

Fishermans Bend

Integrated Transport Plan

October 2017

Transport for Victoria
Department of Economic Development, Jobs, Transport and Resources
1 Spring Street Melbourne Victoria 3000
Telephone (03) 9651 9999

TRANSPORT FOR VICTORIA

TABLE OF CONTENTS

PART A	3
1 Executive Summary	3
2 Background	5
3 The Existing Network	6
4 Objectives, Targets and Principles	7
4.1 Targets	7
4.2 Principles	7
5 Transport Issues and Opportunities	9
5.1 Challenges and Opportunities	9
5.2 Current Transport trends in the area	10
5.3 Central City Comparator	10
5.4 The need to do things differently	10
5.5 Economic Benefits of Connectivity	11
6 Recommendations	12
6.1 Light Rail	12
6.2 Bus	12
6.3 Underground Rail	13
6.4 Active Transport (Walking and Cycling)	15
6.5 Road Network	17
6.6 Freight, Goods and Services Movement	18
6.7 Water Transport	19
6.8 Travel Demand Management	19
PART B	20
7 Public Transport Modelling	20
8 Light Rail Alignment Assessment	23
9 Underground Rail Alignment Assessment	32
10 Webb Dock Freight Corridor Assessment	37
11 Water Transport Strategic Assessment	41
12 Parking and Travel Demand Management Strategic Assessment	45
13 Conclusion	54

PART A

1 Executive Summary

Purpose of this Document

The Fishermans Bend Integrated Transport Plan (ITP) is an assessment of the likely requirements for the transport network in Fishermans Bend in the context of its proposed evolution and development, and an assessment of appropriate responses. The plan is used to provide broad advice and to inform the Fishermans Bend Framework Plan supporting its 2050 goals and objectives, by providing recommendations for the development of the Fishermans Bend transport network

Part A outlines the background, opportunities and recommendations, whilst **Part B** provides detailed modelling, options assessments and strategic assessment criteria that were used to develop the recommendations and key conclusions.

Summary

The Victorian Government has identified Fishermans Bend as a key urban renewal precinct in close proximity to the existing Central Business District (CBD) and Docklands. The Fishermans Bend Taskforce has been asked to develop a revised Framework Plan to guide the development of Fishermans Bend until 2050.

An Integrated Transport Plan (ITP) has been developed by Transport For Victoria (TFV) working in close partnership with the Department of Environment, Land, Water and Planning (DELWP), Fishermans Bend Taskforce and the Fishermans Bend Transport Working Group including the City of Melbourne, City of Port Phillip and Port of Melbourne Corporation.

With over 260,000 daily trips expected to be generated by residential development alone, a mode shift to walking, cycling and public transport will have a significant impact on transport and amenity outcomes for the precinct. Whilst the early provision of high quality pedestrian, cycling and public transport networks presents a significant challenge, the transformation of the precinct provides an opportunity to create an enduring legacy for Melbourne similar to the Hoddle Grid.

Integration of the land use for Fishermans Bend and recommendations outlined in this transport plan will be the most effective way to achieve the Fishermans Bend Vision. On their own, neither will adequately provide for a sustainable Fishermans Bend that will deliver economic and social benefits for Victoria.

The land use and transport planning interaction in the existing central city, such as the excellent connectivity, small city blocks, a fine grain network of streets and lanes, and active street frontages, all provides an excellent pedestrian environment and a high quality public realm that is attractive to business and residents. This provides an excellent benchmark for the development of new central city precincts such as Fishermans Bend.

To achieve a world class urban renewal outcome and transport system for Fishermans Bend, it is recommended that a high quality, connected and adaptable transport network be provided, prioritising walking, cycling and public transport whilst effectively managing freight and private vehicle movements.

To achieve these outcomes, new ways of thinking about Fishermans Bend are recommended, not simply the business as usual model of the past.

The recommended Fishermans Bend transport network in 2050 provides:

- A series of dedicated strategic cycling corridors which provide safe, direct and easy to navigate routes for cyclists travelling into the central city and into surrounding neighbourhoods.
- A network of enhanced and new bus services which knit Fishermans Bend into wider Melbourne.
- Two new light rail routes – one north and one south of the Westgate Freeway – connecting with the central city via a single new walking, cycling and public transport connection across the Yarra River

- A series of new streets creating a permeable network improving accessibility and enhancing walking and cycling choices.
- New widened footpaths providing sufficient space for activity, new canopy trees, water sensitive urban design and places for community interaction.
- Provision for new stations in the precinct to leverage off a potential long term new underground rail connection linking Southern Cross and the Werribee line via Fishermans Bend.
- A safeguarded corridor for a potential future road and rail freight connection to Webb Dock.
- A package of travel demand management measures including development of travel plans, car share provision, car parking levy options and consideration of precinct car parking opportunities.

Strategic Alignment

The following plans, policies and strategies have informed the development of the Fishermans Bend ITP:

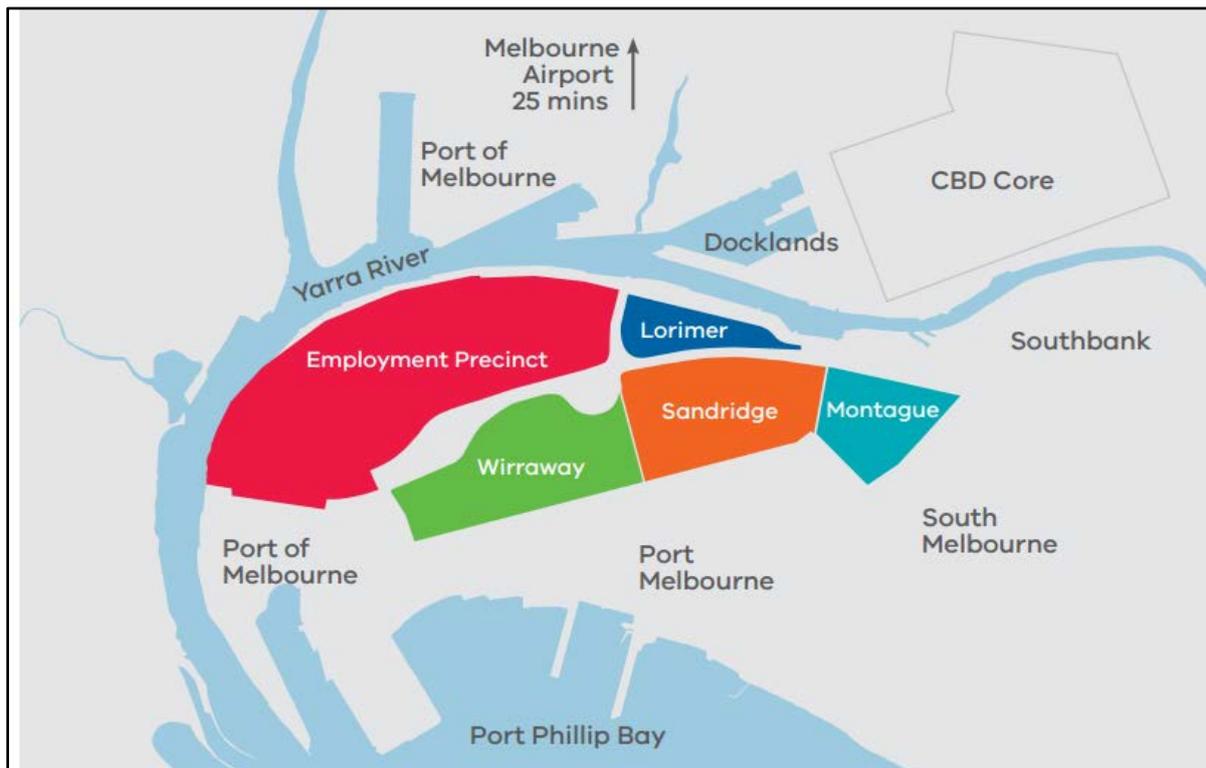
- Plan Melbourne
- Victorian Cycling Strategy
- City of Melbourne and City of Port Phillip transport strategies and plans
- Metropolitan Waste Strategy

2 Background

The Fishermans Bend Vision establishes the next chapter in Melbourne’s growth story.

The area will provide 80,000 jobs and a range of well-served, higher density housing options for 80,000 people. It identifies that to do this, new and improved transport connections will be required to link Fishermans Bend to the CBD and the broader transport network, while leveraging its strategic location between Port Phillip Bay, the Yarra River and the CBD.

Figure 1: Fishermans Bend Precincts



The transport vision for Fishermans Bend is to create optimal levels of walking, cycling and public transport connectivity that will set a new benchmark for Melbourne. The target is for 80 per cent of transport movements to be made by public transport, walking or cycling.

The vision establishes that transport planning and road space allocation will be informed by a hierarchy that puts walking as a first choice for getting around. Walking, cycling and public transport will be used for most passenger movements within Fishermans Bend, with freight corridors identified for the effective movement of products and goods.

3 The Existing Network

Fishermans Bend is an area of approximately 485 hectares to the south of the Yarra River and at the northern point of Port Phillip Bay.

The area has changed dramatically over recent decades – from wartime aerodromes to its current industrial and logistics uses. With the rezoning of 250 hectares of this land in 2012 to Capital City Zone, a new process of transformation is now underway.

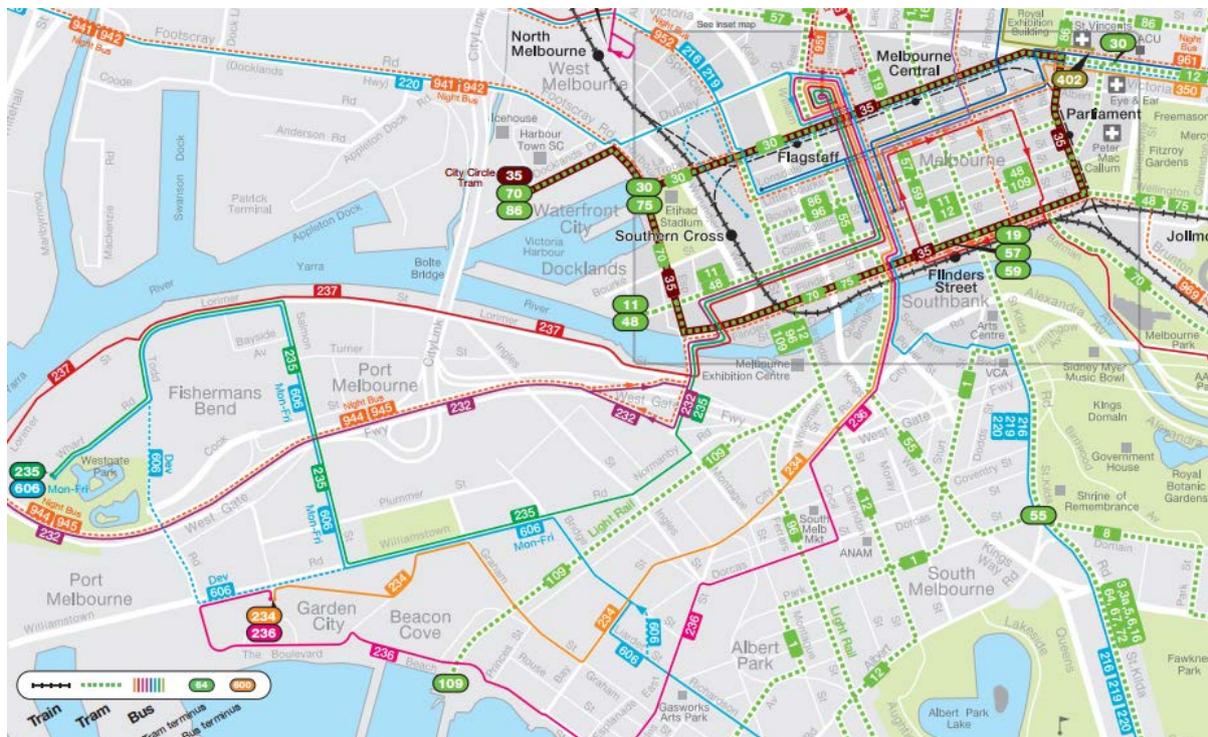
Current access to Fishermans Bend is heavily dependent on car travel reflecting its legacy of land uses. The industrial and logistic uses create a number of truck movements which use the road network within Fishermans Bend to access the key network of the Westgate Freeway.

Public transport access to the area is limited to low frequency bus services with some light rail services in the Montague Precinct.

The road network has not been designed for walking and cycling with very limited on road bicycle lanes, large block sizes and an absence of footpaths in some areas. If current mode shares for the City of Port Phillip were experienced in Fishermans Bend, in conjunction with the predicted growth in population, this would result in adding approximately three times the current traffic volumes to the street network.

The \$1.8 billion Port Capacity Project has improved road access and facilities at Webb Dock. An increase in freight activity is expected which has been supported by recent government investments at the intersections of Todd Road and the Westgate Freeway.

Figure 2: Current public transport network



4 Objectives, Targets and Principles

The potential for Fishermans Bend to be home to 80,000 people and 80,000 workers by 2050 presents a significant challenge to the existing transport network, one that cannot be met through existing business as usual transport planning approaches.

Transport planning has responded to this challenge by setting a series of targets, objectives and design principles that have informed the development of recommendations and will continue to inform development of transport projects as they emerge.

4.1 Targets

The following targets set the benchmarks for the long term planning of Fishermans Bend:

- 80 per cent of trips are made by sustainable transport modes.
- People with a wide range of abilities are able to get around independently.
- Accesses to services (community infrastructure, open space and public transport) are generally within a 400 metre walk of homes and businesses.
- Walkability score of more than 90 via WalkScore is achieved for all dwellings and workplaces.
- 24 hours a day, 7 days a week access is maintained to the growing port.

4.2 Principles

To achieve a world class renewal and transport system for Fishermans Bend, that supports the challenging targets identified above, the following design principles have been established:

Principle 1: Provide a quality transport network in Fishermans Bend

- Transport infrastructure and services will integrate with and support the vision for changing land use and associated transport demand.
- Strategic transport linkages will complement existing networks and connect to metropolitan and regional destinations via existing and planned central city gateways (such as Southern Cross, North Melbourne, Arden and Domain).
- Land use planning will influence development to cluster community services, major entertainment, recreation, retail, education and employment uses around public and active transport routes and nodes, as well as effective freight movement.
- A fine grain of high quality walking, cycling and public transport linkages will link the five Fishermans Bend precincts with the adjoining areas such as the Hoddle Grid, Southbank, Docklands, North Melbourne, Arden Street, St Kilda, St Kilda Road, Domain, Port Melbourne, South Melbourne, Bay Street and Melbourne's inner western suburbs.
- High quality transport infrastructure will be integrated with streets and surrounding buildings through best practice design, including the use of elements that enhance climate change resilience.
- Footpaths will progressively be upgraded to remove pedestrian obstacles such as signs, poles, street furniture, signal boxes, telecommunication boxes and street trees, ensuring all footpaths are Disability Discrimination Act compliant.

Principle 2: Prioritise walking, cycling and public transport

- The street hierarchy will prioritise pedestrians, cyclists and public transport in key streets. The design of streets (including allocation of road space) will recognise this hierarchy, whilst providing for freight and general traffic on preferred routes.

- On-street and off-street car parking provision will be minimised by specifying best-practice parking rates and maximising provision of car share, bike share and bicycle parking, and consider centralised car parking facilities to encourage use of walking, cycling and public transport for short to medium distance trips.
- Land use planning and building design will encourage a mix of commercial and residential activity to reduce or avoid the need for longer distance trips. This includes the 10 minute neighbourhood concept for Fishermans Bend where local shops and services, parks, education, community and cultural services, and public transport are generally located within a 10 minute walk of dwellings and workplaces.
- Land use planning, building design and public realm design will encourage activated, permeable and people-friendly built environments.
- A fine grain, legible and connected pedestrian and bicycle network will integrate with the built environment, applying best practise examples from successful precincts in Melbourne and around the world.
- Increased urban greening and canopy cover will support active transport uses through the use of undergrounding infrastructure.
- Key pedestrian and cycling streets will be designed in ways that provide low speed and safe environments, encouraging the uptake of sustainable modes by people of all ages.

Principle 3: Enable freight and private vehicle movements

- The operating and growing Port of Melbourne at Webb Dock will have ongoing access via road and rail, currently provided via Lorimer Street. In the longer term, freight movements may be provided via a new road and rail freight connection, with the land set aside and preserved in the short term.
- The impact on the external transport network surrounding Fishermans Bend, and potentially impacting freight movements, will be minimised by maximising the use of walking, cycling and public transport to access the precinct, rather than private vehicles.
- The street hierarchy for the precinct and adjoining areas will include appropriate traffic routes connecting to key destinations.
- The growth of activity at Webb Dock will be supported whilst managing the impacts on urban amenity.
- Access to Station Pier will be maintained to support the continued operation of activities.
- Land use planning and building design will minimise the need for local service, delivery and waste freight movements within Fishermans Bend, including the application of consolidated waste freight servicing across the precinct.
- Network planning and street design will minimise the impact of through freight and general traffic on abutting land use.
- Street design will cater for those transport movements that are required to service the local area (including construction and last mile freight deliveries).

