



# Yanchep Rail Extension

PROJECT DEFINITION PLAN JUNE 2018

# Contents

<b>FOREWORD</b>	<b>1</b>
<b>PROJECT SNAPSHOT</b>	<b>2</b>
Alkimos Station*	2
Eglinton Station*	3
Yanchep Station*	3
<b>EXECUTIVE SUMMARY</b>	<b>4</b>
The Strategic Need	4
The Project	4
Project Objectives	4
Delivery Strategies	4
Timing	5
<b>1 METRONET OVERVIEW</b>	<b>6</b>
<b>2 PROJECT OVERVIEW</b>	<b>8</b>
2.1 Planning Context	8
2.2 Transport Context	10
2.3 The Project	10
2.4 Land Use Integration	12
<b>3 STRATEGIC JUSTIFICATION</b>	<b>14</b>
3.2 Supporting Metropolitan Growth	17
3.3 Supporting Regional Growth	17
3.4 Addressing Transport Service Gaps	18
<b>4 ROUTE CORRIDOR</b>	<b>20</b>
4.1 Route and Station Locations	20
4.2 Environmental Considerations	20
4.3 Heritage Considerations	22
<b>5 TRANSPORT OPERATIONS AND INFRASTRUCTURE</b>	<b>24</b>
5.1 Rail Operating Strategy	24
5.2 Bus Operating Strategy	24
5.3 Infrastructure Requirements	28
<b>6 STATIONS AND PRECINCTS</b>	<b>32</b>
6.1 Yanchep Station and Precinct	34
6.2 Eglinton Station	38
6.3 Alkimos Station	42
6.4 Precinct Delivery Strategy	44
<b>7 PROJECT COST, SCHEDULE AND DELIVERY</b>	<b>46</b>
7.1 Transport Infrastructure Cost Estimate	46
7.2 Sources of Funds	46
7.3 Procurement Strategy	46
<b>8 IMPLEMENTATION FRAMEWORKS</b>	<b>48</b>
8.1 Project Governance Structure	48
8.2 Approvals	49
8.3 Benefits Management	50
8.4 Risk Management	50
8.5 Issues Management	52
8.6 Digital Engineering	52
8.7 Communications and Engagement	52

## METRONET partner agencies



# Foreword

Growth in Perth's North-West Corridor was an idea first conceived in the 1970s. It was an idea with a staged approach with rail as a central piece of infrastructure to help connect and move people living and working in the area.

Supporting this growth in a planned and sustainable way will become more important than ever. That is why we have established METRONET – a new approach which brings transport and land use planning together to work as a team as we design and deliver development intensifying rail infrastructure.

For the Yanchep Rail Extension we will see not only the Joondalup Line extend to Yanchep with three new stations, we will also see the planning for three new communities that will become a neighbourhood, town and secondary city for Perth.

The stations will provide a high-level of service for passengers on day one of operations and become the heart of walkable and lively places for the people who will choose this area to live, work and play in, in the future.

This Project Definition Plan is an important step in defining the project scope, which will be delivered in the coming years, creating around 1,300 jobs as the railway is built.

**Hon Rita Saffioti MLA**

Minister for Transport; Planning and Lands



# Project snapshot



## Alkimos Station\*

## Eglinton Station\*

## Yanchep Station\*

\*Final details of station features are subject to a detailed design process and may change.



- 3,616** daily boardings (2031)
- 41-minute** journey to Perth
- 600** parking bays
- 8** bus stands
- 10** u-rail and 2 bike shelters
- Passenger toilets
- Lifts, escalators and stairs
- Universal access



- 4,792** daily boardings (2031)
- 46-minute** journey to Perth
- 400** parking bays
- 8** bus stands
- 10** u-rail and 2 bike shelters
- Passenger toilets
- Lifts and stairs
- Universal access



- 11,032** daily boardings (2031)
- 49-minute** journey to Perth
- 1000** parking bays
- 14** bus stands
- 10** u-rail and 2 bike shelters
- Passenger toilets
- Lifts, escalators and stairs
- Universal access

# Executive Summary

## The Strategic Need

Perth's population is expected to grow from 2.02 million in 2017 to 3.5 million by 2050 (*Perth and Peel @3.5 million*) with the North-West Metropolitan Sub-Region expected to accommodate a significant portion of this growth with its population expected to reach 740,000 by 2050.

The Yanchep Rail Extension is an essential element of managing this growth and meeting the area's future needs. The project will see the Joondalup Line extended 14.5 kilometres from Butler Station to Yanchep, with three new stations at Alkimos, Eglinton and Yanchep.

