certainty | A certainty level of low was given due to the limited aggregated Council information providing evidence of need and solution. A business case or feasibility study was not publically available. |

| Option | Community space refurbishment or rationalisation |
|---|---|
| Reference | 2.5.5 |
| Option Code | CSR |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Council asset registers and annual reports. |
| Evidence source(s) | Community Infrastructure Fund guidelines - http://grantsandfunding.com.au/grants/community-sustainability-infrastructure-fund/ |
| Commentary on certainty | Certainty level of low given limited aggregated Council information providing evidence of need and solution. A business case or feasibility study was not publically available. |

| Option | Community space shared use agreements |
|---|---|
| Reference | 2.5.6 |
| Option Code | CSS1 |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Council documented shared use arrangements, Council meeting minutes |
| Evidence source(s) | 79 Victorian Local Councils<br>Report by the Ministerial Advisory Committee - http://www.mpa.vic.gov.au/wp-content/uploads/2014/07/FBAC-Report-Number-1-October-2015.pdf<br>Schools as community spaces - http://www.education.vic.gov.au/Documents/school/principals/infrastructure/sacfpolfworkg.pdf. |
| Commentary on certainty | Certainty level of low given limited aggregated Council information providing evidence of need and solution. A business case or feasibility study was not publically available. |

| Option | Community space financial planning |
|---|---|
| Reference | 2.5.7 |
| Option Code | CSF |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Reported capital expenditure data |
| Evidence source(s) | Know your Council website - https://knowyourcouncil.vic.gov.au/ |
| Commentary on certainty | Certainty level of low given limited aggregated Council information providing evidence of need and solution. A business case or feasibility study was not publically available. |

## 2C Strengthen access to cultural infrastructure

| Option | Cultural experience digital platform |
|---|---|
| Reference | 2.7.1 |
| Option Code | CED |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Creative Industries Taskforce Report 2015, Cultural Venues Annual Reports; Victorian Auditor-General's Office: Collections Management in Cultural Agencies (2012). |
| Evidence source(s) | Cultural Venues Annual Reports, Creative Victoria, Victorian Auditor-General's Office |
| Commentary on certainty | Certainty level medium, as Victorian Auditor-General's Office highlighted the importance of an online collection to Victoria through its review of Collections Management in Cultural Agencies (2012). |

| Option | Cultural programme statewide coordination |
|---|---|
| Reference | 2.7.2 |
| Option Code | CPS2 |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Creative Industries Taskforce Report 2015 - http://strategy.creative.vic.gov.au/creative-industries-taskforce-report |
| Evidence source(s) | Creative Victoria |
| Commentary on certainty | Certainty level low, a business case or feasibility study was not publically available, however, the Creative Industries Taskforce identifies the importance of a statewide cultural program to increase Victoria's standing on the global stage and to increase the economic benefits captured by the State. |

| Option | Cultural artefact acceptance policies |
|---|---|
| Reference | 2.7.3 |
| Option Code | CAA |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Cultural Venues Annual reports |
| Evidence source(s) | Creative Victoria |
| Commentary on certainty | Certainty level low, as the Creative Industries Taskforce highlighted the potential importance of a coordinated cultural program in its 2015 report but a feasibility study was not publically available. |

| Option | Cultural collection storage |
|---|---|
| Reference | 2.7.8 |
| Option Code | CCS |
| **Certainty of evidence rating** | **High** |

| | |
|---|---|
| Type of evidence | Collections storage business case<br>http://www.audit.vic.gov.au/publications/2012-13/20121024-Cultural-Agencies/20121024-Cultural-Agencies.html<br>https://museumvictoria.com.au/pages/1711/MV_Strategic_Plan_2013-18.pdf |
| Evidence source(s) | Arts Victoria/DPC (now Creative Victoria) |
| Commentary on certainty | Need for solution outlined in business case |

| **Option** | **Cultural venue utilisation regulation** |
|---|---|
| Reference | 2.7.5 |
| Option Code | CVU |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Council event/public space permit approvals process, public space/outdoor activities policies<br>Plan Melbourne 2015 Review |
| Evidence source(s) | 79 Victorian Local Councils<br>Report by the Ministerial Advisory Committee |
| Commentary on certainty | A certainty level of low given that a business case or feasibility study was not publically available. |

| **Option** | **Cultural venue pricing regime** |
|---|---|
| Reference | 2.7.6 |
| Option Code | CVP |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Cultural venues pricing strategies and annual reports (i.e. Arts Centre Melbourne new three tiered business model) |
| Evidence source(s) | Melbourne and regional cultural venues, Creative Victoria |
| Commentary on certainty | Certainty level low, a business case or feasibility study was not publically available. |

| **Option** | **Melbourne Cultural precinct connectivity** |
|---|---|
| Reference | 2.7.7 |
| Option Code | CPC |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Melbourne Arts Blueprint |
| Evidence source(s) | Creative Victoria |
| Commentary on certainty | Certainty level low, a business case or feasibility study was not publically available. |

| **Option** | **Contemporary art gallery of Victoria** |
|---|---|
| Reference | 2.7.9 |
| Option Code | CAG |
| **Certainty of evidence rating** | **Low** |

| | |
|---|---|
| Type of evidence | Creative Industries Taskforce Report 2015 |
| Evidence source(s) | Creative Victoria |
| Commentary on certainty | Certainty level low, a business case or feasibility study was not publically available. |

## 2D Maximise positive impacts on amenity and wellbeing from infrastructure

| Option | Heavy vehicle road use regulation enforcement |
|---|---|
| Reference | 2.6.2 |
| Option Code | HVR |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Legislation<br>Regulations<br>Study findings<br>VicRoads website |
| Evidence source(s) | **VicRoads / EPA / Department of Health / City of Maribyrnong**<br>Trucks & the Inner West - Truck Count Results (2015)<br>**EPA Victoria**<br>Environment Protection (Vehicle Emissions) Regulations 2013<br>EPA Regulatory Impact Statement - Environment Protection (Vehicle Emissions) Regulations 2013<br>**Victorian Government**<br>Environment Protection Act 1970<br>**VicRoads**<br>https://www.vicroads.vic.gov.au/business-and-industry/heavy-vehicle-industry/heavy-vehicle-road-safety/truck-curfews |
| Commentary on certainty | Existing evidence relates to the effect of truck curfews in the inner west. A one year truck curfew trial in the north eastern suburbs is currently being implemented. No feasibility study has been completed to assess the cost or impact of increasing ground enforcement. |

| Option | HPFV network completion |
|---|---|
| Reference | 2.6.4 |
| Option Code | HPF |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | DEDJTR and local council strategic documents<br>Strategic documents and policies<br>Newspaper articles<br>VicRoads planning and project website<br>Victorian Auditor-General's Office audit<br>RACV website<br>Consultancy reports |
| Evidence source(s) | **VicRoads**<br>https://www.vicroads.vic.gov.au/planning-and-projects/regional-road-projects<br>Traffic Noise Reduction Policy (2005)<br>Traffic Noise Reduction Policy Review (2015)<br>**DEDJTR**<br>Victorian Transport Plan (2008)<br>Moving More With Less (2013)<br>Victorian Freight and Logistics Plan (2013)<br>**Great South Coast**<br>Regional Transport Strategy (2014)<br>http://www.railfreightalliance.com/wp-content/uploads/2014/06/Great-South-Coast-Regional-Transport-Strategy.pdf<br>**Newspaper articles**<br>Various<br>**Victorian Auditor-General's Office** |

| | |
|---|---|
| | http://www.audit.vic.gov.au/publications/20130821-Transport-infrastructure/20130821-Transport-infrastructure.html<br>**RACV**<br>http://www.racvgrowingpains.com.au/wps/wcm/connect/racv/growing-pains/home/regional-victoria/home/your-municipality/mildura<br>**National Infrastructure Construction Schedule**<br>https://www.nics.gov.au/Home/Planning<br>**AECOM**<br>Horsham Bypass Addendum Report for Option D:Cost Benefit Analysis (2014)<br>Bulla Bypass/Melbourne Airport Link Planning Study Transport Modelling (2013) |
| Commentary on certainty | Feasibility studies have been completed; however these are not publically available. |

| Option | Alternative energy vehicles |
|---|---|
| Reference | 2.6.6 |
| Option Code | AEV |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | VicRoads strategic document<br>Industry advocacy paper and fact sheet<br>Research papers |
| Evidence source(s) | **VicRoads**<br>Traffic Noise Reduction Policy Review (2015)<br>**Energy Supply Association of Victoria**<br>Sparking an Electric Vehicle Debate in Australia (2013)<br>http://ewp.industry.gov.au/sites/prod.ewp/files/Sparking%20an%20Electric%20Vehicle%20Debate%20in%20Australia.pdf<br>Alternative Fuel Vehicles: Driving the uptake fact sheet (date unknown)<br>http://www.esaa.com.au/Library/PageContentFiles/69ae0935-d7e1-4dfe-9d3d-0309a1ff8e62/150729%20esaa%20Alternative%20Fuel%20Vehicles%20Fact%20Sheet.pdf<br>**CSIRO**<br>Spatial Modelling of Electric Vehicle Charging and Demand and Impacts on Peak Electrical Loads in Victoria (2012)<br>http://economicdevelopment.vic.gov.au/__data/assets/pdf_file/0019/1092232/CSIRO-Spatial-Modelling-of-EV-Charging-and-Grid-Impacts-in-Victoria.pdf<br>Higgins A, Paevere P, Gardner J and Quezada G Diffusion of Competing Vehicle Options Across a Landscape of Heterogeneous Consumers (2012)<br>https://publications.csiro.au/rpr/download?pid=csiro:EP112587&dsid=DS2 |
| Commentary on certainty | |

| Option | CityLink to Western Ring road connection |
|---|---|
| Reference | 2.6.7 |
| Option Code | EWW |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Preliminary feasibility study<br>Project fact sheet<br>Project audit |

| | |
|---|---|
| Evidence source(s) | **DEDJTR**<br>Preliminary feasibility study<br>**Victorian Government**<br>Western Section of East West Link Project Overview<br>**Victorian Auditor-General**<br>East West Link Project Audit (2015)<br>http://www.audit.vic.gov.au/publications/20151209-East-West-Link/20151209-East-West-Link.pdf |
| Commentary on certainty | Some feasibility work undertaken as part of East West investigations but work has not proceeded substantially past the planning stage. A business case or feasibility study was not publically available. |

| **Option** | **Road space allocation changes** |
|---|---|
| Reference | 2.6.8 |
| Option Code | RSA |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Project audit |
| Evidence source(s) | **VicRoads, PTV**<br>http://www.audit.vic.gov.au/publications/20140611-ICT-Improve-Traffic/20140611-ICT-Improve-Traffic.html#s23<br>**News article**<br>http://www.smh.com.au/nsw/the-plan-to-make-sydney-a-walking-city-again-20150501-1mxjfc.html |
| Commentary on certainty | It is already in existence in a number of locations. |

| **Option** | **Transport network price regime** |
|---|---|
| Reference | 2.6.9 |
| Option Code | TNP |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Academic articles<br>Industry submissions and discussion papers<br>International programs and studies |
| Evidence source(s) | **National Transport Commission**<br>Heavy Vehicle Pricing Option: Development and Assessment Framework Discussion Paper (2010)<br>**Australian Trucking Association**<br>http://www.truck.net.au/sites/default/files/submissions/CRRP%20Pricing%20Options%20Paper_ATA%20response.pdf<br>**Australasian Railway Association**<br>http://transportreform.org/file.php?fileID=26<br>**Institute of Transport and Logistics Studies**<br>http://sydney.edu.au/business/__data/assets/pdf_file/0008/107774/ITLS-WP-11-17.pdf<br>**International Transport Forum**<br>http://www.internationaltransportforum.org/Proceedings/Lisbon2009/2-Gille.pdf |
| Commentary on certainty | No Australian business case/feasibility studies have been completed to date, however several Australian studies/papers argue in favour of national transport pricing reform. There is evidence of international pricing regime success. |

| Option | Hoddle Street/Punt Road public transport prioritisation |
|---|---|
| Reference | 2.6.10 |
| Option Code | HSP1 |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Hoddle street study (2010/2011), number of current feasibility studies relating to streamlining and POA projects. |
| Evidence source(s) | **VicRoads**<br>https://www.vicroads.vic.gov.au/planning-and-projects/melbourne-road-projects/punt-road-hoddle-street<br>http://consult.vicroads.vic.gov.au/hoddle-street-punt-road-consultation |
| Commentary on certainty | Preliminary feasibility study has been completed. |

## 3A Improve accessibility for people with disabilities and/or mobility challenges through infrastructure

| Option | Residential facilities for people with disabilities |
|---|---|
| Reference | 3.8.3 |
| Option Code | RFP |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Research and policy guidelines<br>Victorian State Disability Plan 2013-2016<br>Productivity Commission 2015<br>The Victorian Governments Social Housing and National Disability Insurance Scheme Reform Group. |
| Evidence source(s) | **Department of Human Services**<br>http://www.dhs.vic.gov.au/about-the-department/plans,-programs-and-projects/plans-and-strategies/disability-services/victorian-state-disability-plan-2013-2016<br>**Productivity Commission**<br>Disability Care and Support, Productivity Commission Inquiry<br>http://www.pc.gov.au/inquiries/completed/disability-support/report<br>**The Victorian Governments Social Housing and National Disability Insurance Scheme Reform Group**<br>http://www.dhs.vic.gov.au/about-the-department/our-organisation/organisational-structure/our-groups |
| Commentary on certainty | Evidence shows increasing access to residential care will improve disability outcomes |

| Option | Social connection |
|---|---|
| Reference | 3.8.4 |
| Option Code | SCC |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Research |
| Evidence source(s) | **Productivity Commission**<br>Disability Care and Support, Productivity Commission Inquiry<br>http://www.pc.gov.au/inquiries/completed/disability-support/report<br>**The Victorian Governments Social Housing and National Disability Insurance Scheme Reform Group**<br>http://www.dhs.vic.gov.au/about-the-department/our-organisation/organisational-structure/our-groups<br>**Department of Health and Ageing, Planning Institute of Australia, ALGA and Heart Foundation**<br>https://www.planning.org.au/policy/healthy-spaces-and-places-2<br>http://www.healthyplaces.org.au/<br>**Urban Land Institute**<br>Building Healthy Places Toolkit<br>http://uli.org/research/centers-initiatives/building-healthy-places-initiative/building-healthy-places-toolkit/<br>**Australian Health and Welfare Institute**<br>http://www.aihw.gov.au/ |
| Commentary on certainty | Research cited shows that improvements to infrastructure planning and design processes to increase accessibility and mobility will be beneficial. |

| Option | Public transport vehicle accessibility |
|---|---|
| Reference | 3.8.5 |
| Option Code | PTV |
| **Certainty of evidence rating** | **High** |
| Type of evidence | Victorian State disability plan<br>Disability Discrimination Act 1992 (Commonwealth)<br>The Victorian Governments Social Housing and National Disability Insurance Scheme Reform Group. |
| Evidence source(s) | **Department of Human Services**<br>http://www.dhs.vic.gov.au/about-the-department/plans,-programs-and-projects/plans-and-strategies/disability-services/victorian-state-disability-plan-2013-2016<br>**Legislation**<br>Disability Discrimination Act 1992<br>**The Victorian Governments Social Housing and National Disability Insurance Scheme Reform Group**<br>http://www.dhs.vic.gov.au/about-the-department/our-organisation/organisational-structure/our-groups |
| Commentary on certainty | Making transport infrastructure more accessible will enhance social inclusion, due to the ease with which people can travel from place to place to access employment and services. |

| Option | Public transport alternative use of taxi or hire car |
|---|---|
| Reference | 3.8.6 |
| Option Code | PTA |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Multi Purpose Taxi Program (MPTP) Review, taxi as buses pilot program, Inquiry into Social Inclusion and Victorians with a Disability (2014). Has been referred to DEDJTR as part of MPTP review and taxi reform policy. |
| Evidence source(s) | **Taxi Services Commission**<br>http://taxi.vic.gov.au/passengers/mptp<br>**Parliament of Victoria: Family and Community Development Committee**<br>http://www.parliament.vic.gov.au/fcdc<br>http://www.parliament.vic.gov.au/file_uploads/_FCDC__Report_into_Social_Inclusion_and_Disbility_TPWLfF1q.pdf<br>**DEDJTR**<br>http://economicdevelopment.vic.gov.au/transport/rail-and-roads/taxis/multi-purpose-taxi-program-review |
| Commentary on certainty | Through changes in regulation the private sector would have the ability to provide innovative, flexible transport solutions to Victorians with a disability. A tailored transport solution would complement public transport services. |