5 Transport Issues and Opportunities

5.1 Challenges and Opportunities

Fishermans Bend is characterised by the following transport challenges:

- Due to the historical industrial land uses, walking and cycling networks within Fishermans Bend are extremely limited, with large block sizes and a lack of dedicated routes.
- Other than Montague Precinct, which is serviced by the Route 96 and 109 light rail lines, the majority of the area is currently relatively poorly connected by lower frequency bus services.
- There are no central city gateway train stations in the vicinity of Fishermans Bend, the closest being Southern Cross Station north of the Westgate Freeway and the Yarra River.
- Fishermans Bend is well connected to the Westgate Freeway and arterial road network; however, there is congestion at peak periods, which is associated with through vehicle movements along the Westgate Freeway to and from the south-eastern and western suburbs.
- The Westgate Freeway and surrounding arterial road network serve as barriers to movement within Fishermans Bend and also to outside the surrounding neighbourhoods.
- Fishermans Bend is adjacent to growing port and freight activities at Webb Dock.
- There is limited publically owned land, resulting in potential significant land and business compensation costs to implement the transport network.

In managing the transition of land uses that will occur at Fishermans Bend over the next decade, a number of other challenges will be presented:

- Delivering a consistently safe and attractive public realm for pedestrians where industrial uses remain and large amount of construction activity will be occurring.
- Managing freight and traffic movement in high amenity street environments whilst ensuring that remaining industrial uses can continue to operate satisfactorily.

Other broader challenges need to be considered also. Climate change is an issue which impacts our economic, social, environmental and public health. Victoria is becoming hotter and drier, facing more periods of extreme heat (days over 35°C) and drought, reductions in annual rainfall and increases in intense rainfall events.

Transport emissions are a significant contributor to rising greenhouse gas concentrations and how transport systems are designed today will determine future emissions for decades to come. Taking steps to transform Melbourne into a low carbon city is both a necessity and an opportunity. Victoria aims to reduce greenhouse gas emissions to net zero emissions by 2050 – creating a low carbon economy, generating new jobs, driving innovation within new and traditional industries and improving the city's liveability.

Despite the challenges, a number of opportunities are presented through the redevelopment of Fishermans Bend, namely:

- A flat topography which makes walking and cycling easier for residents and workers.
- The existence of wide road cross sections that have been designed to accommodate freight and logistics associated with current land uses, providing a generous reservation for conversion into high amenity streets.
- Fishermans Bend is at most 6km from the existing Melbourne CBD, enabling a significant number of activities for residents and workers to be accessible by short trips undertaken by walking, cycling and public transport.
- When new residents move homes or change jobs they are more susceptible to changing their behaviour. Fishermans Bend presents a significant opportunity to provide people with new options for mobility and influence mode choice from the moment they move into a new home or change job location.
- The redevelopment of the whole of Fishermans Bend enables the creation of a new home/work precinct providing residents with access to jobs and services within a 10 minute walk.

5.2 Current Transport trends in the area

The travel behaviour of inner Melbourne is different to the rest of Metropolitan Melbourne and indeed Victoria:

- 58 per cent of trips are by private vehicle within in the City of Port Phillip compared with, for example, 85 per cent within the City of Wyndham (VISTA 2009).
- 46% of work trips within the City of Port Phillip are by private vehicle, compared with the City of Wyndham at 72% (Journey to Work ABS Census 2011).
- Suburbs within municipalities have different travel behaviours depending on the transport networks and job access. The average in the City of Port Phillip (46 per cent by private vehicle) compares with Port Melbourne at 54 per cent and the St Kilda Road precinct at only 37 per cent (Journey to Work ABS Census 2011).

Journey To Work (ABS) data also provides a strong basis for understanding where people are travelling. These highlight a strong attraction for current City of Port Phillip residents to local and central city jobs. This is unsurprising as the central city is the highest area of job density in Victoria and within close proximity between the central city and Port Phillip.

Applying current City of Port Phillip trends to Fishermans Bend would mean that almost 80 per cent of work journeys are towards the CBD and inner Melbourne suburbs. This creates significant movement challenges for the future transport network.

5.3 Central City Comparator

Melbourne's transport network is a traditional hub and spoke network with the majority of public transport and major roads being directed to the centre of the city. This makes it a particularly transport rich location and an attractive place to do business due to its ease of access and catchment of residents from a large area.

Fishermans Bend is two and half times the size of the Hoddle Grid. The current central city including the Hoddle Grid and Docklands has a wealth of public transport options with two major rail termini at Flinders Street Station and Southern Cross Station in addition to a number of stations which make up the City Loop. This group of stations caters for the job density of Melbourne's CBD and enables the distribution of jobs across the area.

The Victorian Government is funding the construction of the Melbourne Metro Tunnel Project which will provide additional capacity for rail services into the central city and improve journey times, further increasing the competitiveness of the central city for jobs and business growth.

In addition to heavy rail options, the central city is serviced by 23 light rail (tram) routes which connect the central city with the inner and middle suburbs of Melbourne and a large number of bus routes which connect wider Melbourne to the central city.

5.4 The need to do things differently

The vision for Fishermans Bend is for an area that makes a significant contribution to Melbourne's liveability and productivity by connecting it with the city and its surrounding established neighbourhoods.

The size of Fishermans Bend has the potential to generate a significant level of travel demand. Over 260,000 daily trips are expected to be generated by residential development alone.

The most effective change from the business as usual approach is to generate a shift of short to medium length trips via public transport, walking and cycling, especially for those to the central city. This could reduce local vehicle movements by up to 90,000 vehicles per day.

To achieve this, Fishermans Bend will need to emulate the characteristics of the existing central city, namely excellent connectivity into and within the area, small city blocks with a fine grain network of streets and lanes, active street frontages, limited parking provision weighted towards short stay and excellent pedestrian environment and a high quality public realm.

It is also possible to improve access to the central city by providing world class cycling environments. Enabling cyclists to access the CBD and surrounding suburbs using dedicated cycle lanes with separation from traffic and priority at intersections.

It is expected that most trips to the outer suburbs would continue to occur by car. This is expected to generate demand of 5,500 vehicles onto the motorway network in the peak hour.

5.5 Economic Benefits of Connectivity

Transport underpins the liveability, efficiency and productivity of cities.

In an internationally competitive market employers require greater flexibility from their workers and workers need better support to respond. Enhanced connectivity plays an important role in facilitating productivity and opportunity by moving skills, labour and knowledge within and between markets. Efficient public transport systems promote geographic integration between residential and employment hubs, increasing the capacity of more dispersed population to generate wealth.

A key factor in determining the viability of different land uses and the intensity of development within infill and brownfield locations is accessibility.

CBDs are accessible to a large and wide pool of potential workers, customers and suppliers supported by many large office and residential buildings. This is not simply because zoning has allowed such development, but because the CBD is the most accessible location serviced by an extensive transport network,

6 Recommendations

A series of recommendations, by mode and network, are outlined below.

These recommendations form the basis of the Fishermans Bend transport vision to 2050 and have been formed by modelling work and a series of detailed option assessments and strategic assessments outlined in subsequent sections of this plan.

6.1 Light Rail

Recommendations:

- **In the medium term, it is recommended that northern and southern light rail connections are provided to support precinct development and growth, with the initial priority being the northern alignment.**
- **It is recommended that a Yarra River crossing is provided to enable the two preferred alignments.**
- **It is recommended that this crossing be enabled with a 6 metre bridge across the Yarra connecting Collins Street on the North to Lorimer Street on the South, avoiding severance of Point Park open space.**

The modelling conclusions demonstrate that two new light rail connections will ultimately be required to service Fishermans Bend catering for the high density residential and employment areas. These will require a new dedicated connection across the Yarra River to link Fishermans Bend to the wider public transport network and the central city.

The preferred alignments for new light rail routes to service Fishermans Bend are the following:

- A Yarra River crossing using the Collins Hartley option aligned to the west of the ANZ building in Docklands and crossing over to Point Park Crescent west at Yarra's Edge.
- Turner Street alignment through the Employment Precinct (northern alignment) and creation of a new tramway through the Lorimer Precinct aligned to a continuation of Turner Street and connecting to new Yarra River Crossing.
- Plummer Street/Fennell Street (southern alignment) with a bridge structure across the Westgate Freeway and connecting to the new Yarra River crossing via Hartley Street.

Prior the construction of a light rail connection, dedicated planning work will be required to develop a full business case outlining the costs, needs and benefits of any new infrastructure. This work will assure that the timing of the investment supports land use changes and delivers maximum benefits to the community. This work will include detailed technical planning, design, environmental assessments and community and stakeholder consultation to develop a business case for the Yarra River crossing for both proposed alignments

6.2 Bus

Recommendations:

- **An immediate increase in AM and PM bus services on existing routes is recommended and has been funded in the 2017/18 Victorian Budget. Further bus upgrades and new routes should be investigated for implementation beyond 2018.**
- **New bus services will be evaluated to further support growth in Fishermans Bend connecting it to surrounding suburbs and key destinations including the new Metro Station at Domain. These should be implemented to meet demand.**

Modelling and community feedback indicate that the current bus network is sparse and infrequent, and current service levels will be unable to service the growth anticipated in Fishermans Bend.

Services which operate along Lorimer Street and into the Employment Precinct already have a high volume of users creating congestion at peak periods of the day.

An upgrade to current bus services in the short term has been funded in the *2017-18 Victorian Budget*.

Modelling indicates that bus service improvements should be continued to be assessed and planned in the short term. As Fishermans Bend grows it may also be required to better connect the precinct to other key nodes of activity across the network beyond the CBD with new routes.

Modelling also indicates that beyond service improvements, additional bus services – some operating as a premium standard – may be required. These services would operate with turn up and go frequencies enabling residents and workers to plan their journey more effectively. Where possible, the routes would operate within dedicated road space to improve journey times, reliability and passenger experience. The following routes have been identified for further investigation:

- Ingles Street to Domain Station linking the precincts of Lorimer and Sandridge. In the medium term, this route would connect two light rail corridors to the new Metro Tunnel Domain Station and St Kilda Road.
- Salmon Street to St Kilda linking the Employment Precinct to Wirraway and onto the communities' in Port Melbourne, and down to St Kilda via activity centres at Bay Street, Albert Park and St Kilda.

6.3 Underground Rail

Recommendations:

- **Should a new cross city underground rail line be prioritised, it is recommended that the potential Fishermans Bend station sites identified in this plan be assessed as part of investigation, assessment and development recommendations.**
- **Planning safeguards for the potential rail and station alignments are preserved via the Fishermans Bend Framework Plan, individual Precinct Plans and Melbourne and Port Phillip Planning Schemes (2017).**

The broader metropolitan growth on the Werribee and Mernda rail lines may lead to the assessment and prioritisation of an underground rail connection linking the Mernda and Werribee lines via Southern Cross and Fishermans Bend.

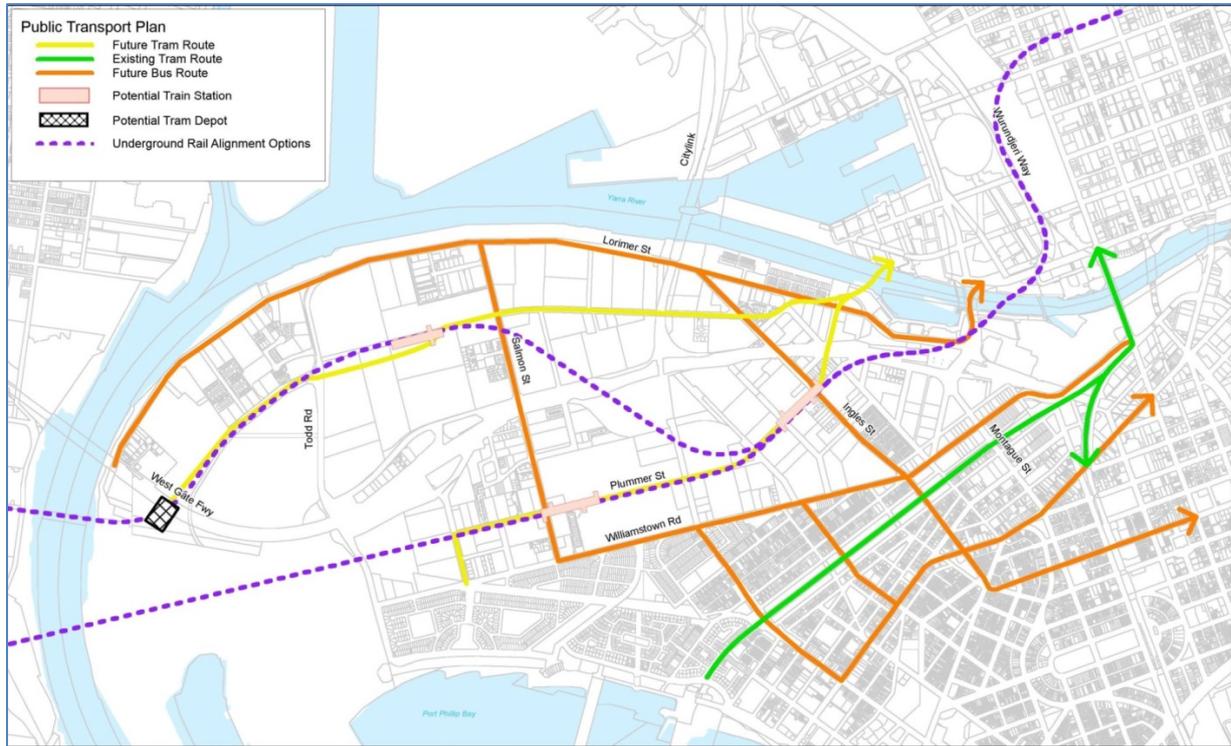
Should this cross city connection be prioritised for assessment and development, it is recommended that an eastern station option in the Sandridge Precinct, close to the intersection of Fennell Street and Ingles Street, be preserved.

A second western station should also be preserved and may be located at either:

- Wirraway Precinct close to the intersection of Salmon Street and Plummer Street; or
- Employment Precinct close to Turner Street within the current GM Holden Site.

A final decision on the western station should be informed by the broader feasibility of the underground rail connection.

Figure 3: The Fishermans Bend Public Transport Plan



6.4 Active Transport (Walking and Cycling)

Recommendations:

- **Deliver a series of principal walking and cycling corridors which provide dedicated space for these movements and lift the presence of these modes as transport choices.**
- **Construct a number of upgraded and additional Westgate Freeway and Yarra River crossings to improve permeability, connectivity and accessibility.**

While there are many geographical advantages for Fishermans Bend which would allow it to become a great place to walk and cycle, there are a number of physical barriers which currently restrict the use of these modes including the need to cross the Westgate Freeway and the Yarra River, the current wide road network, lack of footpaths/cycle paths and high road speeds.

A key target of the transport plan is to deliver a network where 80 per cent of all journeys with an origin or destination within Fishermans Bend (including internal journeys) are undertaken by sustainable transport, and enabling a broad cross section of society to be engaged in regular active transport use.

Accordingly, land use planning will need to support the walking network with access to services (community infrastructure, open space and public transport) generally located within a 400 metre walk of homes and businesses. Substantively this can be supported through developing a fine grain walking and cycling network with street blocks no larger than 100 metre, and a clear separation of walking and cycling from other road users.

A set of principle walking and cycling corridors have been developed that provide the backbone to this active network. These feature safe, ample and separated connections that link to adjoining communities, as well as Docklands, the CBD and the Westgate Punt.

A critical element will be to create a new connection across the Yarra River. This is recommended to form part of a future light rail connection.

New strategic cycling corridors are recommended to provide separated cycling facilities along:

- Buckhurst Street/Bay Street linking Port Phillip Bay (at Bay Street) to the central city via Montague Precinct (Buckhurst Street).
- Turner Street linking the Employment Precinct, Lorimer and the central city.
- Plummer Street/Fennell Street corridor connecting Sandridge and Wirraway to the central city.
- Williamstown Road and Lorimer Street.

General walking and cycling can be encouraged through the use of lower speed limits for internal streets, the provision of on street cycling infrastructure, particularly at public transport stops, and through the use of on street markings and signage.

The pedestrian network has been informed by the location of public transport hubs, and through working with the Fishermans Bend Taskforce the draft open space and activity centre networks.