Coordinate the delivery of passenger rail as part of planning for major urban growth provides an important framework around which urban centres and supporting bus, cycle and pedestrian links can be developed. The new stations will provide new residents with high quality public transport access to other parts of the city, while creating the focus for progressive mixed use development that will provide amenity, services and employment for growing local communities.

## The Project

The transport infrastructure investment includes:

- constructing 14.5 kilometres of new dual-track to extend the Joondalup Line from Butler to Yanchep;
- developing a new station at Alkimos complete with station infrastructure, including cut-and-cover tunnel construction, parking, bus interchanges, passenger amenities, cycling facilities and standard station systems to cater for approximately 3,616 daily boardings (2031) and offering around a 41-minute journey to Perth;
- developing a new station at Eglinton complete with station infrastructure, including parking, bus interchanges, passenger amenities, cycling facilities and standard station systems to cater for an estimated 4,792 daily boardings (2031) and offering approximately a 46-minute journey to Perth;
- developing a new station at Yanchep complete with station infrastructure, including cut-and-cover tunnel construction, parking, bus interchanges, passenger amenities, cycling facilities and standard station systems to cater for an estimated 11,032 daily boardings (2031) and offering approximately a 49-minute journey to Perth;

- nine road-over-rail bridges;
- new bus stowage depot at Alkimos;
- modifying Butler Station into a 'through' station; and
- 13.8 kilometres of new principal shared pathway, for cyclists and pedestrians adjacent to the rail line.

As a result of the integrated METRONET approach the Yanchep Rail Extension will also facilitate land use solutions that promote and encourage higher-density development surrounding the station precincts.

## Project Objectives

The Yanchep Rail Extension will contribute to change Perth's development pattern and growth trajectory. Developing the walkable catchment around Yanchep, Eglinton and Alkimos stations into a mix of uses, and housing types provides a unique opportunity for the project to contribute to, and exceed, area growth targets set out in the State policy frameworks and local planning frameworks.

From a transport perspective, the project will address the three key problems impacting public transport in the area to ensure forecast population-driven increases in travel demand are met, urban congestion is alleviated and efficient travel times are provided for those accessing jobs, services and amenities. Other transport benefits include:

- increasing the reach and frequency of bus services in the area;
- contributing to the long-term expansion of the greater Perth passenger rail and bus network; and
- providing alternative, sustainable transport options, as shared paths connect the stations to surrounding residential and employment areas.

## Delivery Strategies

### Transport Infrastructure

The rail infrastructure outlined in this document will be delivered by the Public Transport Authority (PTA). The PTA conducted a detailed procurement options analysis, which recommends the following models to deliver the necessary works and best value for money:

- bundling the main project works for Yanchep Rail Extension, together with the Thornlie-Cockburn Link, into a single Competitive Alliance contract;

- using individual Design and Construct contracts to procure appropriate enabling and forward works on each site; and
- procuring professional services using standard PTA procurement process with the option to include additional projects based on performance.

### Station precincts

The METRONET Office will continue to work with state agencies, local governments and the private sector to prepare planning frameworks around Alkimos, Eglinton and Yanchep stations, that enable the precincts to develop as mixed-use centres over time.

The State Government will consider applying state planning schemes to station precincts to facilitate METRONET outcomes. This would be in the form of an improvement scheme administered by the Western Australian Planning Commission (WAPC) or a redevelopment scheme managed by the State's land development agency (LandCorp/MRA).

## Timing

Procurement for the Yanchep Rail Extension is expected to take up to 12 months, with construction beginning in 2019. During the procurement and detailed design stage, the contractor will be requested to optimise their construction methods and strive to achieve the Government's target completion date in 2021.

**The Yanchep-Two Rocks area alone is anticipated to accommodate 2 to 3 per cent of Australia's population growth over the next 40 years due to the availability of relatively affordable urban zoned land, and the continued demand for coastal living.**

# 1 METRONET Overview

METRONET is the Government's vision to integrate transport and land use planning in Western Australia and provide a framework to support sustainable growth of greater metropolitan Perth over the next 50 to 100 years.

More than just a rail infrastructure program of works, METRONET planning goes beyond the station forecourts to shape and support development of communities within the surrounding walkable catchments.

The Yanchep Rail Extension is one of a series of METRONET projects that will add significant capacity to Perth's public transport network. Combined, METRONET Stage 1 is proposed to deliver approximately 72 kilometres of new passenger rail and up to 18 new stations, which represents the single largest investment in public transport in Perth's history (Figure 1).

