



# BUSINESS CASE

## EXECUTIVE SUMMARY

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Independent infrastructure advisors have named North East Link as **Victoria's priority road infrastructure project.**



## Background to the North East Link Project

The Victorian Government has announced it will build North East Link – completing the ‘missing link’ in Melbourne’s cross-city orbital road network between the M80 Ring Road (M80) and the Eastern Freeway/EastLink.

The Government’s announcement followed Infrastructure Victoria’s nomination of North East Link as a high priority infrastructure project for the state in its *30-Year Infrastructure Strategy*, released in 2016. Infrastructure Victoria noted that the link will enhance access to major suburban business and employment centres, improve orbital road connectivity across Melbourne and boost the capacity of the city’s freight network.

In October 2017, the five-year *Victorian Infrastructure Plan* confirmed North East Link as one of several ‘catalyst’, state-shaping infrastructure projects designed to stimulate economic growth, create jobs and deliver positive, long-term benefits for Victorians. The State Budget 2017-18 allocated funding for business case development, consultation and route selection for the project.

This business case tests the merits of the investment based on a broader assessment of Melbourne’s transport needs, changing travel patterns and the evolving structure of the city. It identifies the problems facing the city’s transport network and the benefits of addressing these problems, with a focus on cross-city orbital connectivity and capacity constraints. A range of potential actions and investments are examined

to confirm that North East Link is the most effective response to these problems. Through comprehensive investigation, modelling and analysis, the business case recommends a corridor for North East Link and presents a concept for the project. The project’s anticipated transport outcomes and benefits are identified and, where appropriate, quantified. Potential adverse social, business and environmental impacts are also outlined.

The business case reports the results of financial, economic and budget and accounting appraisals of the North East Link Project. It provides the Victorian Government with sufficient information to make investment decisions about the project and recommends procurement, funding and delivery approaches.

Following its consideration of the business case, Victorian Government approval will be required for further funding to proceed with and deliver the project.



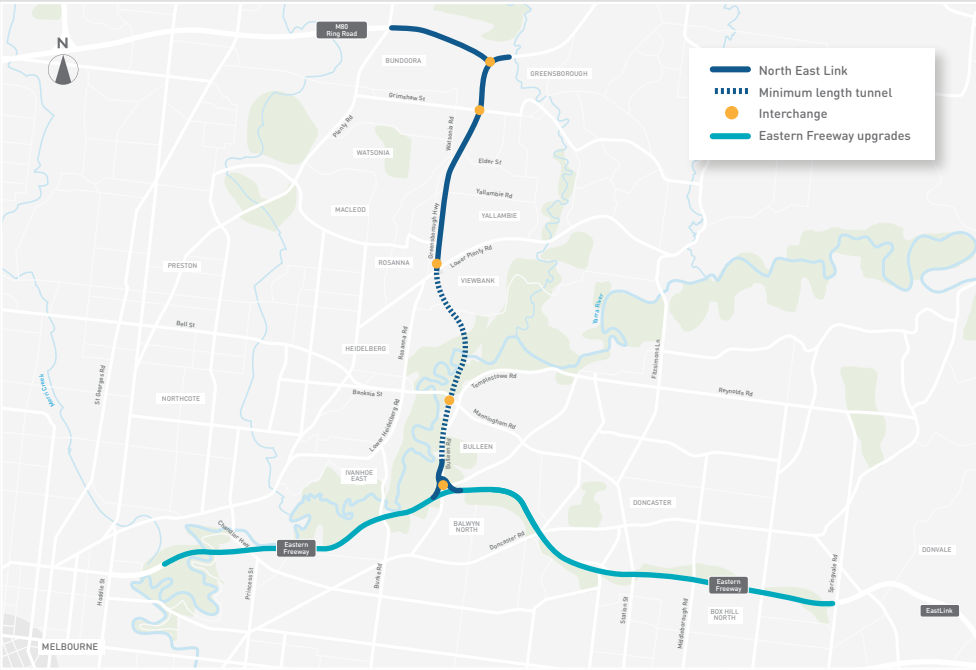
# North East Link project overview

As defined in the concept developed for the project (detailed in Chapter 6 of the business case), the proposed North East Link will begin on the Eastern Freeway at Springvale Road before connecting via a new 11-kilometre roadway to the M80 Ring Road at Greensborough, with upgrades to the M80 between Greensborough and Plenty Road.

The new roadway will extend from the Eastern Freeway at Bulleen to the eastern end of the M80. The northern section of the roadway will run at surface before descending into a cutting south of Watsonia Station and then into twin three-lane tunnels just north of Lower Plenty Road. It will then transition to a viaduct structure just north of Koonung Creek to connect to the Eastern Freeway. Connections will be provided to the new roadway at Greensborough Bypass, Grimshaw Street, Lower Plenty Road and Manningham Road.

Modernisation of the Eastern Freeway is a core element of the project to ensure the freeway integrates effectively with North East Link and keeps pace with changing travel demands. The modernisation will include widening of the freeway between Chandler Highway and Springvale Road, and provide for the Doncaster Busway (featuring dedicated bus lanes creating an uninterrupted path for bus services travelling between the eastern suburbs and the central city). The Eastern Freeway will not be tolled.

North East Link will be tolled and the project includes the infrastructure and systems required to support tolling. The project also incorporates dedicated, end-to-end Intelligent Transportation Systems (ITS) (including along the Eastern Freeway) to enable North East Link to operate as a Managed Motorway and integrate effectively with connecting freeways and arterial roads.



North East Link Concept: sections and connections

North East Link will connect with Melbourne’s existing freeways, allowing for freeway-standard orbital movements around Melbourne, starting from Altona and ending in Frankston. For the first time, Melbourne will have a fully connected orbital freeway network that will provide continuous traffic flow conditions for long distance travel across and through Melbourne, with links to key parts of the arterial road network.

North East Link will unlock the currently poorly connected asset of the Eastern Freeway, maximising freight efficiency throughout the region. It will connect the Eastern Freeway to the M80 and Hume Freeway, creating a continuous freeway-standard road for freight, drawing trucks away from the arterial road network and reducing pressure on the M1 corridor.

## A fully connected orbital freeway from Altona to Frankston



For the first time, Melbourne will have a fully connected orbital freeway network.

The project also includes:



Works on the M80 between Plenty Road and Greensborough



Maintenance of and improvements to local access for communities adjacent to North East Link and the Eastern Freeway, including new local roads, intersection reconfigurations and land bridges



Upgrades to Bulleen Road



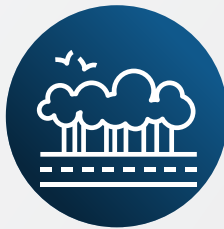
New walking and cycling paths along North East Link and the Eastern Freeway, and completion of the 100-kilometre continuous ring road cycling trail



Upgraded and new noise barriers to meet VicRoads' traffic noise standards for new freeways



A Freeway Control Centre for controlling traffic on the new link and managing roadway operations



A high-quality approach to landscaping, architecture and urban design.

Complementary projects have been identified to leverage opportunities created by the project to deliver further benefits for Melbourne's north east. These projects include upgrades to arterial roads, additional walking and cycling paths, and improvements to bus services and train stations. Some of these complementary projects have been included in costing and BCR for the project, including safety and pedestrian works on Rosanna Road, bicycle paths along the North East Link, improvement works at Watsonia rail station. Other broader opportunities are outside the scope of the North East Link Project and do not form part of the concept design; separate funding requests and, in some instances, business cases will be needed to progress these projects.



Project benefits and costs

1.3 BCR				
Estimated project benefits				
Total benefits after discounting to today's value	Total benefits for freight users after discounting	Benefits minus costs after discounting	Total benefits over 50 years without discounting	Boost to North and Eastern Metro Gross Regional Product
\$10.9B	\$4.1B	\$2.2B	\$103.5B	\$7.5B

Estimated project cost (total project risk adjusted capital cost)		
Real P50 (\$b)	Real P90 (\$b)	Nominal P90 (\$b)
11.9	12.7	15.8



Project Objectives and Guiding Principles

The North East Link Project has a strong focus on supporting business and jobs growth in Melbourne's north, east and south east, while also improving cross-city connectivity and helping to address critical traffic, freight and amenity issues. High-level Project Objectives and Guiding Principles reflecting this focus have been defined and were used to evaluate strategic and project options for North East Link.

Project Objectives			
<b>Objective 1</b> Improve business access and growth in Melbourne's north, east and south east	<b>Objective 2</b> Improve household access to employment and education in Melbourne's north, east and south east	<b>Objective 3</b> Improve freight and supply chain efficiency and industrial growth across the north, east and south east	<b>Objective 4</b> Improve access, amenity and safety for communities in the north east

Guiding Objectives			
<b>Guiding Principle 1</b> Minimise impacts on communities	<b>Guiding Principle 2</b> Minimise impacts on environmental and cultural assets	<b>Guiding Principle 3</b> Minimise impacts during the construction phase	<b>Guiding Principle 4</b> Optimise the efficient use of resources



## Context for the project

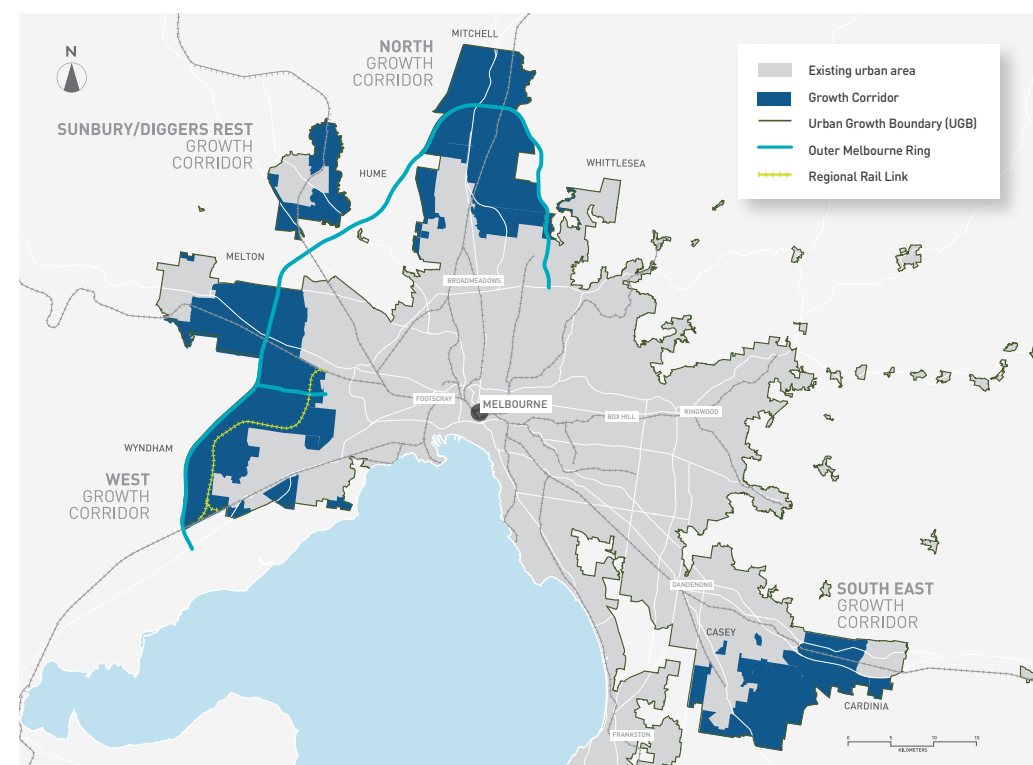
Over the last 50 years, Melbourne has experienced major changes and shifts in its population, economy, industrial base and spatial organisation. These changes have been central to the city's success, but they have created many challenges. To meet these challenges – and remain a productive, competitive and liveable city – Melbourne must have a reliable and efficient transport network that provides a range of travel options and choices, and that supports a growing population and an evolving city structure.