Figure 4: The Fishermans Bend Walking Plan

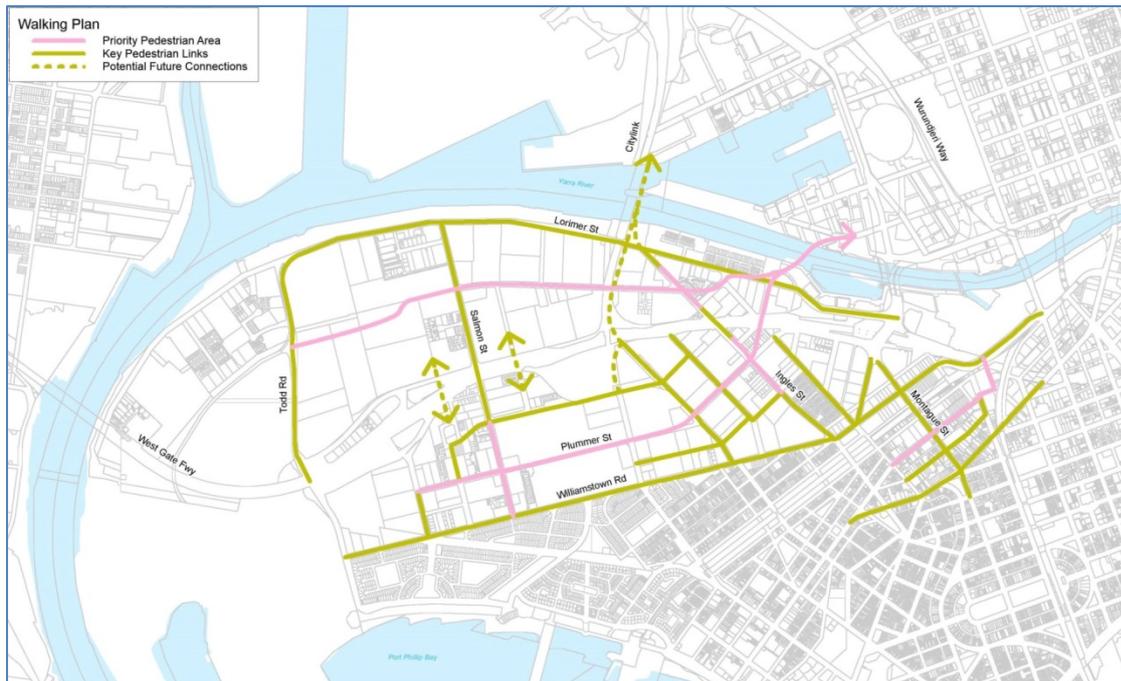
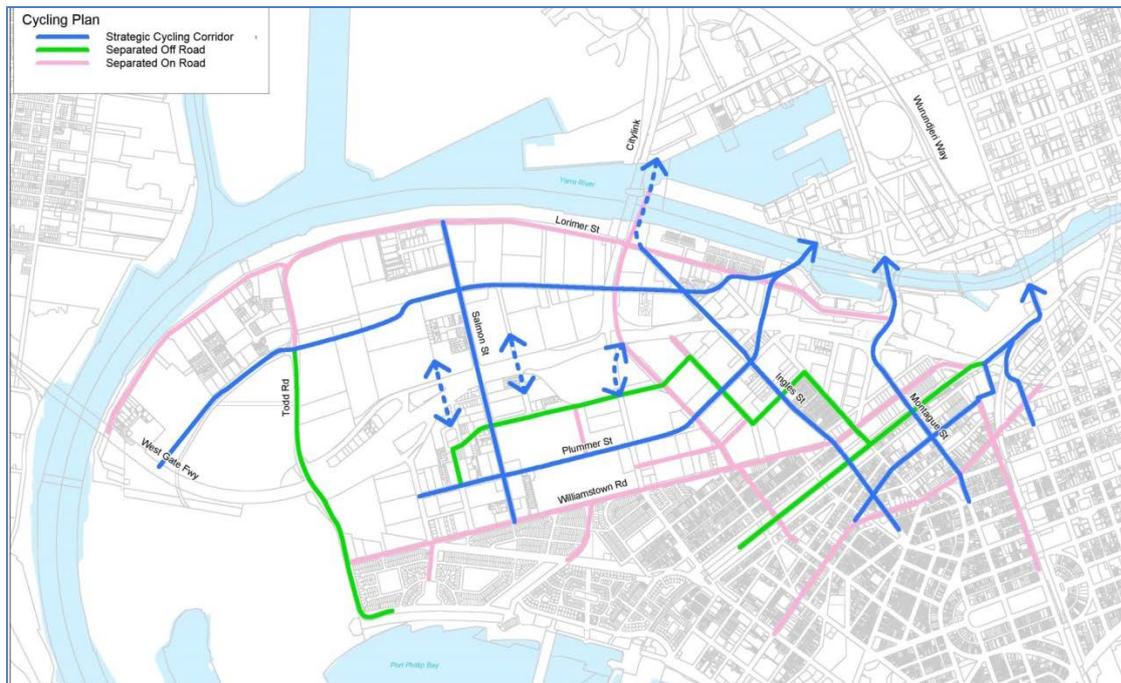


Figure 5: The Fishermans Bend Cycling Plan



6.5 Road Network

Recommendations:

- Provide a network of arterial and collector roads that enable vehicle access across the precinct.
- Redevelop the current large block sizes within Fishermans Bend to deliver more permeable and connected spaces through the introduction of a series of new roads, streets and laneways. New developments should provide regular interruptions to provide for walking, cycling and vehicle access.

With up to 20 per cent of all journeys with an origin or destination within Fishermans Bend (including internal journeys) to be undertaken by private vehicles, the local road network will need to accommodate vehicles effectively and safely.

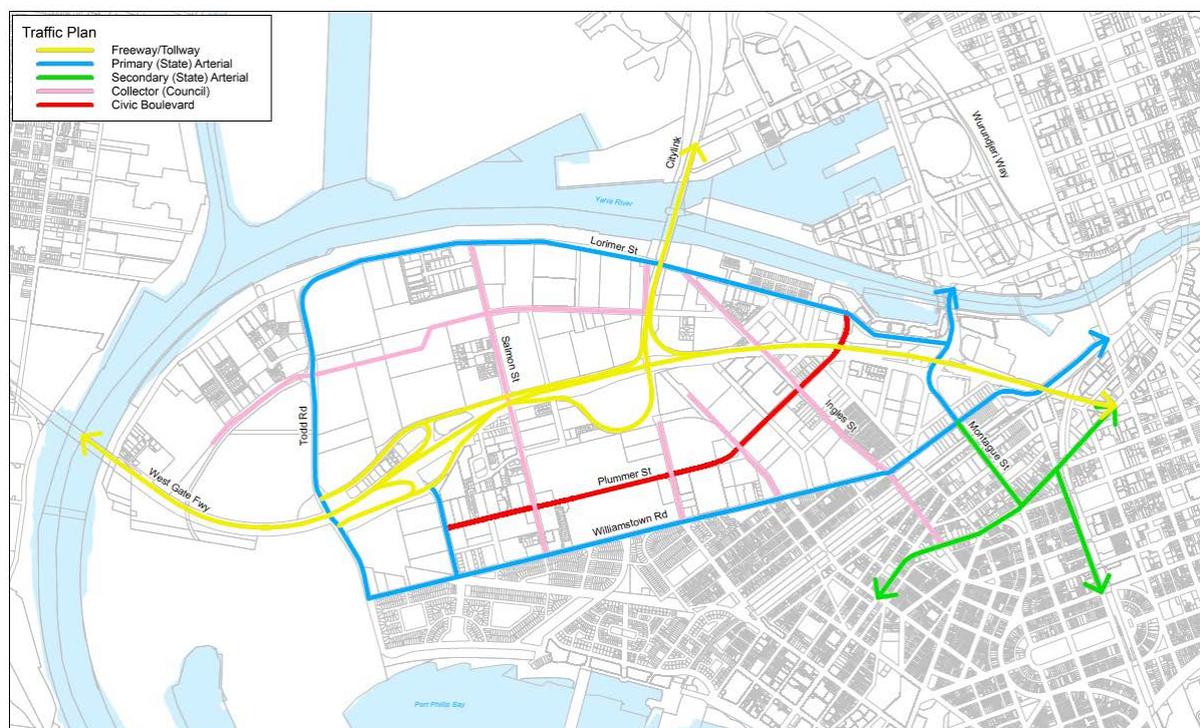
For this to occur a designated set of arterial and collector roads will be required to ensure that vehicles have access across the precinct to support private vehicles, service and commercial vehicles, buses as well as provide for safe and separated walking and cycling.

Plummer Street has also been designated for boulevard treatment which will include planting of trees and installation of street furniture, feature public spaces and support the public realm.

The street network is designed to provide the vehicle access required for functional development and local access, and will be delivered to enable people with a range of abilities to get around independently on the pedestrian and cycling network.

The road network will be designed to provide places to park cars, bicycles, emergency services and limited loading facilities encourage a diversity of land uses front streets providing activation and passive surveillance opportunities.

Figure 6: The Fishermans Bend Road and Traffic Plan



6.6 Freight, Goods and Services Movement

Recommendations:

- Safeguard the existing freight connections to Webb Dock which are sufficient to meet the short to medium term demands for freight movements, including exploring the potential to strengthen existing structures for higher mass vehicles.
- Safeguard a future road and rail corridor to connect Webb Dock to Swanson/Appleton Docks which, depending on port traffic growth, may need to be constructed over the next 40 years. An alignment option is recommended for long term corridor protection.

The critical goal for freight transport planning in Fishermans Bend is to:

- Safeguard the existing 24 hours a day, 7 days a week freight corridor for road and rail freight to service the port precinct and Webb Dock.
- Support freight and services efficiency, deliveries and waste management.

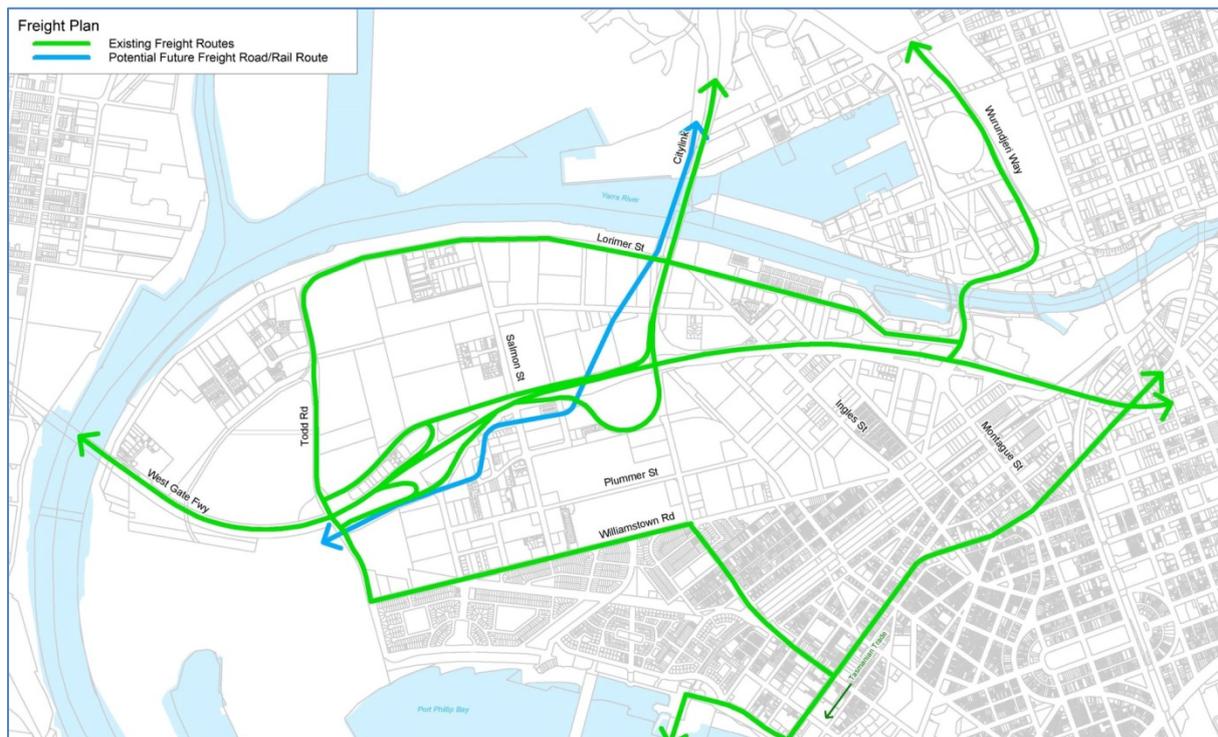
It is recommended that Lorimer Street be maintained, in the short to medium term, as the principal freight route for vehicles which cannot use the Westgate Freeway and require access to port facilities. This will support 24 hours a day, 7 days a week port activity at Webb Dock, Station Pier and along the Yarra River.

It is also recommended that the current over-dimensional routes along Lorimer Street and Williamstown Road/Normanby Road be maintained.

The use of principal freight corridors to minimise impacts on residential and commercial activities within Fishermans Bend will be promoted and supported with design of the network.

Planning safeguards will be put in place via the Fishermans Bend Framework Plan and any associated Planning Scheme Amendments to protect the future road/rail freight alignment.

Figure 7: The Fishermans Bend Freight Plan



6.7 Water Transport

Recommendations:

- **The option of a ferry service to Fishermans Bend is not recommended but further evaluation may be revisited on a regular basis as the population grows, and as technology and regulations change.**
- **The Westgate Punt service is recommended to be continued.**

The assessment of water transport options show that it is currently unviable to operate a ferry service to link Fishermans Bend to the central city.

The Westgate Punt service continues to provide a valuable connection to the western suburbs and should continue into the future. Ongoing service operation should be provided via the Westgate Punt.

6.8 Travel Demand Management

Recommendations:

- **As public transport and new walking and cycling connections are implemented across Fishermans Bend, the Congestion Levy should be expanded to the entire Fishermans Bend area. Revenue raised via the Levy should be used to fund further transport improvements within the vicinity of Fishermans Bend.**
- **Undertake further investigations in relation to precinct parking structures to understand market uptake, potential future demands, site placement, capacity and planning policy amendments required for implementation to be successful.**

A series of soft communications and hard infrastructure policy measures are recommended to support Fishermans Bend reach its goal of 80 per cent of journeys occurring by walking, cycling and public transport.

Local government should develop an on-street car parking strategy to support the growth and transition of land use in Fishermans Bend, with the introduction of an on-street car parking policy prior to large scale redevelopment of sites.

The city Parking (Congestion) Levy should be introduced to align with the implementation of new public transport infrastructure. Other elements of travel demand management should be introduced alongside new developments.

Local government should also respond and assist new residents and businesses as development rolls-out in providing up to date advice and help with travel planning.

PART B

Part B of this document provides a modelling summary, detailed options assessment and other strategic assessment criteria that were used to develop the recommendations and key conclusions.

7 Public Transport Modelling

The first stage of the planning process was to conduct demand modelling for Fishermans Bend which was undertaken using the Victorian Integrated Transport Model (VITM). The VITM is a strategic transport model owned by Transport For Victoria. It is a powerful strategic planning tool commonly used in Victoria for comparing the likely impacts of scenarios under different land use and transport network assumptions. Its strength lies at representing strategic level demand and travel patterns and comparing the options based on the same assumptions. VITM is a suitable tool for this project as it requires transport modelling at the strategic level to inform assessment of different public transport network options that support the planned land use development. A full output for the VITM modelling is available in *Fishermans Bend Tram Extension – VITM Modelling* (WSP Parsons Brinckerhoff 2017). A future year VITM model was developed as the foundation for testing the proposed public transport options. Two 2051 land use scenarios for Fishermans Bend were considered. These are set out in the table below:

Table 1: 2051 land use assumptions in Fishermans Bend precincts

Land Use Assumptions	Vision			Vision plus University		
	Population	Employment	Enrolments ¹	Population	Employment	Enrolments ²
Wirraway West	8,140	5,017	870	9,005	4,963	870
Wirraway East	8,880	4,839	840	9,429	4,955	840
Sandridge North	9,462	4,061	-	10,047	4,146	-
Sandridge South	15,788	6,944	-	16,956	7,217	-
Lorimer	15,981	6,270	-	15,580	8,400	-
Montague	13,809	4,799	1,611	18,858	5,661	1,611
Employment Precinct North	-	16,484	675	-	18,543	3,922
Employment Precinct South	-	5,641	1,228	-	6,664	7,722
Fishermans Bend	71,970	54,055	5,224	79,875	60,550	14,965
Metropolitan Melbourne	7,277,705	3,884,297	1,981,847	7,277,355	3,884,734	1,981,667

Project Cases

As the vision for Fishermans Bend is for urban transformation, it is necessary to reduce private vehicle mode share. For this to happen, Fishermans Bend public transport network will need new and improved connections linking Fishermans Bend to the CBD and Melbourne’s wider transport network. It will also need to boast high levels of walking, cycling and public transport connectivity similar to the CBD. Six project cases were developed to test public transport and demand assumptions, these are outlined below and in table x:

- **Project Case 1: initial tram extension** – developed from previous planning work, and includes extensions of tram routes 11 and 48 from Victorian Harbour to Fishermans Bend via Collins Street extension.
- **Project Case 2: SmartBus variation** – proposed tram on the Turner Street replaced with a high frequency bus (up to every 2-3mins), resulting in less cost in terms of rolling stock and infrastructure but lower transport capacity.

¹ Includes primary, secondary and tertiary enrolments

² Includes primary, secondary and tertiary enrolments

- **Project Case 3: New rail line** – new rail line between Clifton Hill and Newport via Plummer Street in addition to trams as per project case 1.
- **Project Case 4: Charles Grimes Bridge variation** – proposed tram or Smartbus routes to cross the Yarra on the existing Charles Grimes Bridge within their own right of way, rather than via the Collins Street Extension.
- **Project Case 5: Fully realised land use with new rail and extra tram service** – Vision plus university land use with new rail line between Clifton Hill and Newport via Plummer Street and additional tram service on Turner Street connecting North Melbourne to Wirraway.
- **Project Case 6: Fully realised land use with new rail line** – Vision plus university land use with new rail line between Clifton Hill and Newport via Fishermans Bend north (Employment Precinct) and Sandridge Precinct).