## 3B Address housing affordability challenges with better social housing

| Option | Social housing asset refresh |
|---|---|
| Reference | 3.9.1 |
| Option Code | SHA |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | International jurisdictions social housing policy |
| Evidence source(s) | http://www.dhcs.act.gov.au/__data/assets/pdf_file/0005/273551/Public_Housing_Asset_Management_Strategy.pdf<br><br>https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/495041/LDDP_160126_full.pdf |
| Commentary on certainty | A number of Australian jurisdictions (NSW, TAS, ACT) have a strategic asset management plan/document (generally 5 year) for social housing but it is unknown if there is a detailed AMP for each asset.<br>Asset management of individual units in the UK is the responsibility of housing associations and Government regulates the approach and compliance with the plan. NSW have a similar approach for community housing.<br>Multiple jurisdictions reinvest property sale proceeds to reduce the level of capital and operating funding required to sustain social housing portfolio.<br>Capital expenditure is funded primarily from the proceeds of property sales nationally and internationally. Examples include, ACT, NSW, UK.<br>The UK dispose of Government land and work with the vendor to deliver social housing on the land. |

| Option | Social housing sector regulatory amendment |
|---|---|
| Reference | 3.9.2 |
| Option Code | SHS1 |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | No direct evidence. |
| Evidence source(s) | No direct evidence. Evidence from similar initiatives.<br>**Ministerial Advisory Committee - Plan Melbourne 2015 Review**<br>MPA propose a similar imitative for affordable housing which could be applied to social housing<br>http://www.mpa.vic.gov.au/increasing-affordable-housing-a-four-point-plan/<br>http://www.planmelbourne.vic.gov.au/__data/assets/pdf_file/0015/131334/Chapter-2-Plan-Melbourne-May-2014.pdf |
| Commentary on certainty | Evidence suggests, locating social housing close to transport networks that increases accessibility to jobs etc. helps in breaking the cycle of homelessness, crime etc.<br>There is no evidence to suggest these initiatives have been applied to social housing.<br>MPA and other Australian jurisdictions have similar initiatives for affordable housing but there isn't strong evidence to support this will work in the context of social housing. |

| Option | Social housing developer incentivisation |
|---|---|
| Reference | 3.9.3 |
| Option Code | SHD2 |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Other International Jurisdictions |
| Evidence source(s) | **NSW, UK & US**<br>https://msd.unimelb.edu.au/sites/default/files/docs/Policy%20planning%20and%20financing%20mechanisms%20paper.pdf<br>http://vcoss.org.au/documents/2014/04/Making-Social-Housing-Work-Web.pdf<br>http://www.facs.nsw.gov.au/__data/assets/pdf_file/0005/317093/Shelter-NSW-Attachment-1.pdf |
| Commentary on certainty | There have been a number of social equity bonds established internationally with many exceeding the target's set for 'success'. This indicates the private sector will drive performance to achieve the return on investment. The majority of social equity bonds are providing services rather than infrastructure and the success targets would need to be carefully considered under this option.<br>It is anticipated this option would not entirely address social housing demand, due to estimated cost pressures but when combined with other options, this would provide a financing and delivery stream for social housing without significantly impacting Government budgets.<br>Social equity bonds have been successfully implemented in:<br>- the UK & US to reduce rough sleeping and chronic homelessness<br>- NSW to restore children in out-of-home care to the care of their parents, and<br>- the UK & US to stop prisoners reoffending. |

| Option | Social housing utilising the defence rental model |
|---|---|
| Reference | 3.9.4 |
| Option Code | SHD1 |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | DHA, Research Studies, Industry |
| Evidence source(s) | **Australia**<br>http://www.ahuri.edu.au/publications/download.asp?ContentID=ahuri_70575_fr&redirect=true<br>https://www.dha.gov.au/annual-reports/2013-2014/pdf/dha_annual_report_1314_section_8.pdf |
| Commentary on certainty | The defence housing model works well in defence but the model has not been trialled for social housing in Australia.<br>The option to purchase the home after a 10-15 year lease does not form part of the defence model. With further consideration, it would be possible for this mechanism to be included in the model.<br><br>The Australian defence housing model sees Defence Housing Australia (DHA) sell properties to private investors under a sale and leaseback arrangement. The majority of investors are mum & dad but DHA have secured large scale investment previously.<br>The funding realised from sales is utilised for capital investment and reinvested into the stock for maintenance. |

| Option | Social housing "Social Rental" model |
|---|---|
| Reference | 3.9.6 |
| Option Code | SHS2 |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Government Studies, Research |
| Evidence source(s) | **UK Government.**<br>**Australian Government**<br>https://www.dss.gov.au/our-responsibilities/housing-support/programmes-services/national-rental-affordability-scheme/about-the-national-rental-affordability-scheme-nras |
| Commentary on certainty | This has worked well in the UK. It is working well where housing associations have tried it in Australia. Needs government reform and incentives to make it more viable as well as education of the general public about the benefits of renting their property as a social rental.<br>The UK have given social landlord flexibility on the types of tenancies they can offer and this has in turn provided local councils the power to manage their housing wait lists, made it easier for social tenants to move within the sector to appropriately sized and located accommodation, and allowed local authorities to reduce homelessness duties.<br>The Australian National Rental Affordability Scheme (NRAS) offers incentives to investors to provide affordable housing. This program is targeted at medium to large investors rather than individual investors but evidence suggests this scheme is effective at delivering increased levels of affordable housing. |

| Option | Social housing transition to private stock |
|---|---|
| Reference | 3.9.7 |
| Option Code | SHP2 |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Currently no evidence of targeted training for social or affordable housing tenants.<br>UK, AUS, VIC evidence of training and upskilling for the unemployed.<br>Housing Vic promote and assist tenants with training and employment but this is not targeted to capacity building to access non-government market. |
| Evidence source(s) | **Victoria**<br>http://www.housing.vic.gov.au/training-and-employment<br>http://www.education.vic.gov.au/Documents/about/department/Skills_and_Jobs_Ed_State_Response.pdf<br>http://www.education.vic.gov.au/victorianskillsgateway/Employers/Pages/Fees-funding-and-financial-support.aspx<br>**UK**<br>https://www.gov.uk/guidance/sfa-support-for-the-unemployed |
| Commentary on certainty | Victoria currently offers training and skills via VET to the unemployed. Specialist courses/training could be developed for social and affordable housing tenants and subsidised. |

| Option | Social housing tenant transfer within a community |
|---|---|
| Reference | 3.9.8 |
| Option Code | SHT |
| **Certainty of evidence rating** | **High** |
| Type of evidence | Facilitation of movement within existing communities currently happens in the social housing sector but stock limitations create significant delays. |
| Evidence source(s) | **Victorian public housing waiting and transfer list** http://www.dhs.vic.gov.au/about-the-department/documents-and-resources/research,-data-and-statistics/public-housing-waiting-and-transfer-list |
| Commentary on certainty | There is an existing process for tenants to transfer public housing, therefore the evidence is very high. Other options will facilitate the transfer of tenants with increases in stock. |

| Option | Social housing stock transfer model |
|---|---|
| Reference | 3.9.9 |
| Option Code | SHS3 |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Evidence from the UK. The UK began promoting stock transfer activity in 1997, which focused on reinvigorating social housing both financially and culturally by changing its management and ownership.<br><br>Evidence identifies the key benefits as:<br>– Channelling investment to remedy neglect<br>– Reforming organisational governance to 'empower tenants and disadvantaged communities'<br>– Stimulating beneficial culture change.<br><br>Reviews have found that the UK transfer policy has been effective and UK Housing Associations have exceeded expectations.<br><br>Significant reform of the Australian social housing sector was introduced in 2009 with a network of interrelated programs and initiatives associated with the NAHA. One objective of the reforms is to strengthen the role of the community housing sector in terms of both its scale and its capacity to respond to housing need. |
| Evidence source(s) | **National Shelter Australia** http://www.shelter.org.au/index.php?option=com_docman&task=doc_view&gid=57&Itemid=491 https://www.jrf.org.uk/report/impacts-housing-stock-transfers-urban-britain |
| Commentary on certainty | There is significant evidence on the transfer of stock to housing associations internationally and within Australia. There is very little evidence to suggest other organisations are suited to managing social and affordable housing. |

| Option | Social housing government role |
|---|---|
| Reference | 3.9.11 |
| Option Code | SHG |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | In the UK over the past 20 years, there has been a shift away from local council managed public housing towards the non-for profit housing association sector. This has occurred as a direct result of government policy and has established the institutional framework for a large increase in private debt finance for social housing, supplied by the major banks that fund ~50% of the value of new social housing.<br><br>Housing associations are private, non-profit organisations that provide low-cost social housing for people in need of a home. Any trading surplus is used to maintain existing housing and to help finance new homes. Although independent they are regulated by the state and commonly receive public funding. They are now the UK's major providers of new housing for rent, while many also run shared ownership schemes to help those who cannot afford to buy a home outright.<br><br>Housing associations provide a wide range of housing, some managing large estates of housing for families, while the smallest may perhaps manage a single scheme of housing for older people. |
| Evidence source(s) | **Australian Housing and Urban Research Institute (AHURI)**<br>http://www.ahuri.edu.au/__data/assets/pdf_file/0006/2202/AHURI_Final_Report_No237_Strategies-of-Australias-leading-not-for-profit-housing-providers-a-national-study-and-international-comparison.pdf<br>http://www.ahuri.edu.au/research/research-and-policy-bulletins/201 |
| Commentary on certainty | Change of roles and responsibilities to better suit parties capabilities and capacity will strengthen social housing model. |

| Option | Public housing sector regulatory amendment |
|---|---|
| Reference | 3.9.12 |
| Option Code | AHR |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | UK planning obligations (Section 106) provide mechanisms to make a development proposal acceptable in planning terms that would not otherwise be acceptable. They are focused on site specific mitigation of the impact of development and the most common use is to secure affordable housing for the development. There are review and appeals procedures under section 106 that allow councils to renegotiate affordable housing levels. A requirement of S106 is for the housing to remain within the affordability parameters over its life i.e. resell at 20% less than full market value.<br><br>This option overlaps with options 3.9.2 and 3.9.4, please see evidence under these options. |
| Evidence source(s) | **Section 106 of the Town and Country Planning Act 1990 (UK)**<br><br>http://www.pas.gov.uk/3-community-infrastructure-levy-cil/-/journal_content/56/332612/4090701/ARTICLE |
| Commentary on certainty | Little evidence of expedited approval processes for planning |

| | |
|---|---|
| | permits with affordable housing included.<br>The s106 planning provision in the UK is a successful mechanism for financing and delivering affordable housing to the open market. These planning provisions do not have an impact on social housing or affordable rental properties.<br>A possible approach to increasing affordable rental properties via this option would be to include similar planning provisions for the delivery of social housing (possibly via development contributions) allow private investors to purchase the affordable properties and lease at a lower rental rate to eligible renters i.e. purchase the property for 20% of the market value and lease for 20% of the market value. |

| **Option** | **Social and affordable housing delivery Fund and incentives** |
|---|---|
| Reference | 3.9.13 |
| Option Code | SAH |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Evidence to suggest legislative and policy reform will deliver on proposed option.<br>NSW and America have Social Housing Funds that are successful |
| Evidence source(s) | **MACS MPS report 2015.**<br>**NSW Social Housing Fund**<br>http://www.dpc.nsw.gov.au/__data/assets/pdf_file/0003/170805/MOU_-_Social_Housing_Fund.pdf |
| Commentary on certainty | Strong evidence to suggest this option would be successful. |

| **Option** | **Public housing regeneration** |
|---|---|
| Reference | 3.9.14 |
| Option Code | PHR |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | The regeneration of social housing estates has occurred internationally and the social benefits of regeneration are well researched. Evidence suggesting increased pride in the community assists to reduce crime etc.<br>Suggested an asset management and investment plan for social housing would identify the appropriate regeneration projects. |
| Evidence source(s) | **International and Australia**<br>http://www.ahuri.edu.au/publications/download.asp?ContentID=ahuri_rap_issue_194&redirect=true<br>http://www.engineering.ucl.ac.uk/engineering-exchange/files/2014/10/Report-Refurbishment-Demolition-Social-Housing.pdf |
| Commentary on certainty | Strong evidence to suggest this has occurred internationally and nationally. |

## 3C Support changing approaches to social service and justice delivery through infrastructure

| Option | Justice colocation of services |
|---|---|
| Reference | 3.10.2 |
| Option Code | JCS |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Anecdotal evidence from interviews<br>Case Study - Neighbourhood Justice Centre<br>Program evaluation - Neighbourhood Justice Centre<br>Case Study - New Zealand |
| Evidence source(s) | **Stakeholder interviews**<br>Various<br>**Evaluating the Neighbourhood Justice Centre in Yarra 2007–2009**<br>http://library.bsl.org.au/jspui/bitstream/1/3713/1/njc_evaluation_main_document.pdf , 2010, accessed February 2016<br>**Ministry of Justice (New Zealand)**<br>Statement of Intent 2014-2018<br>http://www.justice.govt.nz/publications/global-publications/s/statement-of-intent-2014-2018/who-we-are/who-we-work-with#social , accessed February 2016 |
| Commentary on certainty | Whilst a business case outlining the benefits of co-locating justice and social services on a broad scale has either not been developed or reviewed, Victoria has successfully trialled the co-location of justice and social services to improve collaboration and to drive improved client outcomes.<br><br>The Neighbourhood Justice Centre (NJC) is Australia's first and only community justice centre and is located in the City of Yarra on a purpose built site. It brings together a multi-jurisdictional court with a wide array of support services and community initiatives including case management, Koori justice, employment and training support, housing assistance, assistance for newly arrived refugees and migrants etc. to leverage a community-based approach to overcoming the root causes of crime. These agencies provide integrated and coordinated services. The NJC began as a pilot project in 2007 and has since been provided with an ongoing budget allocation as an independent evaluation in 2010 found there were real and practical benefits that were derived from the NJC.<br><br>Further analysis would need to be conducted to determine whether this model could be appropriately applied across other Victorian locations.<br><br>The Neighbourhood Justice Centre (NJC) is Australia's first and only community justice centre and is located in the City of Yarra on a purpose built site. It brings together a multi-jurisdictional court with a wide array of support services and community initiatives. An evaluation of the Centre found that:<br><br>1. Recidivism rates were reduced from 41% down to 34%<br>2. Offenders were 14% less likely to re-offend compared to other courts<br>3. Completion of Community Based Orders was 10% higher than the statewide average<br>4. Neighbourhood Justice Centre offenders did an average of 105 hours of unpaid community work in Yarra, compared to the statewide average 68 hours |

| | |
|---|---|
| | 5. The Centre provided strong support for people attending court, helping them negotiate the justice system. For example, the Neighbourhood Justice Officer was present in nearly 80% of criminal matters<br>6. Benefit-cost modelling showed that for every $1 invested in the NJC, the expected return would range between $1.09 and $2.23<br>7. Every $1 the NJC invested in community projects attracted $5.66 from other agencies.<br><br>This was due to the benefits derived from the wrap-around client service model made possible by the close proximity of services to one another.<br><br>The state government has recently committed $30,000 to support the development of a masterplan for the Werribee Justice Precinct, which could include a courthouse, police station and community legal centre. |

| **Option** | **Justice case management system** |
|---|---|
| Reference | 3.10.3 |
| Option Code | CSC |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Anecdotal evidence from interviews<br>Case Study - South Australia<br>Case Study - New South Wales<br>Case Study - Western Australia<br>Case Study - Australian Capital Territory |
| Evidence source(s) | **Stakeholder interviews**<br>V**arious**<br>**Government of South Australia**<br>Attorney-General's Department, Transforming Criminal Justice: Strategic Overview, http://www.agd.sa.gov.au/sites/agd.sa.gov.au/files/documents/Initiatives%20Announcements%20and%20News/Justice%20Sector%20Reform/TCJ%20Strategic%20Overview.pdf , 2014, accessed February 2016<br>**Department of Justice (New South Wales)**<br>Strategic Plan 2014-15, http://csa.intersearch.com.au/csajspui/bitstream/10627/865/1/JUSTICE_STRATEGIC_PLAN_2014_160914_1800.pdf , accessed February 2016<br>**Department of Attorney General (Western Australia)**<br>Annual Report 2014/15: Integrated Courts Management System, http://www.ar.dotag.wa.gov.au/l/integrated_courts_management_system.aspx?uid=6226-8680-5176-0707 , accessed February 2016<br>**Victorian Auditor-General's Office**<br>Connecting Courts – the Integrated Courts Management System, June 2009 |
| Commentary on certainty | There is likely to have been a business case developed to support the introduction of the Victorian Integrated Case Management System program, in July 2005, although the implementation of the system was ultimately not successful.<br><br>The original business case has not been provided or reviewed. It is also unknown as to whether it has been updated to reflect the current requirements of Victoria's court network.<br><br>The benefits associated with improved data management across the courts and justice sector more broadly are widely recognised. |