### Melbourne's unprecedented growth

While Melbourne's population has been increasing for more than a decade, the recent scale of growth is unprecedented for an Australian city. In the year

to June 2016, almost 30 percent of Australia's population growth occurred in Melbourne. If current trends persist, Melbourne will be a city of eight million people by 2051, surpassing Sydney as Australia's largest city by population and reaching a population as big as London and New York City today.

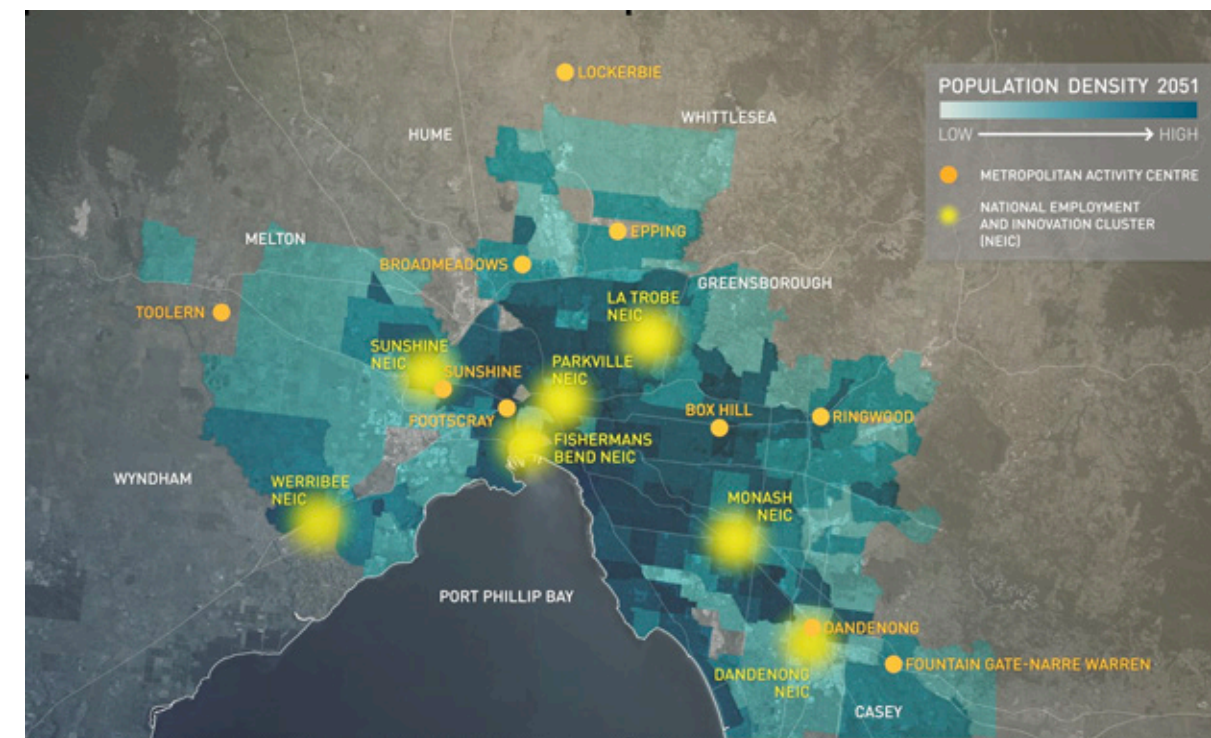
While some of Melbourne's future growth will be absorbed by the central city and inner suburbs, most growth will occur in the outer suburbs. As shown in the figure below, Melbourne is growing along four main corridors: north, north west, west and south east. Roughly half of all growth over the last decade has occurred along these corridors and nine of the city's top ten fastest growing suburbs are in the outer north, west and south east.



Melbourne's four growth corridors

As Melbourne continues to grow, some parts of the city will become more densely developed than others. The figure below shows forecast population density across Melbourne to 2051, illustrating the increasing density expected to occur in the city's growth corridors and around Metropolitan Activity Centres (MACs) and National Employment and Innovation Clusters (NEICs).

### Population density to 2051



Melbourne's population boom has underpinned consumer demand, housing construction and economic growth; however it has also created significant demands on housing, infrastructure, services and the environment. In the decades ahead, Melbourne must be able to offer access to jobs and education, and meet basic housing, energy and transport needs, in ways that are efficient and sustainable. A large city that grows without these opportunities and services in place is at high risk of experiencing adverse economic, environmental and social consequences. With the benefits of a productive, competitive and liveable Melbourne extending well beyond the city's boundaries, maintaining these features is also critical to strengthening the Victorian and Australian economies.

### Melbourne's north east

Melbourne's north east comprises the municipalities of Banyule, Darebin, Nillumbik, Whittlesea, Manningham, Boroondara, Maroondah and Yarra Ranges. It is home to approximately 947,000 residents, around 20 percent of the city's population. Housing is typically in the form of low density detached dwellings, with higher density development clustered around the employment

and retail precincts of Greensborough, Ringwood, Heidelberg, La Trobe University, Box Hill and Doncaster.

While the north, south east, north west and west corridors are recording strong population growth, the north east is experiencing relatively low growth. This pattern of growth, which is expected to continue, is due largely to geographical constraints and the development limits imposed by the city's Urban Growth Boundary.

The north east's location between two urban growth corridors – and between the major freeway connections of the M80 and the Eastern Freeway – means that the region's arterial road network is struggling to accommodate an increasing number of cross-city freight and commuter trips. Population growth in these corridors, along with the future expansion of major industrial precincts in the north and south east, will generate even higher traffic volumes across the arterial road network in the north east. If not addressed, this will affect amenity and safety in communities adjacent to the network and bring some of the north east's valued attributes and community assets under pressure.



## The importance of the Urban Growth Boundary

The Urban Growth Boundary (UGB) is a critical feature in planning for Melbourne's future as a liveable, sustainable and accessible city. The UGB applies around the urban areas of metropolitan Melbourne and is designed to direct development to areas with appropriate infrastructure and services, and to protect valuable agricultural land, rural landscapes, important habitats and environmental features.

The UGB was legislated in 2002 to contain the city's sprawl and encourage more sustainable, higher density development within existing centres. High demand for housing from a rapidly growing population has led to the boundary being expanded several times. The current UGB was confirmed as the outer limit for Melbourne's growth in Plan Melbourne 2017-2050, reflecting its importance in containing urban sprawl and creating a more consolidated city.

While the UGB can only be changed by majority vote in both houses of the Victorian Parliament, planning for new infrastructure should avoid straining the boundary or encouraging its expansion. In Melbourne's north east, placing the UGB under pressure has the potential not only to push the city's growth out into rural areas and natural landscapes, but also to jeopardise the attributes valued by residents and communities.

## An evolving urban spatial structure

Melbourne's liveability and the performance of the urban economy does not depend solely upon economic factors. The availability and condition of infrastructure affects the costs of production and the profitability of many sectors of the economy. Productivity growth depends upon the city being able to efficiently connect workers with firms and the providers of goods and services with customers and suppliers. As Melbourne has grown, the city's ability to facilitate these connections has declined.

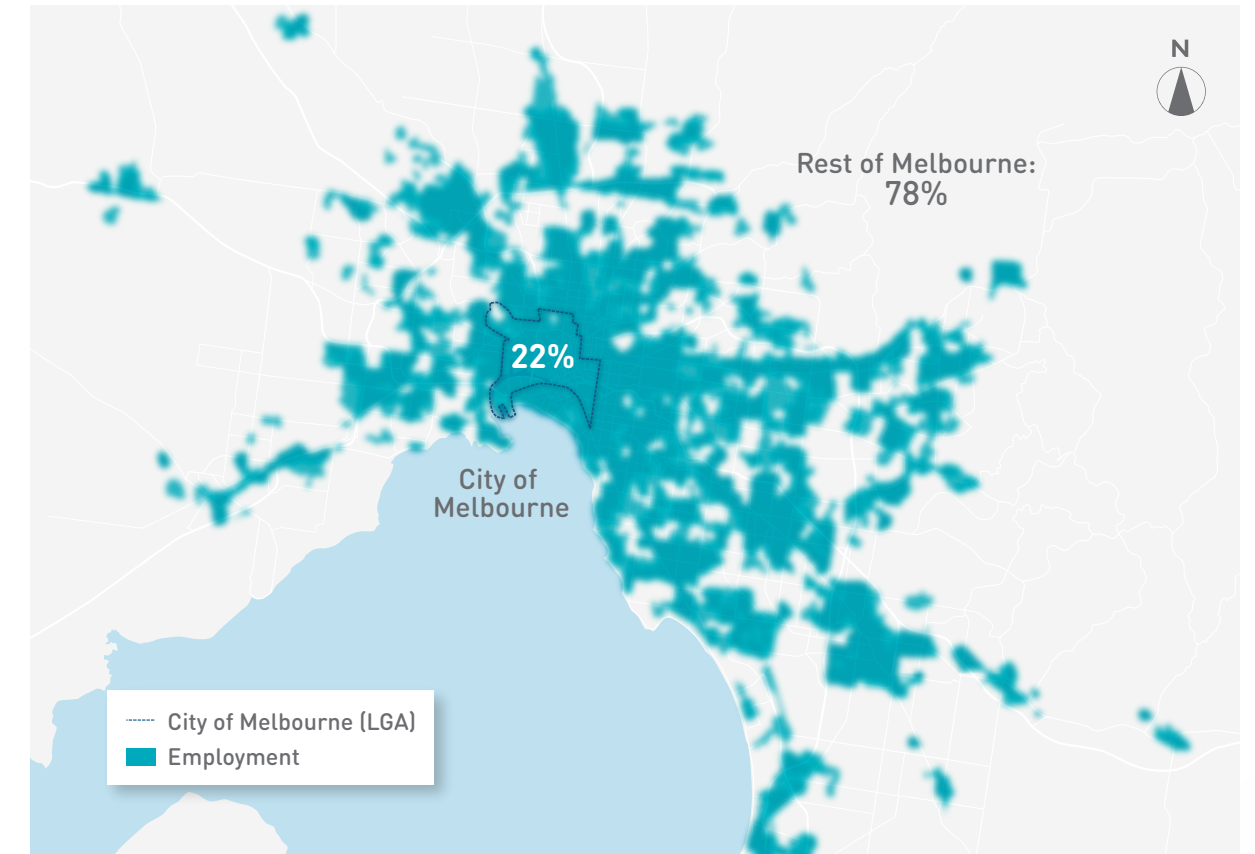


Between the 1950s and today, an increasing proportion of Melbourne's jobs has spread to secondary centres in the city's middle and outer suburbs, largely in the north and east (as shown in the following figure). This has led to the emergence of large secondary business centres and new relationships between jobs and population across the city. However, the distribution of jobs has not kept pace with increasing population in the city's growth corridors.