Table 2: Fishermans Bend tram, bus and rail services included in each project case

Route	Description	Included						
		Project Case	1	2	3	4	5	6
Fishermans Bend tram services								
Route 11	Reservoir – Fishermans Bend via Plummer Street		✓	✓	✓	✓	✓	✓
Route 48	Doncaster Park and Ride – Fishermans Bend via Turner Street		✓		✓	✓	✓	✓
Route 46	North Melbourne Station – Fishermans Bend via Turner Street							✓
Connection to CBD								
Alignment 1	Via Collins Street Extension		✓	✓	✓		✓	✓
Alignment 2	Via Charles Grimes Bridge					✓		
Complementary Fishermans Bend bus services								
Route FB-B1	Elsternwick – Fishermans Bend		✓	✓	✓	✓	✓	✓
Route FB-B2	Garden City – Queen Victoria Market		✓	✓	✓	✓	✓	✓
Route FB-B3	Domain – Fishermans Bend		✓	✓	✓	✓	✓	✓
Route FB-B4	Gardenvale – Albert Park		✓	✓	✓	✓	✓	✓
Route FB-B6	Southern Cross – Newport		✓	✓		✓		
Route FB-B6	Southern Cross – Fishermans Bend				✓		✓	✓
Route FB-B7	Garden City – Queen Victoria Market		✓	✓	✓	✓	✓	✓
Premium SmartBus service on Turner Street via Collins Street Extension Link								
Route FB-B5	Southern Cross Station – Fishermans Bend (Smartbus)			✓				
Rail service to Fishermans Bend								
Rail					✓		✓	✓
Rail alignment through Fishermans Bend								
Alignment 1	Default Plummer Street option				✓		✓	
Alignment 2	Alternative northern alignment							✓

Demand Forecasting Results

The key findings of the VITM results are:

- All options with a new underground rail service appear to perform better than options without rail as they have a greater increase in daily public transport trips. This is consistent with the fact that these options have additional public transport services available. In the vision only land use scenario, Project Case 3 shows the greatest increase in trips at around 81,000, followed by Project Case 1 and 4 which both show similar increases at roughly 42,000 and 40,000 trips respectively. In the vision land use plus university scenarios, the increase in public transport trips in Project Case 5 and 6 are roughly 91,000 and 89,000 respectively.
- The Turner Street Smartbus option (Project Case 2) does not appear to perform as well as other options, as this option has the least increase in daily public transport trips at approximately 27,000 trips.
- The Collins Street Extension option (Project Case 1) and Charles Grimes Bridge option (Project Case 4) are similar in performance, with an increase in daily public transport trips of around 42,000 and 40,000 respectively. This suggests that the alignment of trams between the CBD and Fishermans Bend is slightly less attractive via the Charles Grimes Bridge alignment.
- Options with rail alignments through Plummer Street (Project Case 5) and rail alignment through Fishermans Bend north (Project Case 6) are similar in performance, with both options having an increase

in daily public transport trips of around 90,000. This suggests the alignment of the trams between the CBD and Fishermans Bend does not have a significant impact on overall public transport patronage.

- Project Case 5 performs slightly better as it provides better public transport services to both the Turner Street and Plummer Street corridors, with three tram services and the rail in Fishermans Bend. Project Case 6 provides good service to the Turner Street corridor to accommodate for the additional employment and enrolments, however, the Plummer Street corridor is only serviced by one tram despite the majority of the additional population being located in this corridor.

Table 3: Daily public transport demand overview – network wide

Mode	Indicator	Base Case	Difference	Project Cases (PC)					
				PC1	PC2	PC3	PC4	PC5	PC6
Public Transport	Total Person trips	3,501,691	Total	42,248	27,387	81,102	35,580	90,553	88,552
			%	1.2%	0.8%	2.3%	1.1%	2.6%	2.5%
	% Mode Share	15.8%	Total	0.2%	0.1%	0.4%	0.2%	0.4%	0.4%
	Total PT boardings (incl V/Line)	5,145,745	Total	100,377	60,301	116,567	93,768	134,422	134,732
			%	2.0%	1.2%	2.3%	1.8%	2.7%	2.6%
	Metro Rail	2,269,383	Total	14,390	7,811	114,129	12,548	116,703	110,425
			%	0.6%	0.3%	5.0%	0.6%	5.1%	4.9%
	Tram	1,577,203	Total	77,998	33,508	23,937	74,147	43,522	44,807
			%	4.9%	2.1%	1.5%	4.7%	2.8%	2.8%
	Bus	1,118,702	Total	6,062	18,207	2,1239	5,522	-2,167	149
			%	0.5%	1.6%	0.2%	0.5%	-0.2%	0.0%

Based on the VITM modelling results, the best performing options in the vision land use scenario in terms of public transport patronage is Project Case 3, given the increased services provided by the rail, followed by Project Cases 1 and 4 which are very similar, and then followed by Project Case 2.

For the vision plus university land use scenarios, Project Case 5 performs slightly better than Project Case 6 due to Project Case 5 providing a better service both to Turner and Plummer Street corridors.

In regards to AM Peak load standard capacity of the proposed tram and bus services in the study area, it was observed in all Project Cases that there are capacity issues on trams and buses for people travelling to Fishermans Bend from the CBD. This is less evident in Project Case 3 with the addition of the rail, similarly with Project Case 5 and 6.

8 Light Rail Alignment Assessment

Transport modelling showed the need for light rail connections to meet transport demand in both the northern (Turner Street) and southern (Fennell/Plummer Street) corridors of Fishermans Bend. These two proposed corridors enable the majority of Fishermans Bend to be captured within a 400 metre walk of light rail services. These critical connections unlock access to the central city and the heavy rail interchange point at Southern Cross Station across the Yarra River.

Further assessment was required to inform the preferred alignments for these future light rail connections so that advice could be provided to inform the framework plan in an integrated manner.

To assist the department reaching alignment conclusions a number of studies were commissioned, these included:

- Jacobs (2016) Fishermans Bend Public Transport and Active Mode Link: Background Study;
- Jacobs (2016) Fishermans Bend Public Transport and Active Mode Link: Option Assessment Report;
- GTA Consultants (2016) Port Junction Microsimulation Modelling;

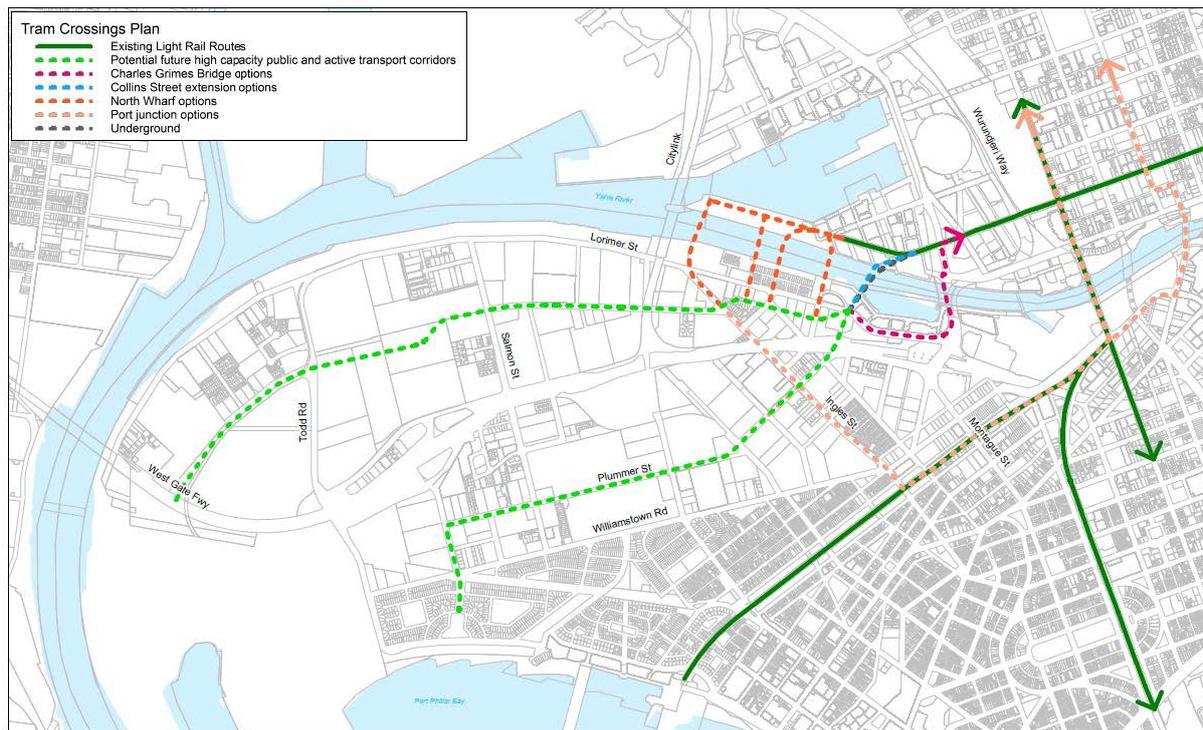
Stage 1 Assessment

Jacobs / WSP Parsons Brinckerhoff – *Fishermans Bend Tram Extension – VITM Modelling* (These studies have informed potential Yarra River crossing options. An initial long list of 10 options were analysed. The long list included the following options set out in table 3 and illustrated in figure 7. The initial analysis of these options is shown in table 4.

Table 4: River Crossing Options Assessed

No.	Name	Description
1	Charles Grimes Bridge At-Grade	Utilising the existing Charles Grimes Bridge slip road structure that currently connects to Navigation Drive to incorporate a public transport. The link continues across the bridge on the western side and continues around the corner onto Lorimer Street and continues west along Lorimer Street.
2	Charles Grimes Bridge Elevated	Utilising the existing Charles Grimes Bridge slip road structure at-grade, but would then increase in grade south of the slip road becoming an elevated structure on the western side and continue around the corner onto Lorimer Street and continue west along Lorimer Street.
3	Charles Grimes Bridge Tidal Flow	Utilising the Charles Grimes Bridge slip road structure at grade for the public and active transport link as a tidal flow arrangement with a bi-directional bus/tram traffic on bridge utilising tidal flow signalling.
4	Collins Street extension fixed structure	New fixed raised bridge structure located to the west of the ANZ building on the north side of the Yarra River in Docklands across to Point Park on the southern side of the Yarra River in Docklands
5	Collins Street extension opening structure	New opening bridge structure located to the west of the ANZ building on the north side of the Yarra River in Docklands across to Point Park on the southern side of the Yarra River in Docklands
6	North Wharf western	New bridge structure across the Yarra River connecting the western end of North Wharf to Ingles Street on the south side of the river.
7	North Wharf central	New bridge structure across the Yarra River connecting the middle of North Wharf to Riggers Place on the south side of the river.
8	North Wharf eastern	New bridge structure across the Yarra River connecting from the end of Bourke Street and connecting into Foundry Way/Rogers Street on the south side of the river.
9	Hartley Street	Alignment commences at the intersection of Lorimer Street/Hartley Street on the southern side of the Yarra River and traverses northwards across the River to the future Tom Thumb Lane before turning east at the Collins Street/Bourke Street intersection.
10	Route 109 Spur	Using the current route 109 tram tracks through Port Junction and taking a spur line off at Ingles Street north into Fishermans Bend and along Plummer Street.

Figure 8: Initial Yarra River Crossing Options considered



The shortlisted options, shown in table 3, were then assessed using a multi-criteria analysis set out in table 5. The assessment of options used a traffic light system to assess each criteria:

- Green – positive impact or no additional impact
- Orange – moderate impact
- Red – significant impact

In the assessment criteria, if an option had a significant impact on any of the primary assessment criteria it was deemed to be too significant to continue to the next stage of the feasibility study. It should be noted that Jacobs also assessed an option connecting from Hartley Street on the north side of the Yarra River. This Hartley Street option was not included in the assessment due to the significant impact it had on approved and under construction buildings at 839-899 Collins Street, Docklands.

The detailed analyses of two main route options were shortlisted for further consideration. These included the Charles Grimes Bridge (both elevated and at-grade options) and the Collins Street extension (both fixed bridge and opening structure). A series of detailed concept plans and 3D images were prepared for the routes under consideration. The 3D visualisations can be found in the Jacobs study (2016) *Fishermans Bend Public Transport and Active Mode Link: Option Assessment Report*.

The multi-criteria analysis (MCA) of the shortlisted options compared the range of options which had passed the stage 1 process.

The Criteria used to assess the options were:

Primary Assessment Criteria

- Public transport operational Impacts – Impacts to journey time, operational complexity, safety risks, reliability, maintenance issues
- Planning and Property Impact – Impact to properties and access, planning constraints, ownership issues
- Structure Feasibility – Feasibility of structural solutions, complexity and extent of additional work required

Secondary Assessment Criteria

- Impact to Traffic – Likely impacts on traffic flows along routes impacted by tram and wider area
- Active Mode Connectivity – Feasibility of providing active mode connectivity and quality of route
- Environmental Impacts – Environmental impacts such as noise, impacts to water quality etc.
- Visual Impact – Visual impact of solutions on local area
- Cost – Estimated cost of solution

Table 5: Initial Analysis of Early Yarra River Crossing Options

No.	Name	Outcome
1	Charles Grimes Bridge At-Grade	Proceed to next stage
2	Charles Grimes Bridge Elevated	Proceed to next stage
3	Charles Grimes Bridge Tidal Flow	Dismissed – Primary criteria rated as significant impact – operational issues with proposed PT corridor (safety and complexity)
4	Collins Street extension fixed structure	Proceed to next stage
5	Collins Street extension opening structure	Proceed to next stage
6	North Wharf western	Dismissed due to two of the primary criteria rated as significant impact – planning/property impacts and structural feasibility
7	North Wharf central	The primary criteria rated as significant impact – planning/property impacts and structural feasibility
8	North Wharf eastern	Dismissed due to significant impact – planning/property impacts and structural feasibility
9	Hartley Street (Initial alignment)	Dismissed due to one of the primary criteria rates as significant impact – structural feasibility of solution (*NOTE New Hartley Collins Street Option included and considered below)
10	Route 109 Spur	Dismissed early due to tram operational impacts, need for another active transport link, longer travel times and need to service employment precinct

Unsuitability of Route 109 Extension Option

A detailed micro-simulation model was undertaken by GTA Consultants to investigate the opportunity to run additional services via the Route 109 alignment with a spur line from Ingles Street to service the southern precincts of Fishermans Bend (Sandridge and Wirraway). This model assessed the intersection of Normanby Road / Whiteman Street / Clarendon Street and also included the intersection of Spencer Street / Flinders Street and City Road / Clarendon Street.

The study assessed the operation of the road and public transport network at these points in 2031. A number of network changes were assumed for the future model year including:

- Increased vehicle trips associated with background network growth;
- Changes to tram vehicles with E-Class trams introduced fully on Route 96 and Route 109;
- Introduction of new tram service along Clarendon Street from the reallocation of services from St Kilda Road as a result of the introduction of the Melbourne Metro Tunnel; and
- Increase of frequency along the Route 109 as a result of upgrades to the terminus at Station Pier to meet the growth challenges of Montague Precinct.

The model showed that additional trams using a Route 109 spur line would be possible, but other factors made this option less desirable than the Collins Street or Charles Grimes Bridge options due to the route length, additional fleet requirement, longer travel times (+10 minutes), tram congestion on Spencer Street/Clarendon Street, operating costs and less significant commercial and residential development outcomes. This option fails to supply a light rail connection to the Employment or Lorimer Precincts. It is therefore not preferred to continue to further analysis and design.

Stage 2 Assessment

The stage one assessment enabled the ruling out of a number of alignment options and provided an opportunity to focus on viable alignments and new sub-options of these alignments.

The alignments assessed are detailed below.

Table 6: Description of options considered in Stage 2 Jacobs Multi-Criteria Analysis

Option No.	Option Name	Description
1A	Charles Grimes Bridge at-grade	At-grade public transport connection along Charles Grimes Bridge Slip lane, cantilevered 3.5m shared path off west side of Charles Grimes Bridge and two lanes of traffic in each direction along Lorimer Street.
1B	Charles Grimes Bridge at-grade	At-grade public transport connection along Charles Grimes Bridge Slip lane, cantilevered 3.5m shared path off west side of Charles Grimes Bridge and two lanes of traffic eastbound and one lane of traffic westbound on Lorimer Street.
2A	Charles Grimes Bridge elevated north	Elevated public transport connection utilising the Charles Grimes Bridge slip lane. The structure rises from the current slip lane high point and continues to reach a height enabling a clearance of 6m from the roadway in Lorimer Street. The structure is located in close proximity to the existing buildings at Yarra's Edge. The structure comes to ground at along Lorimer Street approximately 30m west of Ferryman Lane. A cantilevered 3.5m shared path off the west of Charles Grimes Bridge provided pedestrian and cyclist access.
2B	Charles Grimes Bridge elevated central	Elevated public transport connection utilising the Charles Grimes Bridge slip lane. The structure rises from the current slip lane high point and continues to reach a height enabling a clearance of 6m from the roadway in Lorimer Street. The structure is located in close proximity to the eastern side of Tower 1 at Yarra's Edge before moving into the centre of Lorimer Street. The structure comes to ground at along Lorimer Street approximately 30m west of Ferryman Lane. A cantilevered 3.5m shared path off the west of Charles Grimes Bridge provided pedestrian and cyclist access.
2C	Charles Grimes Bridge elevated south	Elevated public transport connection utilising the Charles Grimes Bridge slip lane. The structure rises from the current slip lane high point and continues to reach a height enabling a clearance of 6m from the roadway in Lorimer Street. The structure is located in close proximity to the eastern side of Tower 1 at Yarra's Edge before moving across the intersection of Lorimer Street / Montague Street to the south side of Lorimer Street and travelling along the northern edge of the Westgate Freeway. The structure is anticipated to remain elevated until it meets a reconstructed Ingles Street Bridge. A cantilevered 3.5m shared path off the west of Charles Grimes Bridge provided pedestrian and cyclist access.
3A	Collins Street extension Fixed structure	Elevated bridge structure across the Yarra River located on the north side to the west of the ANZ building at Docklands and crossing on the southern side through Point Park. Structure remains elevated through Point Park and across Lorimer Street to cross the Westgate Freeway. Walking and cycling access is provided both in elevated structure and also via south side of Yarra River onto the bridge structure providing minimum of 3m shared path on both east and west sides of the bridge structure.
3B	Collins Street extension opening structure	A bridge structure which is partially elevated over the Yarra River but comes to land at both banks of the River. The bridge would be constructed to have an opening element to enable vessels taller than the structure to access and egress the Yarra's Edge Marina. Walking and cycling access is provided by paths on both sides of the structure at a minimum width of 3m each but likely to be wider to cater for future demand.