| | |
|---|---|
| | Other jurisdictions such as New South Wales, South Australia, Western Australia and the Australian Capital Territory are either developing or implementing information sharing strategies and systems.<br><br>New South Wales has implemented JusticeLink, an integrated multi-jurisdictional court administration system and electronic document filing system supporting the Court System and Office of the Sheriff of New South Wales. There have been some issues associated with the accuracy of data against client records. However, the Department of Justice's 2014-15 Department Program Portfolio document identifies clear benefits through addressing long standing issues with user experience, configurability, performance and online services.<br><br>Western Australia has also introduced the Integrated Courts Management System (ICMS) to replace its court criminal case management systems. It aims to make information used by courts and tribunals more efficient through the transfer of information across the whole justice system. The ACT Government has signed an agreement with Western Australia to purchase and use their courts case management system to improve service delivery collect data about court operations and cases, improve the efficiency and timeliness of court and tribunal operations, as well as substantially reducing the need for paper documents.<br><br>The South Australian government has also recognised the importance of sharing data more broadly, introducing the Criminal Justice Information Management (CJIM) project. The CJIM aims to "improve the exchange, timeliness and accuracy of information across the criminal justice system" through the better sharing (and electronic exchange of) information. It recognises that "the current use of technology across the criminal justice system reflects...silos...information is not readily shared and the same information is entered into different systems multiple times...there must be a continued focus on breaking down these silos to facilitate access to information along the continuum of the criminal justice system. There must be a common and consistent view of a person in the criminal justice system in order to ensure that processes (both procedural and technological) prevent people from falling through the cracks". |

| Option | Mobile police and justice workforce |
|---|---|
| Reference | 3.10.4 |
| Option Code | MPW |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Anecdotal evidence from interviews<br>Victoria Police Corporate Plan<br>Victoria Police Vision Statement<br>Media announcements |
| Evidence source(s) | **Stakeholder interviews**<br>Various<br>**Victoria Police**<br>Victoria Police Corporate Plan 2015-18 - YEAR 1, (2015)<br>Victoria Police Blue Paper: A Vision for Victoria Police in 2025 (2014) |
| Commentary on certainty | Victoria Police's corporate plan recognises the need for Victoria Police to modernise its systems, including the introduction of |

| | |
|---|---|
| | mobile technology for operational police that is integrated with its central information management systems. Increasing the mobility of police officers enables them to increase the time they spent in the community.<br><br>Victoria Police's Bluepaper also emphasises the importance of using technology to enable intelligence-shaped, mobile service delivery, as well as real-time, practical engagement with the community. This supports a service delivery model and geographical footprint that is focused on accessibility through mobility.<br><br>A number of police forces have either trialled or are planning on trialling mobile policing technology, including iPads and mobile fingerprinting scanning devices.<br><br>New South Wales, South Australia, Queensland and the Northern Territory are assessing the value of using iPad technology to increase access to data and to decrease time spent by police officers on administration e.g. NSW Mobile Notices gives traffic and general duties officers the ability to perform secure, live lookups of vehicle registration, licence and other information, capture relevant geo-location data, attach photos and enter additional information about the incident. Data captured is transmitted back to central systems for processing. The driver can also be provided with on the spot information such as the number of points lost, the cumulative points they have incurred and the total cost of the fine for the infringement. An infringement notice is created as a PDF document, and the driver can request for it to be electronically sent via email or MMS, or delivered via post.<br><br>Police officers in South Australia are piloting technology that enables them to scan fingerprints on the spot. The fingerprint scanning device is connected to the officers' Android-powered smartphones. Once captured, an app cross-references the fingerprint against the regular national police database. If a match is found, further information is provided including any bail conditions, outstanding warranties and vital behavioural clues such as violent tendencies.<br><br>Pilot evaluations and feasibility studies assessing the effectiveness of the above initiatives were not located. |

| Option | Supreme Court upgrade |
|---|---|
| Reference | 3.10.6 |
| Option Code | SCU |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Feasibility Study by Billard Leece Partnership |
| Evidence source(s) | **Billard Leece Partnership 2006**<br>http://www.blp.com.au/projects/supreme-court-of-victoria-redevelopment/ |
| Commentary on certainty | The evidence at this stage is only conceptual undertaken in 2006. No further work has been undertaken since that period. |

## 4A Provide access to the diversity of employment opportunities offered by the central city

| Option | Road space allocation changes |
|---|---|
| Reference | 2.6.8 |
| Option Code | RSA |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | PTV feasibility studies (Route 96), Auditor General reports, academic papers |
| Evidence source(s) | **VicRoads, PTV**<br>http://www.audit.vic.gov.au/publications/20140611-ICT-Improve-Traffic/20140611-ICT-Improve-Traffic.html#s23<br>http://sydney.edu.au/business/__data/assets/pdf_file/0008/28781/majids.pdf<br>http://www.vtpi.org/whoserd.pdf |
| Commentary on certainty | It is already in existence in a number of locations. |

| Option | Transport network price regime |
|---|---|
| Reference | 2.6.9 |
| Option Code | TNP |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Studies and program evaluations from London and Singapore; Grattan Institute analysis. |
| Evidence source(s) | http://content.tfl.gov.uk/central-london-congestion-charging-impacts-monitoring-sixth-annual-report.pdf<br>http://grattan.edu.au/wp-content/uploads/2014/04/070_daley_roads_pricing.pdf<br>http://www.theicct.org/sites/default/files/publications/congestion_apr10.pdf<br>http://www.bbc.com/news/uk-england-london-21451245<br>http://www.ttc-global.com/uploads/The-Costs-of-Implementing-Road-Pricing-Systems-abstract.pdf |
| Commentary on certainty | Evidence from other countries exists that support confidence in the impacts of this intervention at a high level. However, the local context and specific design of the intervention will determine the impacts and the evidence base at this level is quite small. The volume of evidence is significantly greater for road pricing compared with PT pricing, but the potential to draw together an evidence base for PT pricing change impacts is considered to be strong if data sets can be made available. |

| Option | Central city job cap |
|---|---|
| Reference | 4.11.1 |
| Option Code | CCJ |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | By capping the number of the jobs in the CBD, access to existing jobs in the CBD will be less constrained. |
| Evidence source(s) | None found |

| | |
|---|---|
| Commentary on certainty | Anecdotal rather than evidence support. |

| Option | Increased Telecommuting |
|---|---|
| Reference | 4.11.2 |
| Option Code | ITT |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Inquiry in the opportunities for people to use telecommuting and e-business to work remotely in rural and regional Victoria |
| Evidence source(s) | **DEDJTR**<br>http://www.vtpi.org/tdm/tdm9.htm<br>http://www.parliament.vic.gov.au/file_uploads/R_R_Summary_Booklet_Feb_2014E3_dv5DCxGB.pdf |
| Commentary on certainty | Anecdotally even though the technology to facilitate telecommuting has been developed, there is little evidence that it has been taken up to a level which a makes a material impact on the travel to and from the CBD. The Victorian Parliamentary Inquiry into telecommuting is short on data or convincing evidence to support its recommendations that the Victorian government should provide greater support for telecommuting in Victoria. |

| Option | Rail signals and fleet upgrade |
|---|---|
| Reference | 4.11.3 |
| Option Code | RSF |
| **Certainty of evidence rating** | **High** |
| Type of evidence | Policy proposal |
| Evidence source(s) | **DEDJTR/PTV**<br>Media<br>http://www.theage.com.au/victoria/doubters-fear-signal-upgrade-wont-work-on-melbournes-old-and-complex-rail-network-20140912-10gdrf.html<br>http://www.theage.com.au/victoria/signalling-trial-could-revolutionise-transport-but-will-we-benefit-20150523-gh7zr3.html |
| Commentary on certainty | Extensive feasibility studies, although trials are ongoing to test the application and benefits. The Age (Sept 2014) found experts that believe the high-speed signalling technology proposed – called communications-based train control – is unproven on a rail network as old and complex as Melbourne's. |

| Option | High capacity trains - 7 car |
|---|---|
| Reference | 4.11.4 |
| Option Code | HCT3 |
| **Certainty of evidence rating** | **High** |
| Type of evidence | Policy proposal |
| Evidence source(s) | **DEDJTR/PTV**<br>http://ptv.vic.gov.au/projects/rail-projects/new-trains/ |
| Commentary on certainty | Extensive feasibility studies |

| Option | High capacity trains - 10 car |
|---|---|
| Reference | 4.11.5 |
| Option Code | HCT2 |
| **Certainty of evidence rating** | **High** |
| Type of evidence | Policy proposal |
| Evidence source(s) | **DEDJTR/PTV**<br>http://ptv.vic.gov.au/projects/rail-projects/new-trains/ |
| Commentary on certainty | Work has been completed by PTV to confirm that the option would increase train capacity to 1570 persons, an increase of more than a third when compared with the capacity of the 7 car HCMTs that will commence operation on the Melbourne metro network in late 2018. |

| Option | Train platform utilisation |
|---|---|
| Reference | 4.11.6 |
| Option Code | TPU |
| **Certainty of evidence rating** | **High** |
| Type of evidence | Policy proposal<br>PTV website<br>Completed project |
| Evidence source(s) | **PTV**<br>https://ptv.vic.gov.au/about-ptv/victoria-s-pt-network/network-statistics/<br>http://ptv.vic.gov.au/projects/railway-stations/richmond-station-canopies-upgrade-project/ |
| Commentary on certainty | A business case or feasibility study is not publically available. |

| Option | Tram and train fleet modifications |
|---|---|
| Reference | 4.11.7 |
| Option Code | TTF |
| **Certainty of evidence rating** | **High** |
| Type of evidence | Policy proposal |
| Evidence source(s) | **DEDJTR/PTV**<br>http://www.heraldsun.com.au/news/victoria/metro-cuts-seats-from-comeng-trains-to-squeeze-in-more-passengers/news-story/40a47d74b3f4d536fff3fea00e76fd4e |
| Commentary on certainty | Feasibility studies for Melbourne are not in the public domain, but there is strong media and interest group (PTUA) evidence on this issue. |

| Option | Transport network information centralisation |
|---|---|
| Reference | 4.11.8 |
| Option Code | TNI |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Network providers are already implementing technology to capture real data to provide travel information. |

| | |
|---|---|
| Evidence source(s) | **PTV, Google Maps, Toll road operators, VicRoads** https://www.google.com.au/url?sa=t&rct=j&q=&esrc=s&source=web&cd=4&ved=0ahUKEwiE_JvI-_jKAhULE5QKHfhUCAUQFggwMAM&url=http%3A%2F%2Fwww.aitpm.com.au%2FArticleDocuments%2F254%2FTraffic_Engineering_Session_1-Phillip_Blake_Open_transport_and_traffic_data.pdf.aspx&usg=AFQjCNHiDj9DAYRhhfGWiryPFThaUwDKUw&bvm=bv.114195076,d.dGo&cad=rja |
| Commentary on certainty | Real time information is already provided through phone applications and network managers. However, the penetration of these applications is still growing and there is limited evidence available that data and applications are driving changes in travel patterns. |

| **Option** | **Car parking management** |
|---|---|
| Reference | 4.11.9 |
| Option Code | CPM |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Anecdotal |
| Evidence source(s) | DEDJTR, VicRoads and DTF (congestion levy information) are likely sources of information however these are not in the public domain. |
| Commentary on certainty | If CBD parking prices were to increase, fewer people would commute by automobile to the CBD. |

| **Option** | **Doncaster heavy rail line** |
|---|---|
| Reference | 4.11.10 |
| Option Code | DHR |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Preliminary feasibility studies, both local council and state government (PTV) commissioned |
| Evidence source(s) | **DEDJTR/PTV** http://ptv.vic.gov.au/projects/rail-projects/rail-feasibility-studies/ http://blogs.crikey.com.au/theurbanist/2014/12/11/would-a-rail-line-to-doncaster-really-get-cars-off-the-freeway/ http://blogs.crikey.com.au/theurbanist/2015/04/29/should-light-rail-to-doncaster-be-a-key-priority-for-melbourne/ |
| Commentary on certainty | Extensive feasibility studies but have not progressed to full business case assessment. |

| **Option** | **Doncaster tram service** |
|---|---|
| Reference | 4.11.11 |
| Option Code | DTS |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Advocacy by user and community group, local councils |
| Evidence source(s) | http://www.ptua.org.au/policy/network/ http://www.heraldsun.com.au/news/victoria/m-line-on-trams/story-e6frf7kx-1111112492565 |
| Commentary on certainty | There are concerns that the steep gradient means that current rolling-stock on the Melbourne network would not be able to climb |

| | |
|---|---|
| | the hill and additional technology and trams would need to be purchased. It has also been said that tram stops could not be built on the side of a hill, as trams would need to keep momentum to climb it. Further investigation with PTV is required. |

| Option | Doncaster bus improvement |
|---|---|
| Reference | 4.11.12 |
| Option Code | DBI |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | PTV and Bus Association Victoria references to strong patronage growth of DART |
| Evidence source(s) | http://www.busvic.asn.au/images/uploads/links/BAV_Metropolitan_Planning_Strategy_Submission-March_2013.pdf |
| Commentary on certainty | Limited evidence available publicly on the existing capacity constraints on the DART services. |

| Option | Strategic transit oriented development corridors |
|---|---|
| Reference | 4.11.13 |
| Option Code | STO |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Proposals, academic literature |
| Evidence source(s) | Plan Melbourne 2015 Review- report by the Ministerial Advisory Committee<br>TTF paper - the benefits of Transit Oriented Development<br>http://www.udiavic.com.au/files/document/filename/292/MAC%202015%20Final%20Report%20(002).pdf<br>http://www.vtpi.org/tranben.pdf |
| Commentary on certainty | Not currently incorporated into Plan Melbourne, but has been recommended by the Plan Melbourne Ministerial Advisory Committee |

| Option | Geelong rail electrification |
|---|---|
| Reference | 4.11.14 |
| Option Code | GRE |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Anecdotal and media, and inferences from past electrification projects |
| Evidence source(s) | http://www.theage.com.au/victoria/some-in-sunbury-not-galvanised-by-train-electrification-20120812-242v3.html<br>http://geelongindy.com.au/indy/2013-04-04/report-on-geelong-rail-future-electric-2/ |
| Commentary on certainty | No feasibility studies available in the public domain for this option. |

| Option | Bendigo rail full metropolitan separation |
|---|---|
| Reference | 4.11.15 |
| Option Code | BRF |

| | |
|---|---|
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Policy Proposal<br>Preliminary feasibility study<br>PTV strategic document<br>Newspaper articles |
| Evidence source(s) | **PTV**<br>Network Development Plan (2012) – http://ptv.vic.gov.au/about-ptv/ptv-data-and-reports/network-development-plan-metropolitan-rail/<br>**Newspaper articles** – http://www.theage.com.au/victoria/bungled-timetable-revamp-leaves-only-two-new-metro-trains-from-36-billion-link-20150621-ghtn5p.html |
| Commentary on certainty | A business case or feasibility study is not publically available. |

| **Option** | **Geelong and Werribee rail upgrade** |
|---|---|
| Reference | 4.11.16 |
| Option Code | GWR |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Preliminary feasibility study<br>PTV strategic document<br>Newspaper articles |
| Evidence source(s) | **PTV**<br>Network Development Plan (2012) – http://ptv.vic.gov.au/about-ptv/ptv-data-and-reports/network-development-plan-metropolitan-rail/ |
| Commentary on certainty | A business case or feasibility study is not publically available. |

| **Option** | **Rowville heavy rail line** |
|---|---|
| Reference | 4.11.17 |
| Option Code | RHR |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Preliminary feasibility studies, both local council and state government (PTV) commissioned |
| Evidence source(s) | **DEDJTR/PTV**<br>http://ptv.vic.gov.au/assets/PTV/PTV%20docs/Feasibility-Studies/Rowville-Rail-Study-Stage-Two-Report-PTV.pdf<br>http://blogs.crikey.com.au/theurbanist/2012/03/13/do-new-suburban-rail-lines-always-make-sense/ |
| Commentary on certainty | Extensive feasibility studies but have not progressed to full business case assessment.<br>It is understood that no strategic transport modelling has been undertaken on this option since 2011, which weakens the evidence base given that modelling techniques and underlying modelling parameters have changed and been strengthened over this period. |