The following Stage One METRONET projects will create the opportunity to transform Perth through an expanded rail network that will see urban intensification in more than 5,000 hectares of land within METRONET station precincts, supporting delivery of the State's metropolitan growth strategy *Perth and Peel@3.5million*:

- Forrestfield–Airport Link;
- Yanchep Rail Extension;
- Thornlie–Cockburn Link;
- Morley–Ellenbrook Line;
- Byford Rail Extension;
- Karnup Station;
- Midland Station relocation and Bellevue extension;
- Level crossing removal on the Armadale and Midland lines;
- Automatic Train Control; and
- Railcar procurement.

The Forrestfield–Airport Link project is well into construction and on track for scheduled completion in 2020. The Yanchep Rail Extension and Thornlie–Cockburn Link projects are at PDP stage and the remaining projects are in concept development phase.

This PDP has been prepared by the METRONET Office to document the further evaluation and refinement of the preferred option and inform an investment decision.

**Figure 1: Proposed METRONET projects**



# 2 Project Overview

Extending the Joondalup Line 14.5 kilometres from Butler Station to Yanchep, with three new stations at Alkimos, Eglinton and Yanchep (Figure 3), will address three problems that are likely to arise should planned public transport infrastructure not be delivered to support projected urban growth in Perth's North-West Sub-region:

- **PROBLEM 1:** Worsening urban congestion due to a lack of efficient transport alternatives and an urban form that promotes car dependency.
- **PROBLEM 2:** Land development continues to focus on private vehicle use and parking, which limits the ability to create higher residential density and meet employment targets.
- **PROBLEM 3:** Social inequality and lower levels of opportunity for people who do not own or are unable to use a private vehicle.

Part of a long-term plan for Perth's north-west corridor, the Yanchep Rail Extension will provide

a viable alternative to private vehicles; improve public transport service times; and increase mobility to strategic metropolitan centres, including Yanchep and Joondalup.

It will also act as a catalyst for higher density development, particularly around station sites and open up business and development opportunities, particularly around Yanchep, which is the planned major centre for the outer extent of the north-west part of Perth.

## 2.1 Planning Context

Extending urban growth to the Yanchep-Two Rocks area, as the northernmost limit of the Perth metropolitan area, was first recognised in The Corridor Plan (1970). Since then, subsequent metropolitan growth strategies and sub-regional plans have introduced and incorporated extending the passenger rail to Yanchep, and progressively sought to encourage higher-density and more compact urban form outcomes for Perth's North-West Sub-region (Figure 2).

Figure 2: North-West Sub-Region Planning (1970-present)