Full plans of each of the routes are provided in Jacobs (2016) *Fishermans Bend Public Transport and Active Mode Link: Option Assessment*.

The MCA scored a variety of criteria. The full list of criteria and the scoring of each option is included in table 7. Due to the level of detail available for each of the options and to help facilitate a comparison between the seven options, five ranking levels were used for the assessment so a difference could be shown between two options with positive ratings. The options were provided a score.

Table 7: Option Assessment Ranking Approach

Rating	What does the rating mean?	Score
High Positive	Strong positive impacts, operational performance, implementable e.g. gains for a large group of users of Fishermans Bend, strong gains for a small group of users of Fishermans Bend	5
Moderate Positive	Moderate positive impacts, operational performance, implementable e.g. moderate gains for some users of Fishermans Bend	4
No Impact	Relative to other options – not negative / not positive	3
Moderate Negative	Some difficulties, some negative impacts e.g. moderate costs to some users of Fishermans Bend; additional time/money is required to overcome specific issues	2
High Negative	Major constraints, major negative impacts e.g. substantial effort required to overcome issues, potential fatal flaws, costs to a large group of users of Fishermans Bend, high costs to a group of users of Fishermans Bend	1

Table 8: Stage 2 Multi-Criteria Analysis of Shortlisted Yarra River Crossing Options

Rating Considerations	Criteria	Option							Comments
		1A	1B	2A	2B	2C	3A	3B	
Improve Transport Efficiency									
Extent of additional active transport facilities provided – number and width of additional facilities	Maximise capacity for active transport	4	4	4	4	4	5	5	
Travel time per tram from Collins Street/Harbour Esplanade intersection to Lorimer Street/Point Park Crescent (eastern intersection)	Travel times across the Yarra River from FB to CBD – public transport	3	3	4	4	4	5	5	138s Collins Street options, 220s CGB option 2, 325s CGB option 1
This considered likely reduction in travel time for active transport users but also the likely increased catchment for users to capture the benefits of additional facilities in new locations and benefits for different areas of Fishermans Bend (users of Lorimer Street versus Montague Street)	Travel times across the Yarra River from FB to CBD – active transport/increased catchment	4	4	4	4	4	5	5	
Impact on travel time for users of CGB or Lorimer Street. This mainly related to the additional delay for the left turn movements from Lorimer Street onto Montague Street for the CGB options. The assessment did not include impact of additional travel time for current users of CGB slip road as it was deemed to be a minority of users	Travel times across the Yarra River - vehicles	1	1	1	3	3	3	3	PM peak – options removing one left turn lane from Lorimer Street to CGB experienced an increase of 114 seconds
Minimise Operating and maintenance costs									
Maintenance costs associated with each option – such as structure to maintain, tram infrastructure, mechanical equipment associated with opening structures	Maintenance costs of the bridge	3	3	2	2	2	2	1	
Number of peak additional trams, tram kilometres and tram hours requires (totals) from previous report completed – SGS report	Additional tram operating costs	1	1	2	2	2	3	3	15 peak trams, 286 tram kms, 31 hours – for CGB options at grade (assumed slightly less for elevated) and 13 peak trams, 238 tram km, 24 tram hours for Collins Street options
Maximise broader economic potential									
Expected additional development potential associated with each route i.e. Collins Street extra benefits due to the 'Brand' potential of the Collins Street address	Development potential – land use activity	4	4	4	4	4	5	5	
Maximise accessibility and minimise negative social impacts									
Number and quality of active transport connections to Docklands, open space, Yarra's Edge, South Wharf	Tram and active mode accessibility	4	4	4	4	4	5	5	
Impact on access to the Yarra's Edge Marina for boats	Marina access to harbour	3	3	3	3	3	1	2	
Number of conflict points with other modes of transport	Safety risks – conflict points	3	3	4	4	4	5	4	
Extent of impact on existing public open space in the areas adjacent to the options	Impact on open space	3	3	3	3	3	2	2	
Minimise negative environmental impacts									

Extent of impact on existing views from residential properties adjacent to the Yarra River and along Lorimer Street	Visual amenity impacts	3	3	2	2	2	2	2	
Extent of potential impact on the Yarra River – new piers within the river etc	Hydrology impacts	3	3	3	3	3	2	1	
Extent of expected impact on noise quality for existing residents adjacent to the route	Noise impact	2	2	1	2	2	1	1	
Minimise constructability challenges									
Complexity of extent of structural work required for each option	Structural complexity	3	3	2	2	2	2	1	
Extent of disruption to businesses and traffic during construction of the option	Disruption during construction	1	1	1	1	1	3	3	
Minimise planning and property impacts									
Difficult or lengthy planning processes, land acquisition required	Planning constraints / land acquisition	3	3	3	3	1	2	2	
Extent of impact on access to existing properties along the route	Property access	2	2	2	2	3	3	3	
RATING	Ranking	5	5	7	3	4	1	2	

The MCA for the Yarra River crossing options clearly identified the preferred option being a fixed bridge structure over the river in a similar alignment to Collins Street on the western side of the current ANZ building connecting into Yarra's Edge at Point Park.

In considering the Charles Grimes Bridge options, it was concluded that these options provide a reasonable public transport connection but additional active transport (walking and cycling) links would be necessary as a shared 3.5m path would not be sufficient to meet the needs of Fishermans Bend. Any additional active transport connection would be an additional project cost which was not included in the assessment. It was generally preferred to progress with option 3C, at this would move the light rail corridor furthest from existing buildings at Yarra's Edge, and reduce road capacity impacts, even though this had the highest land acquisition outcomes.

Stage 3 - Further Assessment – Hartley Collins Street Sub Option

Following further analysis of the options and public consultation responses it was decided to review an amended Collins Street option, named Hartley Collins Street. The aim was to provide a Collins Street connection without the need to split the open space currently provided at Point Park in Yarra's Edge. This option would join the existing tram network in Collins Street on the northern side of the Yarra River and then take a diagonal approach in a south western direction across the Yarra River to come into Point Park Crescent West and Hartley Street on the south side of the Yarra River.

Technical engineering feasibility of the option was conducted to prove that it was feasible. Both a 6m and 9m clearance above the Yarra River were investigated, including provision for sea level rise. Only the 6m option enables the route to be level with the ground through Yarra's Edge precinct, Lorimer Street and also at Collins Street. The 9m option however, would require an elevated structure which would start rising the intersection of Collins Street and Harbour Esplanade and would also not return to ground level at Lorimer Street. Analysis of the existing Yarra's Edge Marina indicated that the additional river clearance would only benefit 9 existing vessels berthed at the marina/ Due to the impacts on wider urban realm and limited reduced impact on vessel movement it was decided not to pursue the 9m option for assessment.

A multi-criteria analysis of the Collins Hartley option compared to Charles Grimes Bridge option 3C was conducted. The same assessment scoring process was undertaken as set out in table 9. This is set out below.

Table 9: Multi-Criteria Analysis of Collins Hartley and Charles Grimes Bridge southern options

Criteria	Charles Grimes Elevated Lorimer Street South Side	Hartley Collins Street fixed bridge
Improve Transport Efficiency		
Maximise capacity for active transport	4	5
Travel times across the Yarra River from FB to CBD – Public transport	4	5
Travel times across the Yarra River from FB to CBD – active transport/increased catchment	4	5
Travel times across the Yarra River – Vehicles	3	3
Minimise Operating and Maintenance Costs		
Maintenance costs of bridge	2	2
Additional tram operating costs	2	3
Maximise broader economic potential		
Development potential – land use activity	4	5
Maximise accessibility and minimise negative social impacts		
Tram and active mode accessibility	4	5
Marina access to harbour	3	1
Safety risks – conflict points	4	5
Impact on open space	3	3
Minimise negative environmental impacts		
Visual amenity impacts	2	2
Hydrology impacts	3	2
Noise impacts	2	2
Minimise constructability challenges		
Structural complexity	2	2
Disruption during construction	1	3
Minimise planning and property impacts		
Planning constraints/ Land acquisition	1	2
Property access	3	3
Unweighted Score	51	58



The multi criteria assessment clearly demonstrates that the Collins-Hartley option is the preferred option. This option still creates an issue for some vessels currently berthed at Yarra's Edge marina.

An opening bridge was assessed as being available to mitigate this issue, however, an opening bridge would impact the operational performance of the public transport network, creating additional breaks in service which will impact high frequency public transport routes and due to the interconnected nature of the network this could have significant impacts along the entire length of the route(s). The additional capital and longer term operating costs of this option has resulted in this option not being preferred for further development.

9 Underground Rail Alignment Assessment

Public Transport Victoria in their long term Network Development Plan - Rail identified a future rail connection linking the Mernda lines via Southern Cross to Fishermans Bend.

Fishermans Bend modelling shows the precinct would benefit from potential stations on this new alignment, supporting the ultimate level of jobs and residences.

To safeguard this future alignment and identify potential station opportunities the Fishermans Bend Taskforce commissioned Aurecon to undertake a rail feasibility study to identify the best rail alignment through Fishermans Bend and assess a number of station options.

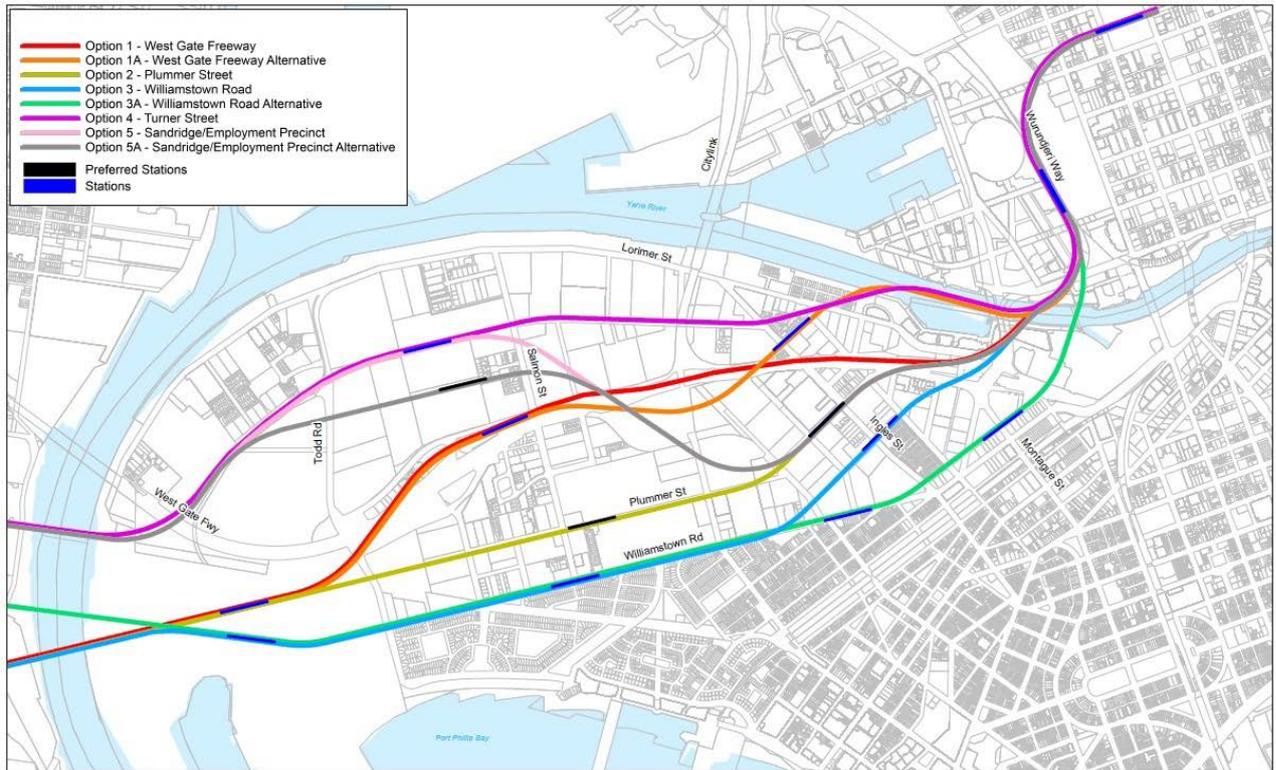
Aurecon identified a number of potential routes through Fishermans Bend to connect to platforms at Southern Cross Station and further to the Werribee line. A number of corridors were identified as being potentially feasible and these are set out in table 6.

Table 10: Feasible rail alignments through Fishermans Bend

Option No.	Alignment	Description
1	Westgate Freeway	Crossing beneath the Yarra River close to the ANL building, the alignment is located beneath the Westgate Freeway. This alignment would require a deep tunnel.
1A	Westgate Freeway Alternative	Crossing beneath the Yarra River in a north-west direction to pass under the townhouses at Yarra's Edge, route crossing under the Westgate Freeway to the west of Ingles Street and then crossing back to the north side of the Freeway around Salmon Street, prior to crossing south under the Freeway around Todd Road.
2	Plummer Street	Crossing beneath the Yarra River close to the ANL building, the alignment is located beneath Fennell Street and Plummer Street. The alignment could be deep tunnel or cut-and-cover construction.
3	Williamstown Road	Crossing beneath the Yarra River close to the ANL building, the alignment crosses the Westgate Freeway and aligns with Woodruff Street. It continues south west to meet Williamstown Road mid-block between Bridge Street and Graham Street before continuing under Williamstown Road.
3A	Williamstown Road Alternative	Alignment crosses the Yarra River and travels under the Convention Centre / Hilton Hotel, Westgate Freeway before taking the alignment of Munro Street. Passing under the corner of North Port Oval the alignment runs under Williamstown Road from approximately the intersection of Bertie Street to the west.
4	Turner Street	Crossing beneath the Yarra River in a north-west direction to pass under the townhouses at Yarra's Edge, the route moves to an alignment under Turner Street travel through Lorimer and into the Employment Precinct under an extended Turner Street.
5	Sandridge / Employment Precinct	Crossing beneath the Yarra River close to the ANL building, the alignment is located beneath Fennell Street before travelling north to travel under the Bolte Bridge on-ramp from the Westgate Freeway and under the Westgate

		Freeway, the corridor then has three options travelling either; (1) close to the Westgate Freeway north side, (2) into the centre of the previous GM Holden site or (3) aligned under extension of Turner Street.
--	--	---

Figure 9: Rail Alignment options through Fishermans Bend



Due to existing structures and the need to cross the Yarra River in two places it was assessed that all rail options would involve a tunnelled structure and would not be elevated or at-grade. A multi-criteria analysis (MCA) of the alignment options and station location options was conducted. Table 7 shows the evaluation criteria for the rail alignment study. The evaluation criteria were derived from the PTV Network Development Plan objectives, Fishermans Bend Strategic Directions and the Fishermans Bend transport objectives.

Table 11: Description of evaluation criteria for rail alignment through Fishermans Bend

Evaluation Criteria	Description
Cost	This criterion includes consideration of: <ul style="list-style-type: none"> • P95 capital cost (quantitative) • Key construction risks allowed for in capital cost • Operating and maintenance costs
Access and urban renewal (Benefit)	This criterion includes consideration of: <ul style="list-style-type: none"> • Increased overall capacity, reliability and convenience of the rail network • Provides staging opportunity for ultimate extension from Fishermans Bend to Newport • Facilitate connection to Werribee and Mernda lines to relieve capacity constraints • Relieve tram and bus congestion • Provide choice of transport options to the community • Improved customer experience and liveability • Improved productivity by minimising passenger travel times on board train • Improved productivity and employment growth through access to Fishermans Bend employment growth areas (station accessibility to patronage demand in development catchments), including travel time from ground to platform level • Catalyse development of Fishermans Bend by locating in areas of prescribed higher density (transport and land use integration) • Transport Connectivity: locate at critical points in Fishermans Bend to allow premium connectivity between transport modes, including walking and cycling infrastructure

During the assessment process of the MCA, each option was assessed relative to the baseline, rather than based on its absolute measure. Option 2 Plummer Street Alignment was selected as the baseline based on findings from *Fishermans Bend Metro Rail Summary for Places Victoria*, May 2013. Table 8 provides a summary of the options assessment. Red indicates that the option scored lower than baseline, yellow generally on par with baseline and green that the option scored better than the baseline.

Table 12: Description of evaluation criteria for rail alignment through Fishermans Bend

Project Option	Evaluation Criteria		
	Cost	Access and Urban Renewal (benefit)	Deliverability (impacts and issues)
Option 2 – Plummer Street Station (baseline)	Baseline	Baseline	Baseline
Option 1A – Alternative Westgate Freeway	Red	Red	Red
Option 3 – Williamstown Road	Yellow	Red	Green
Option 5 – Sandridge/ Employment	Red	Yellow	Yellow
Option 5A – Sandridge/ GM Holden	Red	Green	Yellow
Option 5B – Sandridge/ Cook Street	Red	Red	Red



The MCA indicated that the preferred alignment was a southern station close to the intersection of Fennell Street and Ingles Street in the Sandridge Precinct; this is located in close proximity to the future proposed commercial hub for Fishermans Bend. For a second underground station at the western end of Fishermans Bend, two options were shortlisted:

- Near the intersection of Salmon Street and Plummer Street in the Wirraway Precinct; or
- Close to the intersection of Salmon Street and Turner Street in the Employment Precinct.