| **Option** | **Central city tram network extension** |
|---|---|
| Reference | 4.11.18 |
| Option Code | CCT |

| | |
|---|---|
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Industry estimate |
| Evidence source(s) | **Industry estimate**<br>https://melbpt.wordpress.com/tram-construction-costs/ |
| Commentary on certainty | A business case or feasibility study is not publically available. |

| **Option** | **Melbourne Metro - Stage 2** |
|---|---|
| Reference | 4.11.19 |
| Option Code | MMS |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Possible policy proposal, included in PTV's reference case for future network development. |
| Evidence source(s) | PTV internal assessments of very long run network needs - best description in the 2012 Network Development Plan. |
| Commentary on certainty | It is understood that no detailed design or modelling has been undertaken of this option. |

| **Option** | **New underground metro rail system** |
|---|---|
| Reference | 4.11.20 |
| Option Code | NUM |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Industry opinion piece<br>Newspaper articles |
| Evidence source(s) | **Industry opinion piece**<br>http://blogs.crikey.com.au/theurbanist/2012/10/04/does-melbourne-need-a-subway/ |
| Commentary on certainty | Conceptual only |

| **Option** | **City loop reconfiguration** |
|---|---|
| Reference | 4.11.21 |
| Option Code | CLR |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Feasibility studies<br>Planning document |
| Evidence source(s) | **DEDJTR/PTV**<br>Feasibility studies - unpublished<br>**PTV**<br>Network Development Plan (2012) – http://ptv.vic.gov.au/about-ptv/ptv-data-and-reports/network-development-plan-metropolitan-rail/ |
| Commentary on certainty | It is understood that cost and benefit analysis has been completed in a feasibility study. This information has not been provided to Deloitte and is not in the public domain. |

| **Option** | **Bicycle highways through the central city** |
|---|---|

| | |
|---|---|
| Reference | 4.11.22 |
| Option Code | BHT |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Unsolicited proposals for the development of networks in Melbourne, and international examples. |
| Evidence source(s) | Media<br>http://www.heraldsun.com.au/news/victoria/consortium-pushes-melbourne-plan-for-elevated-cycle-freeway-to-keep-bikes-and-cars-separate/news-story/55017b0a9df87fcb3f0505169d08845d<br>Academic<br>http://www.planetizen.com/node/81542/responding-bike-improvement-skeptics<br>Bicycle advocate groups<br>http://www.victorian-cycling-network.org/bicycle-routes/melbourne-planned/melbourne-b1veloway |
| Commentary on certainty | It is expected that additional studies have been undertaken by transport agencies in Victorian and other Australian states, which are not available in the public domain. |

| **Option** | **Water taxis/buses/ferries to the central city** |
|---|---|
| Reference | 4.11.23 |
| Option Code | WTB |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Trials have been undertaken from Werribee region. |
| Evidence source(s) | **DEDJTR**<br>Melbourne Ferries Background Study (2013) - http://www.dtpli.vic.gov.au/__data/assets/pdf_file/0007/228625/Melbourne-Ferries-Background-Study-Final-21032013-WebFinal.pdf<br>Media - http://www.theage.com.au/victoria/bay-ferries-would-struggle-to-be-feasible-study-finds-20120529-1zheh.html |
| Commentary on certainty | Still in trial phase; the 2013 makes reference to internal Department of Planning and Community Development work on economic and commercial feasibility analysis. |

| **Option** | **Cross city road tunnel** |
|---|---|
| Reference | 4.11.24 |
| Option Code | CCR |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Conceptual |
| Evidence source(s) | None identified. |
| Commentary on certainty | Conceptual |

| **Option** | **Hoddle Street/Punt Road public transport prioritisation** |
|---|---|
| Reference | 2.6.10 |
| Option Code | HSP1 |

| | |
|---|---|
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Hoddle street study (2010/2011), number of current feasibility studies relating to streamlining and POA projects. |
| Evidence source(s) | **DEDJTR and VicRoads**<br>https://www.vicroads.vic.gov.au/planning-and-projects/melbourne-road-projects/punt-road-hoddle-street<br>Media<br>http://www.theage.com.au/victoria/radical-plan-to-ease-hoddle-street-gridlock-20150321-1m4iyz.html |
| Commentary on certainty | Preliminary feasibility study<br>Media reports say that VicRoads was looking into this option and would report to government by the end of 2015. |

| **Option** | **Hoddle Street / Punt Road Traffic Management Systems** |
|---|---|
| Reference | 4.11.26 |
| Option Code | HSP2 |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Hoddle street study (2010/2011), number of current feasibility studies relating to streamlining and POA projects. |
| Evidence source(s) | **DEDJTR and VicRoads**<br>https://www.vicroads.vic.gov.au/planning-and-projects/melbourne-road-projects/punt-road-hoddle-street<br>Media<br>http://www.theage.com.au/victoria/radical-plan-to-ease-hoddle-street-gridlock-20150321-1m4iyz.html |
| Commentary on certainty | Preliminary feasibility study |

| **Option** | **Regional rail eastern corridor dedicated rail track** |
|---|---|
| Reference | 4.11.27 |
| Option Code | RRE1 |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Policy Proposal<br>Preliminary feasibility study |
| Evidence source(s) | **PTV**<br>Network Development Plan (2012)<br>http://ptv.vic.gov.au/about-ptv/ptv-data-and-reports/network-development-plan-metropolitan-rail/ |
| Commentary on certainty | It is believed that a preliminary feasibility study has been completed however no information has been provided to Deloitte. PTV's Network Development Plan does not mention this potential project. |

| **Option** | **CityLink to Western Ring road connection** |
|---|---|
| Reference | 2.6.7 |
| Option Code | EWW |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Preliminary feasibility study<br>Project fact sheet<br>Project audit |

| | |
|---|---|
| Evidence source(s) | **DEDJTR**<br>Preliminary feasibility study<br>**Victorian Government**<br>Western Section of East West Link Project Overview<br>**Victorian Auditor-General**<br>East West Link Project Audit (2015)<br>http://www.audit.vic.gov.au/publications/20151209-East-West-Link/20151209-East-West-Link.pdf |
| Commentary on certainty | Some feasibility work undertaken as part of East West investigations but work has not proceeded substantially past the planning stage. A business case or feasibility study is not publically available. |

| **Option** | **Eastern Freeway to CityLink connection** |
|---|---|
| Reference | 4.11.28 |
| Option Code | EWE |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Short Form Business Case<br>Project audit |
| Evidence source(s) | **DEDJTR**<br>East West Link Stage 1 Short Form Business Case (2013)<br>**Victorian Auditor-General**<br>East West Link Project Audit (2015)<br>http://www.audit.vic.gov.au/publications/20151209-East-West-Link/20151209-East-West-Link.pdf |
| Commentary on certainty | The Victorian Auditor-General's Office report referenced above says:<br>*The business case, which is a critical step in any major project, did not provide a sound basis for the government's decision to commit to the investment because it did not clearly establish the need for the investment through a robust analysis of the costs, benefits and risks of reasonable options.*<br>The full business case is not publically available. |

| **Option** | **Regional Rail electrification** |
|---|---|
| Reference | 4.11.30 |
| Option Code | RRE2 |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Conceptual only<br>PTV strategic document |
| Evidence source(s) | **Past project information**<br>http://www.laingorourke.com/our-work/all-projects/sunbury-electrification.aspx<br>**PTV**<br>Network Development Plan (2012) |
| Commentary on certainty | As part of PTV's Network Development Plan, RRRL will be electrified and turned into the Grovedale-South Yarra Link some time before 2032. No other information is publically available. |

| **Option** | **Geelong fast rail** |
|---|---|
| Reference | 4.11.31 |
| Option Code | GFR |
| **Certainty of evidence rating** | **Low** |

| | |
|---|---|
| Type of evidence | Conceptual |
| Evidence source(s) | **DEDJTR and PTV**<br>http://www.austrak.com/files/documents/project_sheet_regional_fast_rail.pdf.<br>https://en.wikipedia.org/wiki/Regional_Fast_Rail_project<br><br>**Private sector interest groups** -<br>http://www.monorailsaustralia.com.au/mglm.html |
| Commentary on certainty | Conceptual |

| **Option** | **Public transport timetabling** |
|---|---|
| Reference | 4.11.32 |
| Option Code | PTT |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Conceptual |
| Evidence source(s) | **DEDJTR and PTV**<br>http://ptv.vic.gov.au/assets/PTV/PTV%20docs/Melbourne-Metro/MM-Concept-of-Operations-June-2013.pdf |
| Commentary on certainty | Conceptual |

| **Option** | **Employment outside central city incentivisation** |
|---|---|
| Reference | 4.11.33 |
| Option Code | EOC |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Conceptual and academic |
| Evidence source(s) | Has been referred to DEDJTR (Transport group)<br>http://www98.griffith.edu.au/dspace/bitstream/handle/10072/43553/75215_1.pdf?sequence=1 |
| Commentary on certainty | Conceptual, with limited evidence found to-date to support this option. As Burke et al (2011) notes, planned employment decentralisation has received very little scholarly attention in recent decades. |

| **Option** | **Melton rail extension** |
|---|---|
| Reference | 1.3.11 |
| Option Code | MRE1 |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Included in PTV's Network Development Plan |
| Evidence source(s) | **PTV NDP**<br>https://s3-ap-southeast-2.amazonaws.com/ptvic/NDPMR+-+Network+Development+Plan+-+Metropolitan+Rail+-+FINAL+for+web+-+up.pdf<br>http://www.delwp.vic.gov.au/__data/assets/pdf_file/0018/308511/Victoria-in-Future-2015-WEB.pdf<br>http://www.audit.vic.gov.au/publications/2009-10/20100623-Major-Rail-Full-Report.pdf |

| | |
|---|---|
| Commentary on certainty | No detailed feasibility study or analysis is available in the public domain. |

| Option | Wallan rail electrification |
|---|---|
| Reference | 1.3.12 |
| Option Code | WRE1 |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | PTV's Network Development Plan |
| Evidence source(s) | **Network Development Plan (2012)**<br>http://ptv.vic.gov.au/about-ptv/ptv-data-and-reports/network-development-plan-metropolitan-rail/<br>https://s3-ap-southeast-2.amazonaws.com/ptvic/NDPMR+-+Network+Development+Plan+-+Metropolitan+Rail+-+FINAL+for+web+-+up.pdf<br>**PTUA**<br>http://www.danielbowen.com/2012/04/29/vline-timetables-circa-2021/ |
| Commentary on certainty | No detailed feasibility study or analysis is available in the public domain. |

| Option | Wollert rail extension |
|---|---|
| Reference | 1.3.14 |
| Option Code | WRE2 |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Local council advocacy |
| Evidence source(s) | Local councils<br>https://www.whittlesea.vic.gov.au/building-planning-and-transport/roads-and-transport/future-transport-needs/integrated-transport-strategy |
| Commentary on certainty | This project does not feature in PTV's 2012 Network Development Plan. Consultation with PTV is required to determine whether it has been included in more recent (unpublished) versions of the Network Development Plan (i.e. the 2015 version), and the rationale for its inclusion. |

| Option | Clyde rail extension |
|---|---|
| Reference | 1.3.15 |
| Option Code | CRE |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Strategic Plan<br>Media |
| Evidence source(s) | **Network Development Plan (2012)**<br>http://ptv.vic.gov.au/about-ptv/ptv-data-and-reports/network-development-plan-metropolitan-rail/<br>http://www.heraldsun.com.au/leader/south-east/support-grows-for-cranbourne-rail-line-extension-government-urged-to-listen/news-story/3fae5d745fa57b22461605aabe7e0a32 |
| Commentary on certainty | The best source of additional information on this option, which was unavailable for use in this exercise, is PTV's 2015 Network Development Plan. |

| Option | Wyndham Vale to Werribee rail extension |
|---|---|
| Reference | 1.3.16 |
| Option Code | WVW |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Included in PTV's Network Development Plan |
| Evidence source(s) | **Network Development Plan (2012)** http://ptv.vic.gov.au/about-ptv/ptv-data-and-reports/network-development-plan-metropolitan-rail/ |
| Commentary on certainty | The best source of additional information on this option, which was unavailable for use in this exercise, is PTV's 2015 Network Development Plan. |

| Option | Advanced Traffic Management |
|---|---|
| Reference | 4.11.35 |
| Option Code | ATM |
| **Certainty of evidence rating** | **High** |
| Type of evidence | Government Programs in Victoria |
| Evidence source(s) | **VicRoads, Managed Freeways Freeway Ramp Signals Handbook, July 2013** https://www.vicroads.vic.gov.au/business-and-industry/design-and-management/design-standards-and-manuals/managed-freeway-manuals |
| Commentary on certainty | Managed Motorways have already been rolled out on sections of Victoria's freeway network |

## 4B Provide better links to non-central city employment centres

| Option | Road space allocation changes |
|---|---|
| Reference | 2.6.8 |
| Option Code | RSA |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | PTV feasibility studies (Route 96), Auditor General reports, academic papers |
| Evidence source(s) | **VicRoads, PTV**<br>http://www.audit.vic.gov.au/publications/20140611-ICT-Improve-Traffic/20140611-ICT-Improve-Traffic.html#s23<br>http://sydney.edu.au/business/__data/assets/pdf_file/0008/28781/majids.pdf |
| Commentary on certainty | It is already in existence in a number of locations. |

| Option | Transport network price regime |
|---|---|
| Reference | 2.6.9 |
| Option Code | TNP |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Studies and program evaluations from London and Singapore; Grattan Institute analysis. |
| Evidence source(s) | http://content.tfl.gov.uk/central-london-congestion-charging-impacts-monitoring-sixth-annual-report.pdf<br>http://grattan.edu.au/wp-content/uploads/2014/04/070_daley_roads_pricing.pdf<br>http://www.theicct.org/sites/default/files/publications/congestion_apr10.pdf<br>http://www.bbc.com/news/uk-england-london-21451245<br>http://www.theage.com.au/victoria/melbourne-congestion-map-a-case-of-stuck-in-the-middle-with-you-and-everybody-else-20151108-gktnnj.html |
| Commentary on certainty | Evidence from other countries exists that support confidence in the impacts of this intervention at a high level. However, the local context and specific design of the intervention will determine the impacts and the evidence base at this level is quite small. The volume of evidence is significantly greater for road pricing compared with PT pricing, but the potential to draw together an evidence base for PT pricing change impacts is considered to be strong if data sets can be made available. |

| Option | SmartBus service provision increase |
|---|---|
| Reference | 4.12.1 |
| Option Code | SSP |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Industry advocacy article<br>Industry advocacy paper<br>ABS data |
| Evidence source(s) | **Australian Bureau of Statistics**<br>http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6401.0Dec%202015?OpenDocument |

| | |
|---|---|
| | **Committee for Melbourne**<br>Submission to the Victorian Competition and Efficiency Commission's Inquiry into Transport Congestion (2005) |
| Commentary on certainty | Existing information on SmartBus service implementation is available but there is no data on potential SmartBus routes. |

| **Option** | **Residential and commercial property densification** |
|---|---|
| Reference | 4.12.2 |
| Option Code | RCP |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Plan Melbourne |
| Evidence source(s) | Plan Melbourne Refresh - unpublished |
| Commentary on certainty | Plan Melbourne has recognised that as Melbourne's population increases it will need to ensure there is appropriate planning provisions to ensure density of residential and commercial land uses around identified employment centres. |

| **Option** | **Mass transit network employment centre de-coupling** |
|---|---|
| Reference | 4.12.3 |
| Option Code | MTN |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Academic article<br>Industry estimates<br>Industry advocacy paper |
| Evidence source(s) | **Graham Currie**<br>Bus Rapid Transit in Australasia: Performance, Lessons Learned and Futures (2006)<br>http://scholarcommons.usf.edu/cgi/viewcontent.cgi?article=1282&context=jpt<br>**Industry estimates**<br>https://melbpt.wordpress.com/rail-construction-costs/<br>https://melbpt.wordpress.com/tram-construction-costs/<br>http://bic.asn.au/information-for-moving-people/bus-rapid-transit<br>**Tourism and Transport Forum**<br>The Benefits of Light Rail (2010) |
| Commentary on certainty | There does not appear to be any documentation in the public domain on potential mass transit interventions for individual employment centres. |

