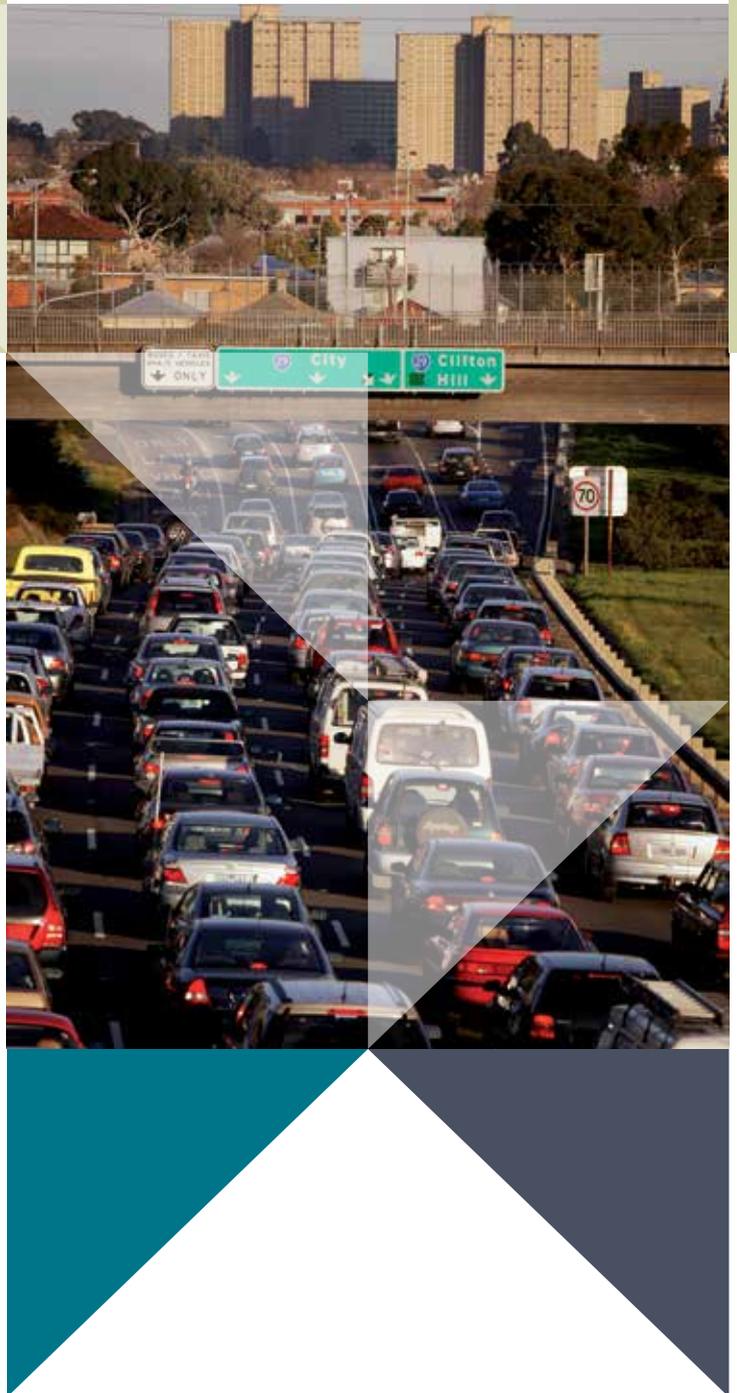


CABINET IN CONFIDENCE

JUNE 2013

# EAST WEST LINK STAGE ONE

SHORT FORM BUSINESS CASE  
INFORMATION FOR  
INFRASTRUCTURE  
AUSTRALIA



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# EXECUTIVE SUMMARY

The East West Link project is an 18-kilometre cross city connection north of the Melbourne central business district, that forms a key element of a suite of high priority and complementary infrastructure projects, including the Port of Melbourne Capacity Enhancement project, Melbourne Airport Expansion, Melbourne Metro rail tunnel, M80 Ring Road Upgrade, Port of Hastings, Western Interstate Freight Terminal, Dandenong Rail Capacity Project and the Removing Level Crossings program, that will collectively drive Victoria's economic growth and enhance liveability. Together, these city-shaping projects will increase the capacity of Melbourne's transport network while boosting productivity, reshaping the city and unlocking land use change and urban renewal.

The full East West Link dramatically improves the connectivity between Melbourne's established east and rapidly growing west, joining the Eastern Freeway at Hoddle Street with the Western Ring Road in Sunshine West.

It provides direct connectivity to Victoria's critical economic engines, including the ports of Melbourne and Hastings, freight and logistics precincts, business and employment clusters and Melbourne International Airport. Importantly, it overcomes Victoria's reliance on the increasingly congested Monash-CityLink-West Gate (M1) corridor.

This short form business case focuses on the first stage of the project – East West Link Stage One – which comprises the following integrated elements (refer to map at Figure 1):

- > a new tolled motorway link between Hoddle Street and CityLink (mainly in tunnel)
- > access via CityLink to M1, Port of Melbourne, Melbourne Airport and M80/Hume Freeway
- > Eastern Freeway upgrading between Hoddle Street and possibly to Tram Road and managed motorways between Hoddle Street and possibly Springvale Road
- > CBD-oriented public transport enhancements to the north of the CBD that are enabled by changed traffic patterns.

FIGURE 1 – EAST WEST LINK STAGE ONE INTEGRAL ELEMENTS

## East West Link Project – Stage One



## Why do we need this project now?

The Victorian Government's strategy to grow the economy, grow employment and to deliver operating surpluses will help it fund transformational infrastructure and boost productivity across the State.

The rate of productivity growth in Australia has been slowing over the last ten years. Productivity growth rates are below the average of member countries in the Organisation for Economic Co-operation and Development. The Commonwealth's January 2010 Intergenerational Report showed that enhancing productivity was the *only* realistic option for Australia to boost its economy.

Victoria contributes 22 per cent of Australia's GDP and has 25 per cent of the nation's workforce. Improving productivity in Melbourne particularly for three of the State's principal economic engines, Melbourne Airport, the Melbourne CBD and the Port of Melbourne, is therefore an essential part of any broader effort to raise national productivity.

Major drivers of the project are:

- > The need to improve access to the highly productive core of Melbourne and enabling the knowledge sector to grow.
- > Improved connectivity between Melbourne's

nationally significant industrial precincts in the south-east and the east, with interstate supply chain corridors in the north and west of Melbourne and the Port.

- > Freight movements are growing rapidly and must be undertaken efficiently.
- > Melbourne and Victoria's rapidly increasing population.
- > Congestion and unreliability are getting worse – The annual cost of congestion is estimated to grow to \$5.0 billion by 2021 and \$7.2 billion by 2031, more than double current levels. The annual economic cost of travel time variability in Melbourne is expected to be more than \$1.4 billion by 2031.
- > Worsening inner city amenity has both economic and environmental impacts as the smart economy will not develop well in areas made unattractive by excess traffic.
- > Equitable access to jobs and services across Melbourne.

Strategic analysis consistently points to excessive dependence on the M1 and the need for more dependable and enhanced east-west connectivity to the north of the Melbourne CBD.



## What is the best option to deliver the benefits?

Options to address traffic issues in the inner north have been developed and assessed over a long period, including the East West Link Needs Assessment (EWLNA, Eddington 2008), which examined a range of public transport, land use, demand management and road solutions. An integrated suite of projects, including East West Link, Melbourne Metro and Doncaster Area Rapid Transit were recommended.

Since the EWLNA, significant further work has identified that the East West Link Stage One is the preferred first stage to meet the Victorian Government's strategic priorities. Stage One addresses the most critical issues and offers the greatest scope for 'adding on' stages that would further enhance access to the port and will enable the full East West Link to be completed in the fastest timeframe. Stage One will generate greater and more widely dispersed benefits than Stage Two. These include:

- > Better connections for Melbourne's freeway network and gateways and a complete new cross-city link better addressing poor east-west connectivity.
- > Strongly establishing the foundations of the full East West Link and efficient operation of subsequent sections.
- > Alleviating critical congestion at the end of the Eastern Freeway.
- > Providing an alternative to the M1 corridor for a large number of freight and other movements.
- > Facilitating growth in Melbourne's central core and opportunities for inner city urban renewal.
- > Maximising opportunities to improve on-road public transport.
- > Completing the unconnected Eastern Freeway and not creating any new points of disconnection (as is the case with Stage Two).

The Victorian Government is committed to delivery of the full East West Link with development of Stage Two (Port to M80 Ring Road) continuing.

The short form business case draws on analysis of possible integrated and enabling works for Stage One. These works have been developed from a detailed network analysis of corridor problems and assessing options to maximise the potential benefits to the corridor.

Users of the Eastern Freeway and new East West Link tunnel come from all parts of Melbourne and regional Victoria. Transport modelling has shown that improvements on both the Eastern Freeway and CityLink will enable the achievement of the full potential benefits of the tunnel component of the project and address the current and future operational issues.

Road congestion limits the reliability and travel speeds of on-road public transport. In particular, north-south tram routes are severely hampered by lack of priority across the heavily trafficked Alexandra Parade corridor. Existing east west traffic impacts upon punctuality, reliability and overall travel times. Congestion on the Eastern Freeway also affects operations of bus services to and from Doncaster and beyond.

As a result of the analysis, various road widening, public transport and operational improvements have been defined as part of the East West Link Stage One.

## MANAGED MOTORWAYS

Across the Victorian transport network, a number of active traffic management measures are being used to manage congestion. Public transport priority lanes are being used along parts of the network, along with capacity increasing measures such as freeway 'ramp metering', contra-flow lanes and en-route information. Managed motorway systems support other sophisticated ITS systems (such as Drive Time, SCATS, and Automatic Incident Detection Systems) that VicRoads uses to maximise the efficiency of the road network and reduce the costs of congestion. Managed Motorways has already been implemented along the M1 – analysis suggests these measures may have increased vehicle throughput of the M1 corridor by some 15 to 20 per cent.