The two options were rated similarly and both could provide different catalysts for development. A decision on an underground rail alignment does not need to occur as part of the Framework Plan but planning provisions need to be implemented to ensure that these options are not built out in the future and protects the future opportunity for Fishermans Bend to benefit from this potential long term project.

10 Webb Dock Freight Corridor Assessment

Jacobs completed a study for TFV to investigate corridors for future road and rail routes from Webb Dock to Swanson Dock and Appleton Dock.

In the short to medium term the existing Lorimer Street road connection to Wurundjeri Way will remain in place and be adequate to support expected volumes needed. The improved Todd Road connection from Webb Dock to the Westgate Freeway will continue to cater for a significant movement associated with Webb Dock.

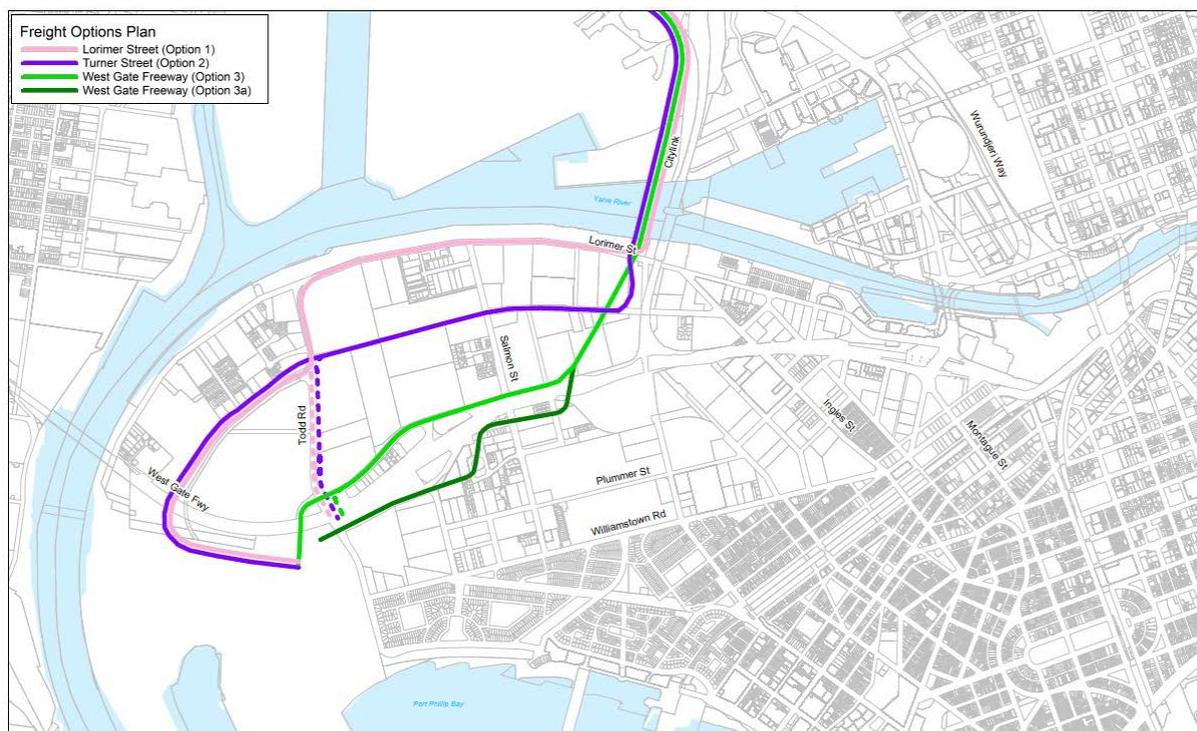
In the longer term, as trade volumes through Webb Dock grow, additional capacity is likely to be needed. Webb Dock has a design capacity of 1.2 million international containers plus another 700-800 container equivalents in Bass Strait, coastal and automotive trade. Around 8,000 truck movements can be expected to and from Webb Dock per day. In future years, Webb Dock could be expanded further.

At higher volumes, Lorimer Street may no longer provide adequate capacity. The expanded growth of Fishermans Bend may also add to the difficulty of accommodating additional truck movements through the area via Lorimer Street.

Three principle corridors were assessed for a future road and rail freight corridor from Webb Dock to a new connection across the Yarra River to the west of the Bolte Bridge. The three corridors were:

1. Lorimer Street;
2. Turner Street;
3. Westgate Freeway.

Figure 10: Freight Corridor Options for Assessment



At-grade and elevated connection options were considered for three corridors. In total eight different alignment options were identified to progress to concept design, urban design, planning and costing considerations. The final package of options is set out in table 8.

Table 13: Freight Corridor Alignment Options

Alignment Option	Location	Description
1A	Lorimer Street	Road and rail operating at-grade within the existing corridor. Option includes two grade separated intersections with rail crossing the Yarra River via a low opening bridge. Road would continue to use the existing road link via Wurundjeri Way.
1B	Lorimer Street	Rail operating on a two lane structure and road continuing to use the existing road links via Wurundjeri Way. Option includes rail crossing the Yarra River via a low opening bridge.
1C	Lorimer Street	Road and rail operating on a four lane structure above Lorimer Street connecting across the Yarra River on a four lane opening bridge.
2	Turner Street	Road and rail operating on a four lane structure above Turner Street connecting across the Yarra on a higher four lane bridge rising to a similar height to the Bolte Bridge.
3A	Westgate Freeway	All Westgate Freeway alignments have in common a connection over the Yarra River rising to a similar height to the Bolte Bridge and take a path to avoid crossing over the AusNet transmission facility. This elevated road and rail route follows the western and northern edge of Westgate Park, crossing Todd Road to the north of the current go-kart track. The route then follows the northern boundary of the Westgate Freeway
3B	Westgate Freeway	An elevated road and rail alignment that follows Cook Street and enters the port area near the current truck access point on the north side of the Westgate Freeway. Given the need to get under the Westgate Freeway, the connection would need to drop as it approaches the port land and would require the realignment of Todd Road to the east to maintain adequate clearance.
3C	Westgate Freeway	Elevated road and rail alignment that is largely located on the southern side of the Westgate Freeway. Option connects into Webb Dock close to the current road access. Corridor crosses the Westgate Freeway to the west of the Bolte Bridge on-ramp.
4	Lorimer and Westgate Freeway	This option split the road and rail corridors. Road corridor is on a similar alignment to 3B but not requiring the realignment of Todd Road. Rail alignment takes an elevated route along Lorimer Street with a low opening bridge across the Yarra River.

A multi-criteria analysis was undertaken on the eight corridor options. All options were scored on a three point scale indicating its relative performance for each criteria compared to the other options. The scoring identified the following:

- Score of 1 – Higher cost, higher impact or lower benefit relative to other options;
- Score of 2 – Medium cost, impact or benefit relative to other options;
- Score of 3 – Lower cost, lower impact or higher benefit relative to other options.

The scoring of the multi-criteria analysis is set out in Figure 9.

Table 14: Freight Connection Multi-criteria workshop results

		Option 1A	Option 1B	Option 1C	Option 2	Option 3A	Option 3B	Option 3C	Option 4
Cost and Delivery	Cost	3	2	1	1	1	1	1	1
	Construction and Deliverability Risk	3	3	2	2	1	1	1	2
Port Efficiency	Landside Port Supply Chain Efficiency	1	1	2	2	3	3	3	2
	Ease of Connection to Webb Dock	3	3	3	3	3	2	3	3
Network, Urban Development and Amenity Impacts	Impact of Connection to Broader Network (Yarra Crossing)	1	1	2	3	3	3	3	2
	Transport Network, Development Impacts (traffic, walking, cycling, public transport)	1	1	3	3	3	2	3	3
	Land Acquisition Impact	3	3	1	2	1	1	1	1
	Environmental Impacts (noise, emissions)	1	1	2	1	3	3	3	2
	Visual and Amenity Impacts	3	3	2	1	2	3	2	2
	Support for Fishermans Bend Renewal (encourage activation of Employment Land)	2	2	3	1	3	3	2	1
Overall Score		21	20	21	19	23	22	22	19

The multi-criteria analysis rated the Westgate Freeway alignments strongest due to their ability to accommodate a road and rail corridor separated from other road users and provides a high level bridge similar to the Bolte Bridge across the Yarra River.

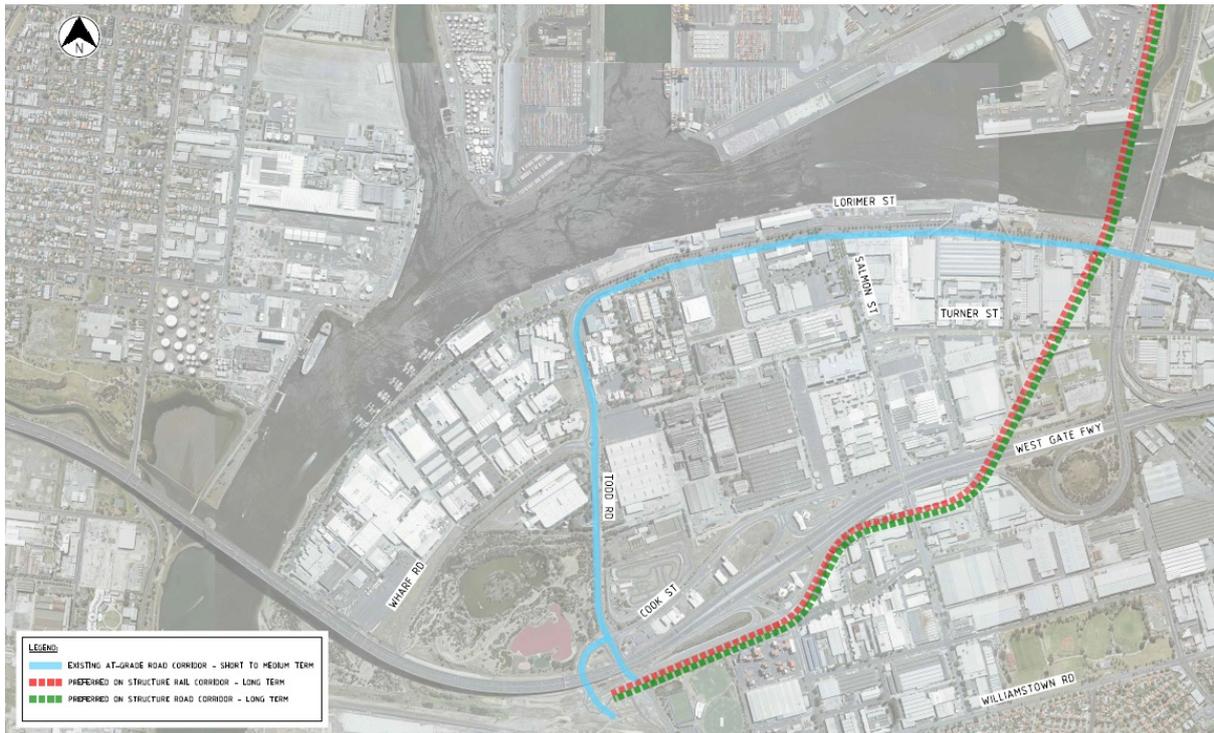
Following the multi-criteria analysis, Jacobs and DEDJTR further assessed the merit of the three Westgate Freeway alignment options. The following key points were noted:

- Whilst option 3A scored the highest through the multi-criteria analysis, it was identified that the most significant obstacle for this route, the potential for undue impact on Westgate Park, distracted from its score only once under the ‘visual and amenity impact’ criteria. By comparison options 3B and 3C were scored down twice due to their primary obstacle factors.
- In the case of option 3B, the need to realign the road network at Todd Road and then how this road would connect in under the Westgate Bridge, impacting the existing road based connections, led lower relative scores under the ‘transport network impacts’ and ‘ease of connection to Webb Dock’ criteria.
- Alignment option 3C was scored down twice relation to other options due to the need to cross the Freeway and pass through land identified for mixed use and residential development. This led to lower scores for the ‘visual and amenity’ and the ‘support for Fishermans Bend renewal’ criteria.

When these key differences were assessed in isolation, it was agreed that the potential for impact on Westgate Park (possible land loss and overshadowing) were far more significant issues than the multi-criteria analysis was able to highlight. Likewise for option 3C, Jacobs and DEDJTR identified that given the renewal of the area impacted by option 3C is likely not to occur for some years into the future, any impacts of option 3C could likely be managed and incorporated into the successful urban design of the area.

Based on the above, the final preferred solution for the long term freight road and rail corridor from Webb Dock is option 3C, see Figure 14 and 15. At this stage, the purpose of identifying option 3C is to support its protection as a possible route for upgraded road and rail links to the port should they be needed.

Figure 11: Preferred route Option 3C alignment



11 Water Transport Strategic Assessment

The Yarra River is an important waterway providing access to the Port of Melbourne for goods and a route for leisure activities. It is underused for commuting or other high volume movements of people. A number of river services have been trialled in this environment but no long term viable service has been successful.

Whilst Fishermans Bend river front access is via the Dockland’s precinct of Yarra’s Edge, with port activities west of the Bolte Bridge to Pier 35, this limits Fishermans Bend waterfront to a small portion west of Pier 35.

WSP Parsons Brinckerhoff undertook a study for the Fishermans Bend Taskforce to investigate the opportunities for water transport to assist in the people movement challenge of Fishermans Bend. Their key findings are set out below.

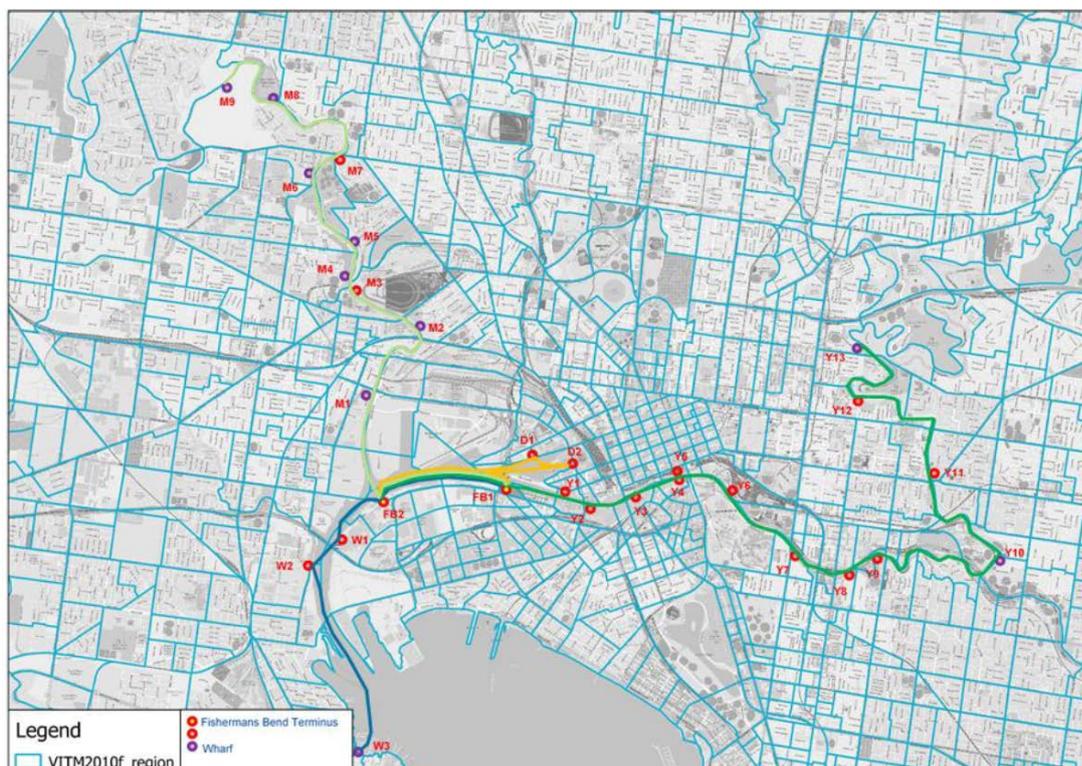
Ferry Operations Assessment

The Victorian Integrated Transport Model (VITM) was used to assess the feasibility and demand for a water ferry service. Four route options were considered. Each was modelled as a train route with a maximum speed of 10km/h (5 knots) which aligns with the speed limit for the river. No delay was assumed for the docking of vessels at potential station locations so overall journey speeds were underestimated which would provide a more favourable demand outcome in the model process. Two embarkation locations have been identified either within or in close proximity to Fishermans Bend, western point near to Pier 35 and intersection of Todd Road / Lorimer Street and eastern point in Docklands near the intersection of Ingles Street / Lorimer Street.

The four routes assessed were:

- Williamstown to Fishermans Bend as a potential replacement Westgate Punt service between Spotswood and Westgate Park.
- Maribyrnong River service from Maribyrnong Defence Site to Fishermans Bend.
- Victoria Harbour to Fishermans Bend service enabling connectivity from Southern Cross, tram passengers.
- Yarra River route connecting from the most eastern navigable point near Dights Falls.