| **Option** | **Arterial road network employment centre enhancements** |
|---|---|
| Reference | 4.12.4 |
| Option Code | ARN |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | State Government strategic document<br>State Road Authority planning and projects<br>State Road Authority annual report |
| Evidence source(s) | **State Government**<br>Plan Melbourne (2014)<br>**VicRoads** |

| | |
|---|---|
| | https://www.vicroads.vic.gov.au/planning-and-projects/melbourne-road-projects/east-werribee-transport-improvement-project<br>VicRoads Annual Report 14-15 |
| Commentary on certainty | Plan Melbourne identifies the need for an arterial road program with short term initiatives:<br>- complete upgrades to arterial roads in established outer suburbs and growth areas including duplication, widening and intersection and interchange upgrades<br>- establish and commence implementation of an arterial road program to serve existing and future growth areas of Melbourne<br>- investigate the reservation of land for future arterial roads and upgrades in the growth areas and outer suburbs.<br>However, this option is not well scoped and no feasibility studies have been completed.<br><br>In 2014 VicRoads received $1.8 million over three years to plan and prepare a business case for the future construction of the Westall Road Extension. This project is currently in the early phase of planning. |

| **Option** | **Rowville heavy rail line** |
|---|---|
| Reference | 4.11.17 |
| Option Code | RHR |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Preliminary feasibility studies, both local council and state government (PTV) commissioned |
| Evidence source(s) | **DEDJTR/PTV**<br>http://ptv.vic.gov.au/assets/PTV/PTV%20docs/Feasibility-Studies/Rowville-Rail-Study-Stage-Two-Report-PTV.pdf<br>http://blogs.crikey.com.au/theurbanist/2012/03/13/do-new-suburban-rail-lines-always-make-sense/ |
| Commentary on certainty | Extensive feasibility studies but have not progressed to full business case assessment.<br>It is understood that no strategic transport modelling has been undertaken on this option since 2011, which weakens the evidence base given that modelling techniques and underlying modelling parameters have changed and been strengthened over this period. |

| **Option** | **Strategic transit oriented development corridors** |
|---|---|
| Reference | 4.11.13 |
| Option Code | STO |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Proposals, academic literature |
| Evidence source(s) | Plan Melbourne 2015 Review- report by the Ministerial Advisory Committee<br>TTF paper - the benefits of Transit Oriented Development<br>http://www.udiavic.com.au/files/document/filename/292/MAC%202015%20Final%20Report%20(002).pdf<br>http://www.vtpi.org/tranben.pdf |
| Commentary on certainty | Not currently incorporated into Plan Melbourne, but has been recommended by the Plan Melbourne Ministerial Advisory Committee. |

| Option | Local bus service standards |
|---|---|
| Reference | 1.3.8 |
| Option Code | LBS |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | State Government strategic document<br>Ministerial Advisory Committee report<br>Industry advocacy paper<br>ABS data |
| Evidence source(s) | **State Government**<br>Plan Melbourne Refresh Discussion Paper (2015)<br>**Ministerial Advisory Committee**<br>Plan Melbourne 2015 Review<br>https://s3-ap-southeast-2.amazonaws.com/ehq-production-australia/45189c582e1cf1f4e6b12125a1ebef13d682729f/documents/attachments/000/028/064/original/MAC_2015_Final_Report.pdf?1445230381<br>**Australian Bureau of Statistics**<br>http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6401.0Dec%202015?OpenDocument<br>**Committee for Melbourne**<br>Submission to the Victorian Competition and Efficiency Commission's Inquiry into Transport Congestion (2005) |
| Commentary on certainty | Plan Melbourne supports the implementation of minimal local bus service levels of 20-minute frequency, 7 days a week, from at least 6am to 9pm. It has referred to the expansion of bus services in all growth areas so that most residents live within 800 metres of either a premium or connector service for consideration as part of transport network planning. |

| Option | Employment outside central city incentivisation |
|---|---|
| Reference | 4.11.33 |
| Option Code | EOC |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Conceptual and academic |
| Evidence source(s) | Has been referred to DEDJTR (Transport group)<br>http://www98.griffith.edu.au/dspace/bitstream/handle/10072/43553/75215_1.pdf?sequence=1 |
| Commentary on certainty | Conceptual, with limited evidence found to-date to support this option. As Burke et al (2011) notes, planned employment decentralisation has received very little scholarly attention in recent decades. |

| Option | CityLink to Western Ring road connection |
|---|---|
| Reference | 2.6.7 |
| Option Code | EWW |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Preliminary feasibility study<br>Project fact sheet<br>Project audit |

| | |
|---|---|
| Evidence source(s) | **DEDJTR**<br>Preliminary feasibility study<br>**Victorian Government**<br>Western Section of East West Link Project Overview<br>**Victorian Auditor-General**<br>East West Link Project Audit (2015)<br>http://www.audit.vic.gov.au/publications/20151209-East-West-Link/20151209-East-West-Link.pdf |
| Commentary on certainty | Some feasibility work undertaken as part of East West investigations but work has not proceeded substantially past the planning stage. A business case or feasibility study was not publically available. |

| **Option** | **Eastern Freeway to CityLink connection** |
|---|---|
| Reference | 4.11.28 |
| Option Code | EWE |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Short Form Business Case<br>Project audit |
| Evidence source(s) | **DEDJTR**<br>East West Link Stage 1 Short Form Business Case (2013)<br>**Victorian Auditor-General**<br>East West Link Project Audit (2015)<br>http://www.audit.vic.gov.au/publications/20151209-East-West-Link/20151209-East-West-Link.pdf |
| Commentary on certainty | The Victorian Auditor-General's Office report referenced above says:<br>*The business case, which is a critical step in any major project, did not provide a sound basis for the government's decision to commit to the investment because it did not clearly establish the need for the investment through a robust analysis of the costs, benefits and risks of reasonable options.*<br>The full business case is not publically available. |

| **Option** | **Public transport timetabling** |
|---|---|
| Reference | 4.11.32 |
| Option Code | PTT |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Conceptual |
| Evidence source(s) | **DEDJTR and PTV**<br>http://ptv.vic.gov.au/assets/PTV/PTV%20docs/Melbourne-Metro/MM-Concept-of-Operations-June-2013.pdf |
| Commentary on certainty | Conceptual |

| **Option** | **Melbourne Airport heavy rail line** |
|---|---|
| Reference | 5.2.3 |
| Option Code | MAH |
| **Certainty of evidence rating** | **Medium** |

| | |
|---|---|
| Type of evidence | Planning study<br>Consultancy report<br>NSW parliamentary report<br>Industry position paper<br>Newspaper articles |
| Evidence source(s) | **PTV**<br>Melbourne Airport Rail Link: Study Overview and Findings (2013)<br>Network Development Plan (2012)<br>**Parsons Brinckerhoff**<br>Melbourne Airport Rail Link Alignment Alternatives Study Volume 2: Technical Report (2012)<br>http://pandora.nla.gov.au/pan/146229/20140508-1455/Melbourne-Airport-Rail-Link-Study-Technical-Report.pdf<br>**New South Wales Parliament**<br>Reducing or removing station access fees at Sydney Airport (2014)<br>https://www.parliament.nsw.gov.au/prod/parlment/committee.nsf/0/08cf3ef25c31f173ca257c8d000046ce/$FILE/Final%20Report%20130228.pdf<br>**Tourism and Transport Forum**<br>Rapid Buses, Road and Rail: Ground transport solutions to meet Melbourne Airport's passenger growth to 2050 (2013)<br>**Newspaper articles**<br>Various |
| Commentary on certainty | Preliminary work has been completed |

| **Option** | **North-East link** |
|---|---|
| Reference | 5.14.6 |
| Option Code | NEL |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Preliminary alignment work<br>DEDJTR strategy document<br>Local council strategy document<br>Industry advocacy paper |
| Evidence source(s) | **DEDJTR**<br>Victorian Transport Plan (2008)<br>**NORTH Link**<br>Northern Horizons Summary Report (2014)<br>**Tourism and Transport Forum Australia**<br>Victorian Election 2010 Transport Policy Proposals<br>**VicRoads**<br>Preliminary alignment work |
| Commentary on certainty | Limited detail on the cost and design of the project. Preliminary alignment work completed by VicRoads has not been provided to Deloitte. |

## 4C Improve access to early childhood care facilities

| Option | School facility use for Out of School Hours Care |
|---|---|
| Reference | 4.13.1 |
| Option Code | SFU |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Industry commissioned reviews and studies |
| Evidence source(s) | **Australia**<br>Independent research<br>http://eprints.qut.edu.au/17810/1/Jennifer_Cartmel_Thesis.pdf<br><br>**Australian Council for Educational Research**<br>http://research.acer.edu.au/cgi/viewcontent.cgi?article=1003&context=aer |
| Commentary on certainty | Strong evidence to suggest co-location is positive and provides benefits to students and local community with close proximity to school and OHSC. |

| Option | Early childhood education corporate office facilities |
|---|---|
| Reference | 4.13.2 |
| Option Code | ECE3 |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Research articles |
| Evidence source(s) | http://www.fastcompany.com/3036419/second-shift/the-case-for-onsite-daycare<br>http://www.theguardian.com/sustainable-business/2016/jan/13/babies-at-work-onsite-childcare-office-goldman-sachs-addison-lee |
| Commentary on certainty | No business case or impact assessment has been done on this. Evidence certainty is minimal. |

| Option | Early childhood education availability |
|---|---|
| Reference | 4.13.3 |
| Option Code | ECE1 |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | United Kingdom policy |
| Evidence source(s) | https://www.gov.uk/help-with-childcare-costs/free-childcare-and-education-for-2-to-4-year-olds<br>https://www.gov.uk/guidance/2-year-old-early-education-entitlement-local-authority-guide<br>https://www.gov.uk/government/publications/2010-to-2015-government-policy-childcare-and-early-education/2010-to-2015-government-policy-childcare-and-early-education |
| Commentary on certainty | In the UK, free childcare is offered to 2-year olds for eligible families. A similar option could be offered and would also contribute to reducing disadvantage. |

| Option | Early childhood education centralised funding model |
|---|---|
| Reference | 4.13.4 |
| Option Code | ECE2 |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | International Government policies |
| Evidence source(s) | **Scottish Government Social Research, March 2013**<br>Early Childhood Education and Care Provision: International Review of Policy, Delivery and Funding<br>http://www.nls.uk/scotgov/2013/9781782564164.pdf |
| Commentary on certainty | International evidence indicates funding and management of the Early Childhood sub-sector generally occurs at a local level.<br>In Scotland & England all funding streams are allocated to local councils to manage within their council. This provides oversight within a network of schools but not country-wide.<br><br>Sweden has a fully integrated system for Early Childhood provision from 12 months to 6 years, the system is relatively decentralised with funding responsibility residing with local authorities. |

## 5A Improve the efficiency of freight supply chains through infrastructure

| Option | Transport network price regime |
|---|---|
| Reference | 2.6.9 |
| Option Code | TNP |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Academic articles<br>Industry submissions and discussion papers<br>International programs and studies |
| Evidence source(s) | **National Transport Commission**<br>Heavy Vehicle Pricing Option: Development and Assessment Framework Discussion Paper (2010)<br>**Australian Trucking Association**<br>http://www.truck.net.au/sites/default/files/submissions/CRRP%20Pricing%20Options%20Paper_ATA%20response.pdf<br>**Australasian Railway Association**<br>http://transportreform.org/file.php?fileID=26<br>**Institute of Transport and Logistics Studies**<br>http://sydney.edu.au/business/__data/assets/pdf_file/0008/107774/ITLS-WP-11-17.pdf<br>**International Transport Forum**<br>http://www.internationaltransportforum.org/Proceedings/Lisbon2009/2-Gille.pdf<br>http://www.audit.vic.gov.au/publications/20130417-Managing-Traffic-Congestion/20130417-Managing-Traffic-Congestion.html |
| Commentary on certainty | No Australian business case/feasibility studies have been completed to date, however several Australian studies/papers argue in favour of national transport pricing reform. There is evidence of international pricing regime success. |

| Option | Port of Melbourne to metropolitan container shuttle |
|---|---|
| Reference | 5.14.1 |
| Option Code | PMM |
| **Certainty of evidence rating** | **High** |
| Type of evidence | DEDJTR business case<br>DEDJTR strategic documents<br>DEDJTR discussion paper<br>PoMC strategic document<br>Senate debate |
| Evidence source(s) | **DEDJTR**<br>http://www.parliament.vic.gov.au/images/stories/committees/pomsc/Transcripts/Port_Rail_Shuttle_Project_Presentation.pdf<br>http://www.vta.com.au/LinkClick.aspx?fileticket=lvuKam2xEps%3D&tabid=1025&language=en-US<br>Victorian Freight and Logistics Plan (2013)<br>Shaping Melbourne's Freight Future (2010)<br>**Port of Melbourne Corporation**<br>Port Development Strategy 2035 (2009)<br>**Senate debate**<br>http://www.openaustralia.org.au/senate/?id=2015-11-12.46.1<br>**Review of reports relating to the MIS**<br>http://www.parliament.vic.gov.au/images/stories/committees/pomsc/Other_Docs/Ref_4_-_Freedom_of_Information_Report_Summary.pdf |

| | |
|---|---|
| Commentary on certainty | |

| Option | HPFV network completion |
|---|---|
| Reference | 2.6.4 |
| Option Code | HPF |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | DEDJTR and local council strategic documents<br>Strategic document<br>Newspaper articles<br>VicRoads planning and project website<br>Victorian Auditor-General's Office audit<br>RACV website<br>Consultancy reports |
| Evidence source(s) | **VicRoads**<br>https://www.vicroads.vic.gov.au/planning-and-projects/regional-road-projects<br>**DEDJTR**<br>Victorian Transport Plan (2008)<br>Moving More With Less (2013)<br>Victorian Freight and Logistics Plan (2013)<br>**Great South Coast**<br>Regional Transport Strategy (2014)<br>http://www.railfreightalliance.com/wp-content/uploads/2014/06/Great-South-Coast-Regional-Transport-Strategy.pdf<br>**Newspaper articles**<br>Various<br>**Victorian Auditor-General's Office**<br>http://www.audit.vic.gov.au/publications/20130821-Transport-infrastructure/20130821-Transport-infrastructure.html<br>**RACV**<br>http://www.racvgrowingpains.com.au/wps/wcm/connect/racv/growing-pains/home/regional-victoria/home/your-municipality/mildura<br>**National Infrastructure Construction Schedule**<br>https://www.nics.gov.au/Home/Planning<br>**AECOM**<br>Horsham Bypass Addendum Report for Option D:Cost Benefit Analysis (2014)<br>Bulla Bypass/Melbourne Airport Link Planning Study Transport Modelling (2013) |
| Commentary on certainty | Feasibility studies have been completed; however these are cumbersome for the users of the transport network to find. These documents have not been provided to Deloitte. |

| Option | Freight precinct land use |
|---|---|
| Reference | 5.14.2 |
| Option Code | FPL |
| **Certainty of evidence rating** | **High** |
| Type of evidence | DEDJTR strategic document<br>Deloitte data (land values) |
| Evidence source(s) | **DEDJTR**<br>Victorian Freight and Logistics Plan (2013) |
| Commentary on certainty | Modelling has been undertaken on the benefits of freight precincts. |

| Option | Webb Dock freight rail access |
|---|---|
| Reference | 5.14.3 |
| Option Code | WDF |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | PoMC strategic document<br>Newspaper articles |
| Evidence source(s) | **Port of Melbourne Corporation**<br>Port Development Strategy 2035 (2009)<br>**Newspaper articles**<br>Various |
| Commentary on certainty | A business case or feasibility study was not publically available. |

| Option | North-East link |
|---|---|
| Reference | 5.14.6 |
| Option Code | NEL |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Preliminary alignment work<br>DEDJTR strategy document<br>Local council strategy document<br>Industry advocacy paper |
| Evidence source(s) | **DEDJTR**<br>Victorian Transport Plan (2008)<br>**NORTH Link**<br>Northern Horizons Summary Report (2014)<br>**Tourism and Transport Forum Australia**<br>Victorian Election 2010 Transport Policy Proposals<br>**VicRoads**<br>Preliminary alignment work |
| Commentary on certainty | Limited detail on the cost and design of the project. A business case or feasibility study was not publically available. |