### The scope of the preferred option for Stage One

The preferred East West Link Stage One option is to deliver a set of east-west corridor initiatives that are integral to achieving the productivity benefits and addressing the needs identified:

- > A new tolled motorway link between Hoddle Street and CityLink (mainly in tunnel) comprising:
  - > An interchange at Hoddle Street to provide for existing traffic movements, with the main carriageways passing under Hoddle Street and the South Morang/Hurstbridge railway line and new provision made for southbound traffic on Hoddle Street to turn west into the Eastern Section tunnel.
  - > A tunnel portal west of Hoddle Street.
  - > Twin 4.4 km three-lane tunnels from the Eastern Freeway to CityLink, starting from west of Hoddle Street, running under Alexandra Parade and continuing under the Melbourne Cemetery, Royal Parade and Royal Park.
- > A tunnel portal in Royal Park west of the Upfield railway line linking to elevated structures providing north- and south-facing connections to CityLink.
- > Single lane east-facing exit/entry ramps allowing access to/from Flemington Road via Elliott Avenue.
- > Eastern Freeway widening between Hoddle Street and possibly to Tram Road, and managed motorways between Hoddle Street and possibly Springvale Road.
- > CBD-oriented public transport enhancements that are enabled by changed traffic patterns and which support greater productivity in inner Melbourne.
- > Access via CityLink to M1, Port of Melbourne, Melbourne Airport and M80/Hume Freeway.

The total cost of the project is \$6-8 billion, based on a risk-based assessment of the likely costs and market response by the project team. The precise cost will be determined as part of the procurement process.



## How do the net impacts justify this project?

### Much improved interstate and international linkages

The project will provide a significant increase in the capacity of Melbourne's road network in connecting to Victoria's key interstate and international gateways. With its ultimate connection to the M80 Ring Road, the project will provide a freeway-standard connection across Melbourne linking Victoria's east, west and north with interstate markets in South Australia and New South Wales, via the Hume Highway.

The project with its component parts will link to the various critical ports – both sea and air – removing substantial impediments to Victorian trade and productivity.

### Wider traffic benefits

The project will influence traffic flows on many roads. Travel time savings will be experienced by users of the project as well as users of other roads in the Melbourne network that experience reduced flows, including passengers in trams and buses. Travel time benefits for all parties have been captured in the economic appraisal.

The economic results suggest that, across the broader Melbourne transport network, there will be very substantial travel time savings.

To maximise community and transport user benefits improvements to public transport, access to CityLink and upgrading the Eastern Freeway are part of the integrated project.



### Travel time reliability improvements

The project will reduce travel time variability, which is valued highly by travellers, especially businesses. It will also improve reliability.

### Contingency for the CityLink Tunnels

An important particular benefit of the project is the network resilience offered through providing an alternative to the Burnley and Domain Tunnels where incidents can significantly affect traffic flows. By providing an alternative quality route, the East West Link will deliver benefits when such events occur.

### Land use and amenity

Improved east-west road connectivity and improved CBD-oriented public transport will support the long-term growth and economic development of Melbourne by enhancing urban renewal projects and supporting new commercial development opportunities. Improved amenity and accessibility will facilitate the transition of land to higher value uses and help to realise desirable urban renewal in the highly productive central city core.

To avoid highly negative amenity and visual impacts, most of the East West Link Stage One is proposed to be in tunnel (4.4 kilometres of the six kilometre total).

## Cost benefit analysis

A formal cost benefit analysis has been carried in accordance with standard methodology. The two components of the costs and the benefits were assessed over the normal 30 year period and with the Infrastructure Australia preferred discount rate of seven per cent. Sensitivity tests were applied at the rates of four and ten per cent.

The core result shows a benefit cost ratio of 1.4 including wider economic benefits as appropriate for a major project of this nature targeting economic growth.

The most appropriate economic metrics for a city-shaping project of the nature of the East West Link Stage One are Benefit Cost Ratio, Net Present Value and Internal Rate of Return measures including wider economic benefits. The realisation of wider, city-shaping benefits has been evident in Melbourne with the delivery and operation of projects of similar scale and reach, including CityLink and the City Underground Rail Loop. The project is clearly of high economic worth, with a BCR of 1.4, having over \$1.4 billion of net economic benefit and an internal rate of return of 9%.

## REGIONAL RAIL LINK CASE STUDY

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Table 1 – Economic Metrics of the East West Link Stage One

	Benefit Cost Analysis Result – Including WEBs		
	Real Discount Rate (%)		
	4%	7%	10%
BCR	2.2	1.4	0.9
NPV (\$m, 2013) i.e. 'Net Benefit'	\$5,628M	\$1,476M	-\$286M
NPV / \$	1.11	0.29	-0.06
IRR	9%	9%	9%

## How is this project to be delivered?

The planned delivery and procurement strategy for the Stage One project is:

- > Hoddle Street to CityLink – Availability Payment PPP model with tolls retained by the State.
- > Other integral elements to be procured separately via traditional methods.

In line with the State's broader objectives the link between the Eastern Freeway and CityLink will be a toll road. Analysis conducted for this has found that the link is best delivered via a model under which the State retains initial demand risk, with PPP delivery of project assets and services. This model provides for an efficient and cost effective balance between the use of public and private sector financing.

Under this model, the State receives the toll revenue stream, bearing the full cost (reduced toll revenues) or full benefit (increased toll revenues) that may result from fluctuating traffic volumes. Asset delivery and ongoing operations are procured via a non-tolled PPP under which the private sector is responsible for the design, construction, finance, operation and maintenance of the Project over the concession period.

A substantial government funding contribution is assumed. This contribution would be sized appropriately to address the high cost of private sector debt (and any prevailing liquidity constraints in the debt market that are relevant to a project of this size), while preserving the risk allocation and financial incentive structures that are central to the PPP model.

**Governance** arrangements for the project include:

- > Overall direction and oversight by a Steering Committee chaired by the Secretary DTPLI, responsible for providing advice to Ministers.
- > Management of the MTPFA Statutory approvals and PPP procurement of the link between Eastern Freeway and CityLink by the Linking Melbourne Authority.
- > Development and procurement of Eastern Freeway widening by VicRoads.
- > Commercial negotiations with Transurban for access via CityLink.
- > Development and procurement of traffic priority works to enhance public transport service delivery by VicRoads.

- > As a classified High Value/High Risk project, the East West Link Stage One, is subject to the Victorian Department of Treasury and Finance's Gateway Review process. The new link (between Hoddle Street and City Link) element of the project currently has completed the first two stages/gates of the review process with funding approved in the recent Victorian State Budget.

## The key risks in delivering this project have been identified and strategies are in place to manage them

A project of this size and significance must be carefully planned to ensure that key risks are identified, managed and mitigated. A comprehensive review undertaken for the business case has identified the major risks and ways to mitigate them:

- > The need to retrofit the project into an existing urban environment – addressed through including contractors experienced in such work in the design team.
- > The high capital cost of the Eastern Section tends to multiply design and construction risks, and introduces its own risks around market capacity – addressed through early engagement with industry.
- > The inclusion of tolls (while providing an important source of funding) introduces revenue risk – addressed through the proposed PPP approach.
- > Risks are associated with commercially integrating the Eastern Section with existing toll roads. Further work, including engaging with the existing toll road concessionaires, will be undertaken in the next stage of project development.
- > There is risk that the detailed design solution does not adequately address the identified problems or fully deliver the intended benefits as specified.
- > With planning and approval processes (and community consultation) having commenced, there is a risk that some timeframes for completing the tender process may not be met.
- > A broad range of construction risks may occur during delivery, resulting in additional cost and/or time being required to deliver the design solution. Effective construction management plans will be developed.

The final allocation of risks between the State and other parties under the ultimate PPP model will play an important part in the State's overall risk management and mitigation plans.

## When will the project be delivered?

Plans have been developed to guide the effective and timely construction of the project. This includes a timetable for the tolled motorway link that aims to:

- > progress the statutory planning and approvals process in 2013, including community and stakeholder consultation
- > commence a competitive tender process in mid 2013
- > finalise statutory planning and environmental approvals in mid 2014
- > select a successful project proponent for the PPP by the fourth quarter of 2014.

Under this timetable, construction of the project would commence before the end of 2014, and is expected to take five years to complete. The statutory planning and environmental approvals process is imperative to the development and delivery of the project and is a key item on the critical path for implementation of the project in accordance with these timelines.

The timing of completion of access of CityLink and upgrading the Eastern Freeway, and the public transport improvements is prior to completion of the tunnel and connections.



# 1. INTRODUCTION

This short form business case presents the strategic case for the East West Link Stage One.

The East West Link Stage One comprises:

- > A new tolled motorway link between Hoddle Street and CityLink (mainly in tunnel) comprising:
  - > An interchange at Hoddle Street to provide for existing traffic movements, with the main carriageways passing under Hoddle Street and the South Morang/Hurstbridge railway line and new provision made for southbound traffic on Hoddle Street to turn west into the Eastern Section tunnel.
  - > A tunnel portal west of Hoddle Street.
  - > Twin 4.4 km three-lane tunnels from the Eastern Freeway to CityLink, starting from west of Hoddle Street, running under Alexandra Parade and continuing under the Melbourne Cemetery, Royal Parade and Royal Park.
  - > A tunnel portal in Royal Park west of the Upfield railway line linking to elevated structures providing north- and south-facing connections to CityLink.
  - > Single lane east-facing exit/entry ramps allowing access to/from Flemington Road via Elliott Avenue.
- > Eastern Freeway widening between Hoddle Street and possibly to Tram Road and managed motorways between Hoddle Street and possibly Springvale Road.
- > CBD-oriented public transport enhancements that are enabled by changed traffic patterns which support greater productivity in inner Melbourne.
- > Access via CityLink to M1, Port of Melbourne, Melbourne Airport and M80/Hume Freeway.

The East West Link Stage One includes opportunities to:

- > improve transport accessibility and deliver significant traffic operational benefits, including less traffic congestion and a reduction in the risks associated with Melbourne's over-reliance on the M1 corridor
- > boost economic development and increase Melbourne's and Victoria's productivity and competitiveness through enhanced freight connections
- > improve public transport in the project corridor for both east-west and north-south services
- > contribute to urban renewal through an enhanced transport network, intensified land use and improvements to community amenity in the corridor
- > support strong suburban commercial centres and jobs closer to where people live through more efficient transport connections and more travel choices.