This mismatch also means that households located close to the central city or along radial transport networks have significantly better access to jobs and services than many households in the middle and outer suburbs. Jobs, services and other activities in established secondary centres are becoming harder to access because existing road and public transport networks do not support efficient cross-city and orbital movements.

As economic activities have become more dispersed, trip patterns have become more complex and less predictable.

## Job density (employment proportions) in Melbourne, 2016



As economic activities have become more dispersed, trip patterns have become more complex and less predictable. Without strong links to an efficient, cross-city orbital network, Melbourne's existing radial transport network is limited in its ability to support these changes in travel demand. While continuing to meet the demand for travel into an expanded city centre (including through the new Metro Tunnel), the radial transport network is reaching the geographic limits of its utility.

The long-term effect of dispersed economic activity and population across the metropolitan area has been an increase in journey times and lower levels of accessibility across the city. This has led to the fragmentation of large consumer, labour and supplier markets into smaller ones, constraining the productivity potential of the city.

The mismatch between the distribution of population and jobs also generates additional travel from the outer suburbs to and through the middle suburbs. This 'through' traffic competes with local traffic, further eroding accessibility to jobs and services. In the north east, the lack of a freeway connection between the fast-growing north and south east means that the region's arterial road network is under high and increasing pressure from this through traffic.

# Melbourne’s cross-city and orbital connectivity

Supporting a growing city requires strong transport connectivity for radial, cross-city and orbital travel. While Melbourne has strong radial connectivity that enables good access to the central city, other trips are not as well served by the transport network.

As the figure below shows, even as Melbourne began to slowly decentralise in the 1970s and 1980s, urban transport infrastructure remained focused on radial trips, with major investments including the construction of the Tullamarine Freeway, South Eastern Freeway, Mulgrave Freeway (now the Monash Freeway), West Gate Freeway (including the West Gate Bridge) and the Eastern Freeway.

Where new orbital routes were provided, such as the M80 Ring Road, they became the catalyst for significant land use change and intensification. High levels of employment and commercial development occurred along these corridors, and outer suburban centres such as Dandenong, Ringwood, Greensborough and Tullamarine experienced rapid growth due to the increased accessibility provided by orbital roads.

Melbourne’s present day orbital corridor connects households and businesses to economic and employment centres across the city’s middle and outer suburbs, and provides a route through the city for moving goods to customers, suppliers, industrial precincts and freight gateways.

Movements between Melbourne’s west and north are facilitated via the M80, which runs from the Princes Freeway in Altona to the Greensborough Bypass in Greensborough. Movements between the east and south east are enabled by EastLink, which traverses the outer eastern suburbs between Donvale and Seaford. However, there is no freeway-standard connection for movements between the eastern end of the M80 and the Eastern Freeway (M3) and northern terminal of EastLink. Instead, these movements are accommodated on a handful of north-south arterial roads.

### Moving more goods around Melbourne

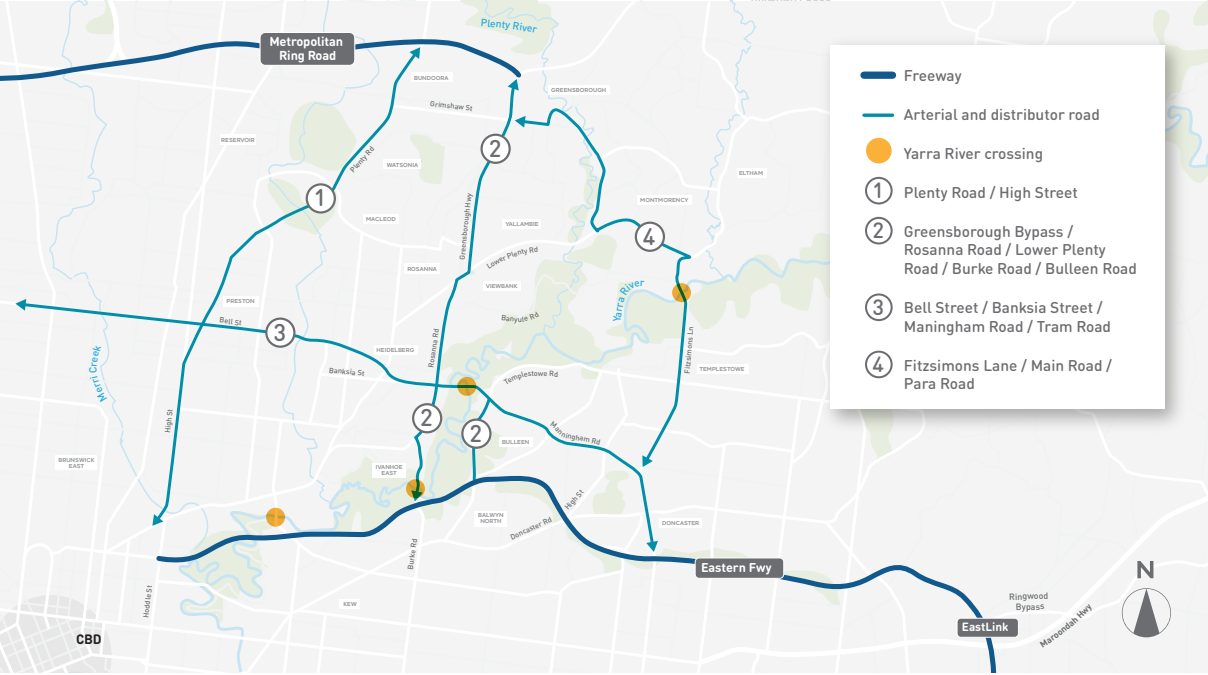
As the population and economy grows, so too does Melbourne’s freight task. Most freight moving through Melbourne is carried on freeways and arterial roads by trucks and light commercial vehicles (LCVs). While the movement of freight on the rail network will grow over time, the fixed infrastructure of rail does not have the flexibility to support shorter, time-critical trips between economic centres or the growing demand for door-to-door deliveries and freight trips with multiple pick-up and drop-off points. The growth of eCommerce means that more goods are being delivered directly from businesses to consumers in residential areas. Businesses in large cities like Melbourne also need to be supplied constantly with merchandise for sale in shops and with materials and parts for use in manufacturing. These freight trips, which made up 7.7 percent of the total vehicle kilometres travelled in Melbourne, do not follow the same patterns as commuting trips.

Notwithstanding the considerable freight task attributable to the movement of commodities to and from the Port of Melbourne, cross-city and orbital movements now comprise a significant proportion of all freight movements. The city’s highly centralised freight transport network – which remains focused on the Port of Melbourne and pre-Federation handling facilities in the central city – is struggling to accommodate these changing freight patterns.

Development of Melbourne’s freeway network from 1970 to present day



Key arterial roads in the north east

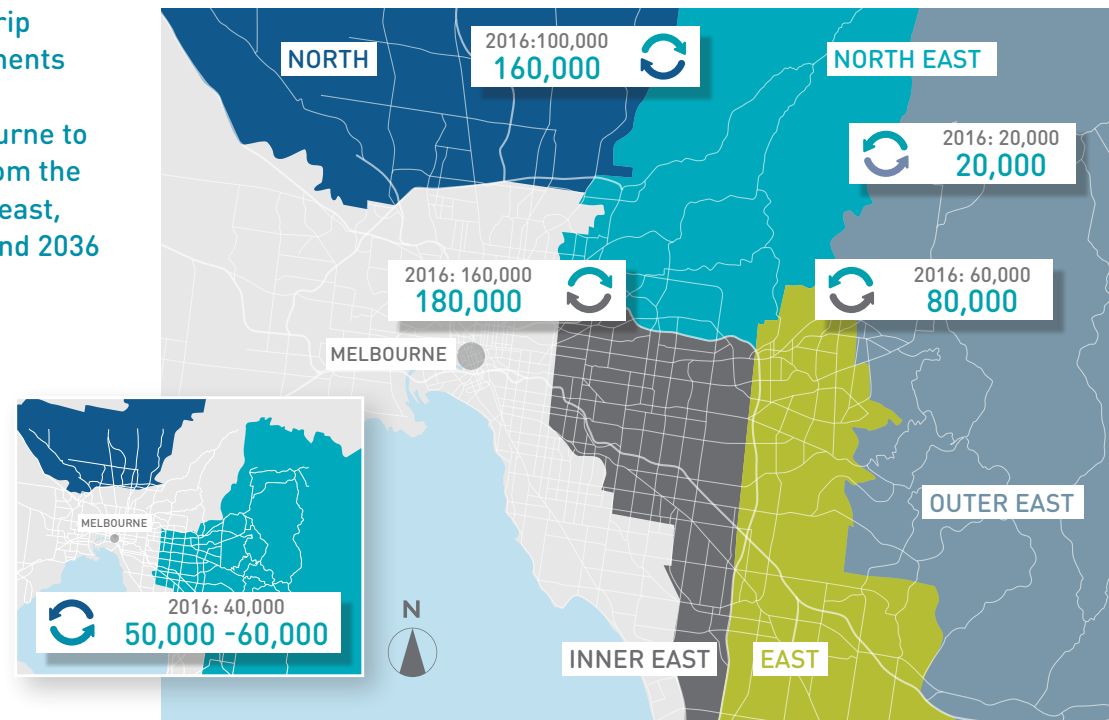


In this part of Melbourne, around 250,000 radial trips are made between the north east and inner and central Melbourne each day. However, demand for cross-city orbital movements in the north east is larger than this radial demand. As shown below, daily trips between the north east and the north (100,000), the inner east (160,000), the outer east (20,000) and east (60,000) currently total approximately 340,000 – and are forecast to increase to approximately 440,000 by 2036.



In addition to these trips to and from the north-east, there is demand for cross-city orbital travel that involves travelling through the north east without stopping. Across a day, approximately 40,000 trips are made between the eastern suburbs and the northern suburbs (shown in the inset in the figure). These are trips that travel through the north-east without stopping.

### Daily trip movements across Melbourne to and from the north-east, 2016 and 2036



Currently, the north east corridor faces the challenge of managing high volumes of local traffic while also accommodating multiple – and often conflicting – important economic journeys that include:

- Commuter trips to employment centres such as La Trobe University, Heidelberg/Austin Medical Precinct, Northland and Ringwood
- Business trips between industrial and commercial precincts and employment and activity centres in the north, east and south east, and to and from Melbourne Airport
- Freight movements, including regional trips to and from Gippsland, interstate trips via the Hume Freeway and cross-city trips to freight hubs in the north (Somerton) and south east (Dandenong). Approximately 46 million tonnes of freight travels through the corridor each year – around 10 percent of the total Victorian freight task. At present, between 8,100 and 9,000 trucks make their way each day through the north east road network via the M80/Greensborough Road interchange.

Constraints to these economic journeys flow through to adverse impacts on the wider Melbourne, Victorian and national economies.