| Option | CityLink to Western Ring road connection |
|---|---|
| Reference | 2.6.7 |
| Option Code | EWW |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Business Case<br>Project fact sheet<br>Project audit |
| Evidence source(s) | **DEDJTR**<br>East West Link Business Case (2013)<br>**Victorian Government**<br>Western Section of East West Link Project Overview<br>**Victorian Auditor-General**<br>East West Link Project Audit (2015)<br>http://www.audit.vic.gov.au/publications/20151209-East-West-Link/20151209-East-West-Link.pdf |
| Commentary on certainty | Some feasibility work undertaken as part of East West investigations but work has not proceeded substantially past the planning stage. A business case or feasibility study was not |

| | |
|---|---|
| | publically available. |

| Option | Eastern Freeway to CityLink connection |
|---|---|
| Reference | 4.11.28 |
| Option Code | EWE |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Short Form Business Case<br>Business Case<br>Project audit |
| Evidence source(s) | **DEDJTR**<br>East West Link Stage 1 Short Form Business Case (2013)<br>East West Link Business Case (2013)<br>**Victorian Auditor-General**<br>East West Link Project Audit (2015)<br>http://www.audit.vic.gov.au/publications/20151209-East-West-Link/20151209-East-West-Link.pdf |
| Commentary on certainty | The Victorian Auditor-General's Office report referenced above says: *The business case, which is a critical step in any major project, did not provide a sound basis for the government's decision to commit to the investment because it did not clearly establish the need for the investment through a robust analysis of the costs, benefits and risks of reasonable options.*<br>The full business case is not publically available. |

| Option | Melbourne Airport new road link |
|---|---|
| Reference | 5.14.7 |
| Option Code | MAN |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Project fact sheet |
| Evidence source(s) | **Melbourne Airport**<br>http://melbourneairport.com.au/docs/lr-024_map-mel-air-fact-sh-airport-drive_cd4.pdf |
| Commentary on certainty | No information is available specific to this option. |

| Option | Outer Metropolitan Ring Road |
|---|---|
| Reference | 5.2.7 |
| Option Code | Unknown |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | VicRoads planning and projects website<br>Victorian Government planning study<br>Consultancy reports<br>Strategy documents<br>Newspaper articles |
| Evidence source(s) | **Victorian Government**<br>Alignment of Outer Metropolitan Ring / E6 Transport Corridor Fact Sheet (2009) |

| | |
|---|---|
| | Planning Assessment Report (2009)<br>**VicRoads**<br>https://www.vicroads.vic.gov.au/planning-and-projects/regional-road-projects<br>Bulla Bypass/Melbourne Airport Link to Outer Metropolitan Ring Planning Study Information Update (2014)<br>**Standing Council for Transport and Infrastructure**<br>National Land Freight Strategy (2012)<br>**AECOM**<br>Bulla Bypass/Melbourne Airport Link Planning Study Transport Modelling (2013)<br>**GHD**<br>Bulla Bypass and Melbourne Airport Link Planning Study Regional Economy Assessment (2013)<br>**Newspaper articles**<br>Various |
| Commentary on certainty | There is limited detail available on the cost and design of the project. A business case or feasibility study was not publically available. . |

| **Option** | **Melbourne to Brisbane freight rail line** |
|---|---|
| Reference | 5.14.8 |
| Option Code | MBF |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Alignment study<br>Industry news |
| Evidence source(s) | **ARTC**<br>Melbourne-Brisbane Inland Rail Alignment Study (2010)<br>http://www.artc.com.au/library/IRAS_Final%20Report.pdf<br>**Industry news**<br>https://sourceable.net/melbourne-to-brisbane-rail-to-cost-10-billion/# |
| Commentary on certainty | The Alignment Study is based on a combination of market, technical and economic inputs. |

| **Option** | **Driverless Freight Vehicles** |
|---|---|
| Reference | 5.14.10 |
| Option Code | DFV |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Trials currently underway in Europe and the United States |
| Evidence source(s) | **Monash University Accident Research Centre**<br>Safety Benefits of Cooperative ITS and Automated Vehicles (2016)<br>**KPMG**<br>vSelf-driving cars: the Next Revolution (2012)<br>**Volvo Group**<br>http://www.volvogroup.com/group/global/en-gb/researchandtechnology/TransportSolutions/PlatooningTrials/Pages/default.aspx |
| Commentary on certainty | Some automated vehicle technologies are currently available, such as lane keep assist. Vehicle platooning for trucks is currently being trialled overseas and is expected to be commercially available by 2025. Fully driverless vehicles are still in development, and may be available to market around 2030. |

## 5B Move people to and from airports more efficiently

| Option | Melbourne Airport bus dedicated road priority |
|---|---|
| Reference | 5.2.1 |
| Option Code | MAB |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Industry position paper<br>Industry newsletter<br>ABS data<br>Newspaper articles |
| Evidence source(s) | **Tourism and Transport Forum**<br>Rapid Buses, Road and Rail: Ground transport solutions to meet Melbourne Airport's passenger growth to 2050 (2013)<br>**Australian Bureau of Statistics**<br>http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6401.0Dec%202015?OpenDocument<br>**BusVic**<br>Bus Solutions Issue 04 March 2011<br>http://www.busvic.asn.au/images/uploads/public/BusSolutions4-Mar2011.pdf<br>**Newspaper articles**<br>Various |
| Commentary on certainty | A business case or feasibility study was not publically available. |

| Option | Melbourne Airport metropolitan public transport connections |
|---|---|
| Reference | 5.2.2 |
| Option Code | MAM |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Industry position paper<br>Industry advocacy article<br>ABS data |
| Evidence source(s) | **Tourism and Transport Forum**<br>Rapid Buses, Road and Rail: Ground transport solutions to meet Melbourne Airport's passenger growth to 2050 (2013)<br>**Australian Bureau of Statistics**<br>http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6401.0Dec%202015?OpenDocument |
| Commentary on certainty | Existing information on SmartBus service implementation is available but there is no data on potential SmartBus routes. |

| Option | Melbourne Airport heavy rail line |
|---|---|
| Reference | 5.2.3 |
| Option Code | MAH |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Planning study<br>Consultancy report<br>NSW parliamentary report<br>Industry position paper<br>Newspaper articles |

| | |
|---|---|
| Evidence source(s) | **PTV**<br>Melbourne Airport Rail Link: Study Overview and Findings (2013)<br>Network Development Plan (2012)<br>**Parsons Brinckerhoff**<br>Melbourne Airport Rail Link Alignment Alternatives Study Volume 2: Technical Report (2012)<br>http://pandora.nla.gov.au/pan/146229/20140508-1455/Melbourne-Airport-Rail-Link-Study-Technical-Report.pdf<br>**New South Wales Parliament**<br>Reducing or removing station access fees at Sydney Airport (2014)<br>https://www.parliament.nsw.gov.au/prod/parlment/committee.nsf/0/08cf3ef25c31f173ca257c8d000046ce/$FILE/Final%20Report%20130228.pdf<br>**Tourism and Transport Forum**<br>Rapid Buses, Road and Rail: Ground transport solutions to meet Melbourne Airport's passenger growth to 2050 (2013)<br>**Newspaper articles**<br>Various |
| Commentary on certainty | Preliminary work has been completed. The full planning study is not publically available. |

| **Option** | **CityLink to Western Ring road connection** |
|---|---|
| Reference | 2.6.7 |
| Option Code | EWW |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Preliminary feasibility study<br>Project fact sheet<br>Project audit<br>Newspaper articles |
| Evidence source(s) | **DEDJTR**<br>Preliminary feasibility study<br>**Victorian Government**<br>Western Section of East West Link Project Overview<br>**Victorian Auditor-General**<br>East West Link Project Audit (2015)<br>http://www.audit.vic.gov.au/publications/20151209-East-West-Link/20151209-East-West-Link.pdf<br>**Newspaper articles**<br>Various |
| Commentary on certainty | Some feasibility work undertaken as part of East West investigations but work has not proceeded substantially past the planning stage. A business case or feasibility study is not publically available. |

| **Option** | **Eastern Freeway to CityLink connection** |
|---|---|
| Reference | 4.11.28 |
| Option Code | EWE |
| **Certainty of evidence rating** | **High** |
| Type of evidence | Short Form Business Case<br>Project audit |
| Evidence source(s) | **DEDJTR**<br>East West Link Stage 1 Short Form Business Case (2013)<br>East West Link Business Case (2013)<br>**Victorian Auditor-General** |

| | |
|---|---|
| | East West Link Project Audit (2015)<br>http://www.audit.vic.gov.au/publications/20151209-East-West-Link/20151209-East-West-Link.pdf |
| Commentary on certainty | The Victorian Auditor-General's Office report referenced above says:<br>*The business case, which is a critical step in any major project, did not provide a sound basis for the government's decision to commit to the investment because it did not clearly establish the need for the investment through a robust analysis of the costs, benefits and risks of reasonable options.*<br>The full business case is not publically available. |

| **Option** | **Outer Metropolitan Ring Road** |
|---|---|
| Reference | 5.2.7 |
| Option Code | OMR |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | VicRoads planning and projects website<br>Victorian Government planning study<br>Consultancy reports<br>Strategy documents |
| Evidence source(s) | **Victorian Government**<br>Alignment of Outer Metropolitan Ring / E6 Transport Corridor Fact Sheet (2009)<br>Planning Assessment Report (2009)<br>**VicRoads**<br>https://www.vicroads.vic.gov.au/planning-and-projects/regional-road-projects<br>Bulla Bypass/Melbourne Airport Link to Outer Metropolitan Ring Planning Study Information Update (2014)<br>**Standing Council for Transport and Infrastructure**<br>National Land Freight Strategy (2012)<br>**AECOM**<br>Bulla Bypass/Melbourne Airport Link Planning Study Transport Modelling (2013)<br>**GHD**<br>Bulla Bypass and Melbourne Airport Link Planning Study Regional Economy Assessment (2013)<br>**Newspaper articles**<br>Various |
| Commentary on certainty | There is limited detail available on the cost and design of the project. A business case or feasibility study was not publically available. . |

| **Option** | **Transport network price regime** |
|---|---|
| Reference | 2.6.9 |
| Option Code | TNP |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Academic articles<br>Industry submissions and discussion papers<br>International programs and studies |
| Evidence source(s) | **National Transport Commission**<br>Heavy Vehicle Pricing Option: Development and Assessment Framework Discussion Paper (2010)<br>**Australian Trucking Association**<br>http://www.truck.net.au/sites/default/files/submissions/CRRP%20Pricing%20Options%20Paper_ATA%20response.pdf |

| | |
|---|---|
| | **Australasian Railway Association**<br>http://transportreform.org/file.php?fileID=26<br>**Institute of Transport and Logistics Studies**<br>http://sydney.edu.au/business/__data/assets/pdf_file/0008/107774/ITLS-WP-11-17.pdf<br>**International Transport Forum**<br>http://www.internationaltransportforum.org/Proceedings/Lisbon2009/2-Gille.pdf |
| Commentary on certainty | No Australian business case/feasibility studies have been completed to date, however several Australian studies/papers argue in favour of national transport pricing reform. There is evidence of international pricing regime success. |

## 6A Boost tourism through infrastructure provision

| Option | Tourism event promotion coordination |
|---|---|
| Reference | 6.16.1 |
| Option Code | TEP |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Victoria's 2020 Tourism Strategy, Tourism 2020 national strategy, Visit Victoria Commissioned Research |
| Evidence source(s) | **Tourism Victoria**<br>http://www.tourism.vic.gov.au/about/strategies-and-publications/victoria-s-2020-tourism-strategy.html<br>**Visit Victoria**<br>http://www.tourism.vic.gov.au/research.html<br>**Tourism Australia**<br>http://www.tourism.australia.com/documents/Tourism_2020_overview.pdf |
| Commentary on certainty | Significant commentary and research completed by Visit Victoria and Tourism Australia. |

| Option | National park private sector development leisure tenure |
|---|---|
| Reference | 6.16.2 |
| Option Code | NPP |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Tourism Victoria (now Visit Victoria) commissioned report on national park lease tenure assessment , Victorian National Parks Act 1975 |
| Evidence source(s) | **Visit Victoria**<br>http://www.tourism.vic.gov.au/research.html<br>**Legislation**<br>Victorian National Parks Act 1975 |
| Commentary on certainty | Investor engagement research, determining lease tenure below 21 years is not viable for significant commercial developments |

| Option | Tourism projects in state-significant zones approval process |
|---|---|
| Reference | 6.16.3 |
| Option Code | TPS |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Victoria's 2020 Tourism Strategy, Victoria's Regional Tourism Strategy 2013-2016, Victorian State Planning Framework (Planning and Environment Act 1987), Unlocking Victorian Tourism: An Inquiry into Victoria's tourism industry Final Report (June 2011) |
| Evidence source(s) | **Tourism Victoria**<br>http://www.tourism.vic.gov.au/about/strategies-and-publications/victoria-s-2020-tourism-strategy.html<br>http://www.tourism.vic.gov.au/about/strategies-and-publications/regional-plans.html<br>**Legislation**<br>Planning and Environment Act 1987<br>Victorian Competition and Efficiency Commission<br>Unlocking Victorian Tourism: An Inquiry into Victoria's tourism industry Final Report (June 2011) |

| | |
|---|---|
| Commentary on certainty | Strategy outlines need for efficient and more flexible planning approvals process in regional/rural areas. This is based on prior research conducted by the Victorian Competition and Efficiency Commission in 2012, which leveraged prior reviews and undertook primary research to feed into its Unlocking Victorian Tourism: An Inquiry into Victoria's tourism industry. |

| **Option** | **Tourism market-led proposals** |
|---|---|
| Reference | 6.16.4 |
| Option Code | TML |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Government investment guidelines |
| Evidence source(s) | Department of Economic Development, Jobs, Transport and Resources<br>Existing Tourism Leases in National Parks: Guidance Note<br>http://www.tourism.vic.gov.au/images/stories/Documents/StrategiesandPlans/TourismInvestmentGuidelines.pdf |
| Commentary on certainty | Certainty is low as no analysis has been completed on feasibility to instigate a new 'significant investment' market led proposal process. Existing investment guidelines related to 'small-scale' investments in national parks. |

| **Option** | **Event coordination statewide** |
|---|---|
| Reference | 6.16.5 |
| Option Code | ECS |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Creative Victoria Industry taskforce Report 2015, Victoria's Tourism 2020 Strategy, Victoria's Regional Statement |
| Evidence source(s) | **Tourism Victoria**<br>http://www.tourism.vic.gov.au/about/strategies-and-publications/victoria-s-2020-tourism-strategy.html<br>**Creative Victoria**<br>http://creative.vic.gov.au/Projects_Initiatives/Creative_Industries_Strategy<br>**Regional Development Victoria**<br>http://www.rdv.vic.gov.au/regional-statement |
| Commentary on certainty | Review of Victoria's events calendar across the State |

| **Option** | **Regional tourism investment prospectus** |
|---|---|
| Reference | 6.16.6 |
| Option Code | RTI |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Victoria's Tourism 2020 Strategy, Regional Statement 2015 |
| Evidence source(s) | **Tourism Victoria**<br>http://www.tourism.vic.gov.au/about/strategies-and-publications/victoria-s-2020-tourism-strategy.html<br>**Regional Development Victoria**<br>http://www.rdv.vic.gov.au/regional-statement |

| | |
|---|---|
| Commentary on certainty | Strategy and statement outlines proposed public infrastructure investment and need to attract private investment in strengthening Victoria's regional tourism offering. This draws on prior Deloitte research that identified that Chinese investors in particular, when presented with a tourism investment opportunity, typically want to invest in a 'packaged solution'. |

| **Option** | **National park public infrastructure provision** |
|---|---|
| Reference | 6.16.7 |
| Option Code | NPP |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Victoria's Tourism 2020 Strategy, Regional Statement 2015, Grampians Peak Trail Masterplan; Unlocking Victorian Tourism: An Inquiry into Victoria's tourism industry Final Report (June 2011) |
| Evidence source(s) | **Tourism Victoria**<br>http://www.tourism.vic.gov.au/about/strategies-and-publications/victoria-s-2020-tourism-strategy.html<br>http://www.tourism.vic.gov.au/about/strategies-and-publications/regional-plans.html<br>**Regional Development Victoria**<br>http://www.rdv.vic.gov.au/regional-statement<br>**Grampian Peaks Trail Masterplan**<br>http://parkweb.vic.gov.au/__data/assets/pdf_file/0005/663341/Grampians-Peaks-Trail-Master-Plan.pdf<br>Victorian Competition and Efficiency Commission<br>Unlocking Victorian Tourism: An Inquiry into Victoria's tourism industry Final Report (June 2011) |
| Commentary on certainty | Strategy, statement (as well as Grampians Peak Trail Masterplan as an example) outlines proposed and needed public infrastructure investment in national parks to enhance Victoria's nature-based visitor experience. It is based on an inquiry conducted by the Victorian Competition and Efficiency Commission that suggested that although 'Victoria's natural assets make it an attractive location for the development of nature-based tourism', however, 'current policy prohibiting private investment in national parks competitively disadvantages Victoria when compared to other Australian jurisdictions such as NSW and Tasmania'. |