## 2. WHY DO WE NEED THIS PROJECT NOW?

### 2.1 Strategic challenges

#### 2.1.1 The economic imperative

The rate of productivity growth in Australia has been slowing over the last ten years. Productivity growth rates are now below the average of member countries in the Organisation for Economic Co-operation and Development. The Commonwealth's January 2010 Intergenerational Report<sup>1</sup> showed that enhancing productivity was the only realistic option for Australia to boost its economy.

Victoria's Gross State Product was \$322 billion (real \$2010-11) in 2011-12, which represented 22 per cent of Australia's Gross Domestic Product (ABS 5220.0). Victoria has 25 per cent of Australia's workforce, with 2.8 million people in employment. Improving productivity in Melbourne particularly for two of the State's principal economic engines, the Melbourne CBD and the Port of Melbourne, is therefore an essential part of any broader effort to raise national productivity.

*The Victorian Government is prioritising economic development given a strong economy will allow the achievement of other goals, including social and environmental. It has analysed the factors that are required to enhance sustained economic growth, particularly around the two critical dimensions of the knowledge economy and freight and has found some important synergies that can be addressed together. The knowledge sector must be enabled to grow.*

Increasingly, cities are recognised as the engines of economic growth. That is particularly the case in Australia where the city centres of Melbourne and Sydney are more important to the economy than the whole resources sector.

The Victorian Government is determined to ensure that Melbourne's central core with its high concentration of knowledge-based industry (which is now the largest in Australia) continues to grow sustainably and efficiently. Doing so means ensuring that sites are available, that workers can access jobs and that connectivity is enhanced to deliver the all-important agglomeration that lifts productivity and ensures that businesses thrive.

Improved access to Melbourne International Airport is also vital for the knowledge sector. Access to the airport from the east of Melbourne is limited due to the lack of east-west connectivity through the inner north. The airport is of particular significance owing to the disproportionate use made of air travel by the advanced business sector on the one hand and by tourists on the other. The Melbourne Airport Master Plan 2013 (Preliminary Draft) anticipates a doubling of passengers in a twenty-year period.<sup>2</sup>

Integrated transport and land-use planning has identified areas of the inner north and inner west as preferred locations for urban renewal and land use change. These are areas that can form part of Melbourne's modern economy, in particular the knowledge-intensive area of Parkville with its medical and higher education/research specialisations. The development of these vital urban renewal opportunities relies on high levels of amenity, which is threatened by increasing traffic congestion and commercial vehicle intrusion resulting from the lack of suitable east-west routes.

The central Melbourne economy relies on good quality public transport access for its rapidly growing numbers of workers. Unfortunately, the largely radial on-road public transport routes crossing the inner north are adversely affected by the need to accommodate east-west traffic reducing the reliability of the services and limiting the frequencies that can be achieved.

1 Australia to 2050: future challenges, Commonwealth of Australia. January 2010

2 Melbourne Airport Master Plan 2008 Australia Pacific Airports (Melbourne) Pty. Ltd. as amended, July 5 2010.

## 2.1.2 Freight movements are also vital

While supporting the growth of the knowledge-based sector, the Victorian Government is equally committed to maintaining and strengthening the State's role as Australia's freight hub. The Government is concerned that access to Australia's busiest container port, the Port of Melbourne, is becoming increasingly constrained. There is insufficient network capacity to ensure that the State's products, out of the regions as well as the city, can reach their domestic and global destinations at the lowest cost. This deficiency has to be addressed.

Victoria remains a significant manufacturing State focusing increasingly on more sophisticated products. Manufacturing requires not only an efficient transport network with good links to the international gateways, but also appropriate well-connected sites from which to operate. The Victorian Government has a manufacturing strategy<sup>3</sup> that aims to "foster the growth of more productive and competitive businesses across Victoria". Most manufacturing businesses are located in an arc from Melbourne's west to north along the Western Ring Road (M80), from Werribee and crossing Sunshine, Keilor and Broadmeadows to Preston. Manufacturing businesses are also located in Melbourne's outer east, in Ringwood and Croydon, and the south east industrial corridor of Dandenong, Springvale and Moorabbin. Maintaining effective connections between these areas and minimising input costs is critical to this sector.

The Victorian Government is planning for more freight to be moved on rail over the next 20 years and beyond. Despite an increase in the rail share, however, road volumes will still increase markedly with road transport remaining the dominant and most efficient way to move large volumes of freight for the foreseeable future.

Nearly all containers moving through the Port of Melbourne have an origin or destination within the Melbourne metropolitan area making road distribution the most cost-effective and practicable option in most instances.

### Freight volumes are growing rapidly

The number of tonnes of freight moving around Melbourne by road will almost double by 2030 from today's levels. The volume of future east-west freight travel demand will be affected by the \$1.6 billion re-development of the Port of Melbourne, announced in April 2012. Container movement in and out of Melbourne is increasing in excess of six per cent every year and is predicted to reach eight million TEU by 2035.

The Department of Transport, Planning and Local Infrastructure forecasts that approaching 2050 the number of truck trips on Melbourne's roads will have increased from roughly 290,000 trips a day at present to almost 650,000.

The Victorian Government will continue, through the Victorian Freight and Logistics Plan (VFLP), to address the major freight challenges discussed above. An overarching principle of the VFLP is to support aggregation of freight activities at key nodes where capacity exists for growth and concentrate heavy freight flows between these key nodes. The approach requires planning for additional road provision to service developments in the outer areas. These are longer term proposals (with the exception of the Western Interstate Freight Terminal) which will be an increasingly important focus of east-west freight. Meanwhile the need for enhanced east-west connectivity grows with very limited spare capacity on the M1 corridor.

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3 A more competitive manufacturing industry: New directions for industry policy and manufacturing, Victorian Government, Department of Building and Innovation Dec 2011.



Source: DPCD (2012), Victoria in Future 2012, Population and household projections 2011-2031 for Victoria and its regions, April 2012, p 7

### 2.1.4 Congestion and reliability are getting worse

East-west travel demand is composed of trips across the city and many short cross city trips, for example into the central and inner city areas. There are 95,000 trips crossing the city in the inner north, which do not have access to direct cross-city connection that mirrors the M1 corridor in the south. The scale of these trips is significant, considering that there are 145,000 trips being made between the west and south of the city with access to the M1 corridor.

In addition to the 95,000 trips crossing the inner north each day, there are also many vehicles making shorter trips from the eastern and western areas into inner areas. Modelling indicates that these journeys will contribute to increasing congestion on local roads, especially in the inner north. Overall, the number of daily journeys across the inner north is currently in excess of 210,000 vehicles each day.

The existing east west transport network does not adequately accommodate the current needs of the city with the resulting outcome being adverse social, economic and environmental impacts. The critical over-reliance on the M1 corridor presents an unacceptable economic risk and the inefficient links to the Port of Melbourne further impede economic growth for the nation. With the projected increases in population and planned economic growth, it is necessary to accommodate essential traffic with enhanced certainty.

FIGURE 5 – CONNECTIVITY CONSTRAINTS IN THE INNER NORTH



### 2.1.5 The importance of urban amenity conditions in inner areas

Extraneous traffic in the city's inner north is detrimental to targeted economic growth, especially in the Parkville precinct that is home to some of the most-advanced research and tertiary education/health facilities in the world. These facilities will help to drive the Victorian economy in the future.

Within the inner north, a significant number of locations have undergone some form of Local Area Traffic Management (LATM) with the aim of reducing speeds and traffic 'rat-running' through local areas. Generally, LATM measures consist of traffic calming devices such as speed humps and narrow points or one way streets.

However, the effect of such extensive traffic calming is that many short local trips bypass local streets and use arterial roads. These short trips on the arterial road network add congestion to the network and impact on longer trips using the network. Figure 5 shows LATM locations in the inner north and the scarcity of the east-west arterial roads through this area.

### 2.1.6 There is a need for equitable access to jobs and services

The Victorian Government is also committed to providing better access to employment for all residents of Melbourne. This includes improving connectivity between growing residential areas in the north and north-west with employment-rich centres in the south-east.

More than 60 per cent of Melbourne's employment is located in two geographical areas: inner Melbourne (comprised of the Melbourne Local Government Area (LGA) and adjoining LGAs) and the south-east Melbourne economic hub.

Strong population growth in the city's north and west is outstripping local employment growth, creating significant travel pressures as more people travel to central, inner and middle-eastern suburbs for work or business. Reasonably extensive industrial areas are being created in the west and the Victorian Government is taking action to promote further employment growth there, including, for example, the redevelopment of the Tottenham/Brooklyn area, the announcement of the establishment of the East Werribee Employment Precinct, the Footscray Central Activities Area and using Avalon Airport as a catalyst for jobs in the outer west. The west will, however, continue to have a significant dependence on established employment areas. Workers in the concentrated employment zones in the CBD and inner areas will be able to use public transport but access to the more dispersed areas will be dependent on good road access for private vehicles and buses.