Rising congestion and declining levels of accessibility across the north east also make it harder for residents to reach jobs and for businesses to connect to workers, customers and other businesses. There is increasing reliance on the M1 corridor for cross-city trips, funnelling these trips into an already congested inner city road network. Diminishing freight efficiency is increasing the cost of doing business in Victoria. As increasing volumes of traffic attempt to navigate the north east corridor to reach their destinations, the liveability of the area suffers.

The Victorian Government has acted to address these issues by funding rail and road projects in Melbourne's north and east and the West Gate Tunnel project. While these investments are expected to alleviate road congestion and improve accessibility, the full economic potential of the network will not be realised in the absence of improved cross-city connectivity movements through the north east.



## Identifying the problems

Three key problems have been identified in relation to transport connectivity in the north east corridor. These problems reflect the current challenges, issues and impacts caused by Melbourne's unconnected freeway network and constrained cross-city orbital movements.

### Problem 1 - Melbourne's poor orbital connectivity is constraining the economic potential of the city and Victoria

Poor connectivity through Melbourne's north east means that the city's orbital movement corridor struggles to support many important and high value economic journeys. With no freeway-standard link in this part of the corridor, arterial roads accommodate orbital movements as well as local traffic movements. Increasing demand for travel through, within and to and from the north east has led to high levels of congestion, increased travel times and poor reliability for road users, and created a significant barrier to the movement of people and goods around Melbourne and Victoria.

The consequences of poor orbital mobility include:

- **Businesses in Melbourne's major population areas in the north, east and south east lack access to the large labour markets that underpin productivity and competitiveness** – Compared to locations with better connectivity, businesses in these parts of the city have access to much smaller labour catchments, making it harder to attract skilled workers and build workforces with the right mix of skills. With employers increasingly looking to locate in places with good access to labour markets, these areas will find it increasingly difficult to attract new businesses and investors, constraining their economic and employment development and job creating potential.

- **Movement between businesses and their customers and suppliers is highly constrained** – Business-related travel between key centres in the north, east and south east (and to the central city) is long and highly variable, and the cost of journeys to Melbourne Airport from these areas is also increasing. This makes it harder for firms to meet changing business travel demands and suggests that employment and activity centres along the orbital corridor are missing out on vital opportunities to expand.
- **Arterial roads in the north east are unable to cater to growing and competing travel demands** – Cross-city orbital movements between the M80, the Eastern Freeway and EastLink are facilitated via a small number of arterial roads that also accommodate growing volumes of local traffic. This creates bottlenecks, delays and unreliable trip times for road users, as well as large numbers of trucks moving through residential roads not designed for them. Without any action being taken, traffic volumes will continue to rise, with significant increases expected on Plenty Road north of the M80, Greensborough Road, Templestowe Road and the Yarra River bridge crossings.



- On-road public transport is slower and less reliable** – A significant proportion of public transport in the north east is provided by bus services. These services are affected by congestion and capacity limitations on the arterial road network, hampering efforts to improve the frequency and coverage of local and cross-city services. Slow and unreliable bus travel times discourage commuters from travelling by bus in the outer suburbs, which – in turn – encourages greater car use and leads to more cars on the road.
- Households are increasingly unable to access economic opportunities** – Access to jobs and education opportunities diminishes with distance from the central city. Compared to inner city areas, people living in Melbourne’s north and north east face longer commuting times by car and public transport and spend a higher percentage of their weekly income travelling

to and from work. With congestion forecast to increase as Melbourne grows, transport inequality and disadvantage in the outer and middle suburbs is also likely to increase, along with a rise in transport costs. Worsening cross-city connectivity will exacerbate these issues.

For Melbourne to continue to support economic development and jobs growth, and lift levels of labour productivity and workforce participation, it must be a well-connected city where businesses and residents have access to a range of travel options. If a fully connected cross-city freeway network cannot be completed, ongoing fragmentation of labour markets, poor business-to-business travel and diminished access to jobs will impose higher costs on business and households, limit the productive potential of the city and constrain Melbourne’s competitiveness.

### The La Trobe and Monash NEICs

The Victorian and Australian Governments are actively promoting the clustering of business activity of national significance in National Employment and Innovation Clusters (NEICs). These centres are intended to become a focus for knowledge-based businesses and are considered crucial for maximising access to high-productivity jobs for Melbourne’s middle and outer suburbs and growth areas.

Monash NEIC is the largest concentration of employment outside the central city, with approximately 75,000 jobs. Monash NEIC includes Monash University and leading education, health, research and commercialisation facilities. La Trobe NEIC is an emerging cluster with an expanding education, health and research role, home to approximately 28,500 jobs. It includes La Trobe University and the Austin Biomedical Alliance Precinct.

As acknowledged in Plan Melbourne 2017-2050, these centres will need access to a large pool of workers if they are to make a major contribution to the Victorian economy, deliver services to large urban catchments and generate and sustain jobs outside central Melbourne. They will also need good transport links with major industrial areas, export gateways, health and education precincts, and activity centres.

Compared to central and inner city locations, the La Trobe and Monash NEICs have much smaller labour market catchments. For example, 29 percent of Melbourne’s total workforce is accessible to the La Trobe NEIC within 45 minutes by car, compared to more than 55 percent for the Parkville NEIC. Just five and 13 percent respectively of the city’s workforce is accessible to the La Trobe and Monash NEICs within 60 minutes by public transport, compared with 38 and 25 percent respectively for the central city and Parkville.

All other major employment centres in the middle and outer north, east and south eastern suburbs have low levels of accessibility to workers compared to the central and inner city.

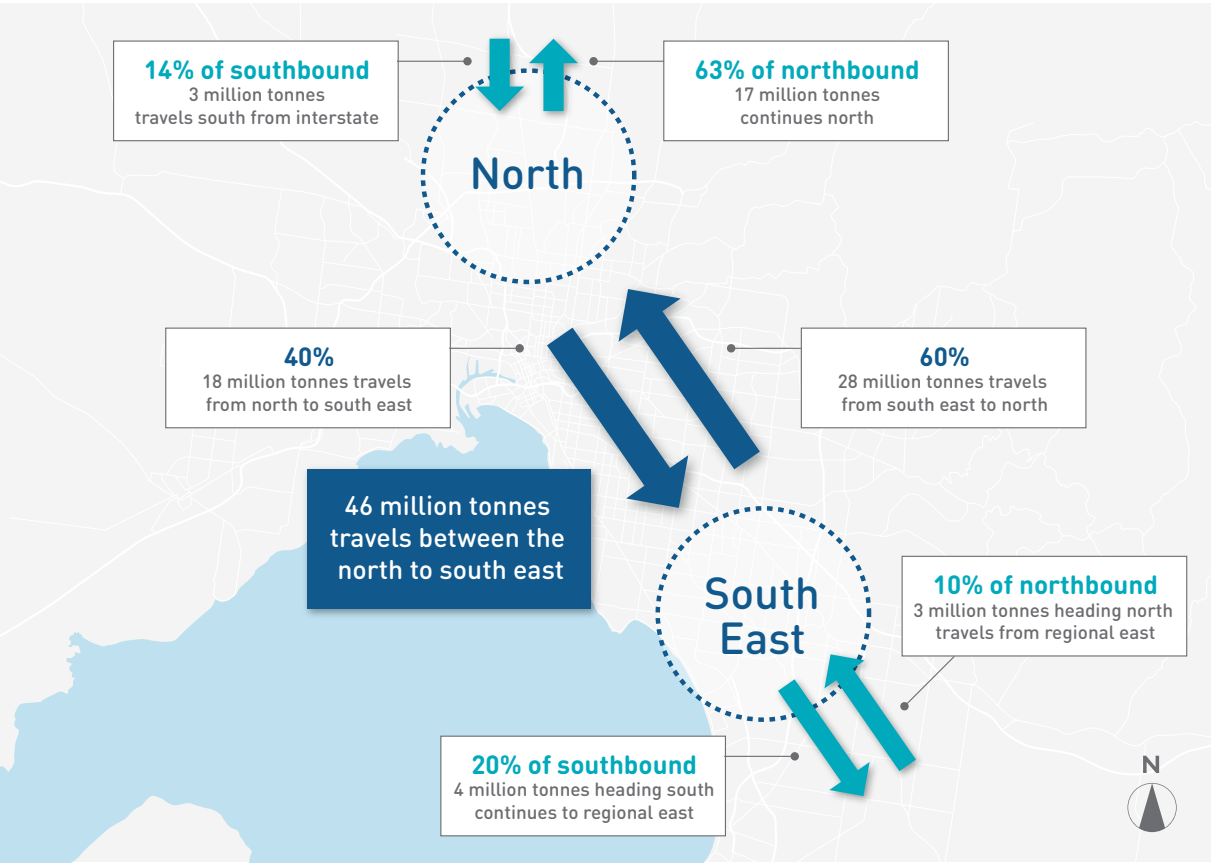
### Problem 2 - Inefficient freight movement between Melbourne’s north and south east is limiting supply chain competitiveness and hindering the growth of high value industries

The north east corridor plays a vital role in facilitating freight flows across Melbourne from the north to the east and south east. This includes linking regional areas (such as Gippsland) and industrial areas, freight gateways and distribution centres in the south east (such as Dandenong and the Port of Hastings) with the Hume Freeway and Melbourne Airport to facilitate interstate and international exports. It supports specific transport and logistics tasks associated with the Melbourne Metropolitan Fruit and Vegetable Market, the Melbourne Airport Industrial precinct and Coles and Woolworths distribution centres in the north, east and south east.

With strong future growth expected in the freight task, moving goods efficiently through this corridor is critical to supporting competitive, high value industries and sustaining Melbourne’s status as the nation’s leading freight and logistics hub.



### Key annual freight movements through the north east







Most freight moving through Melbourne is carried on freeways and arterial roads by trucks. While the movement of freight on the rail network will grow over time, the fixed infrastructure of rail does not have the flexibility to support shorter, time-critical trips between economic centres or the growing demand for door-to-door deliveries and freight trips with multiple pick-up and drop-off points. This means that cross city and orbital road trips are likely to continue to comprise a significant proportion of freight movements across the wider city as goods move between freight gateways, logistics and distribution centres, businesses and households.

Poor orbital connectivity through the north east leads to significant inefficiencies (and associated costs) in the freight task:

- **Lack of access for High Productivity Freight Vehicles (HPFVs) along the north east corridor affects industries that transport larger loads and impacts productivity and competitiveness** – Restricted HPFV access means that more trucks are needed to move the same volume of freight, resulting in increased congestion and impacts on noise, air quality and road safety. Businesses based in the north east have less flexibility and limited (and costlier) options for transporting larger loads, reducing their productivity and competitiveness. Broader statewide productivity and economic benefits associated with the use of HPFVs are also at risk.
- **Traffic congestion and poor reliability contribute to diminished freight productivity** – The north east ‘gap’ in the freeway network is a significant supply chain bottleneck that constrains freight movements and increases the cost of transporting goods from where they are

produced to customers in Melbourne, Victoria or overseas. This is potentially a significant competitive disadvantage for businesses operating in high value industry sectors.