## 6B Enable the growth of a highly skilled, digitally connected workforce through infrastructure

| Option | School and Tertiary Education cooperation |
|---|---|
| Reference | 6.17.1 |
| Option Code | STE |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Existing Trade Training Centre (TTC) / Trade Skills Centre (TSC) commonwealth funded program and newly (15-16) state funded Tech Schools program. TTC's are located at schools sites and it is hoped Tech Schools will be located in Tertiary settings. |
| Evidence source(s) | TTC In Schools Program Independent Review https://docs.education.gov.au/system/files/doc/other/final_ttc_independent_review_13_oct.pdf |
| Commentary on certainty | Strong evidence to support partnerships with schools and tertiary providers to deliver educational programs co-located. |

| Option | TAFE asset market driven partnerships and funding |
|---|---|
| Reference | 6.17.2 |
| Option Code | TAF |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Victorian Government commissioned Review. |
| Evidence source(s) | VET Funding Review has recommended an audit of assets to understand which assets are of value, underutilised or redundant and Government fund the costs, obligations and restrictions imposed on TAFE institutions, including asset maintenance. |
| Commentary on certainty | Strong evidence to suggest recent policy changes have drastically impacted the TAFE sector and its sustainability. The VET Funding Review recommends an audit if all TAFE assets be conducted and Government is currently preparing a response to the VET Review. |

| Option | Education Precincts linking the education sector and private sector |
|---|---|
| Reference | 6.17.3 |
| Option Code | SEP |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Significant international research regarding university-industry-government relationships<br><br>Current projects occurring internationally and in Victoria. |
| Evidence source(s) | http://triplehelix.stanford.edu/3helix_concept<br><br>http://www.carltonconnect.com.au/about/cci-site-updates/carlton-connect-community-update/<br><br>http://www.semip.org.au/<br><br>http://www.scotsman.com/news/innovation-centres-to-bolster- |

| | |
|---|---|
| | scotland-1-3379040<br><br>http://triplehelix.stanford.edu/3helix_concept |
| Commentary on certainty | Strong evidence to support the benefits of specialised education precincts and their value to students and the broader industry. |

| Option | Vocational Education long term funding certainty |
|---|---|
| Reference | 6.17.4 |
| Option Code | VEL |
| **Certainty of evidence rating** | **High** |
| Type of evidence | Best practice asset management. Extensive international evidence to support long-term planning and investment is required for assets. |
| Evidence source(s) | International, national & state evidence<br>http://www.dtf.vic.gov.au/Publications/Investment-planning-and-evaluation-publications/Asset-management/Sustaining-Our-Assets-Government-asset-management-policy-statement<br><br>http://www.google.com.au/url?sa=t&rct=j&q=&esrc=s&source=web&cd=5&cad=rja&uact=8&ved=0ahUKEwicorOI3vvKAhUBFJQKHSaxCtIQFgg0MAQ&url=http%3A%2F%2Fwww.dtf.vic.gov.au%2Ffiles%2Faa84ddb9-ba5a-4dc9-8470-a5a20108e0be%2FAsset-Management-Accountability-Framework-February-2016.pdf&usg=AFQjCNE4PkYr9b8O9XVsKXwexpHHan0azw&bvm=bv.114195076,d.dGo |
| Commentary on certainty | Best practice asset management details long-term planning and investment is most effective for assets. |

## 7A Improve rural and regional water security

| Option | Recycled treated wastewater for drinking |
|---|---|
| Reference | 7.18.3 |
| Option Code | RWW |
| **Certainty of evidence rating** | **High** |
| Type of evidence | Preliminary costings of indirect potable reuse options are available through various cost benefit studies |
| Evidence source(s) | **State Government**, Academic papers - sources http://www.water360.com.au/wp-content/uploads/2015/07/20131014-ATSE-Drinking-Water-Recycling-Report-Summary.pdf http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2672392/ http://www.nwc.gov.au/__data/assets/pdf_file/0008/11024/using-recy-water-drinking-body-Waterlines-0607.pdf |
| Commentary on certainty | Has been successfully implemented in other countries. |

| Option | Recycled treated wastewater for non-potable agricultural use |
|---|---|
| Reference | 7.18.8 |
| Option Code | TWR |
| **Certainty of evidence rating** | **High** |
| Type of evidence | Departmental research |
| Evidence source(s) | Has been referred to DELWP as part of new Water Plan. http://www.nwc.gov.au/__data/assets/pdf_file/0008/11024/using-recy-water-drinking-body-Waterlines-0607.pdf |
| Commentary on certainty | Evidence is high as and meets risk assessment as per Australian Recycled Water Guidelines. |

| Option | Wonthaggi desalination plant expansion |
|---|---|
| Reference | 7.18.9 |
| Option Code | WDP |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Industry estimation of future water needs, based on current usage and water storage trends |
| Evidence source(s) | http://www.theage.com.au/victoria/will-victorias-desalination-plant-need-to-get-bigger-20160228-gn5k26.html |
| Commentary on certainty | When water storage capacity falls from the current five years supply to 3.5 years, Victorian water businesses have estimated that this should trigger an increase in the desalination capacity from 150 GL to 200 GL a year. |

## 7B Manage pressures on landfill and waste recovery facilities

| Option | Landfill waste levy increase |
|---|---|
| Reference | 7.19.1 |
| Option Code | LLI |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Economic studies on effect of increasing landfill levy. Evidence from other state jurisdictions. |
| Evidence source(s) | Sustainability Victoria various research papers on the costs of waste management in the state of Victoria - Further details<br><br>http://www.wastenet.net.au/Assets/Documents/Content/Information/Background_Paper_Levy_Final_amended_March_2012.pdf<br><br>https://www.epa.nsw.gov.au/resources/wasteregulation/CIE-waste-levy-recyclers.pdf |
| Commentary on certainty | There is data which links the cost of waste management with total waste going to landfills, resource recovery centres and re-processors |

| Option | Household waste disposal fees |
|---|---|
| Reference | 7.19.2 |
| Option Code | HWD |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Economic studies on effect of increasing landfill levy |
| Evidence source(s) | Lake Macquarie City Council<br>Variable Pricing or "User Pays" for residential waste services.<br><br>http://www.lakemac.com.au/downloads/Waste%20Recommendations%20of%20the%20ordinary%20council%20meeting%2011-10-2011.pdf |
| Commentary on certainty | Although the report has been prepared for Lake Macquarie City Council, the analysis is quite broad and can be directly applied to analysis at a state level in Victoria.<br><br>Having a weight based system is not preferred as it is the most susceptible to illegal dumping and the technologies has not been fully developed yet. Collection cycles based on the frequency of collection would mean there is less scope for illegal dumping as bins would be in relatively secure areas until they are put out for collection. Brisbane City Council trialled the implementation of a similar system that used RFID tags to identify bins. |

| Option | Recycled material usage in building construction |
|---|---|
| Reference | 7.19.3 |
| Option Code | RMU |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Economic study on the impact from the Green Building council. University Research. |

| | |
|---|---|
| Evidence source(s) | Research and industry engagement papers conducted in the development of the green star rating tool.<br><br>http://www98.griffith.edu.au/dspace/bitstream/handle/10072/17060/47509_1.pdf?sequence=1 |
| Commentary on certainty | The research is more geared to integrating the requirements into developments rather than looking at the macro impacts. |

| **Option** | **Waste landfill site land buffers** |
|---|---|
| Reference | 7.19.4 |
| Option Code | FLS |
| **Certainty of evidence rating** | **High** |
| Type of evidence | Strategic papers released by various agencies within Victoria's waste management industry |
| Evidence source(s) | **Sustainability Victoria, SWIRRP**.<br><br>**Metropolitan Waste and Resource Recovery Strategic Plan**<br>http://www.sustainability.vic.gov.au/our-priorities/statewide-waste-planning/2015-2020-priorities/statewide-waste-and-resource-recovery-infrastructure-plan<br><br>**EPA Guidelines**<br>http://www.epa.vic.gov.au/~/media/Publications/788%203.pdf |
| Commentary on certainty | Current development planning has a direct impact on the future landfill site land buffers. Planning encroachment on Victoria's key waste and resource recovery hubs. |

| **Option** | **Landfill site consolidation** |
|---|---|
| Reference | 7.19.5 |
| Option Code | LOC |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Strategic papers released by various agencies within Victoria's waste management industry. Other jurisdictions evidence. |
| Evidence source(s) | **Metropolitan Waste and Resource Recovery Strategic Plan**<br>http://www.sustainability.vic.gov.au/our-priorities/statewide-waste-planning/2015-2020-priorities/statewide-waste-and-resource-recovery-infrastructure-plan<br><br>**EPA NSW**<br>http://www.epa.nsw.gov.au/wastegrants/landfill.htm<br>http://www.environment.nsw.gov.au/resources/grants/140702ApGdeLS2.pdf |
| Commentary on certainty | Evidence is anecdotal, no direct implementation evidence available. |

| **Option** | **E-waste Services** |
|---|---|
| Reference | 7.19.8 |
| Option Code | EWS |
| **Certainty of evidence rating** | **High** |

| Type of evidence | Case studies |
|---|---|
| Evidence source(s) | Victorian case studies - Managing e-waste in Victoria<br><br>http://anzrp.com.au/wp-content/uploads/2015/02/Global-e-waste-systems-A-Report-for-ANZRP-by-EIU-FINAL-WEB.pdf<br><br>http://i.unu.edu/media/unu.edu/news/52624/UNU-1stGlobal-E-Waste-Monitor-2014-small.pdf |
| Commentary on certainty | In Victoria, the cost of recycling most types of e-waste can be greater than the revenues generated from the recovered materials, often making disposal to landfill a cheaper option for managing e-waste. For instance, recycling televisions and computers costs between $500 and $1000 a tonne. This comprises costs for:<br><br>- collection and storage infrastructure<br>- transportation in appropriate vehicles, with specific standards<br>- dismantling (mostly manual)<br>- management and disposal of residual waste (higher costs for hazardous materials)<br><br>Conversely, sending e-waste to landfill costs between $150 and $250 a tonne.<br><br>Victoria generates approximately 25% of Australia's e-waste, which estimated to be approximately 447,000 tonnes per annum (112,000 tonnes in Victoria). Although figures and targets from National Television and Computer Recycling Scheme (NTCRS) suggest that up to 50% of TV's and computers are recycled (Total in Australia is 131,000 tonnes, Victoria is approximately 32,750 tonnes).<br><br>Removing all e-waste managed by the NTCRS, leaves approximately 16,375 tonnes to e-waste going to landfill. |

## 8A Help preserve natural environments and minimise biodiversity loss through infrastructure

| Option | National park pricing and expenditure regime |
|---|---|
| Reference | 8.20.1 |
| Option Code | NPP |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | 2013 RIS for new fees and charges in Victoria's Parks and Forestry. |
| Evidence source(s) | 2013 RIS<br>http://www.depi.vic.gov.au/__data/assets/pdf_file/0020/205517/Victorian-National-Parks-Camping-and-Accommodation-Fees-Regulatory-Impact-Statement-October-2013.pdf<br>2015 Parks Vic internal analysis - not available to Deloitte<br>Research on public views on national park pricing schemes<br>http://www.uq.edu.au/rsmg/docs/ClemWPapers/EEE/WP79.pdf |
| Commentary on certainty | Parks Vic revised the charges for national park tourism in December 2015, so it is expected that Parks Vic will have some recent analysis of the tourism-environmental outcomes trade-off. |

| Option | Habitat corridor link expansion and improvement |
|---|---|
| Reference | 8.20.2 |
| Option Code | HCL |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Environmental interest groups have published material on this issue, with much focus on the Southern Brown Bandicoot. |
| Evidence source(s) | Victorian National Parks Association<br>http://vnpa.org.au/admin/library/attachments/PDFs/Reports/Melbourne's%20Urban%20Expansion%20-%20Threatened%20Species%20on%20Our%20Doorstep.pdf |
| Commentary on certainty | No costings have been done and the scope of the program will require several smaller projects that could have highly variable costings. |

| Option | National park private management |
|---|---|
| Reference | 8.20.3 |
| Option Code | NPP |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Opinion and thought pieces |
| Evidence source(s) | Journals:<br>https://www.quarterlyessay.com/qe/48/after-the-future/449<br>https://theconversation.com/thinking-corporately-getting-national-parks-on-national-balance-sheets-8152 |
| Commentary on certainty | Tim Flannery has made the case for this approach. Key challenge will be making the case to the public and setting appropriate performance metrics in contracts.<br><br>A 2012 piece on moving private sector management practices across to the management of parks doesn't suggest full |

| | |
|---|---|
| | privatisation, but arguably this is the best way to move in that direction. |

| Option | Riparian fence investment |
|---|---|
| Reference | 8.20.4 |
| Option Code | RFI |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Academic research, environmental group op-eds |
| Evidence source(s) | Government Bodies<br>http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/lwm_biodiversity_grazing_pdf/$FILE/Milestone-Final-Doc%20ch3-8.pdf<br>http://vnpa.org.au/admin/library/attachments/PDFs/Policy%20briefs/Policy%20brief-Crown%20frontage%20licence%20review_amended.pdf |
| Commentary on certainty | Available analysis from highly credible sources is limited. Environmental interest groups have done analysis that suggests that at a cost of approximately $40 million per year for five years, nearly 6000 kilometres of river bank could be fenced off, protecting almost one million hectares of habitat. |

## 8B Improve the health of rivers and streams through infrastructure

| Option | River and waterways natural flow regimes |
|---|---|
| Reference | 8.21.1 |
| Option Code | RWN |
| **Certainty of evidence rating** | **High** |
| Type of evidence | Melbourne Water reports. Results of existing programs. |
| Evidence source(s) | https://www.environment.gov.au/system/files/resources/43d0da9e-c594-4b28-ae03-3ebf6e0f69eb/files/moving-water.pdf |
| Commentary on certainty | Based on the results of existing programs it has been shown that the implementation of this option can be effective in maintaining and improving the health of affected river flows. |

| Option | Riparian fence investment |
|---|---|
| Reference | 8.20.4 |
| Option Code | RFI |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Academic research, environmental group op-eds, case studies |
| Evidence source(s) | 1. http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/lwm_biodiversity_grazing_pdf/$FILE/Milestone-Final-Doc%20ch3-8.pdf http://vnpa.org.au/admin/library/attachments/PDFs/Policy%20briefs/Policy%20brief-Crown%20frontage%20licence%20review_amended.pdf 2. http://www.trc.govt.nz/riparian-management/ |
| Commentary on certainty | Available analysis from highly credible sources is limited. Environmental interest groups have done analysis that suggests that at a cost of approximately $40 million per year for five years, nearly 6000 kilometres of river bank could be fenced off, protecting almost one million hectares of habitat. |

| Option | Waterway infrastructure to remove pollutants |
|---|---|
| Reference | 8.21.3 |
| Option Code | WIR |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Government reports and studies |
| Evidence source(s) | 1. **Ministerial Advisory Committee** - Plan Melbourne 2015 Review; Referred to DELWP for new Water Plan. 2. http://www.melbournewater.com.au/whatwedo/protectrivers/improving-river-health/pages/improving-river-health.aspx |
| Commentary on certainty | Available analysis from highly credible sources is limited. Victoria and other states have implemented many of the required infrastructures, just not on as wide a scale. |