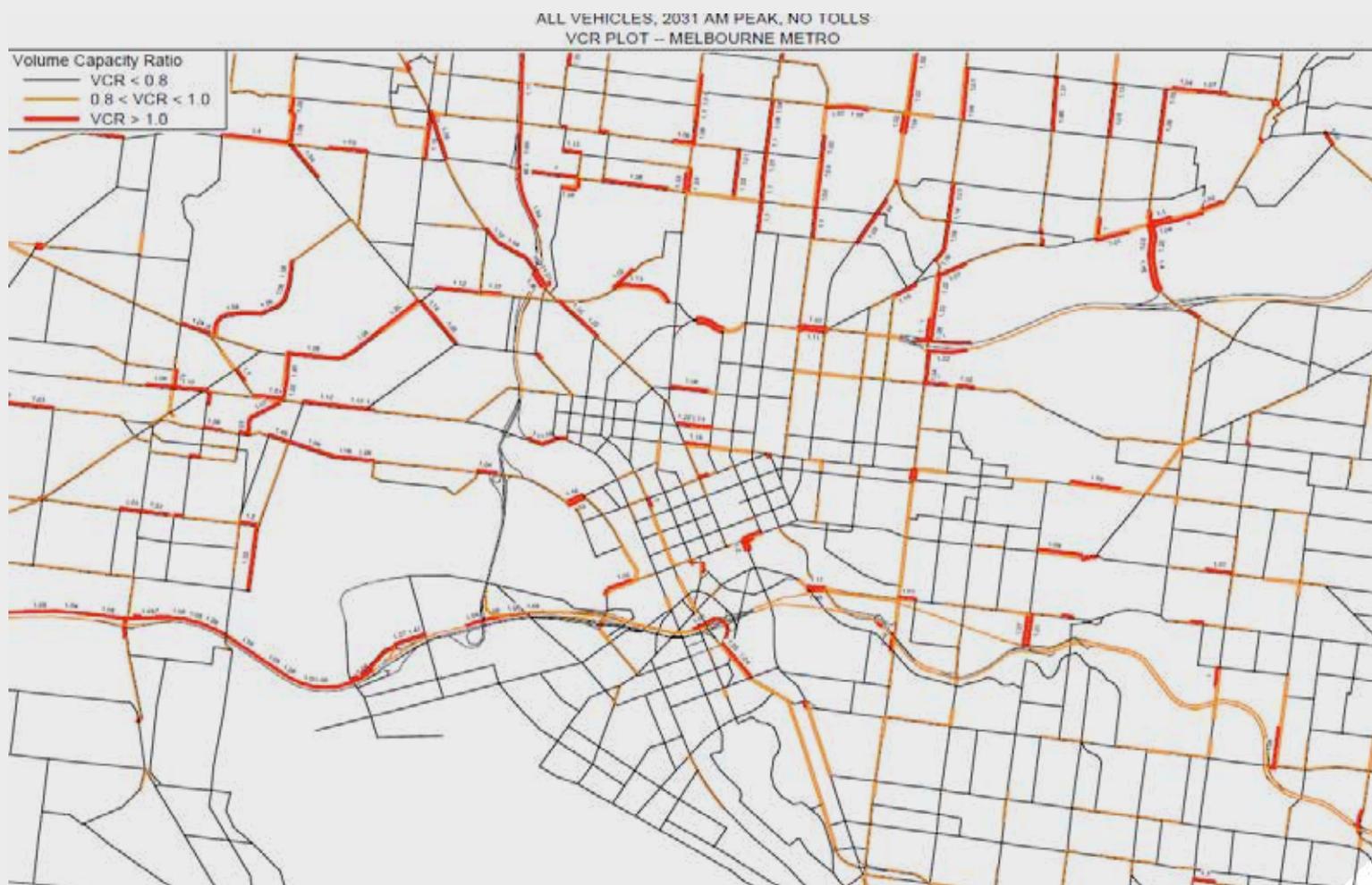
## 2.2 The specific problems to be addressed by this initiative

*The strategic analysis consistently points to the need for significantly enhanced east-west connectivity to the north of the Melbourne CBD.*

There are multiple problems that can be drawn from considering the strategic drivers. But they can all be associated with a particular deficiency in the Melbourne transport network – the lack of a high quality east-west route north of the CBD to match the M1 Monash Freeway to the south. Problems include:

- > Congestion on the inner northern road network affects freight movements and is a detriment to the knowledge economy. Supporting a growing city and an increasingly diverse economy requires strong transport connectivity. While Melbourne has strong radial connectivity, through the rail network and city oriented freeways, cross-city trips are not as well served by the city's transport network.
- > East-west movements have become increasingly important as a result of the changes in Melbourne's economic geography.
- > Melbourne's economy is constrained, as essential traffic cannot gain reasonable access to critical destinations such as Melbourne Airport and Port of Melbourne owing to the lack of sufficient road capacity north of the CBD.
- > An estimated 140,000 vehicles per day from the Eastern Freeway compete for road space with public transport services, including north-south tram and bus services and on-road cycling in the inner north. This severely impacts on inner city amenity and limits the frequency and reliability of on road public transport services.

FIGURE 6 – ESTIMATED MORNING PEAK CONGESTION, 2031



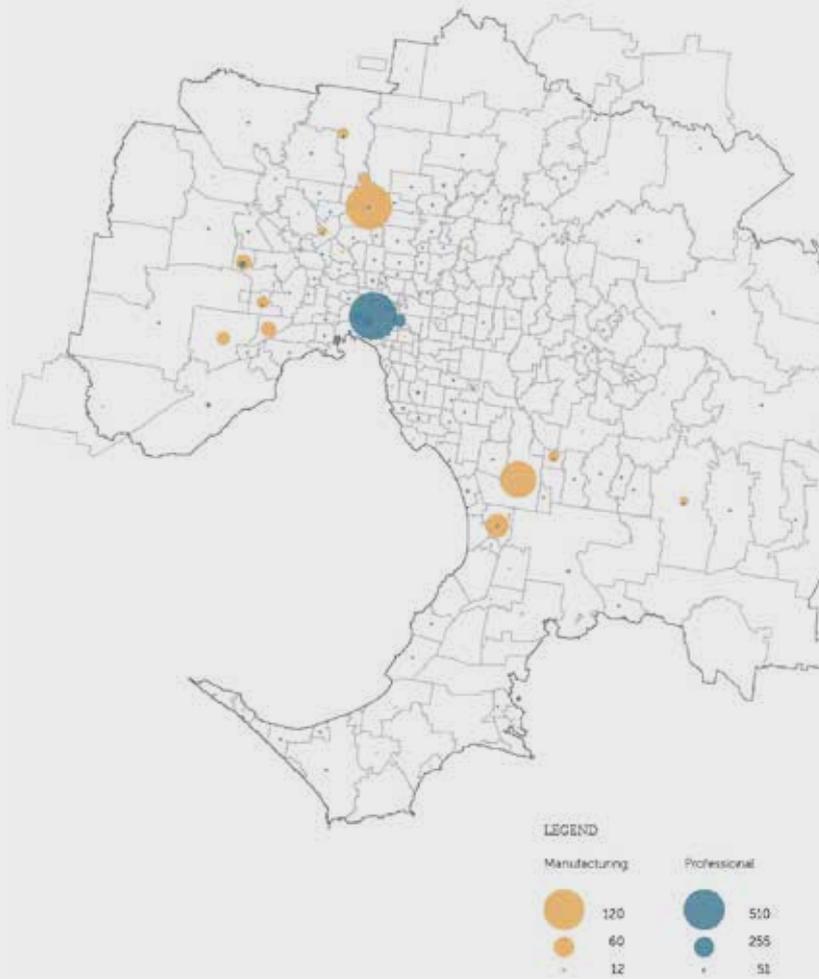
Source: VITM July 2012

### 2.2.1 The growing effects of congestion

The most visible symptom of the problems is congestion. Congestion is a daily occurrence. It is expected to be widespread across the inner city network by 2031, particularly on east-west routes, with the M1 corridor badly affected despite upgrading and allowing for its active management. Diversion of some private vehicle traffic as a result of the major passenger rail schemes will have only a minor, though important, effect.

Unnecessary costs arise directly from the congested conditions, which impose severe delays on traffic movements, and indirectly by limiting the ability of industry to move from inner areas to lower costs sites in the growth areas of Melbourne. Industry can be reluctant to relocate to peripheral areas as costs to service the Port of Melbourne or centrally located customers from those areas are too high. That lack of mobility for industry then has a knock-on effect, as suitable sites for redevelopment for businesses (or residential uses) that gain greater advantage from an inner city site are not freed-up for the most productive uses.

FIGURE 7 – GROWTH IN MANUFACTURING AND PROFESSIONAL SERVICES BUSINESS ESTABLISHMENTS (NUMBERS) 2001-2011 IN MELBOURNE



### 2.2.2 The need for enhanced and more dependable east-west connectivity

Despite the challenges some manufacturing, warehousing and distribution and similar industries have moved towards available land in outer areas, particularly to the west, north and south-east, and have released land in inner Melbourne for growing knowledge-based service industries (as illustrated in Figure 7).

The shift of manufacturing activity from inner Melbourne to outer metropolitan areas has implications for the city's transport network. Where in the past much of the city's freight moved in and out of inner Melbourne, it now needs to bypass inner Melbourne to service the growing manufacturing and warehousing precincts in outer Melbourne.

Increased east-west network capacity will be critical in providing connectivity to the growing freight generation at the Port of Hastings and the new interstate freight terminal located in Melbourne's west.

Poor connectivity is also hampering the equitable re-balancing of the city's residential development. The west is a preferred location for population growth that is much closer to the economic and social heart of the city than is the outer south and east, which have taken a disproportionate share of development in the past.

The State's plans provide for improved public transport (Regional Rail Link and Melbourne Metro in particular) to service this growth to the west. These public transport projects will serve the passenger transport needs with high-capacity rail access to the CBD and concentrated employment areas, but will not serve freight movements, nor provide realistic access to more dispersed employment and services particularly in the established areas in the east. This lack of access will lead to continued relative economic and social disadvantage for Melbourne's western and northern communities.

#### Excessive dependence on a single high capacity road

Victoria's reliance on the M1 corridor cannot be overstated. The corridor currently carries over 175,000 vehicles per day. Traffic volumes will continue to grow as the Victorian trade throughput increases over the next 20 years, and as Melbourne's population grows from around four million towards six million.

Melbourne's exposure to over reliance on the CityLink section of the corridor is illustrated by an incident from October 2012. On that occasion a computer switch breakdown closed the Burnley and Domain tunnels for more than 12 hours causing traffic chaos that extended across a 20 kilometre radius. More than 120,000 motorists were forced to use alternative routes resulting in extensive gridlock. Journeys that normally took 50 minutes took two hours. Trams and buses were caught in the congestion and the rail network was also affected as additional commuters tried to use the services. The Australian Industry Group called the day 'one of the most disruptive of the year'.



### 2.2.3 The economic and environmental impact of worsening inner city amenity

Many of the 210,000 daily vehicle trips making cross-city journeys across the inner north of Melbourne each day divert to east-west suburban roads to avoid congestion on designated cross-city routes.

This demand is serviced on substandard mixed-use arterial roads. These are roads such as Bell Street, Brunswick Road and Victoria Street that serve by default as major through routes despite being unsuited for such a role with a variety of residential and commercial frontages. The roads are used for bus and tram routes and suffer from significant severance. The rat running undertaken along the east-west corridor on local roads impacts on amenity for residents, as well as attractiveness and potential of these corridors for urban renewal.

### 2.2.4 The need to improve access to the highly productive core

Land is required for investment and development to support the continued expansion of the central city. There must also be a deep labour pool able to gain access to the jobs.

As discussed above, the land can be freed-up if improved connectivity allows manufacturing and distribution roles to move to outer areas more suited to their needs.