- **Inefficient cross-city orbital access through the north east places pressure on other key routes** – The lack of efficient cross-city orbital access through the north east places additional pressure on other key routes across the network, with supply chains increasingly reliant on the M1 corridor, which is heavily congested for a large and growing part of the day, and is increasingly susceptible to incidents and long periods of disruption.
- **Poor freight accessibility in the north and north east raises the cost of moving goods and doing business** – With no fully connected freeway link, freight flows across Melbourne from the north to the east and south east rely heavily on arterial roads through the north east to travel between the M80 and the Eastern Freeway. Unsuitable terrain, truck curfews and other constraints contribute to increased transaction costs for businesses using these routes. Excluding congestion impacts, constraints in the north east are estimated to cost freight operators 12 percent more than equivalent distance deliveries in the north west. With strong growth expected in the industrial precincts of Somerton and Tullamarine (in the north) and Dandenong (in the south east) over the next 20 years – and additional industrial/commercial precincts likely to develop in fast-growing suburbs – these constraints and costs will continue to rise.

Melbourne also has a strong competitive advantage in being home to the nation’s largest curfew-free airport. Poor orbital connectivity means that the opportunities presented by this advantage are not being fully realised.

### Problem 3 – Congestion and heavy vehicles on neighbourhood roads in the north east is harming liveability and community wellbeing

Congestion on the north east arterial road network – along with a lack of safe and appropriate walking and cycling facilities – results in longer and less predictable travel times for residents and reduced access to important local destinations. Residents are also exposed to higher levels of noise and emissions, and an increased risk of road crashes.

These factors are diminishing the Victorian Government’s ability to realise a key platform of Plan Melbourne – the 20-minute neighbourhood – and are reducing the capacity of the north east to contribute to managing Melbourne’s future population growth in a sustainable way that supports liveable, healthy and attractive communities.

Issues associated with this problem include:

- **Access to key destinations and valued community places is restricted** – Overly trafficked roads in the north east restrict residents’ access to jobs, local services, schools, hospitals, retail centres, recreational facilities and other valued community places. People commuting to work from the north east by car already spend a significant part of their total journey time moving along local and arterial roads to reach higher capacity parts of the network. Without significant new capacity, these journeys are likely to be restricted even further. Between now and 2036, travel times between key destinations in the north east are forecast to worsen by between 15 and 50 percent.
- **High traffic volumes and freight are reducing local amenity and quality of life for residents** – People living in the north east experience the full effects of growing traffic volumes and limited road capacity, as a growing number of freight vehicles use arterial roads to move between the north, east and south east. Each day, around 9,000 trucks move along Greensborough Road north of Grimshaw Street. Other roads carrying high truck volumes include Fitzsimons Lane, Bulleen Road, Plenty Road and Rosanna Road (where nearly 30 percent of freight vehicles



using the road are large articulated trucks). These volumes are forecast to increase. Without new transport infrastructure, daily truck volumes along Rosanna Road will increase by approximately 1,300, which means that between 3,800 and 5,000 trucks will be moving along the road every day by 2036. These heavy vehicle movements are a significant factor in growing local traffic congestion, contribute to increased emissions and traffic noise, and heighten safety risks for motorists and pedestrians.

- **Reduced opportunities to improve bus, cycling and walking connections are eroding liveability, health and wellbeing, and increasing community dislocation** – Limited public transport services and poor walking and cycling infrastructure restrict accessibility in the north east. Just two percent of trips originating in the north east are on foot or bicycle, compared with 5.1 percent city-wide. Public transport use is also lower than the Melbourne average: 14 percent compared to 19.2 percent.
- **Sustainable and productive growth in the north and north east is being put at risk by low levels of accessibility and amenity** – Suburbs in the north and north east will need to accommodate a significant proportion of the city’s population growth over the next 30 years. The ability of these parts of the city to support this growth is being put at risk by a congested arterial road network that is unable to meet current and future transport needs. Growing traffic volumes, less reliable travel times, declining accessibility and loss of amenity could deter household and business investment. They could also curtail land use planning options, restricting the ability of the State Government and local councils to respond to changing conditions and emerging trends.





## Confirming North East Link as the right strategic response

The State Government has identified the North East Link Project as a priority investment requirement for Victoria. To conform with the Department of Treasury and Finance's High Value High Risk (HVHR) Guidelines for major infrastructure projects, the business case considered a broad range of strategic interventions to address the identified problems, including:

- **Measures to manage demand on the transport network** – such as road pricing (noting that this would be contrary to current Government policy), land use interventions, freight demand management and encouraging changes in travel behaviour

- **Interventions to improve productivity of the transport network** – such as the use of Intelligent Transportation Systems (ITS), Managed Motorways and modified freight operations
- **Increased supply of transport assets** – such as upgrades to existing roads, a new freeway link, new arterial road connections, bus improvements and new rail connections.

### The future without a freeway-standard orbital link

Without North East Link, road network performance in Melbourne's north east will deteriorate significantly:

- Orbital through movements between the north and east will increase from 40,000 trips a day to between 50,000 to 60,000 trips a day by 2036.
- The continued reliance on Rosanna Road will increase the conflict between local and 'through' traffic use of the road. Trucks volumes on Rosanna Road will increase by 1,300 a day.
- Overall, traffic throughout the arterial road network in the north east will increase by approximately 5,000 to 10,000 vehicles per day between now and 2036.
- Traffic volumes across the Yarra River are expected to increase by 25 percent.
- Average vehicle speeds are expected to decline at a faster rate than the rest of Melbourne (by up to 16 percent during the peak periods), making already slow commutes in the north east even slower.

Growth in Melbourne's outer north will generate increased travel demand to the middle ring suburbs, continuing to put pressure on the arterial road network in the north east, especially during the morning and evening peak periods. As the arterial road network in the north east is already saturated, the capacity to cater for additional trips in the future is limited. More commuters and freight travelling between the north and south east need to seek alternative routes with greater capacity to reach their destinations. For example, trucks travelling between the northern industrial precincts and south eastern industrial precincts will continue to use the already congested M1. This has significant consequences for the broader Melbourne and Victorian economies.

Without North East Link, road network performance in Melbourne's north east will deteriorate significantly.

Combinations of these interventions were used to develop five strategic options:

- **Strategic Option 1: Network upgrade** – focusing on upgrading existing arterial roads and walking and cycling infrastructure, and providing new bus routes and extra buses services to address constraints in the transport network
- **Strategic Option 2: Demand and productivity management** – implementing demand management pricing (such as tolling existing facilities, cordon pricing and pricing based on direction of peak travel and/or vehicle occupancy – noting that this would be contrary to current Government policy), supported by corridor plans (such as extending truck bans and enforcing mode priority during peak periods) and land use interventions (such as changing zoning to encourage or discourage density around employment and/or residential areas)
- **Strategic Option 3: Public transport and freight** – making significant investments in public transport (including increasing the frequency of SmartBus services and constructing a spur line from the Hurstbridge railway line to the La Trobe NEIC) and undertaking freight-focused interventions (including constructing an intermodal freight rail network)
- **Strategic Option 4: Bypass freeway** – constructing a bypass freeway linking the M80 to the Eastern Freeway without intermediate interchanges, supported by a package of complementary measures
- **Strategic Option 5: Connected freeway (North East Link)** – constructing a connected freeway linking the M80 to the Eastern Freeway that

incorporates connections to the wider arterial road network, supported by a package of complementary measures similar to the 'bypass motorway' option. The key difference between this option and Strategic Option 4 is that it provides connections to key employment and activity centres in the north east.

These options were tested against five criteria: benefits, cost, time, risk and impacts. Based on this evaluation, **Strategic Option 5 (Connected freeway) was confirmed as providing the most comprehensive and viable solution** to the identified orbital connectivity and capacity problems on the road network in the north east.

This option also delivers the highest amount of benefits across a medium-term timeframe for relatively fewer dis-benefits (adverse impacts) and risks. It provides connectivity to key employment and residential centres to facilitate economic growth and opportunities for residents, and will move trucks off local roads, improving liveability and wellbeing for communities in the north east. These benefits are supported by modelling and economic analysis undertaken by Infrastructure Victoria, which show the North East Link as being a relatively high-performing project that offers substantial benefits in terms of linking people to employment across the city.



This strategic response is part of a broader range of projects in Melbourne’s north and east including:

- A \$395 million package of works to duplicate the rail track between Heidelberg and Rosanna to deliver additional services and improve reliability on the Hurstbridge and South Morang railway lines (including removing level crossings at Grange Road, Alphington and Lower Plenty Road, Rosanna) and add a new bus route between Greensborough and Diamond Creek
  - Removal of level crossings at Bell Street in Preston and High Street in Reservoir as part of the Government’s program to remove 50 dangerous and congested level crossings across the city.
  - Construction of the Mernda Railway line extension, which includes three new stations, bus connection improvements and new walking and cycling paths
- Widening of Chandler Highway to six lanes and building a new bridge to the west of the existing bridge
  - Upgrades to Plenty Road between McKimmies Road and Bridge Inn Road
  - Upgrades to Yan Yean Road between Diamond Creek and Kurrak roads in Plenty
  - Upgrade of the M80 from upgrade of the M80 from Laverton to Greensborough, which includes widening from three to four lanes in each direction from the Princes Freeway to the Western Highway, and from two to three lanes from Plenty Road to Greensborough Highway, to connect to the already improved sections on the freeway.

These projects are outlined below.

Other Victorian Government transport projects in Melbourne’s north and east



Investigating corridor options

Having confirmed a connected freeway as the most viable and effective response to the identified problems, potential corridor options for North East Link were identified and assessed.

Identifying potential corridors

Studies extending back to 1929 (when the concept of a Melbourne ‘ring road’ was first raised) have recognised the need for a link between the M80 and the Eastern Freeway/EastLink. However, a preferred route has never been identified and no established road reservation exists for such a link. Accordingly, a broad set of initial potential alignment options were identified, including those considered in previous studies and others not previously considered. Key factors in identifying potential corridors included:

- Assessing existing and future traffic conditions and transport movements
- Investigating existing road corridors and utilities easements that could be used for corridors

- Identifying potential corridors and constraints to these corridors (such as difficult terrain, sensitive environmental areas and important community assets)
- Considering as tunnelling to avoid sensitive environmental and urban areas or to mitigate surface impacts, as well as likely geotechnical issues and the suitability of areas for tunnel construction
- Identifying opportunities for connections to the existing road network
- Considering current and future patterns of land use and development in the north east, including avoiding placing pressure on the Urban Growth Boundary.

A surface road-only option through any part of the north east was discounted early in the investigation due to its impacts on areas of environmental sensitivity and existing urban development.





Four broad corridor options were identified, as shown in the figure below.

North East Link corridor options



Assessing corridor options

The options assessment process was guided by the Australian Transport Assessment and Planning (ATAP) Guidelines. A three-tiered approach was adopted to narrow down a long list of possible corridor options to a preferred option:

- Stage 1: Strategic Merit Test (SMT) – an assessment of a corridor’s alignment with the North East Link Project Objectives
- Stage 2: Rapid appraisal – an initial indicative assessment of the scale of a corridor’s benefits and costs as assessed against the Project Objectives and Guiding Principles
- Stage 3: Detailed appraisal – a more detailed assessment of a corridor’s benefits and costs as assessed against the Project Objectives and Guiding Principles.