## 9A Smooth the adjustment to a carbon-constrained world through infrastructure

| Option | Energy demand management efficiency schemes |
|---|---|
| Reference | 9.22.1 |
| Option Code | EDM1 |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Strategy has been used in the residential market with positive results. |
| Evidence source(s) | Many studies have been conducted for tariff reforms to drive changes to usage patterns and reflect true cost of supply. Beyond Zero Emissions Melbourne University Energy research Institute "Zero Carbon Australia Stationary Energy Plan". |
| Commentary on certainty | Has been proven to have work in the residential market. |

| Option | Ageing coal generation asset transition |
|---|---|
| Reference | 9.22.2 |
| Option Code | ACG |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Published asset lives and plant life extension spend history |
| Evidence source(s) | **Clean Energy Council**<br>https://www.cleanenergycouncil.org.au/policy-advocacy/renewable-energy-target/power-generation-sector-at-crossroads.html<br><br>**Climate Council**<br>http://www.climatecouncil.org.au/uploads/f9ba30356f697f238d0ae54e913b3faf.pdf<br><br>**Australian Conservation Foundation**<br>https://www.acfonline.org.au/sites/default/files/resources/ACF_Leadership_required_Coal_transition_plan_0.pdf |
| Commentary on certainty | Heavily reliant on Federal policy. RET targets in the past have been successful in encouraging investment in renewables. Victoria trialled a contract for shutdown a few years ago but the prices from e.g. Hazelwood were close to 10 times what was anticipated. |

| Option | Wind and solar energy generation large scale investments |
|---|---|
| Reference | 9.22.3 |
| Option Code | WSE |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | DEDJTR discussions, planning reports (electricity grid). |
| Evidence source(s) | DEDJTR discussions.<br>Beyond Zero Emissions Melbourne University Energy research Institute. "Renewable Energy Superpower".<br>"Zero Carbon Australia Stationary Energy Plan".<br>AEMO planning report (refer Aurecon /Deloitte ICA report). |
| Commentary on certainty | Heavily reliant on policy. Schemes such as RET targets in the past have been successful in encouraging investment in renewables. |

| Option | Alternative energy vehicles |
|---|---|
| Reference | 2.6.6 |
| Option Code | AEV |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Academic research<br>Automotive industry research<br>AECOM report looking at the Sydney Greater Metropolitan Region, dated 4 September 2009. |
| Evidence source(s) | Energy Supply Association of Australia - Sparking an Electric Vehicle Debate in Australia<br>http://sydney.edu.au/business/__data/assets/pdf_file/0017/225251/stepheng-seminar.pdf<br>https://www.maddocks.com.au/app/uploads/articles/climate-change-and-the-transport-sector-are-we-travelling-in-the-right-direction-update-november-2010.pdf<br>https://theconversation.com/the-infrastructure-australia-needs-to-make-electric-cars-viable-40368 |
| Commentary on certainty | Evidence is strong that incrementally the viability is feasible. The uncertainty exists around the wholesale viability to provide large scale benefits for this need. |

| Option | Energy efficient development |
|---|---|
| Reference | 9.22.5 |
| Option Code | EED |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Industry forums; Departmental reports |
| Evidence source(s) | Grattan institute,  Beyond Zero Emissions<br>Melbourne University Energy research Institute "Renewable Energy Superpower".<br>"Zero Carbon Australia Stationary Energy Plan"<br>MPS MAC Report 2015<br>Beyond Zero Emissions Buildings Plan |
| Commentary on certainty | Evidence is strong that incrementally the viability is feasible. There is a lot of knowledge in the industry about energy efficiency in buildings which can be rapidly applied and create many jobs. |

| Option | Coal fired electricity plant conversion to gas fired plant |
|---|---|
| Reference | 9.22.7 |
| Option Code | CFE |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Industry forums. Other Jurisdictions. |
| Evidence source(s) | United States<br>http://www.power-eng.com/articles/print/volume-119/issue-6/features/coal-to-gas-plant-conversions-in-the-u-s.html |
| Commentary on certainty | Carbon Capture has significant technical challenges to be a financially viable option. A number of world-wide projects are struggling for large scale technical viability. Brown coal gasification |

| | |
|---|---|
| | is a technically viable option (refer HRL business case) however financially project failed to stack up commercially without substantial subsidy. This is also the case for similar projects in Queensland and Overseas. |

| Option | Community wind farms |
|---|---|
| Reference | 9.22.8 |
| Option Code | CWF |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Sustainability Victoria |
| Evidence source(s) | Sustainability Victoria<br>Hepburn Community Wind Park<br>http://www.abc.net.au/local/stories/2011/11/08/3359203.htm<br>"Zero Carbon Australia Stationary Energy Plan" |
| Commentary on certainty | Initiative is untried. Review of the few schemes that have been followed through to implementation suggest further investigation would be worthwhile |

| Option | Energy Storage Infrastructure |
|---|---|
| Reference | 9.22.9 |
| Option Code | ESI |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Planning reports |
| Evidence source(s) | DEDJTR discussions.<br>Beyond Zero Emissions Melbourne University Energy research Institute. "Renewable Energy Superpower".<br>"Zero Carbon Australia Stationary Energy Plan".<br>AEMO planning report (refer Aurecon /Deloitte ICA report). |
| Commentary on certainty | Evidence is strong that incrementally the viability is feasible. Technical assessment clearly shows large scale impact would be minimal. |

| Option | Energy demand management tariff reform |
|---|---|
| Reference | 9.22.10 |
| Option Code | EDM2 |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Price controls have been used before with positive results |
| Evidence source(s) | Many studies have been conducted for tariff reforms to drive changes to usage patterns and reflect true cost of supply.<br>Beyond Zero Emissions Melbourne University Energy research Institute "Zero Carbon Australia Buildings Plan" |
| Commentary on certainty | Evidence shows that tariff reform has worked in the past. The uncertainty exists around the wholesale viability. |

## 9B Adapt infrastructure to changing climate conditions

| Option | Bicycle and walking path expansion and improvement |
|---|---|
| Reference | 2.4.4 |
| Option Code | BWP2 |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Research and surveys. |
| Evidence source(s) | Research from the University of Canterbury http://ir.canterbury.ac.nz/bitstream/handle/10092/10315/12651301_PHA%20AGM%20Aug%202014.pdf;jsessionid=B3A53F556FEF0DCF336BBFEC507DE8D5?sequence=1 |
| Commentary on certainty | It is widely accepted that greater accessibility to safe, well-provisioned footpath and cycle-way infrastructure leads to greater use and more active lifestyles. |

| Option | Connected active cities |
|---|---|
| Reference | 1.1.3 |
| Option Code | CAC |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Case based evidence from other jurisdictions of similar implementations. Research and government investigations. Existing planning documentation. |
| Evidence source(s) | **Heart Foundation**<br>http://ir.canterbury.ac.nz/bitstream/handle/10092/10315/12651301_PHA%20AGM%20Aug%202014.pdf;jsessionid=B3A53F556FEF0DCF336BBFEC507DE8D5?sequence=1<br>**Planning Institute of Australia**<br>https://www.planning.org.au/documents/item/257<br>http://www.planning.org.au/documents/item/6216<br>**Australian Local Government Association**<br>**Plan Melbourne**<br>http://www.planmelbourne.vic.gov.au/__data/assets/pdf_file/0017/131336/Chapter-4-Plan-Melbourne-May-2014.pdf |
| Commentary on certainty | The heart association and planning institute of Australia have conducted research in to the establishment and planning of more active cities, however monitoring and measuring of the long term effectiveness of these policies and suggestions are unknown to date.<br><br>The implementation of active cities is a key part of Plan Melbourne. |

| Option | Urban Forest |
|---|---|
| Reference | 9.23.3 |
| Option Code | UFF |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Government Strategy |

| | |
|---|---|
| Evidence source(s) | https://www.melbourne.vic.gov.au/SiteCollectionDocuments/urban-forest-strategy.pdf |
| Commentary on certainty | Urban forestry has yet to be well researched, implemented and evaluated in an Australian context. There is a reliance on research from the US, Europe, Scandinavia and Asia to supplement our thinking and programs. |

| **Option** | **Alternative energy vehicles** |
|---|---|
| Reference | 2.6.6 |
| Option Code | AEV |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Academic research<br>Automotive industry research<br>AECOM report looking at the Sydney Greater Metropolitan Region, dated 4 September 2009. |
| Evidence source(s) | Energy Supply Association of Australia - Sparking an Electric Vehicle Debate in Australia<br>http://sydney.edu.au/business/__data/assets/pdf_file/0017/225251/stepheng-seminar.pdf<br>https://www.maddocks.com.au/app/uploads/articles/climate-change-and-the-transport-sector-are-we-travelling-in-the-right-direction-update-november-2010.pdf<br>https://theconversation.com/the-infrastructure-australia-needs-to-make-electric-cars-viable-40368 |
| Commentary on certainty | Evidence is strong that incrementally the viability is feasible. The uncertainty exists around the wholesale viability to provide large scale benefits for this need. |

## 10A Improve the resilience of critical infrastructure to disruptive events

| Option | Data centre location diversification |
|---|---|
| Reference | 10.24.1 |
| Option Code | DCD |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Preliminary feasibility studies |
| Evidence source(s) | Enterprise Services<br>http://www.theaustralian.com.au/business/technology/equinix-to-build-us60m-data-centre-in-melbourne/story-e6frgakx-1226808391440 |
| Commentary on certainty | Exact location of Data centres could not be found through publicly available information. Generally speaking they are located in the CBD and surrounding suburbs, as Telstra have two in the CBD and one in Windsor. Equinix has also opened a facility in Port Melbourne. |

| Option | Fuel reserve regulation |
|---|---|
| Reference | 10.24.2 |
| Option Code | FRR |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Industry commissioned reports suggest that fuel reserves are unknown or are in short reserve supply. |
| Evidence source(s) | Industry reports - Australia's Liquid Fuel Security Part 2 A report for NRMA Motoring & Services Prepared by John Blackburn AO (February 2014)<br>Maintaining Supply Security & Reliability for Liquid Fuels in Australia (2013) |
| Commentary on certainty | Industry has commissioned reports which details Australia's fuel reserves are low when compared to other countries. |

| Option | Critical asset centralised risk management |
|---|---|
| Reference | 10.24.3 |
| Option Code | CAR |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Limited as current practice is for each individual emergency service agency to develop their own infrastructure and asset management plan with limited (if any) coordination between agencies. |
| Evidence source(s) | Victorian Emergency Management Strategic Action Plan (2015 - 2018)<br><br>Emergency Management Victoria<br>https://www.emv.vic.gov.au/ |
| Commentary on certainty | Whilst no business case or impact assessment has been done on this, the importance of sector-wide integration was a recurring theme coming out of stakeholder interviews. A greater evidence base documenting inefficiencies of current statewide emergency management infrastructure needs to be developed. |

| Option | Western and eastern treatment plant resilience |
|---|---|
| Reference | 10.24.4 |
| Option Code | WET |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Lessons learnt document from NZ Earthquakes. |
| Evidence source(s) | Melbourne Water Climate Change Study http://www.melbournewater.com.au/whatwedo/projectsaroundmelbourne/Pages/Eastern-Treatment-Plant-tertiary-upgrade.aspx and Eastern Treatment Plant Upgrade: A Summary of Melbourne Water's preferred approach<br><br>http://www.melbournewater.com.au/aboutus/reportsandpublications/Documents/Melbourne_Water_2013_Water_Plan.pdf<br><br>Earthquake Repairs at Christchurch WWTP – lessons for resilience |
| Commentary on certainty | The NZ Case Study revealed that the biggest risk posed by the natural disaster was from the failures in the upstream wastewater network, rather than failures at the plant itself. |

| Option | Infrastructure resilience assessment test |
|---|---|
| Reference | 10.24.7 |
| Option Code | IRA |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Conceptual only. |
| Evidence source(s) | **Ministerial Advisory Committee - Plan Melbourne 2015 Review** |
| Commentary on certainty | Conceptual only therefore low in certainty. |

## 10B Address infrastructure related emergency response challenges

| Option | Critical asset centralised risk management |
|---|---|
| Reference | 10.24.3 |
| Option Code | CAR |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Ministerial Guidelines<br>Current Legislation<br>Current policy |
| Evidence source(s) | **Emergency Management Victoria**<br>Victorian Emergency Management Strategic Action Plan 2015-2018 (2015)<br>**Ministerial Guidelines for Critical Infrastructure Resilience (2015)**<br>http://fire-com-live-wp.s3.amazonaws.com/wp-content/uploads/Ministerial-Guidelines-for-Critical-Infrastructure-Resilience1.pdf<br>**Victorian Legislation**<br>**Emergency Management Amendment (Critical Infrastructure Resilience) Act 2014**, No. 76 of 2014 |
| Commentary on certainty | There is currently a state wide plan to manage critical infrastructure and associated risks. The Emergency Management Amendment (Critical Infrastructure Resilience) Act 2014 specifies that the relevant Minister is responsible for identifying and assessing major, significant and vital critical infrastructure. This infrastructure must be included in the Victorian Critical Infrastructure Register, established and maintained by Emergency Management Victoria, and include details such as it's (i) the name and location; (ii) the relevant Department; (iii) the relevant Minister; (iv) the date of the declaration as vital critical infrastructure; (v) the relevant responsible entity and (vi) the relevant Industry Accountable Officer. The responsible entity is responsible for emergency risk management planning and documentation. The criticality assessment methodology is outlined in the Victorian Criticality Assessment Tool (VicCAT). Risk Management Plans (RMPs) must align to requirements stipulated in the Ministerial Guidelines for Critical Infrastructure Resilience.<br>Further analysis should be conducted to identify whether additional benefits could be achieved by incorporating Ambulance Victoria and Victoria Police into Emergency Management Victoria's coordinated asset planning function. Business cases for this have either not been drafted or provided. |

| Option | Emergency management services co-location |
|---|---|
| Reference | 10.25.1 |
| Option Code | EMS |
| **Certainty of evidence rating** | **Medium** |
| Type of evidence | Current policy<br>Anecdotal evidence |
| Evidence source(s) | **Emergency Management Victoria**<br>Victorian Emergency Management Strategic Action Plan 2015-2018 (2015)<br>**Stakeholder interviews**<br>Various |

| | |
|---|---|
| Commentary on certainty | As part of its Victorian Emergency Management Strategic Action Plan 2015-2018, Emergency Management Victoria has recognised the importance of developing a formalised integrated emergency management service delivery model, including creating interoperable assets.<br>Currently, Emergency Management Victoria provides significant support to the Metropolitan Fire Brigade, Country Fire Authority, Victoria State Emergency Services Authority and the Emergency Services Telecommunications Authority. Further analysis should be conducted to identify whether additional benefits could be achieved by incorporating Ambulance Victoria and Victoria Police into Emergency Management Victoria's coordinated asset planning function. Business cases for this have either not been drafted or provided. |

| **Option** | **Emergency traffic management** |
|---|---|
| Reference | 10.25.2 |
| Option Code | ETM |
| **Certainty of evidence rating** | **Low** |
| Type of evidence | Case Study - Queensland |
| Evidence source(s) | **Academic paper**<br>Han, C., Eady, P., & Blogg, M., Performance Evaluation of Gold Coast Emergency Vehicle Priority System (EVPS), 2015<br>**Department of Transport and Main Roads (Queensland)**<br>Emergency Vehicle Priority, http://www.tmr.qld.gov.au/Safety/Road-safety/Emergency-Vehicle-Priority.aspx, 2015, accessed February 2016<br>**Media Statements**<br>Minister for Main Roads, Road Safety and Ports and Minister for Energy and Water Supply: The Honourable Mark Bailey, Emergency vehicles get priority at traffic lights across the state, Sunday, November 22, 2015<br>http://statements.qld.gov.au/Statement/2015/11/22/emergency-vehicles-get-priority-at-traffic-lights-across-the-state |
| Commentary on certainty | A business case for this initiative in the Victorian context has either not been drafted or provided. Significant analysis should be undertaken to determine the benefits associated with introducing a similar initiative to Victoria, as this initiative will be highly contextualised to local conditions. |

## About Deloitte

Deloitte refers to one or more of Deloitte Touche Tohmatsu Limited, a UK private company limited by guarantee, and its network of member firms, each of which is a legally separate and independent entity. Please see www.deloitte.com/au/about for a detailed description of the legal structure of Deloitte Touche Tohmatsu Limited and its member firms.

Deloitte provides audit, tax, consulting, and financial advisory services to public and private clients spanning multiple industries. With a globally connected network of member firms in more than 150 countries, Deloitte brings world-class capabilities and high-quality service to clients, delivering the insights they need to address their most complex business challenges. Deloitte has in the region of 225,000 professionals, all committed to becoming the standard of excellence.

## About Deloitte Australia

In Australia, the member firm is the Australian partnership of Deloitte Touche Tohmatsu. As one of Australia's leading professional services firms, Deloitte Touche Tohmatsu and its affiliates provide audit, tax, consulting, and financial advisory services through approximately 6,000 people across the country. Focused on the creation of value and growth, and known as an employer of choice for innovative human resources programs, we are dedicated to helping our clients and our people excel. For more information, please visit Deloitte's web site at www.deloitte.com.au.