The labour pool can be provided through Melbourne's combination of heavy rail and the tram network, which provide a dense network of high-quality public transport services similar to the heavy and light metro systems, which serve other highly productive cities overseas. The on-road tram services, are, however, badly affected by the volume of conflicting surface traffic. At present city tram services (such as routes 1, 8, 19, 86, 96 and 112 on north-south streets including Royal Parade, Lygon, Nicholson, Smith and Brunswick Streets) experience significant congestion at Alexandra Parade-Princes Street-Cemetery Road, badly impacting reliability.

The volume of traffic on congested surface roads also limits the ability to provide bus priority for routes serving areas that do not have rail access such as Doncaster.

The Victorian Government is planning for major urban renewal in the inner north and west as extensions to the productive core. These desirable developments will themselves increase travel demands, however, strengthening the need to address the congestion and enhance the public transport service.

### 2.2.5 The scale of the costs of inaction

Analysis in the EWLNA<sup>4</sup> and confirmed by subsequent detailed investigation by the Victorian Government has indicated that road and rail capacity will not be sufficient to cater for growth in east-west travel. Radial on-road public transport is also struggling with both absolute journey times and reliability as a result of the significant growth in the CBD.

The metropolitan transport network is under significant pressure, which will greatly increase with the population and employment changes.

Traffic queues daily on the Eastern Freeway with the freeway halting abruptly on the edge of the city at Hoddle Street. The long queues on the Eastern Freeway have the effect of pushing cross-town traffic further north. Alexandra Parade is one of inner Melbourne's busiest routes and experiences prolonged congestion across the day. Weekend traffic is also congested, with traffic backed up along the length of the street.

The recently completed upgrade to the M1 corridor has provided some respite. Traffic demand is, however, estimated to exceed capacity within 10 to 15 years. There is no alternative to the M1 corridor as a direct cross-city connection, leaving the network exposed to regular disruption and uncertain travel times.

The annual cost of congestion is estimated via modelling to be around \$3.5 billion in 2011. This is forecast to grow to \$5.0 billion by 2021 and \$7.2 billion by 2031, more than double current levels. The significant component of this congestion cost relating to truck movements is forecast to triple from \$0.5 billion today to more than \$1.5 billion by 2031. In addition to the cost of congestion, the cost to the economy of variability in travel times has now become a significant factor. Using the UK recommended methodology<sup>5</sup>, modelling suggests the annual economic cost of travel time variability in Melbourne will rise to \$1.1 billion by 2021, adding more than a fifth to the cost of congested travel. This cost is predicted to rise further, to more than \$1.4 billion by 2031.

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4 Eddington 2008

5 Department for Transport, Transport Analysis Guidance (TAG), The Reliability Sub-Objective, TAG Unit 3.5.7, April 2009

## 2.2.6 How will the problems appear in the future?

Given the substantial growth predicted in population, jobs, freight task and port throughput, the problems identified above will result in steadily increasing social, environmental and economic costs including:

- > increased travel time and reduced travel reliability impacting on productivity
- > reduced reliability for all travellers (freight, business travel, public transport)
- > higher vehicle operating costs from increased stop-start travelling on congested roads
- > higher crash rates
- > increased environmental impacts including noise, greenhouse gas and air pollution
- > reduced amenity and severance affecting residents from rat running and use of local roads when major links are congested
- > fewer agglomeration/productivity benefits that companies could otherwise achieve from being located in close proximity, as worsening travel time and reliability encourages businesses to locate in cheaper locations or areas outside of Victoria/Australia
- > less worker flexibility and ease to switch to more productive jobs because of barriers accessing the east, west and inner northern areas of Melbourne.

These problems exist today and are expected to become much larger. Significant growth in demand along the key east-west links is expected over the next twenty years. Without increases in the capacity of the network, problems will only worsen.

Given the expected time to implement a project of the scale needed to make a significant impact on the problems, the priority to achieve substantial progress is clear.

## 2.3 The proposed strategic solution

Given the strategic analysis and problem specification an infrastructure solution that provides better connectivity between the east and west of the city while reducing surface traffic appears, conceptually, to be the most likely way forward. Section 3 below explores the options within this concept.

Indicatively, a new high capacity road that removes traffic from the local roads and sub-standard arterials and with good links to the freeway network is required – i.e. a new east-west link.

It should aim specifically to enhance productivity, including providing a better environment to attract highly qualified workers and their families. Highly qualified workers have a choice as to where they live and work that extends across international boundaries. Improving connectivity will provide a deeper pool of labour and enhance the ability to match desired skill sets with job opportunities.

The project should also be designed to help to achieve the wider goals through removing traffic from urban streets and through improving connectivity, especially for those living in areas that are not well-served with jobs and services.

The link could also reduce traffic and environmental conflicts to allow urban redevelopment to higher and better uses and allow for enhanced on-road public transport.

## 2.4 How the solution aligns with the Victorian and Commonwealth's broader goals

### 2.4.1 The strategic goals of the Victorian Government

The Victorian Government's economic strategy is reflected in the 2013-14 State Budget – *Building for Growth*, which outlines its commitment to:

- > a growing economy
- > growing employment
- > growing budget surpluses
- > major new infrastructure.

This strategy reflects the State's strong financial management and competitive advantages. These include:

- > The State is best positioned to accommodate and sustain growth and expansion.
- > The Australian capital of the knowledge economy, with the most skilled workforce.
- > The State with the strongest health, science, medical research and technology sectors.
- > Australia's most globally-focused economy, and most Asia-capable workforce.
- > A State with world-class strengths in business services, food and fibre, freight and logistics, manufacturing, tourism, major events and cultural services.

While building the foundation for a strong economy, the Victorian Government has also committed to funding major, productivity enhancing infrastructure as well as making ongoing investments in new roads, public transport and other assets required to keep pace with population growth and maintain liveability.

In particular, the Government will pursue major new initiatives to drive growth, investment and jobs for the long-term benefit of Victorian families, including building a world-class road network to link people, products and markets both in Melbourne and across regional Victoria.

An east-west link would be an integral element of a suite of interventions aimed at achieving the Victorian Government's overall aims for Victoria. The expected benefits of the strategic solution – with the appropriate care given to its various central and enabling components – would be well-aligned with the State's objectives and will build on the competitive advantages. An east-west connection from deep in the eastern suburbs to the Western Ring Road as a whole would provide vital capacity to support growth. An eastern section alone focused on removing inner city traffic and connections to the ports should play a central role in facilitating the growth of the knowledge economy while also improving access to the State's physical connections to the global economy.

### 2.4.2 Commonwealth policy alignment

The solution would be a critical addition to the National Land Transport Network, particularly in relation to its connection to the Port of Melbourne, the M80 Ring Road, the future Port of Hastings and the Western Interstate Freight Terminal.

In this role, the solution would also support the outcomes sought through the Commonwealth Government's National Ports Strategy as it relates to planning for and providing long-term freight network capacity and land-side connections to nationally significant ports.

In relation to the National Land Freight Strategy, the solution would be part of the Victorian Government commitment to undertaking long-term planning for the freight network. The solution's development should have regard to the appropriate road governance options and measures to optimise the benefits for freight and options to encourage private sector investment.

The solution would be consistent with the Commonwealth Government's objectives through the next phase of the *Nation Building Program*, due to commence in 2014. It would deliver benefits that lift productivity to support economic growth through an efficient and connected freight network. The city-shaping nature of the integrated solution should also enhance urban productivity, livability and access to essential services by freeing up network capacity for enhanced public transport north of Melbourne's CBD.

## 3. WHAT IS THE BEST OPTION TO DELIVER THE INTENDED BENEFITS?

### 3.1 The strategic east-west road options to deliver the intended benefits

Alternative ways to provide the additional connectivity across Melbourne were investigated as part of the East West Link Needs Assessment Study (EWLNA) including routes to the south of the CBD. None of the options were as successful as an inner northern route in addressing all the problems, with a route already existing to the south and with the need for a new route closer to the desire-lines to the north.

As part of the EWLNA study, a set of packages was developed and tested against economic/ financial, environmental, social and transport criteria i.e. a multi-criteria 'triple-bottom line' assessment of various scenarios for managing the problem.

The strategic options assessment in the EWLNA study recommended the East West Link: a new 18-kilometre inner urban road connection extending across Melbourne from the Eastern Freeway to the Western Ring Road, as this emerged as a strong and integral response to Melbourne's poor east-west connectivity, and thus productivity issues. The study also recommended Melbourne Metro (East-West Rail Tunnel), Doncaster bus service improvements, Regional Rail Link, demand-management and efficiency measures and a series of lower cost complementary public transport initiatives.

### 3.2 Other possible options

While a road construction option (in association with major public transport projects) was recommended by the EWLNA study, the Victorian Government has tested whether other solutions to the multiple problems might exist. It looked at 'better use' initiatives and investment in public transport, as well as alternative road options.

#### 3.2.1 Better use initiatives – managed motorways and road pricing

Across Victoria's transport network, traffic management measures are being used to manage congestion. Public transport priority lanes are in use along parts of the network together with capacity increasing measures such as ramp metering and real-time information.

These traffic management measures are part of the M1 corridor upgrade (known as Managed Motorways) and are being extended to other parts of the network.

The Managed Motorway system may reduce congestion but will not reduce the demand for additional east-west connectivity to a sufficient extent as to achieve the objectives. Analysis by VicRoads suggests that Managed Motorways may have increased vehicle throughput by 15 – 20 per cent. While this is very beneficial in the shorter-term it is not sufficient to address the full suite of problems, given their scale.

Nevertheless Managed Motorways are seen as an integral part of the solution.

Road pricing, similarly, is seen as an appropriate inclusion in the package, through the mechanism of tolling, but not a solution in itself.

Melbourne already manages its traffic demand through fiscal measures such as tolls and high parking charges as well as prioritisation of road space for public transport, cyclists and pedestrians on various parts of the network. Further introduction of direct road charging such as is seen in London and Stockholm, for example, is generally targeted at radial road traffic to the city centre and depends on the availability of circumferential roads to carry traffic that might be diverted. The East West Link Stage One is therefore more of a complement to such schemes than an alternative.