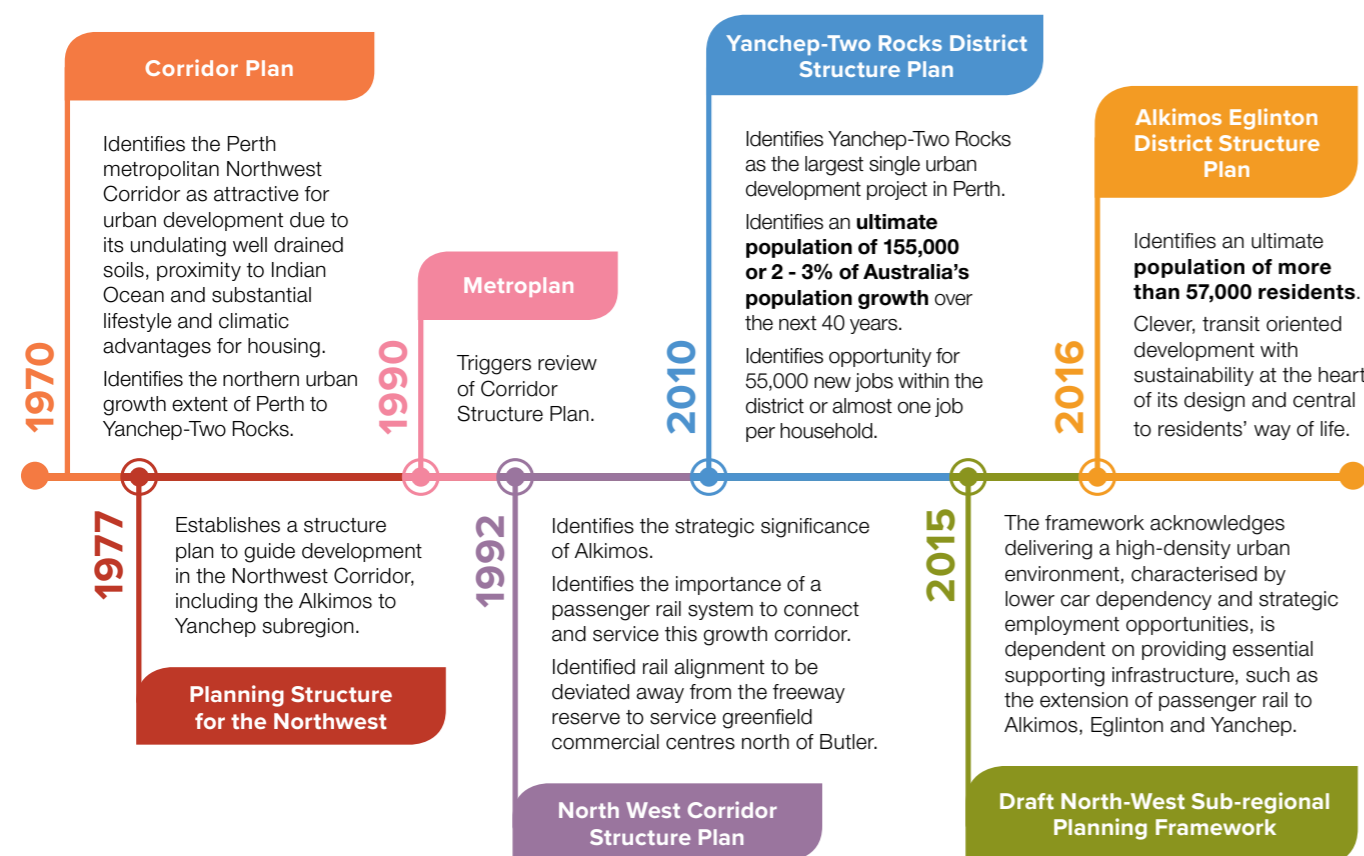
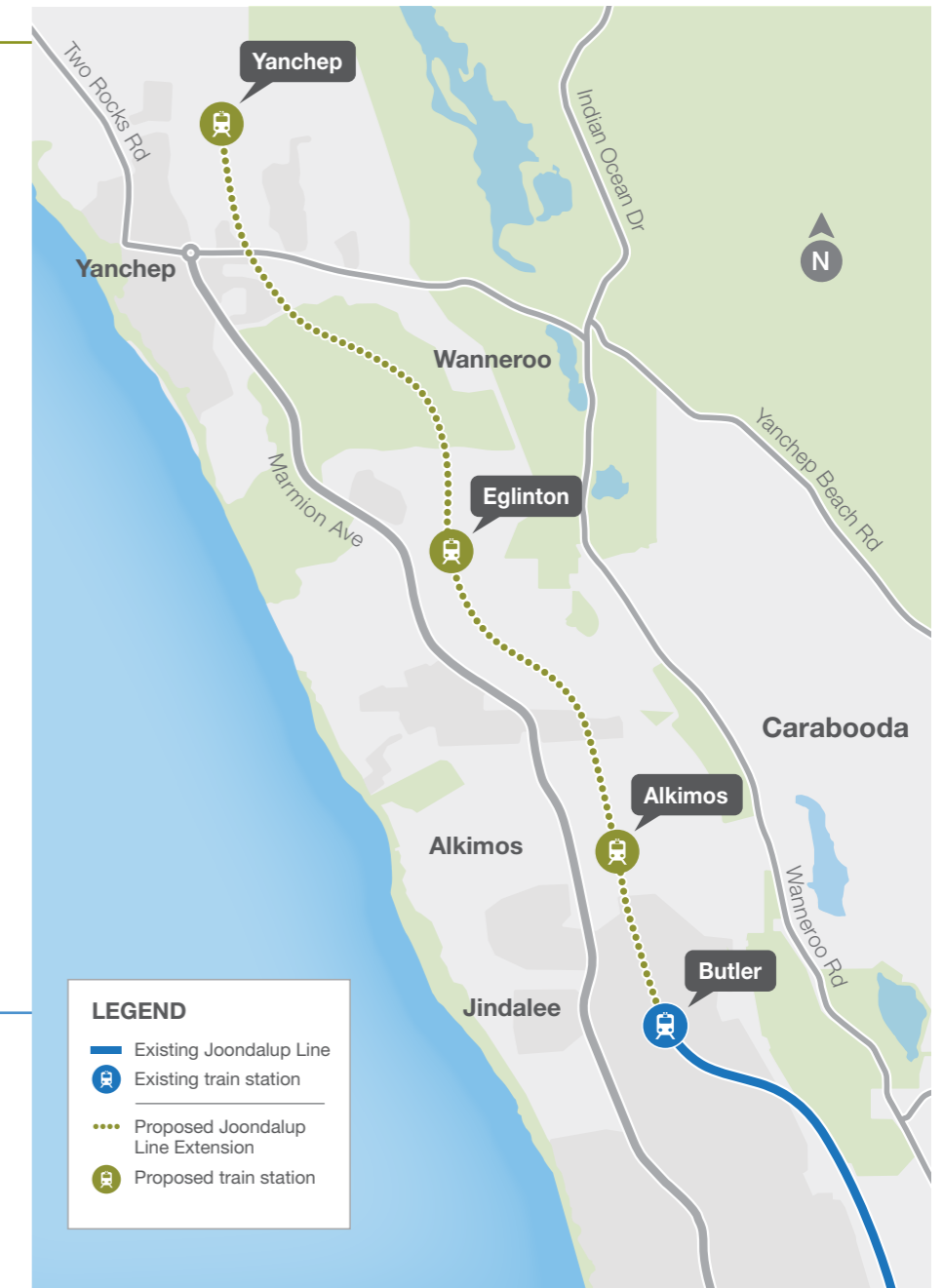