Figure 12: Map of Water Transport Routes Modelled

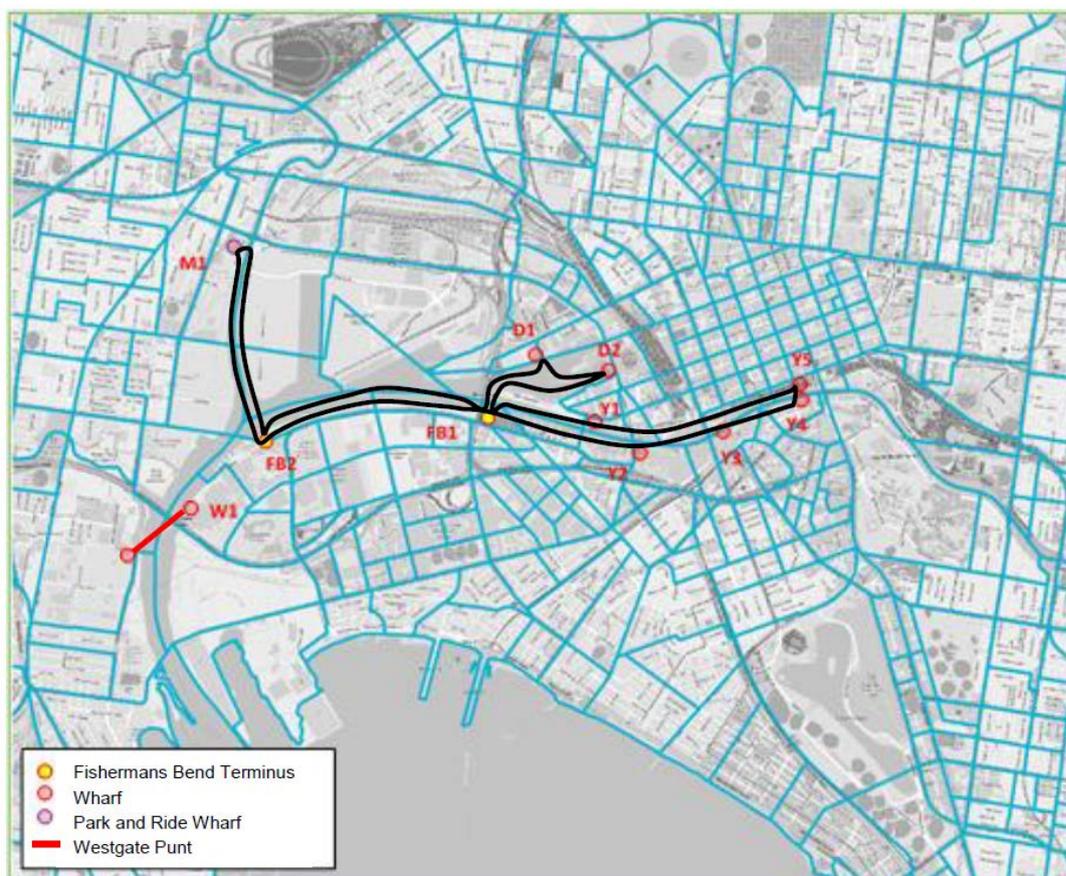


The modelling of each of these routes indicated demand on some routes, in particular the Yarra and Maribyrnong routes, however further analysis showed relatively few trips to Fishermans Bend. The low demand in Fishermans Bend appears to be due to the very slow ferry journey times and competition from other transport modes.

Following modelling, these routes were refined due to the diminishing patronage experienced towards the end of each of the original routes. This resulted in four preferred routes being further investigated:

- Williamstown route – there is very low demand on this route and the distance of travel is relatively long. The recommendation is to not include this route, but to support the continued operation of the Westgate Punt as a standalone operation.
- Maribyrnong route – whilst the demand on this route is generally stronger than the other routes, there is a rapid drop in the benefit of operations beyond Shepherd Bridge (Footscray Road). It is therefore recommended that the focus be on identifying a suitable site for a park and ride facility in this vicinity and truncate this route at that point.
- Docklands – there is sufficient demand for trips out of Victoria Harbour to make this a location of interest, and the relatively short route distance suggests that this route should be included in further assessment.
- Yarra route – the most significant demand points on this route are Southbank and Flinders Street Station wharf. Beyond these locations there is a significant distance past the sports and entertainment precinct before there is further commuter demand. Therefore, it is recommended that this route not operate beyond Flinders Street Station wharf.

Figure 13: Refined Water Transport Route Options



The refined route was modelled in VITM had a 10 minute peak frequency and 20 minutes frequency during non-peak periods. Total demands for the refined routes by stop are indicated in table 10.

Table 15: Refined Fishermans Bend focused route

Route and Wharf	AM Peak (2hr) Boardings	Total Daily Boardings
M1 – Shepherd Bridge	300	1,007
FB2- Todd Road Wharf	117	747
D1 – Waterfront City	66	390
D2 – Harbour Esplanade	464	1,322
FB2 – Bolte Bridge Wharf	170	2,504
Y1 – Collins Landing	353	1,166
Y2 – South Wharf	95	561
Y3 – Southbank / Casino	188	853
Y5 – Flinders Street Station	498	1,544
Total	2,250	10,094

An economic and financial analysis was completed with estimated capital and operating costs compared against the estimated patronage. The analysis appraised the following network scenarios:

Scenario 1: The ‘Base Case’ Fishermans Bend network option (full route) assessed at the Myki Fare Level.

Scenario 2: The Fishermans Bend refined network option assessed at the Myki Fare Level.

Scenario 3: The Fishermans Bend refined network option assess at a total fare of \$5 per trip.

Estimates of the likely cost recovery for each network scenario are provided in table 11.

Table 16: Financial viability of each network scenario

Option	Financial BCR	NPV (PV \$M)	Cost Recovery (%)	Total Capex (PV \$M)	Total Opex (PV \$M)	Total Trips (PA)
Scenario 1						
100 person vessel	0.2	-\$295	22%	\$102	\$287	4.47M
50 person vessel	0.2	-\$248	25%	\$87	\$256	
Scenario 2						
100 person vessel	0.3	-\$133	29%	\$46	\$142	2.53M
50 person vessel	0.3	-\$109	33%	\$37	\$126	
Scenario 3						
100 person vessel	0.5	-\$43	45%	\$46	\$142	1.46M
50 person vessel	0.5	-\$43	52%	\$37	\$126	

An economic appraisal was completed assessing the incremental economic costs and benefits of each scenario compared to a do nothing scenario. The economic benefits that were:

- Public transport user benefits – benefits include vehicle operating cost savings from people switching from car to public transport. Certain benefits are unperceived/misperceived by users but result in a change in consumption of resources, so resource cost correction were applied, this includes fare revenue and parking resource cost corrections.
- Road user benefits (decongestion) – benefits related to reduce road congestion as a result of people switching from cars to public transport.
- Non-user benefits (externality impacts) – benefits accruing to Victorians as a result of a reduction in car kilometres on the road, such as reduction in crashes and greenhouse gas emissions resulting from people switching from cars to public transport.

A summary of the economic assessment results for each network scenario is provided in table 12.

Table 17: Economic benefit of each network scenario

Option	BCR	NPV (\$M)	Total Trips (PA)
Scenario 1			
100 person vessel	0.4	-\$201	4.47M
50 person vessel	0.6	-\$153	
Scenario 2			
100 person vessel	0.7	-\$63	2.53M
50 person vessel	0.8	-\$26	
Scenario 3			
100 person vessel	0.7	-\$51	1.46M
50 person vessel	0.8	-\$28	

Based on the expected patronage, up front capital investment and the ongoing operating costs of ferries, it is unlikely that the provision of water transport services to Fishermans Bend will be financially viable for a private operator and unlikely to justify public investment with a benefit cost ratio less than 1.

The proposed ferry network would only deliver up to 1,200 to 1,500 people to Fishermans Bend during the morning peak period. This represents a very small percentage of the overall people movement task associated with Fishermans Bend.

At this point in time it is not recommended to pursue a water transport service for Fishermans Bend.

Westgate Punt Assessment

The existing Westgate Punt service provides a popular and useful cycling connection between Spotswood on the western bank of the Yarra River across to Westgate Park on the eastern bank of the river. This service creates an important link in the metropolitan bicycle network.

The punt provides a Yarra River crossing every 20 minutes on weekdays between 06:30am and 09:20am, and then between 4:00pm and 6:50pm, with the trip taking five to seven minutes per trip (one way) on average.

The Victorian Government provides a subsidy for the punt operations that enables the charging of a \$2 a trip (rather than \$5 per trip) during the weekday peaks which assists with attracting regular users. The punt also operates a service on weekends and public holidays with the punt operating on demand, with a \$5 per trip being charged.

Whilst the Spotswood, Newport and South Kingsville areas adjacent to the western stop are the greatest generator of trips (29%), the trips from neighbouring suburbs in the inner south west – Williamstown (21%), Altona/Altona North (15%), Yarraville (12%) are also strong.

Destinations of punt trips are dispersed with Fishermans Bend / Port Melbourne receiving the largest share of trips (30% of all destinations). However, destinations such as the Melbourne CBD (20%), Docklands/Southbank (12%) and Domain/St Kilda Road (9%) rank highly in terms of destinations.

The distribution of the origins and destinations of punt trips suggests that the punt provides a more attractive travel option than closer and more frequent public transport services to the Melbourne CBD and expanded central city. This indicates a strong personal preference for cycling for those extended trips.

The Western Distributor project will complete the Federation Trail improving access to the Westgate Punt for community in Melbourne's west. This may create additional patronage.

Employment growth in Fishermans Bend has the opportunity to increase demand on the Punt as well as the general background growth in cycling which is occurring across Melbourne.

The recently released Parks Victoria Westgate Park masterplan proposes to shift the eastern wharf of the punt services from the northern side to the southern side of the Westgate Bridge. This will aid legibility and way finding. The reconstruction of the wharf provides the opportunity to upgrade facilities and address some issues with the current location including improved signage, lighting, shelter and user facilities.

The growth of Fishermans Bend and service improvements are likely to result in increased demand for the Westgate Punt over the next 35 years.

12 Parking and Travel Demand Management Strategic Assessment

The 80 per cent target for people using walking, cycling and public transport will not be delivered solely through the use of providing additional opportunities for people to use these modes. It will need to be supported by a range of travel demand management measures which provide people with the 'nudge' to consider using walking, cycling and public transport.

Travel demand management is a general term for strategies that increase overall system efficiency by encouraging a shift from single occupant vehicles. This supports a focus on moving people and goods rather than motor vehicles.

Travel demand management seeks to reduce automotive vehicle trips and hopefully vehicle kilometres travelled by increasing travel options and helping individuals modify their behaviour, or by reducing the physical need to travel through integrated land use and transport planning.

Parking Management Options

Parking management is a general term for strategies that encourage more efficient use of existing parking facilities, reduce parking demand and shift travel behaviour away from car use.

The supply of free or inexpensive parking at a destination is a key decision factor cited for choosing to drive a car rather than taking public transport, walking or cycling.

On-Street Car Parking

Street space is limited in urban environments and must perform a number of functions to support daily activity, provide a space for meeting and gathering as well as enable people to move and access services and employment.

To maximise the benefits to the community, on-street car parking should be:

- Biased to short-stay, paid parking.
- Delivered in the form of parallel parking to maximise available space for other modes, improved public realm and economic outcomes.
- Limited on key public transport and vehicular routes to improve traffic flow.

In-Development Off-Street Car Parking and Storage

In development car parking will provide necessary car parking to support the tenants including as necessary short stay car parking. It should be designed to meet the following outcomes:

- Unbundled from individual apartments or business tenancies to enable their reallocation and flexibility for adaptive reuse into the future.
- Private car parking numbers should be limited, particularly within 400 metres (10 minute walk) from existing and proposed high frequency public transport stops.
- Whilst the maximum residential parking ratio specified in the planning scheme is currently 1 space/dwelling, residential development within 0-0.5 spaces/dwelling should be encouraged.
- Employment parking will depend on the particular nature of the use, but for offices should not exceed one space per 100m² of net floor area.
- Car parking should not be visible from the street and preferably not from laneways – parking must be wrapped in a sleeve of active uses (such as be screened with a layer of active uses and not be visible from the street).
- Car parking areas should be designed to facilitate adaption to other uses in the future. To this end level floors and minimum floor to ceiling heights of 3 metres are required.
- Entries and exits to car parking facilities should generally be closed by a well-integrated door.

- Should seek to include car share spaces within larger developments that can be used by residents, employees and visitors.

Centralised Off-Street Car Parking

Parking Precinct Stations (PPS) are centralised parking that is provided in lieu of parking within nearby developments. ‘Nearby’ means that the PPS is within easy walking distance (400 metre) of the development.

Unbundling parking compels developers to sell or lease parking independently of residences or commercial leases.

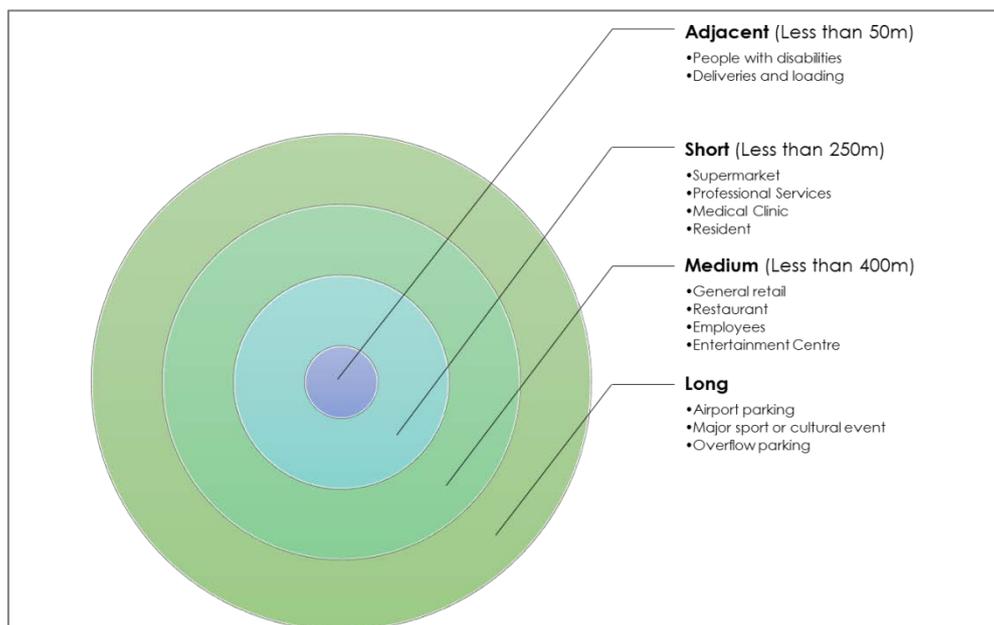
PPS have been implemented in very few cities around the world, however where implemented they have most commonly been part of pioneering developments and part of a wider sustainability objective.

The following objectives for PPS in Fishermans Bend have been established:

- Influencing travel demand – PPS should contribute to achieving a pattern of transport use and mode shares that help deliver the wider Vision for Fishermans Bend.
- Improving urban design – PPS should ensure that development frontages are not dominated by parking, or access to parking, and that streets are activated by place functions.
- Create conditions for development efficiency – PPS should provide parking efficiency, especially for smaller sites that tend to have vehicle and car parking access that is compromised – i.e. relying on car lifts, inefficient floor plate configuration etc.

Generally, the time and distance which drivers are prepared to walk depends on the length of time that will be spent at their destination, as well as the length of time spent during the associated car trip. The acceptable walking distance can also be impacted by the quality of the pedestrian environment, climate, line of sight, and friction such as crossing busy roads. Where parking is charged, these tolerances are often increased, with employees and other long stay users willing to walk distanced in the order of 600m.

Figure 14: Acceptable Walking Distances (adapted from the Victorian Transport Policy, Canada)



Fishermans Bend already has a Parking Overlay which establishes maximum car parking rates. With maximum parking rates in place, the market provides an amount of parking that is less than the maximum limit. In Fishermans Bend, developers are providing parking at a rate of 0.6 spaces per apartment. These 0.6 spaces are effectively an outturn of parking as a result of policy and market requirements. If PPS are implemented, it is likely that the market will respond by providing a lower parking outturn, which will depend on different uses.

An assessment of the level of this impact and indicative impact on parking outturns is provided in table 13.

Table 18: Theoretical outturn parking with and without Precinct Parking Off-Site

	Parking Overlay (Max Rate e.g. Capital City Zone)	Maximum outturn parking provision with parking on-site	Factors that influenced max parking provided with maximum limited (on-site)	Impact on Maximum outturn parking with PPS	Factors that influence parking provided with maximum limits where parking is located in PPS (mandatory off-site)
Dwelling	1 (per dwelling)	⬇️	<p>Quality of alternative transport including the service, proximity, frequency and convenience.</p> <p>Location of the dwellings within the precinct.</p> <p>Purchaser profile – investor and occupant priorities differ.</p>	⬇️⬇️	<p>Proximity and convenience of off-site parking location. The relative proximity and convenience of alternative transport.</p> <p>The relative cost of car parking in the area (the decision to purchase alternative sites).</p> <p>The inconvenience is likely to lead to a decrease in the amount of parking, but is likely to offset by public transport provision in Fishermans Bend.</p>
Office	1 (per 100m2)	⬇️	<p>Only small amounts need to be supplied on site to attract occupants, especially for service industries.</p> <p>Car shares and other innovations are contributing to a reduction in parking.</p> <p>Demand for staff commuter parking depends on convenience of different modes and associated journey to work time.</p>	⬇️⬇️	<p>There is precedent for decoupled and precinct based car parking in the CBD with car parks being operated as independent commercial businesses.</p> <p>Demand based on provision of alternative modes.</p> <p>Employers potentially drive laissez faire approach to employee parking.</p> <p>This commercial incentive is likely to lead to a reduction in parking.</p>
Retail	1 (per 100m2)	●	<p>Depends on whether it is a destination, retail or bulky goods.</p> <p>Unlikely to relate to provision of other modes (other than rail).</p>	⬇️	<p>There is some appetite for ‘precinct’ type parking for retail destinations – refer CBD and larger shopping centres where the distance between park and shop can be substantial. While maximum parking policy applied, smaller retailers are likely to provide less parking. The established model is likely to lead to higher uptake.</p>
Supermarket	2 (per 100m2)	●	<p>The amount of car parking that is supplied will depend on:</p> <ul style="list-style-type: none"> Scale, type, and distribution of supermarket; Surrounding dwelling density and type; Quality of alternative transport, including the type, proximity, frequency and convenience 	⬇️	<p>Car parking provision will be similar whether on site or in a centralised facility.</p> <p>The provision of car parking in close proximity will determine the nature of the supermarket offering rather than the type and proximity of car parking determining the amount supplied.</p> <p>Likely to be no change to the provision of parking.</p>

● - No change in parking provided for provided for a particular development
 ⬇️ - indicates a decrease in the amount of parking provided.