### 3.2.2 Public transport options

Several major public transport investments will have an impact on Melbourne's east-west connectivity. The Regional Rail Link is underway and will improve connectivity from the west to the city centre. It will not, however, be able to target the travel movements that go to and from the east, nor is it likely to have sufficient impact on existing road flows to release capacity for the fast growing freight volumes.

The Melbourne Metro rail tunnel will similarly be highly beneficial in serving radial movements from the newer population areas of the west, connecting the residents to city centre jobs and is a commitment of the Victorian Government. Relief offered on the roads will again be worthwhile, but insufficient to negate the need for the East West Link Stage One, having very minor effect in particular on the high volumes of surface traffic in the inner north and its impact on tram and bus services.

Public transport options do not offer a solution in themselves, but are also included as integral elements of the project to enable all the problems to be addressed.

### 3.2.3 Other road options

The only potential road option that would avoid the need for a new corridor to be developed is further expansion of the M1. As discussed above, that route is already the subject of active management. It has also had a very substantial upgrade over the last decade. It has now reached the practical limit of potential expansion owing to bridge and tunnel constraints. The M1 cannot, by definition, serve all desire lines equally and the heavy dependence of the city on a single route is itself already seen as an unacceptable risk.

Treatments along Hoddle Street were not considered to be feasible or worthy of investigation.

As noted, the EWLNA study looked at alternative routes and concluded that the road component of the package was best provided north of the CBD, extending the Eastern Freeway.

## 3.3 East-West Link staging and sequencing

Since the EWLNA, significant further work has been undertaken to identify the preferred content, staging and sequencing of the East West Link. The section between Hoddle Street and CityLink was identified as the preferred first stage as it addresses the most critical issues and offers the greatest scope for 'adding on' stages that would further enhance access to the port and will enable the full East West Link to be completed in the fastest timeframe. As a stand alone project, Stage One will generate greater and more widely dispersed benefits than Stage Two. These include:

- > better connections for Melbourne's freeway network and gateways and a complete new link across the central city better addressing poor east-west connectivity.
- > strongly establishing the foundations of the full East West Link and efficient operation of subsequent sections
- > alleviates critical congestion at the end of the Eastern Freeway
- > provide an alternative to the M1 corridor for a large number of freight and other movements
- > facilitate growth in Melbourne's central core and opportunities for inner city urban renewal.
- > maximise opportunities to improve on-road public transport.
- > complete a currently unconnected Eastern Freeway and not create any new points of disconnection (as is the case with Stage Two).

The Victorian Government is committed to delivery of the full East West Link with ongoing assessment and refinement of Stage Two continuing.

FIGURE 8 – TRAFFIC IMPACTS OF EAST WEST LINK ROAD TUNNEL



### 3.4 Project components

The business case draws on analysis of possible integrated, enabling works for the Stage One of the project. These works have been developed from a detailed network analysis of corridor problems and assessing options to maximise the potential benefits to the East West Link corridor.

Users of the Eastern Freeway and new East West Link tunnel come from all parts of Melbourne and regional Victoria. Transport modelling has shown that improvements on both the Eastern Freeway and CityLink – which will be primary access points for the East West Link – will enable the achievement of the full potential benefits of the tunnel component of the project and address current and future operational issues.

In addition, road congestion plays a major part in restricting the reliability and travel speeds of on-road public transport such as trams and buses.

In particular, north-south tram routes running through the inner north are severely hampered by lack of priority across the heavily trafficked Alexandra Parade corridor. The need to accommodate the requirements of the essential east-west traffic impacts upon reliability and overall travel times. Congestion on the Eastern Freeway also affects operations of bus services to and from Doncaster and beyond, particularly as traffic diverts to use other roads that serve as important bus routes.

As a result of the analysis, various project elements have been defined as part of the East West Link Stage One, as described below:

#### Road tunnel from Eastern Freeway to CityLink

Stage One will be a tolled motorway from the Eastern Freeway to CityLink and will include associated access ramps connecting each carriageway to the new road.

#### CityLink connection

Access via CityLink to M1, Port of Melbourne, Melbourne Airport and M80/Hume Freeway.

#### Eastern Freeway upgrade

Upgrading of the Eastern Freeway as part of the project would extend from Yarra Bend Road to possibly Tram Road while implementing a managed motorways system on the freeway between Hoddle Street and possibly to Springvale Road. Numerous widening and managed motorways combinations were tested to determine the combination that would maximise the overall benefits and which should be seen as an inherent part of the project. It should be noted that scoping and costs are preliminary and subject to refinement in the time period of procurement of the tunnel section.

#### Managed Motorways

Across the Victorian transport network, a number of traffic management measures are being used to manage congestion. Public transport priority lanes are being used along parts of the network, along with capacity increasing measures such as freeway 'ramp metering', contra-flow lanes and en-route information. Managed Motorways systems support other sophisticated ITS systems (such as Drive Time, SCATS, and Automatic Incident Detection Systems) that VicRoads uses to maximise the efficiency of the road network.

Managed Motorways can reduce the costs of congestion. Managed Motorways has been implemented along the M1, and VicRoads analysis suggests these measures may have increased vehicle throughput of the M1 corridor by some 15 to 20 per cent.

#### Public Transport upgrades

A range of public transport upgrades have been analysed and selected that are enabled with the new East West Link road tunnel, and which support greater productivity in inner Melbourne.



# 4. THE SCOPE, COST AND PROGRAM FOR THE PREFERRED OPTION

## 4.1 The preferred option

The preferred Stage One option is to deliver a set of east-west corridor initiatives that are integral to achieving the productivity benefits and addressing the needs identified:

- > A new tolled motorway link between Hoddle Street and CityLink (mainly in tunnel).
- > Eastern Freeway upgrading between Hoddle Street and possibly to Tram Road and managed motorways between Hoddle Street and possibly Springvale Road.
- > CBD-oriented public transport enhancements to the north of the CBD that are enabled by changed traffic patterns.
- > Access via CityLink to M1, Port of Melbourne, Melbourne Airport and M80/Hume Freeway.

The new tolled motorway link includes:

- > An interchange at Hoddle Street that will continue to provide for all existing traffic movements, with the main carriageways passing under Hoddle Street and the South Morang/Hurstbridge railway line and new provision made for both northbound and southbound Hoddle Street traffic to turn west into the tunnel.
- > A tunnel portal west of Hoddle Street.
- > Twin 4.4 km three-lane tunnels in each direction from the Eastern Freeway to CityLink, starting from west of Hoddle Street, running under Alexandra Parade and continuing under the Melbourne Cemetery, Royal Parade and Royal Park.

FIGURE 9 – EAST WEST LINK STAGE ONE INTEGRAL ELEMENTS



- > A tunnel portal in Royal Park west of the Upfield railway line linking to separate elevated structures providing north-facing connections to CityLink near Brunswick Road and south-facing connections to CityLink near the soundtube.
- > Single lane east-facing exit/entry ramps allowing access to/from Flemington Road via Elliott Avenue.

## 4.2 Costs

The estimated costs are between \$6 billion and \$8 billion, to be confirmed as part of the procurement process. These costs have been derived from a risk and market based cost and constructability assessment of the designs developed by the project team. Independent and comprehensive peer reviews have also been carried out to inform this assessment.

## 4.3 Program

Plans have been developed to guide the effective and timely construction of the tunnels and ramp connections. This includes a timetable that aims to:

- > Progress the statutory planning and approvals process in 2013, including community and stakeholder consultation.
- > Commence a competitive tender process in mid-2013.
- > Finalise statutory planning and environmental approvals in mid-2014.
- > Select a successful project proponent for the PPP by the fourth quarter of 2014.

Under this timetable, construction of the project would commence before the end of 2014. The statutory planning and environmental approvals process is imperative to the development and delivery of the project and is a key item on the critical path for implementation of the project in accordance with these timelines.

The timing of completion of the upgrading of CityLink and the Eastern Freeway, and the public transport improvements is prior to completion of the tunnel and connections.



## 5. HOW DO THE NET IMPACTS JUSTIFY THIS PROJECT?

The economic appraisal is for Stage One of the East West Link, comprising the following integrated elements (refer to map at Figure 1):

- > a new tolled motorway link between Hoddle Street and CityLink (mainly in tunnel)
- > access via CityLink to M1, Port of Melbourne, Melbourne Airport and M80/Hume Freeway
- > Eastern Freeway upgrading between Hoddle Street and possibly to Tram Road and managed motorways between Hoddle Street and possibly Springvale Road
- > CBD-oriented public transport enhancements to the north of the CBD that are enabled by changed traffic patterns.

### 5.1 Transport benefits

#### 5.1.1 Much improved interstate and international linkages

The project will provide a significant increase in the capacity of Melbourne's road network in connecting to Victoria's key interstate and international gateways. With its ultimate connection to the M80 Ring Road, the project will provide a continuous freeway-standard connection across Melbourne linking Victoria's east, west and north with interstate markets in South Australia and New South Wales, via the Hume Highway.

The project, with its connectivity through CityLink, will support interstate and international trade through the Port of Melbourne and at interstate freight terminals planned for Melbourne's west and north. These gateways play a critical role in the export chains for Tasmania, parts of New South Wales and South Australia as well as for Victoria itself. Any limitations on the efficiency of the Port of Melbourne have flow-on effects to those States and the national economy.

The international airport at Tullamarine, with connection via CityLink, is also an important gateway for interstate business. Substandard access from the east of Melbourne and Gippsland to the airport from Eastern Melbourne will be addressed via the links to the Eastern Freeway and EastLink.

The project is expected to draw a significant amount of traffic from parallel east-west routes such as Alexandra Parade and Bell Street. Road users who divert to the project as well as those who remain on parallel routes will gain significant travel time improvements.

#### 5.1.2 Wider traffic benefits

The project will be an important component of the transportation network in Victoria and will influence traffic flows on many roads. Travel time savings will be experienced by users of the project as well as users of other roads in the Melbourne network that experience reduced flows, including passengers in trams and buses. Travel time benefits for all parties have been captured in the economic appraisal.

To make use of the project, a number of users are expected to change their journeys, for example, switching their destinations to access alternative parts of Melbourne.

While a small percentage of travellers will experience increased travel times, the economic results suggest that, across the broader Melbourne transport network, there will be very substantial travel time savings.

In order to maximise community and transport user benefits improvements to public transport and upgrades to CityLink and the Eastern Freeway are part of East West Link Stage One.