The Strategic Merit Test and rapid appraisal set aside corridor options D and B as they performed poorly against the Project Objectives and Guiding Principles compared to the other corridors.

The detailed appraisal found that corridor option A performs significantly better than corridor option C in relation to the Project Objectives and Guiding Principles. Corridor option A provides more benefits to the transport network, removes more vehicles off local roads and has a lower whole of life cost. In summary, Corridor A:

- Provides the best opportunity to make appropriate connections to the existing road network that respond to travel demand through, in and out of the north east of Melbourne, attracting the most through traffic to the new link of all the options considered

- Provides better connectivity for all freight journeys and serves a greater number of freight catchments for trucks travelling across the city’s north, north east, east and south east
- Works together effectively with the road network in the north east, having the greatest ability of all the options to reduce traffic on existing arterial roads and provide opportunities to improve conditions for more local journeys and on-road public transport
- Provides better access for businesses and households in the north, north east, east and south east to workers, jobs and services (because it connects close to areas of greater

economic and employment activity). Corridor A also provides the greatest improvement in business access to labour markets of all the corridor options considered.

Based on the assessment, **corridor option A was selected to proceed to business case assessment** and the planning and environmental approvals process.

Consulting with the community

NELA sought early input from the community, local councils and non-government organisations before starting to evaluate the four potential project corridors.

In May 2017, NELA canvassed community views via a widely advertised opt-in survey. The aim of the survey was to understand what people value about living and working in the north east, their thoughts on current traffic problems and how North East Link should be designed and developed. NELA also asked how people would like to be involved as the project proceeds.

In August 2017, the four potential corridors were announced, along with the Project Objectives and Guiding Principles. Through extensive face-to-face and online consultation, NELA asked people to comment on whether they felt the objectives and principles would deliver the North East Link they wanted in the way they wanted. NELA also sought views on whether the minimum tunnel sections in each corridor option were appropriate and how the indicative interchange locations might affect communities and road users.

The corridor options assessment considered feedback and information provided by the community and stakeholders, alongside evidence from technical investigations. The assessment also considered questions raised by community members and stakeholders, which identified areas where further research was required, clarified what is and isn’t acceptable to sections of the community, and helped to understand likely concerns, opportunities and ‘hot spots’ that could arise regardless of which corridor was chosen.

Corridor option A provides more benefits to the transport network, removes more vehicles off local roads and has a lower whole of life cost.



## North East Link Concept – outcomes, benefits and impacts

Having identified Corridor A as the optimal alignment for North East Link, a concept design was developed for the project. The scope of the concept design is outlined on pages 4 and 5. The concept design has been developed for the purposes of assessing the benefits, impacts and economic value for money of North East Link to enable the Victorian Government to make an informed investment decision.

Should the project proceed past the business case stage, the State will undertake a more exhaustive consideration of all aspects of the project, including investigating and refining design options and construction methods. This will result in the preparation of a detailed Reference Design that will be subject to further environmental impacts assessment as part of the statutory approvals process.

North East Link will unlock the currently poorly connected asset of the Eastern Freeway, connecting it to the M80 and Hume Freeway.

The key components of the project's Concept Scope are:

- A new 11 kilometre roadway between M80 Ring Road at Greensborough and Eastern Freeway.
- Upgrade to the M80 Ring Road between Plenty Road and Greensborough.
- The northern section of the roadway will run at surface before descending into cutting south of Watsonia Station.
- The roadway will continue into Victoria's longest tunnel: three-lane twin tunnels travelling for 5 kilometres beneath Bulleen Road, residential and sensitive environmental areas including Bolin Bolin Billabong, Banyule Flats and the Yarra River, to just north of Koonung Creek.
- Then the roadway transitions into a new viaduct structure just north of Koonung Creek to connect to the Eastern Freeway.
- Interchanges at Bulleen Road, Manningham Road, Lower Plenty Road, Grimshaw Street and the M80 Ring Road.
- A significant expansion and upgrade of the Eastern Freeway between Springvale Road in Donvale and Bulleen Road in Bulleen. Up to seven new lanes will be added. Express lanes at major interchanges will reduce the kind of merging and weaving that leads to traffic congestion.
- Dedicated bus lanes creating an uninterrupted path for bus services travelling between the Doncaster and the central city (Doncaster Busway).

### Transport outcomes

Once operational, North East Link is expected to deliver positive transport outcomes across the network as far as Gippsland in the south east and interstate to the north via the Hume Freeway. These outcomes are described in detail in Chapter 7 and include:

- **Significant reductions in travel times on key routes**, including trips that are up to 30 minutes faster between the Eastern Freeway and the M80, 30 percent (or around 15 minutes) faster along the existing arterial road corridor and up to 40 percent quicker on the Eastern Freeway
- **Improved travel times between activity centres**, including reductions of 20 percent and 25 percent respectively in the AM peak between South Morang and Box Hill and between Greensborough and Heidelberg
- **Congestion relief across the road network**, especially at the Yarra River crossings, along the Eastern Freeway and on north-south arterial roads in the north east such as Rosanna Road (11,000 fewer vehicles each day), Greensborough Road (32,000 fewer vehicles) and Fitzsimons Lane (14,000 fewer vehicles)
- **Up to 30 percent faster trip times for buses** travelling via the Doncaster Busway along the Eastern Freeway
- **Provision of high quality walking and cycling infrastructure** along the full length of the corridor, improving access to local destinations and encouraging a shift to active transport modes for short journeys.

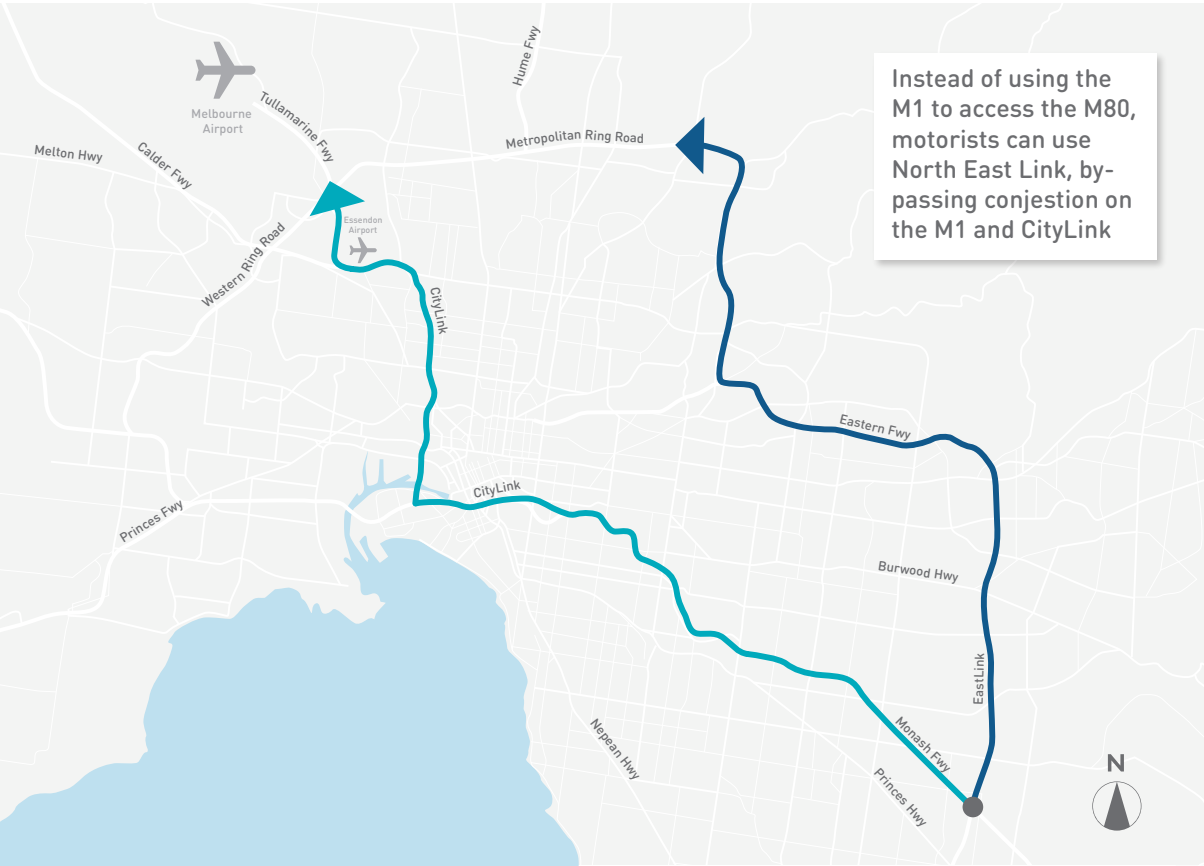
North East Link will unlock the currently poorly connected asset of the Eastern Freeway, connecting it to the M80 and Hume Freeway. Trucks will no longer have to weave through the arterial road network or detour through the inner city. Freight will be redistributed from the arterial road network onto the freeway network, resulting in:



- **15,000 fewer trucks on arterial roads** in the north east each day (a 17 percent decrease overall and a 75 percent reduction on Rosanna Road)
- **Faster and more reliable travel times for freight**, enabling significant cost savings for firms and industries moving goods along cross-city and orbital routes
- **Traffic relief along the M1 corridor**, allowing it to operate more efficiently with reduced traffic volumes.

Giving drivers a greater choice of routes to travel from one side of the city to the other will reduce reliance on the M1 corridor and improve resilience across the freeway network. It will also allow Melbourne’s freeway network to transition to a fully Managed Motorway, improving freeway capacity and vehicle speeds and enabling quick and effective responses to incidents and traffic congestion.

### A new route choice with North East Link



Giving drivers a greater choice of routes to travel from one side of the city to the other will reduce reliance on the M1 corridor and improve resilience across the freeway network.

### Benefits

Preliminary assessments of the project’s economic, social, environmental and business benefits have identified that North East Link will deliver significant and tangible benefits to businesses and households in north east Melbourne and across the city more widely. An overview of anticipated benefits is shown below.