Figure 3: Project Alignment and Station Locations



## City Shaping Benefits

- Delivers amenity to stimulate new employment opportunities in the Yanchep Strategic Metropolitan Centre.
- Catalyst for higher-density development around the new stations.
- Supports continued growth of the Joondalup City Centre and the future Yanchep City Centre by improving access to the trade and employment catchments of the subregion.
- Contributes to more affordable living choices and more equitable housing and service access for vulnerable community members.

## City Serving Benefits

- Provides a high-capacity public transport option to the rapidly growing sub-region.
- Addresses worsening urban congestion by providing an efficient car alternative for trips between the sub-region and the Perth CBD.
- Reduces local car dependency and improves accessibility for people without access to a private vehicle.



The project delivers amenity to stimulate new employment opportunities in the Yanchep Strategic Metropolitan Centre.

At the local level, the Yanchep Rail Extension is closely aligned with the North-West Sub-regional Planning Framework and supported by several local planning frameworks and structure plans. In particular, the proposed:

- **Yanchep Station precinct** – is at the centre of the Yanchep Strategic Metropolitan Activity Centre.
- **Alkimos Station precinct** – is within the Alkimos Secondary Activity Centre.
- **Eglinton Station precinct** – is within the Eglinton District Activity Centre.

Collectively these plans provide for an appropriate distribution of jobs, services and amenities throughout the region, focusing on a mix of uses including commercial, retail, higher-density housing, entertainment, tourism, civic/community, higher education, and medical services around the new stations.

## 2.2 Transport Context

The Northern Suburbs Transit System (NSTS) Master Plan for the construction of an electrified passenger railway from Perth to Currambine was finalised in November 1989. Construction commenced in July 1991, and passenger services to Currambine began in March 1993.

In June 2000, a Master Plan was prepared for the extension of the NSTS from Currambine to Clarkson (“Interim Master Plan June 2000 – Currambine to Clarkson”). The extension to Clarkson was built between 2001 and 2004 as part of the New MetroRail (NMR) project and services commenced in October 2004. The NMR project also included a new railcar stowage and maintenance depot at Nowergup 2.4 kilometres north of Clarkson in the median of the future Mitchell Freeway between Hester Avenue and Lukin Drive.

The Butler Master Plan (July 2008) recognised that for there to be a sustainable alternative to inter-regional private car use then a high-quality public transport system extending through the future growth areas of the North West corridor to Yanchep would be required. This need has been reflected in structure plans throughout the Butler to Yanchep area which include a railway alignment to the Yanchep City Centre.

In 2009, the Government committed to a station at Butler which was completed in 2014. The station provides convenient transport access to the surrounding community. While it has improved short-term transport access to Alkimos, Eglinton and Yanchep, continued growth of the area is placing pressure on Butler Station requiring further extension of the railway.