### 5.1.3 Travel time reliability improvements

The project will provide additional road connectivity, which will reduce travel time variability across the road network. This will mean that road users will have greater certainty about the time their trip will take and how much it will vary between trips. This certainty is valued highly by travellers, especially businesses.

### 5.1.4 Contingency for the CityLink Tunnels

An important particular benefit of the project is the network resilience offered through providing an alternative to the Burnley and Domain Tunnels. Incidents in these tunnels can significantly impair the ability for passenger, commercial and freight vehicles to traverse the city. By providing an alternative quality route, the East West Link will deliver benefits when such events occur.

The formal economic appraisal captures the impacts on travel times, vehicle operating costs, accidents, environmental impacts and wider economic benefits based on the probability of both short-term partial closures and long-term full closures occurring. The wider impact of increased reliability and confidence in the Melbourne transport network cannot be fully represented in these calculations. However, it is worth noting that, as these impacts are based on outputs from a strategic traffic model, they provide an inherently conservative view of the benefits. A 'live' example of the actual effect of a closure is highlighted on page 19 of this document with the closures of the Domain and Burnley tunnels in October 2012.

## 5.2 Land use and amenity

Improved east-west road connectivity and improved radial CBD-oriented public transport will support the long-term growth and economic development of Melbourne by enhancing urban renewal projects and supporting new commercial development opportunities. Improved amenity and accessibility to a number of inner urban areas will make them more attractive places to live and invest, facilitating the transition of land to higher value uses and helping to realise desirable urban renewal in the highly productive central city core.

The project draws a significant amount of traffic from parallel east-west routes in the corridor, particularly in the area bounded by Bell Street in the north and Victoria Parade in the south, and many local roads in the area. The project is expected to support urban renewal in the following ways:

- > Improving amenity in inner urban neighbourhoods by reducing traffic volumes on local streets.
- > Unlocking opportunities for urban renewal through the separation of local and cross-city movements and the freeing-up of road space for other activities, enhancing the economic development potential of the central city and inner north, and supporting the changing industry base of the inner west.

To avoid highly negative amenity and visual impacts, most of the East West Link Stage One is proposed to be in tunnel (4.4 kilometres of the six kilometre total) to minimise negative social, visual, noise and other environmental impacts.



## 5.3 Economic assessment

### 5.3.1 Approach

The principal driver for the East West Link Stage One is to enhance the productive capacity of Melbourne and Victoria (and therefore of Australia). Accordingly, the most important test of the project is how well it does so. The economic benefits can be measured through the direct travel time and operating cost savings for transport coupled with enhanced productivity as a result of improved connectivity – agglomeration benefits.

Beyond these wider economic benefits, the project is expected to generate economy-wide benefits for Victoria, triggered initially by the construction activity and then by the flow-on of the enhanced productivity.

These true benefits of the project are discussed in this section. Section 5.3.2 then presents the results of the more restricted standard analysis of the East West Link Stage One as would be applied to a less strategic transport project.

In carrying out that analysis the Victorian Government has been up-front in acknowledging and taking account of the redistribution and traffic inducing effects of a major road. This approach has the result of reducing the assessed benefits of a project as individual user decisions to gain benefit from the additional capacity erodes the overall benefits. Unusually, these effects are explicitly accounted for in the analysis (otherwise the calculated benefits would be significantly higher). Victoria has carefully defined the elements that make up the East West Link Stage One to maximise the benefits sought and to minimise undesirable effects. Providing the new tunnel as a toll road and using capacity released on surface roads for public transport are examples of the approach.

### 5.3.2 Travel time savings

Users of the Melbourne transport network will be major beneficiaries of the project, as it will provide an east-west transport link north of the CBD to cater for orbital movements across the city, providing better access to jobs and supporting the more efficient movement of freight by removing traffic from congested arterial roads onto the freeway network. Public transport users benefit from reduced traffic competing for road space.

Improvements in average travel times across the Melbourne transport network are a major benefit of the project. These benefits will accrue to:

- > existing road users who divert to the new road or take advantage of reduced congestion enabled by the integrated project
- > public transport users who benefit from routes that are faster and more reliable when less-affected by conflicting road traffic
- > travellers switching modes of transport due to the improved travel times offered by the project
- > travellers switching their destinations to access more desirable destinations (which may involve taking longer trips)
- > existing M1 road users who will experience reduced congestion offered by other existing users who switch from the M1 to Eastern Freeway corridor.

While cars are expected to gain the largest portion of travel time savings, light commercial and heavy vehicles comprise a relatively high portion of the travel time savings expected from the project (close to 20 per cent).



### 5.3.3 Growth in Melbourne's competitive central core

#### Agglomeration benefits

One of the most significant benefits expected from the project is agglomeration, which relates to the positive externality (benefit) that firms experience when their commercial activities are well-connected. Firms and workers often cluster: hence the existence of cities, financial districts, business parks and technology corridors. This clustering is driven by the improved knowledge sharing and access to suppliers and labour markets that come with higher densities of activity.

The project will improve transport links between high value and relatively dense areas of Melbourne by bringing firms closer together in terms of travel time and increasing overall employment accessibility to further increase the density of the cluster.

The project will significantly improve the accessibility of current and future employment areas in Melbourne. This improved accessibility will enable improved connections between employers, labour markets, suppliers and other employers.

#### Tax revenue from increased employment/ longer hours

The integrated project is expected to facilitate additional output from workers as they are encouraged to increase their labour supply in response to reduced commuting time and costs. This combines with extra output from existing workers. In addition, workers may shift to more productive jobs because of a decrease in commuting time.

For the purposes of the cost benefit analysis (CBA), the incremental tax revenue from any additional output is recognised as an additional benefit not captured elsewhere in the appraisal.

#### Imperfect competition

A traditional CBA measures the reduction in labour costs to firms from travel time savings as a proxy for the actual value to society of the time saving. This is because, in a perfectly competitive market, hourly labour costs equal hourly productivity. Perfect competition ensures the price a firm can charge for a good or service is the same as the cost of producing that good or service. In reality, many markets are not perfect: firms can charge more for a good or service than it costs to produce. Labour costs in such imperfect markets therefore underestimate productivity and, therefore, the value of business time savings.

#### Economy-wide benefits for Victoria

The project is expected to generate broader economic activity induced by improvements to transport productivity and increased expenditure throughout the economy. The CBA does not measure these benefits as they are indirect measures not easily attributed to a particular project.

The project will result in a significant increase in economic activity in Victoria – observed in the increase in Victoria's GSP as well as employment. This is driven by expenditure during the construction period, which continues into the operation period as productivity improvements drive further economic growth (e.g. as a result of travel time savings for service industries such as transport, postal and warehousing).

By 2050 Victorian GSP would increase by \$580 million (real) pa. Employment would remain slightly above the long-term average in Victoria owing to the productivity gains that are achieved through the project.

Household and government consumption expenditure is also increased as a result of the project, and is a proxy measure of the effect on living standards, or welfare, of households. Household consumption is driven by wage and employment, as employment or wages increase household consumption increases. The project results in an increase in employment in Victoria and higher wages. Household consumption follows a similar ongoing trend as employment, however, instead of returning to levels close to without the project base case, household consumption remains high due to higher wages persisting in Victoria as a result of the project.

## 5.4 Economic analysis and results

### 5.4.1 The cost benefit calculation

A cost benefit analysis has been undertaken in accordance with standard methodology (but with the non-standard inclusion of the effects of redistribution as outlined earlier, to account for the effect of induced demand). The two components of the costs and the benefits were assessed over the normal 30 year period and with the Infrastructure Australia preferred discount rate of seven per cent – which is higher than the accepted value in Victoria. Sensitivity tests were applied at the rates of four and ten per cent.

### 5.4.2 Capital and operating costs

Forecast risk adjusted capital costs of \$6 – \$8 billion as well as operating costs, have been adjusted for inclusion in the economic appraisal by converting them to real values (e.g. excluding escalation) and removing profit margins.

Operating costs include an allowance for major periodic maintenance. The operating costs have been calculated as a net present cost.

### 5.4.2 Benefits

The benefits in the standard calculation relate principally to the monetising of the travel time, operating cost and crash savings. The input values to the calculations were derived from a comprehensive and well-validated traffic model. The model was also used to derive values for the enhanced reliability expected and for the benefit of providing resilience against the dependence on the M1 corridor. As discussed above, the project is also intended to generate very significant wider economic benefits through the greatly enhanced connectivity.

### 5.4.3 Ramp-up and accounting for the progressive redistribution destination shifting effect

A ramp-up profile is applied to scale down demand forecasts in the first two years of the operation of the project in recognition of the fact that travellers take time to adjust to the opportunity of a new facility.

The factors applied were:

- > 74.3 per cent of headline estimate at opening (end of construction period).
- > 97.0 per cent after one year. 100 per cent after two years.

Redistribution (or destination shifting as part of induced demand) occurs over a longer period than the ramp-up. For this analysis it is estimated to happen progressively over some 10 years. This is a conservative assumption which has the effect of reducing the benefits calculated. The effect is implemented in the modelling by progressively shifting from fixed matrix results to variable matrix outputs when building the final time profile of transport impacts. Outputs are thus 'blended' using a linear profile, with the opening year being represented mostly (90 per cent) by the fixed matrix outputs (and 10 per cent by the variable matrix outputs). By the ninth year of operation, demand outcomes are represented mostly (90 per cent) by the variable matrix outputs. Beyond the tenth year of operation, only the variable matrix outputs are used (100 per cent). For this project the destination shifting could happen over a longer time period than 10 years and this is reflected in the sensitivity analysis documented further below.

### 5.4.4 Results

The most appropriate economic metrics for a city shaping project of the nature of the East West Link Stage One are BCR, NPV and IRR measures including wider economic benefits. The realisation of wider, city-shaping benefits has been evident in Melbourne with the delivery and operation of projects of similar scale and reach, including CityLink and the City Underground Rail Loop. Using this measure the project is clearly of high economic worth, with a BCR of 1.4, having over \$1.4 billion of net economic benefit and an internal rate of return of 9%.