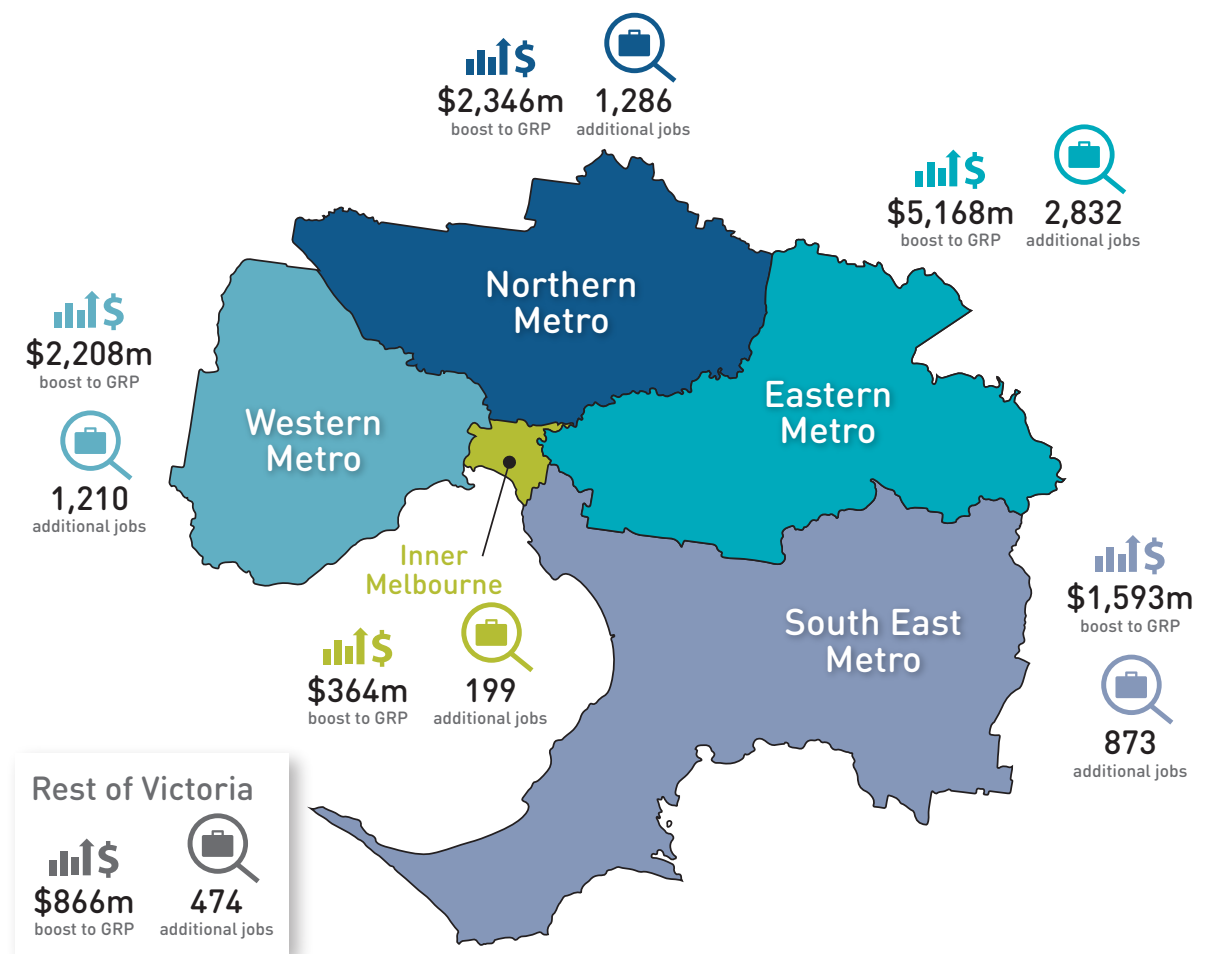
### Overview of North East Link benefits

Productive businesses	Competitive supply chains	Economic growth	Prosperous households	Liveable neighbourhoods
<p>\$250 million in economic value each year from better business connectivity</p>	<p>\$427million of economic value each year from better freight connectivity</p>	<p>\$12.5 billion increase in Gross State Product (GSP) for Victoria</p>	<p>\$324 million in economic value each year from better household connectivity</p>	<p>\$41 million in economic value each year from improved safety and amenity</p>
<p>Businesses in the north east will have access to 62,000 more workers</p>	<p>2% increase in connectivity between manufactures and suppliers</p>	<p>Will support 10,300 additional (net) jobs during construction</p>	<p>Workers in the north east will have access to 56,000 more job opportunities</p>	<p>100 fewer crashes each year on local roads in the north east</p>
<p>\$590 million increase in productivity from business clustering</p>	<p>More line haul freight carried on HPFVs between the north and south east</p>	<p>Will support 3,400 additional (net) jobs in Victoria each year during the operating period</p>	<p>Provide improved access to education for residents in the north east</p>	<p>\$52 million in reduced pollution benefits for local areas each year</p>
<p>Will attract 5,500 more jobs to businesses in the north east</p>	<p>\$148 million reduction in vehicle operating costs each year for freight vehicles</p>	<p>\$7.5 billion increase in Gross Regional Product (GRP) for the north east</p>	<p>Will attract 9,700 more people to live in the north east</p>	<p>Healthier communities from more walking and cycling opportunities</p>

As a significant proportion of these benefits accrue to business and freight users, the project is expected to result in significant productivity gains throughout the economy, which – in turn – will help to stimulate economic activity. Productivity improvements provided by the project are expected to increase Victoria’s Gross State Product by about \$12.5 billion through to 2046. The project is also expected to stimulate significant additional jobs growth. These benefits will be greatest in the north east, but positive economic and employment impacts are expected to be distributed across other parts of the city and Victoria.



Distribution of economic and employment benefits



Who will benefit from the project?

- Private road users will enjoy faster and more reliable travel times.
- Public transport users will benefit from faster and more reliable bus services, especially along the Eastern Freeway.
- Cyclists and pedestrians will benefit from new paths and routes, and safer, less congested roads.
- Workers living in Melbourne’s north, north east and south east will have access to more jobs.
- Businesses will have access to larger labour pools and better connections to customers, suppliers and other businesses. Improvements in accessibility and connectivity will drive higher levels of business productivity.
- Road freight operators will benefit from faster road speeds and reduced trip times to pick-up and deliver goods. Fleet operators will benefit from reduced costs for LCVs, HCVs and HPFVs and increased productivity from reduced travel times, reliability improvements and congestion relief.



- Communities in the north east will be better connected and safer and healthier, with improved local amenity and liveability. Access to employment and education opportunities will improve significantly and household incomes are expected to increase.
- Regional centres such as Gippsland and regional industries needing to move time-critical goods will benefit from improved connections to other parts of Victoria, the broader national freight network and Melbourne Airport.
- Victorians will benefit from higher levels of economic activity, with GSP expected to increase substantially and more permanent jobs created across the Victorian economy.
- Governments will have a greater ability to deliver policies, initiatives and priorities that benefit the Victorian and national economies.

Impacts

An urban project of the scale of North East Link cannot be delivered without some undesirable impacts. During construction, potential impacts include traffic disruptions, dust emissions associated with spoil removal and other construction activities, elevated noise and vibration levels, landscape and visual impacts, restricted access to properties and facilities, and disturbance of waterways. These impacts would be temporary and be mitigated and managed by adopting well-tested construction methods, adhering to relevant standards and guidelines, and monitoring impacts.

Detailed plans will be developed and implemented to manage potential amenity and traffic impacts during construction. A Community and Stakeholder Engagement Management Plan will be developed in consultation with local councils to involve the community in understanding, preparing for and minimising these impacts.

Some residential properties would need to be acquired for construction works, mainly north of Lower Plenty Road. Most of these residents are likely to have a strong attachment to their properties and the local community. Impacts are expected to be more significant for vulnerable residents, with moving likely to be a stressful event and finding a suitable alternative property potentially challenging.

A number of businesses would need to be fully or partially acquired (or occupied temporarily), largely south of Manningham Road. Sporting and recreational facilities would also be affected by the project.

Further investigations will be undertaken during the Reference Design and planning approvals phases to confirm the number and type of properties, businesses and community facilities impacted by the project. During development of the Reference Design, permanent acquisition or temporary occupation requirements will be minimised as much as practicable. Compensation for parties with an interest in land required for the project will be provided in accordance with the *Land Acquisition and Compensation Act 1986*, and early and ongoing assistance will be given to residents and businesses affected by acquisition.

During operation, traffic noise impacts may increase due to new or upgraded road infrastructure, as well as along roads with higher traffic volumes. Noise modelling will be undertaken to establish noise mitigation requirements and acoustic controls. New and upgraded noise barriers will be provided where needed to mitigate increased traffic noise to achieve required noise levels.

These and other potential longer term impacts will be investigated further during the statutory planning and environmental approvals process, which will also identify appropriate measures to avoid, minimise or manage adverse impacts. A set of Environmental Performance Requirements (EPRs) will be developed for the project to define the minimum environmental outcomes that must be achieved for design, construction and operation. The EPRs are likely to include requirements to comply with specific regulations, policies and guidelines, achieve (or exceed) recognised thresholds and levels, and adopt industry best-practice or well-tested construction approaches and methods.



Leveraging North East Link: potential complementary projects

Complementary projects have been identified to capitalise on the opportunities created by North East Link to deliver further benefits for Melbourne’s north east. These projects are designed to improve safety, enhance urban amenity, improve active transport and public transport services, and provide better access to important local destinations.

Preliminary discussions, investigations and analysis conducted with Transport for Victoria, PTV, VicRoads and local councils have identified potential complementary projects that directly or indirectly enhance the benefits delivered by North East Link. These projects include:

- **Road network improvements** – such as the E6 Transport Corridor (a new freeway connection from the Hume Freeway near Kalkallo to the M80 at Thomastown) and upgrades to Rosanna Road and Diamond Creek Road
- **Additional shared use path opportunities** – including the completion of existing trails and routes, and the construction of new paths
- **Public transport improvements** – such as lifting the performance of bus services on the arterial road network in the north east, providing better bus access to Melbourne Airport and the La Trobe NEIC and improving access to Watsonia and Greensborough railway stations



- **Local projects** – including walking, cycling and open space initiatives proposed through community submissions and in local council transport plans and strategies.

These complementary works are outside the project’s scope and are not part of the concept design. Separate funding requests would need to be prepared for these works and detailed business cases may need to be prepared for larger projects.

Some of these complementary projects have been included in costing and BCR for the project, including safety and pedestrian works on Rosanna Road, bicycle paths along the North East Link, improvement works at Watsonia rail station. Other broader opportunities are outside the scope of the North East Link Project and do not form part of the concept design; separate funding requests and, in some instances, business cases will be needed to progress these projects.



Financial analysis

For the purposes of financial analysis, a ‘Reference Project’ has been developed by NELA. The concept design developed for North East Link has formed the basis for the capital expenditure project costings and operation and maintenance (O&M) requirements have informed the estimation of these costs.

Project cost

North East Link will run through well-established, densely populated and developed urban areas with no surface road reservation. As a result, most of the principal roadway will be in tunnel to minimise adverse visual, social and environmental impacts. This increases the construction cost substantially.

The cost breakdown for the project is outlined below.

Estimated Project Cost – total project risk adjusted capital costs			
	Real P50 (\$b)	Real P90 (\$b)	Nominal P90 (\$b)
TOTAL Capital Cost	11.9	12.7	15.8

Tolling

North East Link will be tolled. Toll revenue has been forecast for the Reference Project based on detailed traffic modelling and adopting a Reference Tolling Solution in line with the tolling principles and criteria adopted for North East Link that are based on similar toll rates on other Melbourne toll roads.

The new North East Link will be tolled but there will be no new tolls on existing routes. This includes no new tolls to use the Eastern Freeway, Greensborough Highway/Bypass and the M80 Ring Road. The project concept for the project includes ways to keep local roads available for local trips.

Funding split

The financial analysis identifies a funding split between toll revenues and public sector funding, with toll revenue contributing approximately 22 percent of the funding requirement for the project and the State providing contributions for the remaining funding requirement.