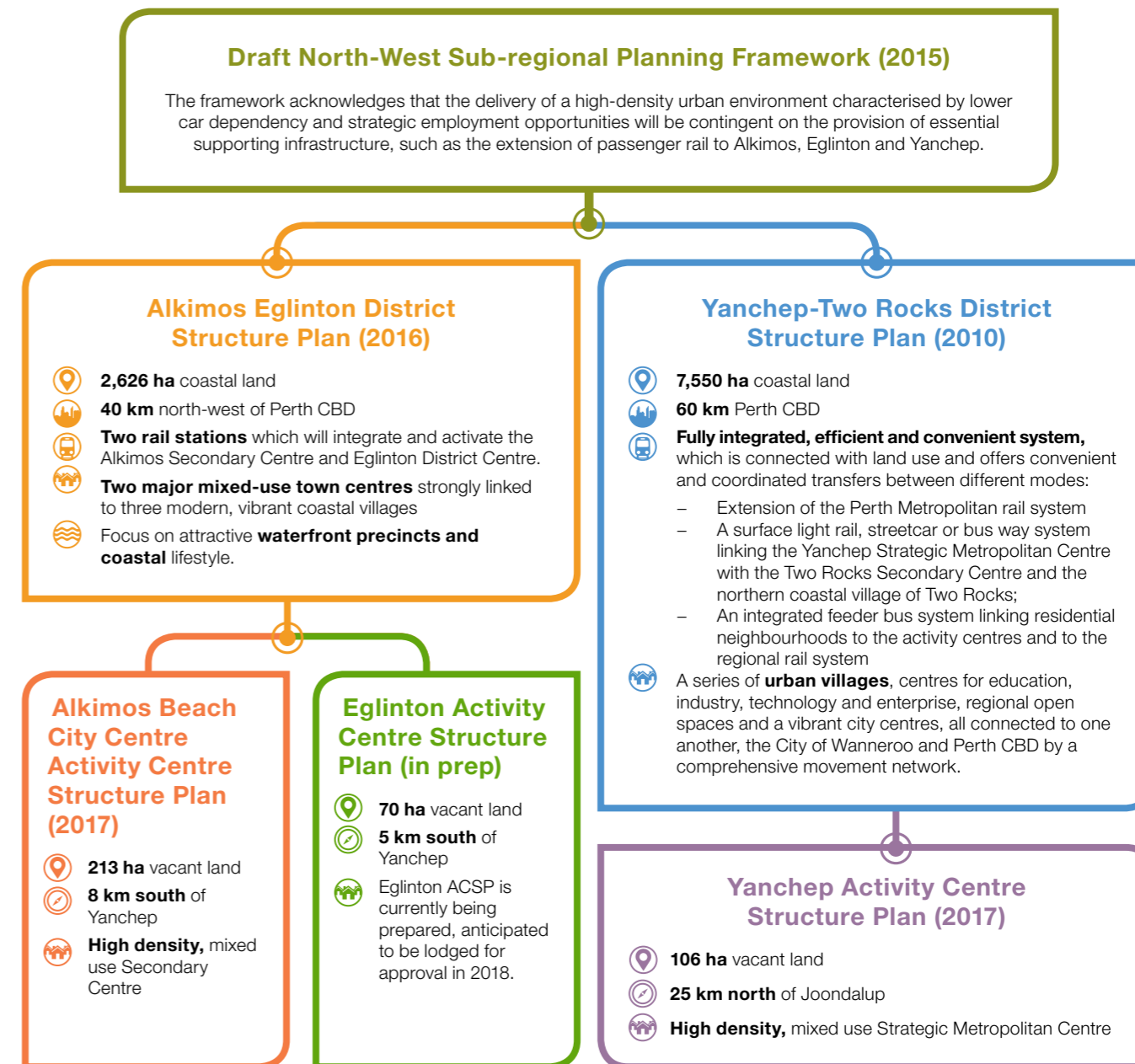
In July 2011, the draft Public Transport for Perth in 2031 Plan was released and included the Butler to Yanchep extension to support the development of the Yanchep City Centre with a station precinct at its centre. This plan was superseded in 2018 by *Perth and Peel @3.5million - Transport Strategy* which maintained the Butler to Yanchep extension as a priority initiative.

## 2.3 The Project

### 2.3.1 Operations

On day one of operations, stations along the Yanchep Rail Extension are collectively expected to have approximately 5,265 daily boardings, growing to 19,440 in 2031. Operational assessments of this projected demand during an hour of the peak period will require rail services on the Joondalup Line to operate with six-car trains at a peak period frequency of six trains per hour to and from Yanchep, consistent with the current level of service to Butler.

Figure 4: North-West Coastal Corridor Planning Framework



### 2.3.2 Asset Investment

Key infrastructure components include:

- **Yanchep Station** – with intermodal rail and bus, up to 1,000-bay car park and active mode facilities.
- **Eglinton Station** – with intermodal rail and bus, approximately 400-bay car park and active mode facilities.
- **Alkimos Station** – with intermodal rail and bus, approximately 600-bay car park and active mode facilities.
- **Railway infrastructure** – 14.5 kilometres of dual narrow-gauge track, extending the existing Joondalup Line from Butler Station to Yanchep.
- **Bridge crossings** – fully grade-separated alignment with the design specifically allowing

for 20 bridge crossings between Butler and Yanchep stations. Nine of these bridges will be delivered as part of the project, with the other 11 bridges assumed to be delivered by developers or local authorities as part of separate projects.

- **Principal Shared Path (PSP)** – 13.8 kilometres of PSP that runs the full length of the rail alignment from Butler to Yanchep, along the western edge of the rail corridor.
- **Bus depot** – a new facility at Alkimos to support the higher frequency bus services.
- **Maintenance and support facilities** – stowage sidings to the north of Yanchep Station capable of accommodating four six-car trains, with no additional rolling stock maintenance or stabling facilities required.