## REGIONAL RAIL LINK CASE STUDY

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Table 2 – Economic Metrics of the East West Link Stage One

Benefit Cost Analysis Result – Including WEBs			
	Real Discount Rate (%)		
	4%	7%	10%
BCR	2.2	1.4	0.9
NPV (\$m, 2013) i.e. 'Net Benefit'	\$5,628M	\$1,476M	-\$286M
NPV / \$	1.11	0.29	-0.06
IRR	9%	9%	9%

Benefit Cost Analysis Result – Excluding WEBs			
	Real Discount Rate (%)		
	4%	7%	10%
BCR	1.3	0.8	0.6
NPV (\$m, 2013) i.e. 'Net Benefit'	\$1,342M	-\$737M	-\$1,530M
NPV / \$	0.26	-0.15	-0.30
IRR	6%	6%	6%

Table 3 – Sensitivity Testing

Benefit Cost Ratio Sensitivity Testing		
Sensitivity test #	Variation	Benefit-Cost Ratio (BCR)
0	Discount rate 7% without WEBs	0.8
1	Discount rate 4%	1.3
2	Discount rate 10%	0.6
3	Including WEBs	1.4
4	Variation in costs - +10%	0.7
	- 10%	0.9
5	Travel redistribution 'capped' at 80% by Year 8 (excluding WEBs)	0.9
6	Travel redistribution 'capped' at 80% by Year 8 (including WEBs)	1.5
7	Future Benefits method for Residual Value (excluding WEBs)	0.9
8	Future Benefits method for Residual Value (including WEBs)	1.5
9	No redistribution of demand (excluding WEBs)	1.2
10	No redistribution of demand (including WEBs)	1.9

#### 5.4.5 Impact of redistribution of travel demand

The traffic model correctly reflects the changes that come about as a result of increased capacity on the road network. As noted by the Victorian Auditor-General in comments on the appraisal of major infrastructure projects in Victoria, travel responses are more than simply re-routing to use the East West Link or switching from other transport modes.

In particular, the traffic demand model estimates the number of users who change their trip destination or origin when the project makes it easier to make a trip of higher value to them. A familiar example is when a household is able to relocate to an area that they consider more attractive but may be further from the wage-earner's employment, when a transport improvement reduces the travel time and makes it acceptable for the regular commute.

While the economic appraisal captures the net utility/consumer surplus generated for users who change their trips, an implication of this change in trip destination can be greater congestion on the network and a reduction to the economic benefit. The integrated project has therefore been designed to optimise the benefits to the Victorian economy with associated enabling projects that reduce the congestion and with public transport upgrades that take advantage of some of the surface road capacity released and will help to minimise the 'induced travel' effect.

## 6. HOW IS THIS PROJECT TO BE DELIVERED?

### 6.1 Funding arrangements

The Victorian Government believes that there is considerable value in providing new roads through the mechanism of tolls. Doing so has multiple advantages – tolls contribute to the overall cost of a project. They help to ensure priority for higher value traffic and serve as a demand management measure. The travelling public of Victoria are well-accustomed to accepting that they should pay for the beneficial infrastructure they use with the existing CityLink and EastLink tollways.

The East West Link Stage One project will require government funding contributions given the high cost of tunnelling and to fund some of the enabling projects, including the public transport improvements.

Following detailed traffic modelling, the testing of a range of toll pricing options and consideration given to consistency with toll pricing and structures on Melbourne's existing toll roads, the business case has adopted a single gantry toll point approach. The ultimate toll pricing solution and level, are however, typically determined post-business case.

The tolling strategy has been developed to optimise the broader community benefits, underpin the finances of the project and strengthen the economic value of the project.

Traffic modelling shows that toll revenue will not cover the full cost of the project, therefore a traditional toll road structure (as with CityLink and EastLink) will not apply to East West Link Stage One.

The State has released initial funding of \$224 million in 2013-14 and \$70 million in 2014-15.

The Victorian Government is fully committed to funding the project and has made all necessary allowances to do so. The State will continue to seek to secure a Federal Government contribution to the project delivery and financing structures to achieve maximum value for money through the procurement.



## 6.2 Delivery strategy

The procurement options assessment framework and process adopted for the project are consistent with DTF and Infrastructure Australia guidelines.

### 6.2.1 Market interest

An extensive market sounding process conducted for the business case found strong interest for the full East West Link and Stage One. All of the 43 domestic and international entities that participated in this process were extremely keen to see Stage One delivered, partly because the national pipeline for infrastructure projects is weak and uncertain.

There was particularly strong interest from international participants, exceeding the level of interest attracted by previous infrastructure projects, in both the number and calibre of interested parties.

The market sounding process highlighted a number of matters that are significant to the development of an efficient procurement solution for the Project.

The overarching themes from the market sounding process provide a useful context to the assessment of the various options identified:

- > There is overwhelmingly strong interest in the Project, with all market sounding participants extremely keen for the Project to be delivered.
- > While Victoria, New South Wales and Queensland all have multi-billion dollar projects in their infrastructure plans, the national pipeline for infrastructure projects is weak.
- > The level of interest from international participants is particularly noteworthy as it clearly exceeds the level of interest attracted by previous infrastructure projects, both in the number and calibre of interested parties. Notwithstanding this very strong level of international interest, the Project will need to compete for global resources. To be effective in this respect, given the Project's size, government will need to demonstrate a clear and strong commitment to the Project.

- > Generally, participants expected that tolls on the Project road will be insufficient to cover Project costs. In addition, current liquidity levels in the debt market have been affected by ongoing global financial market uncertainties and the exit of a number of European banks from the domestic project finance market. As a result, debt available for individual projects is currently constrained. Further, as an ongoing effect of the global financial crisis (GFC), debt margins remain high.

These factors, combined with the view that it will improve the efficiency of the Project's capital structure under any model, result in a market expectation that the Project will include some form of government funding contribution (State and/or Federal).

### 6.2.2 Procurement strategy

The agreed delivery and procurement strategy for the project, as detailed above, is:

- > New link from Hoddle Street to CityLink – Availability Payment PPP model with tolls retained by the State.
- > Enabling and public transport works to be procured separately via traditional methods.

After assessing a broad spectrum of possible procurement models, the analysis conducted for this business case has found that this link is best delivered via a model under which the State retains initial demand risk (at least until traffic volumes are proven), with 'availability' based PPP delivery of project assets and services. This model provides for an efficient and cost effective balance between the use of public and private sector financing.

Under this model, the State is the recipient of the toll revenue stream, bearing the full cost (reduced toll revenues) and full benefit (increased toll revenues) that may result from fluctuating traffic volumes. Asset delivery and ongoing operations are procured via a non-tolled PPP under which the private sector is responsible for the design, construction, finance, operation and maintenance of the project over the concession period (but does not bear toll revenue or demand risk).

A sizeable government funding contribution is assumed. This contribution would be sized appropriately to address the ongoing high cost of private sector debt (and any prevailing liquidity constraints in the debt market that are relevant to a project of this size), while preserving the risk allocation and financial incentive structures that are central to the PPP model.

## 6.3 Governance

Governance arrangements for the project include:

- > management of the PPP procurement of the link between Eastern Freeway and CityLink by the Linking Melbourne Authority
- > development and procurement of Eastern Freeway widening by VicRoads
- > commercial negotiations for CityLink access
- > development and procurement of traffic priority works to enhance public transport service delivery by VicRoads, working closely with Public Transport Victoria
- > overall direction and oversight by a Steering Committee chaired by the Secretary DTPLI, responsible for providing advice to Ministers.

As a classified High Value/High Risk project, the East West Link Stage One is subject to the DTF and Finance's Gateway Review process. The project currently has completed the first two stages/gates of the review process with funding approved in the recent Victorian State Budget.

## 6.4 Program

Preliminary plans have been developed to guide the effective and timely construction of the Project. This includes a timetable for the tolled motorway link that aims to:

- > commence the statutory planning and approvals process in 2013, including beginning community and stakeholder consultation
- > finalise statutory planning and environmental approvals by mid 2014
- > commence a competitive tender process by mid 2013

- > select a successful project proponent for the PPP by the fourth quarter of 2014

- > complete enabling and public transport works prior to completion of construction of the new link in 2019/20.

## 6.5 Risk management

### 6.5.1 Overall project risks

A project of this size and significance must be carefully planned to ensure that key risks are identified, managed and mitigated.

A comprehensive review undertaken for the business case has identified a number of risks arising from the project's defining features and characteristics:

- > The need to retrofit the project into an existing urban environment amplifies potential negative impacts (and their attendant risks) on surrounding areas and the existing transport network during the construction period.
- > The high capital cost of the Eastern Section tends to multiply design and construction risks, and introduces risks around market capacity
- > The inclusion of tolls (while providing an important source of funding) introduces revenue risk.
- > Risks are associated with commercially integrating the Eastern Section with existing toll roads. Further work, including engaging with the existing toll road concessionaires, will be undertaken in the next stage of project development.
- > There is risk that the detailed design solution does not adequately address the identified problems or fully deliver the intended benefits as specified.



- > With planning and approval processes (and community consultation) having commenced, there is a risk that some timeframes for completing the tender process may not be met.
- > A broad range of construction risks may occur during delivery, resulting in additional cost and/or time being required to deliver the design solution. Effective construction management plans will be developed. In addition to the site access and ground condition, risks include:
  - > programming and project management risks
  - > Industrial relations risks (including as they affect both labour cost and productivity)
  - > plant and equipment procurement risks (including in relation to the cost of major equipment such as tunnel boring machines)
  - > material prices and procurement risks
  - > Interface risks (between the different components of the overall Project construction)
  - > spoil removal (in relation to the transport and disposal costs for the spoil created by tunnelling – which for a project of this scale will be significant)
- > impacts on surrounding environment such as dust, noise, vibration, groundwater management and contamination (handled by stringent environmental management plans to be prepared by the construction contractor).
- > wet weather risks.
- > traffic management risks (on the transport network surrounding the Project site, including on key routes such as the Eastern Freeway, CityLink, Alexandra Parade, Hoddle Street and north-south tram and bus routes that cross Alexandra Parade)
- > Commercial D&C risks such as the risk of counterparty default and/or contractor claims (noting that these risks will tend to be amplified by the Project's size).

The final allocation of these risks between the State and other parties under the ultimate PPP model will play an important part in the State's overall risk management and mitigation plans. Detailed plans will be developed as part of the upcoming stage of project development work, however it is expected that the majority of design and construction and operation and maintenance lifecycle risks will be transferred to the private sector under the PPP.







## Accessibility

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