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## Economic appraisal and project BCR

The economic appraisal performed for the business case (presented in Chapter 10) indicates that North East Link will deliver significant economic value for Victoria and the national economy: total economic benefits are estimated to be about \$2.2 billion greater than the costs of the project.

Transport benefits – such as improved travel times, reduced congestion and lower vehicle operating costs – account for more than 92 percent of the project's economic benefits, totalling over \$10.8 billion (present value) in economic value. Wider economic benefits (WEBs) associated with improved business productivity total \$0.9 billion (present value).

The benefit cost ratio (BCR) of the project is estimated to be 1.3, which means that for every dollar spent on the project, the Victorian economy will receive \$1.30 of value in return. If wider economic benefits (WEBs) are included, the BCR improves to 1.4.

These BCR results do not include any benefits associated with the potential complementary projects identified in the business case. Many of these initiatives are expected to have positive BCRs that cannot be achieved or would be enhanced by the project. As noted, these projects require separate development, funding, business case and approval processes.

The economic appraisal performed for the business case indicates that North East Link will deliver significant economic value for Victoria and the national economy.



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## Procurement

A reference packaging and procurement approach has been prepared for the business case, informed by preliminary market sounding and a detailed evaluation of possible options. This approach aims to maximise competition and market capacity and capability by optimising the size of construction packages and managing interfaces between the project's construction and operation.

A Reference Packaging solution has been identified for the purposes of informing the business case and which identifies a potential delivery structure that responds to the following objectives:

- Optimise market participation and maximise competition to drive value for money
- Optimise transport network integration by being able to accommodate future changes in technology, the transport network and operating policies
- Maximise budget certainty to the State
- Optimise the management, allocation and pricing of risk between all parties to the project
- Meet the State's timeframes for delivery of the project
- Maximise the operational performance of North East Link

This Reference Packaging Solution will be further developed and tested, including through more detailed market sounding, to finalise a delivery solution that drives adequate competition and determines the appropriate scope, incentives and interface points for delivery of the project.

Under the Reference Packaging Solution, a **Primary Package** consisting of the middle section of North East Link (including the tunnel) will be procured as an Availability PPP and designed, constructed, operated and maintained by a single private sector operator (PPP Co). Market sounding to date has demonstrated strong market interest in the project delivered as an Availability PPP.

One or two **Secondary Package(s)** for the outer sections of the road will be procured with a separate private sector party (or parties) as the D&C contractor(s). The scope of the Secondary Construction Package(s) will be identified following further development of the commercial framework for the project and further market sounding. Post-construction, the road assets delivered through the Secondary Construction Package(s) may be included in the Availability PPP arrangement.

A separate **State-owned entity (State Toll Co)** will collect toll revenue and undertake all customer interface activities. Creating this entity offers a clear differentiation between the scope of the PPP Co and the State Toll Co, establishing strong lines of accountability and minimising potential interfaces. It also means the State can consider monetisation/divestment options in the future, once toll revenues have matured.

Adopting this solution will require careful consideration of the interfaces between design, construction and operation, and between each of the separate construction packages. A preliminary assessment has identified three potential contractual frameworks to manage these interface risks. Further analysis and market testing will be conducted to better understand these risks and determine the most robust and effective way to allocate them.

A preliminary scoping analysis has been conducted to determine how best to align the incentives and interests of the PPP Co with the State's – noting that more traffic means more revenue for the State, but additional O&M costs for the contractor. NELA will continue to explore and refine these options.





## Budget and accounting

Chapter 12 reports the results of the analysis of indicative budget impacts associated with the project. To address the balance sheet constraints of potential operators identified during the market sounding, DTF and NELA have deemed that the Availability PPP for the Primary Package will benefit from State funding contributions. This is consistent with recent Victorian PPP projects.

Further consideration of the amount, timing and structure of the State's funding contributions will be undertaken in the next stage of the North East Link Project's development. In considering these contributions, the State will seek to balance a reduction in the private financing costs of the contractor with the need to preserve the risk allocation and performance incentives that are central to the Availability PPP model.



## Risk analysis

The North East Link Project has several defining characteristics that influence its risk profile:

- The project will have a significant tunnelling component, which introduces geotechnical and construction risks.
  - The project will have a very high capital cost (due in part to the tunnelling component), which increases the magnitude of construction risk and introduces risk associated with market capacity and financing.
  - The size and complexity of the project means there is an increased chance of scope changes and cost increases during the detailed design phase.
  - Interfaces between North East Link and existing roads will add complexity to the project's risk profile. Traffic flows may be affected on the M80 and EastLink, with any impacts on EastLink potentially having implications for the State's commercial interests under the EastLink Concession Deed with ConnectEast.
  - As with any large transport project, estimated O&M costs are based on traffic forecasting. These costs may increase if traffic levels are higher than anticipated; conversely, toll revenues may fall if traffic volumes are lower than forecast.
  - The project alignment has elements of brownfield and greenfield development, which elevates risks around gaining planning and environmental approvals within the required timeframe. It also increases the prospect of community and stakeholder opposition to the project, potentially leading to delays to project timelines.
- Key project risks have been identified and quantified based on the North East Link concept design. The next phase of work will include finalisation of risk allocation between the

State and the private sector (following further market sounding and determination of a final procurement model) and development of a detailed management plan for risks retained by the State.

The analysis undertaken for the business case has also considered the uncertainties facing the project, including the deployment of self-drive cars,

emerging customer models such as ride-sharing and potential network pricing reforms. Options are being examined to build flexibility into the design and delivery of the project to deal with these uncertainties and minimise risks associated with them.



## Project delivery

Preliminary plans have been developed to guide the delivery of the project. This includes:

- **Governance arrangements for the project**  
– These arrangements, which incorporate oversight by the Office of the Coordinator-General, are designed to deliver the project using best practice across technical disciplines, make project delivery clearly accountable to government and provide robust oversight and stewardship of the project.
- **Stakeholder engagement and communications**  
– NELA recognises that public participation is essential for achieving high quality outcomes across all phases of the project. A Communications and Engagement Strategy has been developed for North East Link that extends across all phases of the project's development and delivery.
- **Statutory planning and approvals pathway** –  
The recommended approval pathway for the project is through declaration of the project as 'public works' under the *Environment Effects Act 1978*, followed by preparation of an Environment Effects Statement (EES) and a Planning Scheme Amendment (PSA) under the *Planning and Environment Act 1987*.

- **Streamlined delivery** – Assuming an EES is required, a request would be made to the Premier for declaration of North East Link under the *Major Transport Projects Facilitation Act 2009*. The project can then use the Act's streamlined delivery provisions, including those covering land acquisition and temporary access to or occupation of land.

An indicative timeline has been established that aims to:

- Commence the EES process in 2018
- Complete the statutory planning and approvals process in 2019
- Commence a competitive market process in 2018 and award contracts in 2020.

Under this timetable, construction of North East Link would commence in 2020, with the new road opening to traffic in 2027.



Structure of the business case

This business case has been prepared by the North East Link Authority (NELA), with the assistance of the Coordinator General (Major Transport Infrastructure Program), Transport for Victoria, relevant Victorian Government departments and agencies, and technical, financial and legal advisers. The business case comprises 14 chapters across four sections, and 26 appendices. A guide to the structure of the business case is provided below.

Section 1 Melbourne’s orbital mobility challenge	<b>Chapter 1 –Context</b> Discusses Melbourne’s advantages and attributes, and the role of transport in a changing and growing city. Explores cross-city orbital connectivity issues in Melbourne and outlines the Victorian Government’s response to these issues.	
	<b>Chapter 2 – Problem</b> Identifies and analyses significant problems arising from poor cross-city orbital connectivity. Describes how the future will look if these problems are not addressed.	<i>Appendix A</i> ILM and BMP <i>Appendix B</i> Legislation and Policy Context <i>Appendix C</i> Transport Assessment – Existing Conditions and Future Base Case Report
	<b>Chapter 3 – Benefits</b> Describes anticipated benefits from addressing the problems identified in Chapter 2 and the importance of these benefits to the economy, businesses, households and government. Identifies Project Objectives and Guiding Principles.	
	<b>Chapter 4 – Strategic response</b> Examines a range of strategic options and tests how effective they would be in addressing the problems identified in Chapter 2. Confirms a connected freeway (North East Link) as the core element in the most effective strategic response to address the problems.	
Section 2 Options	<b>Chapter 5 – Project options analysis</b> Identifies four broad corridor options for North East Link and evaluates these against the Project Objectives and Guiding Principles. Recommends a corridor option that best addresses the problems arising from poor orbital connectivity, most effectively meets the Project Objectives and minimises impacts.	<i>Appendix D</i> Options Assessment Report <i>Appendix E</i> Community Engagement Report 2017

Section 3 The North East Link	<b>Chapter 6 – The solution</b> Presents the North East Link concept (the proposed project base scope). Identifies the minimum infrastructure required to meet anticipated demand, based on a comprehensive ‘optioneering’ process and engineering and other technical studies. Outlines potential complementary projects that could be delivered alongside North East Link.	<i>Appendix G</i> Preliminary Environmental Assessment Report <i>Appendix H</i> Preliminary Social and Business Report <i>Appendix I</i> Complementary Projects <i>Appendix J</i> Concept Summary <i>Appendix K</i> Transport Assessment – Project Case Report <i>Appendix L</i> Constructability Assessment
	<b>Chapter 7 – Transport outcomes</b> Reports the results of the transport impacts assessment conducted for the business case.	
	<b>Chapter 8 – Benefits and impacts</b> Describes how the concept meets the Project Objectives and its potential benefits and impacts.	
	<b>Chapter 9 – Financial analysis</b> Reports the results of the financial analysis conducted for the business case. Outlines funding requirements and options.	<i>Appendix M</i> Financial Analysis Report <i>Appendix M1</i> Strategic Tolling Report <i>Appendix N</i> Cost Estimate Report <i>Appendix O</i> Risk Summary <i>Appendix P</i> Independent Cost Review Report
	<b>Chapter 10 – Economic appraisal</b> Reports the results of the economic appraisal conducted for the business case, including the cost benefit analysis.	<i>Appendix Q1</i> Economic Appraisal <i>Appendix Q2</i> Assessment of Potential Land Use Impacts <i>Appendix R</i> Traffic Modelling Report



Section 4 Taking action	<b>Chapter 11 – Procurement</b> Identifies and analyses potential procurement options for North East Link. Recommends a packaging and procurement solution, including an approach to delivering the tolling system.	<i>Appendix S</i> Procurement Analysis
	<b>Chapter 12 – Budget and accounting</b> Reports the results of the budget and accounting analysis conducted for the business case. Presents preliminary budget impacts on the State’s balance sheet and operating statement.	Appendix T Preliminary Accounting Advice
	<b>Chapter 13 – Risk analysis</b> Describes the project’s risk profile and identifies and quantifies key risks.	
	<b>Chapter 14 – Delivery and implementation</b> Sets out the implementation plan for North East Link, including recommended governance arrangements, statutory approvals pathway and stakeholder engagement and communications. Provides an indicative timeline and milestones for the North East Link Project.	<i>Appendix U</i> Stakeholder and Community Engagement Plan  <i>Appendix V</i> Approvals Pathway Report