### 2.3.3 Non-Asset Investment

Outside of this project scope is non-asset investment in travel demand management (TDM) initiatives, which are designed to optimise patronage of the new rail service and overcome barriers to uptake, such as the low cost of parking, low congestion levels and rate of development in the catchment area.

A travel behaviour change program will be launched following opening of the Yanchep Rail Extension and other infrastructure improvements, targeting residents in the suburbs along the extended Joondalup Line.

## 2.4 Land Use Integration

Following an Integrated Transport and Land Use Planning (ITLUP) approach (Figure 5), the METRONET Office has undertaken a preliminary evaluation of all proposed station precincts to identify development opportunities. The evaluation included:

- baseline analysis of existing precinct character and latent development potential;
- identification of future precinct typologies and land use characteristics;

- assessment of market profile and demand for future land uses; and
- prioritisation of station precincts for planning/development intervention.

*Perth and Peel @3.5 million* identifies Yanchep as a future Strategic Metropolitan Centre, Alkimos as a Secondary Centre and Eglinton as a District Centre. The stations at Alkimos, Eglinton and Yanchep will facilitate efficient passenger rail operations, as well as being a catalyst for high-density, high-amenity land use in the surrounding station precincts.

The station precincts are being planned by landowners and developers in consultation with the METRONET Office to ensure an appropriate mix of land uses, densities, urban form and amenity are delivered to support the intended role and function of each centre- maximising the social and economic returns delivered by the project's transport investment.

Figure 5: METRONET ITLUP approach

<b>Station precinct analysis</b>	A detailed analysis of each precinct using Western Australia's Integrated Land Information Database (ILID) and site verification identified latent land use potential that can be realised through transport infrastructure investment. This analysis will inform the integrated land use plans for each precinct.
<b>Precincts policy</b>	To facilitate the proper application of existing policy and address gaps to deliver optimal outcomes, the METRONET Office developed a policy framework to inform planning, design and assessment approaches to integrate transit within precincts. The policy operates on three levels: <ul style="list-style-type: none"> <li>• Station precinct typologies: a system-wide approach to identifying the long-term role, function and form of stations and precincts. The Station Precinct Typology Framework provides an overview of the expected long-term outcome for each station precinct, covering development intensity, optimal land use mix, urban design considerations, infrastructure investment and operational requirements.</li> <li>• Precinct design: addresses the wider approach to integration of transit within new or existing centres, it details land use, built form, movement network and landscape considerations in advance of the Design WA Precinct Policy being finalised.</li> <li>• Station design: addresses the design of the transit infrastructure and immediate environment within the wider precinct context.</li> </ul>
<b>Station precinct planning</b>	In collaboration with local governments, state government planning and land development agencies and private landowners, existing structure plans are being reviewed and new plans developed for METRONET precincts. These plans are being prepared to align with METRONET projects.
<b>Economic and market assessment</b>	To best consider the scale of land development for METRONET projects, SGS Economics & Planning was commissioned to assess the greater Perth land development market to: <ul style="list-style-type: none"> <li>• model anticipated absorption rates across land use sectors;</li> <li>• identify station precincts that should be targeted for early intervention;</li> <li>• confirm which of the new precincts should be made 'planning ready' for market responsive development over time; and</li> <li>• identify likely development staging timeframes.</li> </ul>
<b>Infrastructure coordination</b>	The METRONET Office will be working with the WAPC's Infrastructure Coordinating Committee and the new Infrastructure WA to ensure cross-government coordination and the timely delivery of services to support the staged delivery of METRONET transport infrastructure and station precincts. The State Government's netVIEW platform is being used to coordinate short, medium and long-term infrastructure requirements.
<b>Planning and development certainty</b>	Along with transport infrastructure investment, planning and development certainty is essential to stimulate investment in METRONET station precincts and clarify future land use expectations. To optimise the benefit and return from the METRONET investment in public transport infrastructure, the METRONET Taskforce has confirmed that State intervention may be required to achieve planning and development certainty. The State Government has two legislative models available depending on the level of intervention required: <ul style="list-style-type: none"> <li>• Redevelopment Areas and Schemes under the Metropolitan Redevelopment Authority Act 2011; and</li> <li>• Improvement Plans and Schemes under the Planning and Development Act 2005.</li> </ul> <p>The METRONET Office is reviewing each station precinct to recommend the preferred planning and development model.</p>
<b>Early activation</b>	To deliver early development activity, amenity around new stations and improve passenger comfort and experience, METRONET is developing strategies to provide a focus for local community development and potentially catalyzing early private sector investment. The METRONET Office is working with landowners to determine the necessary infrastructure and development pre-conditions that will support the start of station operations.