In determining the design and delivery of any PPS model, regulatory and policy decisions result in different options being more or less feasible. To assess all the options for implementing PPS at Fishermans Bend, combinations of different models have been reviewed with a view towards creating recommended scenarios for more detailed analysis. The options reviewed can broadly be grouped into three categories:

- Market Led Approach – private sector driven through Private funding.

- Creating Incentives – public sector investment to create Public/Private Partnership environment.
- Public Sector Led – public funded where the public sector invests in broader outcomes and therefore invests directly in PPS (an option that does not exclude some longer term transition to private investment).

A range of models for delivering PPS were tested through mapping the policy options for PPS. This is presented in the table19 below.

Table 19: An assessment of options for implementing PPS in Fishermans Bend

	Description	The mandate for the provision of PPS	Planning Policy Levers	Improving urban design	Public/Private Sector mix	Outcomes	Assessment for Fishermans Bend
1. Market Led Approach	Precinct car parking evolved through use of policy levers that lead to behaviour change and transition to new models over time	Not mandated precinct parking	Minimum or maximum could apply. Land use planning policy should recommend PPS.	As not mandated, the majority of developments are likely to develop underneath existing buildings (as is the current model)	A private sector led approach. Public sector policy simply supports PPS delivery	Relies on the market adopting PPS to realise the long term benefits. This is likely in areas where single ownership exists but it is unlikely where there are diverse landowners	This option is not recommended for Fishermans Bend
2. Market Led Approach	Precinct car parking is required via planning scheme/ design controls. It is delivered by the market with limited intervention.	Mandated precinct parking,.	Minimum or maximum could both apply. Planning policy needs to mandate PPS.	Planning guidance needs to provide direction to the market on efficient means to consolidate parking.	The market's likely to provide both on-site and off-site PPS.	This option requires strong commitment by Government to legislate and planning policy change in introducing mandatory precinct parking.	This option is applicable to Fishermans Bend and in the long term this might lead to a fundamental shift in the way that car parking is provided in denser mixed use areas.
3. Incentives	Incentives to encourage development to adopt a precinct approach either on site or off site to deliver the long term benefits and flexibility of decoupling car parking.	Not mandated precinct parking	Parking policy is used as an incentive for PPS (e.g. more parking is allowed if a developer locates in a PPS).	Depending on the level of incentive, the option is likely to lead to clusters of PPS.	The amount of parking located in the PPS depends on the levels of incentives associated with public sector investment.	Public sector investment balanced with the wider Vision.	This option is applicable to Fishermans Bend, with targeted public sector investment this will lead to a clustering of PPS in key precincts in Fishermans Bend.
4. Incentives	Incentives to support a shift to off-site precinct car parking to support the realisation of urban design benefits	Mandated Precinct parking	Planning policy to provide direction on suitable consolidation strategies	Locates PPS off site and realises urban realm benefits across the area.	Mandated approach means that Private Sector must deliver PPS so no public sector investment required.	Options provides urban realm benefits and benefits to private sector in terms of incentive (e.g. land cost)	Do not progress. Mandating unlikely to be required if the incentives are planned correctly.
5. Public Sector Led	Provision of car parking by the public sector that leads to it being adopted as a precinct approach to car parking in lieu of private car parking	Not mandated precinct parking	Policy supports PPS (e.g. through a case in lieu strategy)	Achieves urban realm benefits if PPS appeal to developers	Requires public sector investment in PPS. Does not guarantee payback period as developers do not need to adopt the PPS or pay into it.	Cash in lieu style model, with not mandatory PPS is a tested model. Could result in long distances to PPS, and financing risks to government.	This option is applicable to Fishermans Bend, as it is relatively tested in Victoria. However, would be first time implementation occurs by government outside a

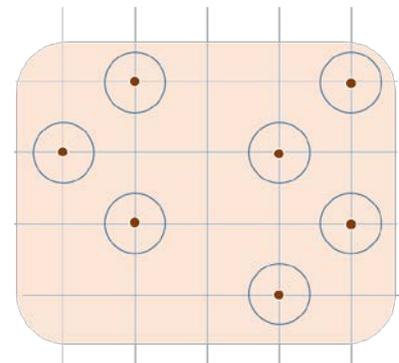
							recognised activity centre.
6. Public Sector Led	Provision precinct car parking by the public sector which the private sector are required to use	Mandated precinct parking	Mandated contribution	Achieve urban realm benefits across the site. The public sector investment provides flexibility.	Public sector investment is required, however the mandatory nature on contributions means that there is certainty on the payback.	Is likely to lead to a network of PPS across the area.	This option is not recommended as phasing, costs and planning for this is likely to be prohibitive.

The two recommended scenarios are:

- Scenario 1 – Market led delivery of PPS. PPS is mandated off-site across Fishermans Bend.
- Scenario 2 – Clustering of PPS in key strategic areas through incentives. Public sector incentives (i.e. parking limits) for PPs, though PPS is not mandated.

Scenario 1 – Market Led approach

Adopts a market led approach to implementing mandated PPS across Fishermans Bend. In this scenario, parking policy continues as per the Capital City Zone with the maximum rate, but parking in PPS is mandated and relies on market led solutions to deliver it. There is no precedent for this model and therefore the legal and planning implications must be explored further.



The likely spatial outcome is PPS being located where developers see economic returns in co-locating PPS. Outside of these areas, the provision of parking is likely to be very low.

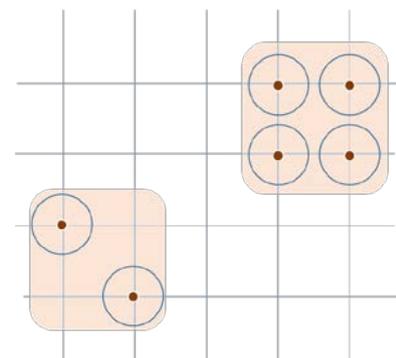
Due to the lack of parking provided by developers, this approach may generate investment in commercial parking stations.

Even on large multi-project sites in single developer control a PPS model has not materialised through market forces. This indicates that PPS negatively impacts project financial feasibility or are perceived to affect feasibility, or does not have end user/purchased support.

Without any established precedent, there will be significant market reluctance to pursue and embrace the PPS model. A PPS model may not emerge at all. If PPS do materialise, they are unlikely to evolve in a coordinated way to fully capture the benefits of the PPS approach.

Scenario 2 – Clustering PPS approach

This scenario delivers PPS through creating public sector incentives (i.e. decreased/increased parking allowances) to promote PPS. Developers are not mandated to deliver PPS however, incentives are provided to encourage PPS within ‘PPS Zones’.



The scenario could deliver PPS in areas designated as ‘Parking Precinct Zones’ and outside of this the Capital City Zone applies where developers can simply provide parking on-site.

Early involvement and investment by the public sector could be used

to secure the facilities, provide certainty to the private sector, and unlock an opportunity to deliver a landmark architecture aligned to a precinct.

Delivery in advance or in parallel requires upfront investment before there is mature demand or sufficient return on investment. As a result, the approach needs to be underpinned by public sector investment, which is likely to be significant given that a good coverage of PPS is required to deliver some convenience of car parking sites (i.e. relatively close to development). This will require the public sector to designate and possibly secure key sites. Delivering convenient PPS will always be hampered where development is occurring across multiple dispersed sites in individual controls without coordinated staging.

Delivering at a significantly discounted cost will require substantial subsidies to the PPS developer, or not full cost recovery in the case of public sector development of PPS.

To minimise the compromises that developers and end users will accept in terms of delivery timing, convenience and cost discount, PPS may need to be made mandatory. This will require developers to select from the car parking options available at the nominated cost, so long as the options are not so poor or so costly as to be a disincentive that stifles development.

The balance of development land outside of the 'Parking Precinct Zone' will evolve with market forces, which for a long time will likely be the status quo of onside car parking.

Implementation

Implementing PPS in Fishermans Bend will need to be both directed and encouraged. Simply mandating PPS will slow or stifle development. Subsidising and forward developing PPS to the extent necessary to shift behaviour will be a high burden on the public sector, at least in the short term.

For the market to embrace PPS as a model and take over its roll out across Fishermans Bend, it will be looking for successful precedents, certainty and a level playing field. The public sector response in both the regulatory frameworks and a commitment to facilitate and subsidise PPS will be key to establishing this mode.

The public sector investment to realise the PPS model could be substantial. It may take a long time to get any return and ultimately the financial return alone may not justify the commitment in the first instance.

Further work is required to investigate the following:

- Potential demands associated with future development and therefore likely parking demand (in context of potential expansion of Car Parking Levy).
- Market demand and anticipated acceptance from a passenger/purchaser point of view as well as developer and financiers.
- Identify potential sites and capacity requirements in each precinct.
- Develop a funding strategy based on areas and suitability of precinct parking zones.
- Planning scheme amendments to the Parking Overlay which covers Fishermans Bend.

Car Share

Over many years a proportion of people who lived in higher density metropolitan areas of Melbourne and Sydney have maintained the ownership of a 'lightly used' car. The convenience of using walking, bicycle riding and public transport to access many destinations resulted in them tending not to use their cars very much. However, these people maintained ownership to have a vehicle available when they wanted (or needed) it. The introduction of car share services has enabled a switch from car ownership for low use households to utilising these services to undertaken those trips requiring a private vehicle.

There are a number of benefits of car share schemes and their uptake by residents in higher density areas which a recent study by Phillip Boyle & Associates found:

- For every car share vehicle in the network there will be 10 fewer privately owned vehicles in the municipality.
- In the City of Sydney car share users reported travelling by car less than before with around 2,000 vehicle kilometres less travelled each year.
- Individual and developers also make monetary savings from not providing or having to pay for in-development car parking. Buildings with less or no car parking are cheaper to build – one architect developer calculated that car park free apartments were \$30,000 cheaper to build. Over the life of the loan this lower initial cost can represent a saving five times greater.
- Wider community benefits estimated at \$40,000 per car share vehicle in the network.

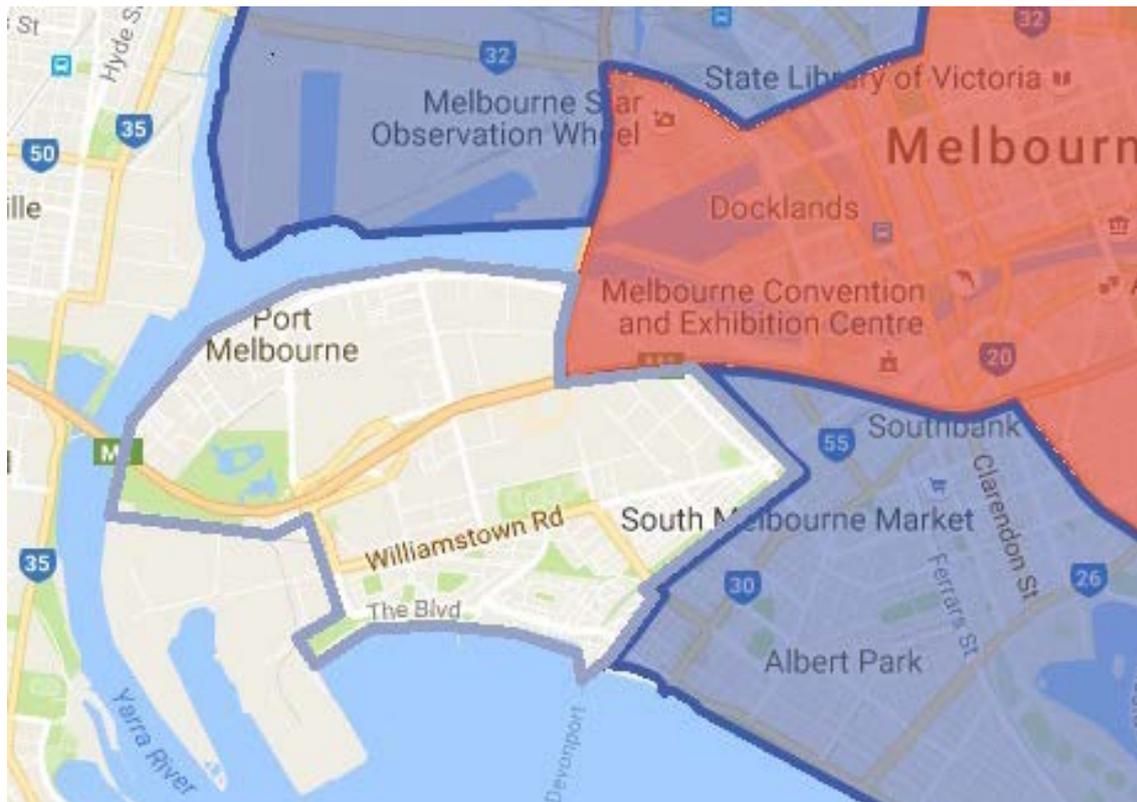
The City of Port Phillip has estimated that Fishermans Bend will need 64 car share spaces by 2021 to manage demand for in-development car parking and also the wider network impacts of private car use. This is a challenging target and will require both on-street and in-development car share spaces to be provided to assist with future residents and employees mobility demands.

A car share 'station' should be available within 200m of every resident and business within Fishermans Bend.

Parking (Congestion) Levy

The Victorian Government introduced a Congestion Levy on non-residential off-street car parking spaces in 2005. This was originally introduced in the central city area but has since been expanded into two zones. The original category 1 zone covers the Lorimer Precinct of Fishermans Bend and the extended category 2 zone including the Montague Precinct and the eastern part of Sandridge Precinct (west of Boundary Street).

Figure 15: Current Congestion Levy mapped across Fishermans Bend



The levy aims to increase the cost of long stay car parking spaces and encourage mode shift through pricing signals to users. In 2016, the cost of a parking space in the category 1 zone is \$1360 per annum and \$960 per annum for spaces in the category 2 zone.

As Fishermans Bend develops there is the opportunity to extend the category 2 zone across the other precincts to provide a price signal to workers in the precinct and also to generate additional revenue to fund transport and mobility improvements.

Pricing

Road pricing has proved an effective tool in other cities to reduce the use of car travel. The introduction of the London Congestion Charge in 2003 resulted in an immediate 25 per cent reduction in vehicles inside the zone, 10 years later the level of vehicle reduction is 10 per cent below previous levels. Infrastructure Victoria's draft 30 year Infrastructure Strategy (2016) identifies in its top three priorities to introduce a comprehensive transport pricing regime to manage demands on the network.

The Victorian Government is currently not proposing the introduction of any road pricing initiatives.

Travel Plans

A travel plan can bring a number of benefits to new developments for the developer, the local council and the ultimate users of a site.

Travel plans are a package of actions, designed by a workplace, school, residential development or community facility that encourage safe, healthy and sustainable travel options. By reducing car travel, travel plans can improve health and wellbeing, free up car parking space, and make a positive contribution to the community and the environment.

Travel plans should include:

- Site assessment including site access, location of nearby community services and summary of the main transport related issues.

- Series of objectives that include the key goals the travel plan seeks to achieve.
- Targets to be achieved over a minimum five year time frame with the interim targets at year one and year three. Targets should be SMART (specific, measurable, attainable, realistic and time bound).
- Package of measures that will contribute to achieve the targets including a mix of hard and soft measures;
- Identify monitoring program for the travel plan.

Travel plans can form a critical part of a planning submission and should be linked to the final granting of the statement of occupancy.

13 Conclusion

The next steps identified in this Plan cannot be done alone. They require input and contributions from many agencies, particularly the Cities of Melbourne and Port Phillip. These councils also have intimate knowledge of their communities and are often best placed to deliver improvements on the ground.

Fishermans Bend will continue to evolve over coming decades. The complex nature of land uses, history, transport infrastructure and community expectations will ensure it continues to be at the forefront of planning in Melbourne's inner city for some time.

Fishermans Bend is a vast mosaic of competing land uses and interests, which must be progressed with care. Many of the significant decisions are ahead, and the concrete has yet to set. In this environment, TFV submits this plan to the Fishermans Bend Taskforce for consideration as part of the Fishermans Bend Framework Plan.



Authorised by
Transport for Victoria
Department of Economic Development, Jobs, Transport and Resources
1 Spring Street Melbourne Victoria 3000
Telephone (03) 9651 9999

© Copyright State of Victoria,
Department of Economic Development, Jobs, Transport and Resources 2016

Except for any logos, emblems, trademarks, artwork and photography this document is made available under the terms of the Creative Commons Attribution 3.0 Australia license.

This document is also available in an accessible format at economicdevelopment.vic.gov.au