# 3 Strategic Justification

The Yanchep Rail Extension supports Western Australia on an economic, metropolitan and regional level, providing benefits towards:

### Public transport

- Public transport travel time savings – from a reduction in the time spent on public transport journeys.
- Increase in public transport fare revenue – from new public transport users.
- Crowding benefit – from a net reduction in crowding on public transport services where bus users benefit from the increased bus services to service the new stations, which is somewhat offset by modest increased patronage on the Joondalup Line train services.
- Improved amenity – public transport users will make use of a new train station and travel on new train carriages, which has an improved amenity over travelling on a bus service accessed via a road side bus stop.
- Benefit of travel demand management – encouraging more people to use public transport over and above the level that would use the new stations.

### Road user

- Road user travel time savings – from a reduction in the amount of road travel due to the switch towards public transport travel.
- Reduction in unperceived road vehicle operating costs – the reduction in car travel also has resource cost savings, some of which are unperceived.
- Road crash cost savings – a reduction in the level of car travel, reduces road crashes.

### Wider economic benefits

- Agglomeration benefits – from productivity benefits of firms being closer to markets
- Imperfect competition – productivity gains from greater competition, induced through improvement in accessibility.

The Yanchep Rail Extension core benefit-cost ratio is 2.6, increasing to 3.4 including wider economic benefits.

### 3.1 Supporting Economic Growth

Perth is strategically located as a key international gateway between Australia, Asia and the Indian Ocean rim. Sharing the same time zone with major international cities including Shanghai, Singapore and Hong Kong provides Perth with a distinct advantage over Australia's other capital cities, making it an attractive option for foreign investors.

Perth contributed approximately \$150 billion to the national economy in 2015/16, corresponding to an average GDP per capita of approximately \$72,000, roughly four per cent above the Australian average. Between 1991 and 2016, Western Australia increased its Gross State Product, outperforming Australia as a whole in 20 out of these 26 years.

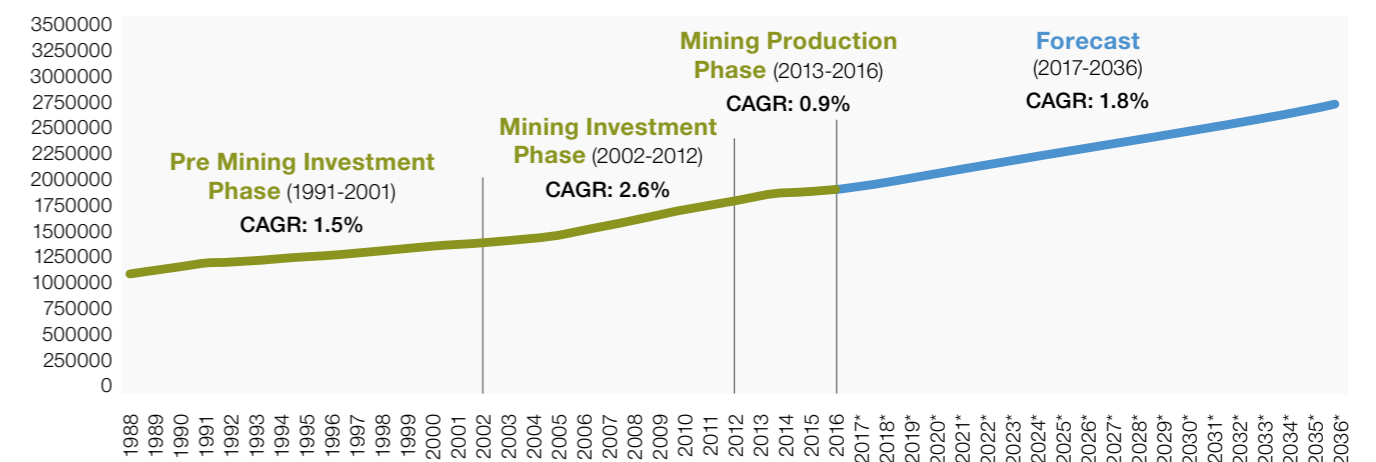
During the mining investment boom from 2002 to 2012, the economy grew significantly through investment activity flowing from outside the State and has seen a corresponding peak in population growth and demand for housing (Figure 6). At the same time there was significant investment in promoting the City's profile for retaining a globally qualified workforce, highlighted by significant investment in the city centre.

To remain one of Australia's leading capital cities and a key international gateway, Perth must continue to invest in essential infrastructure that supports continued economic productivity and attracts international investment.

Perth is strategically located as a key international gateway between Australia, Asia and the Indian Ocean rim.

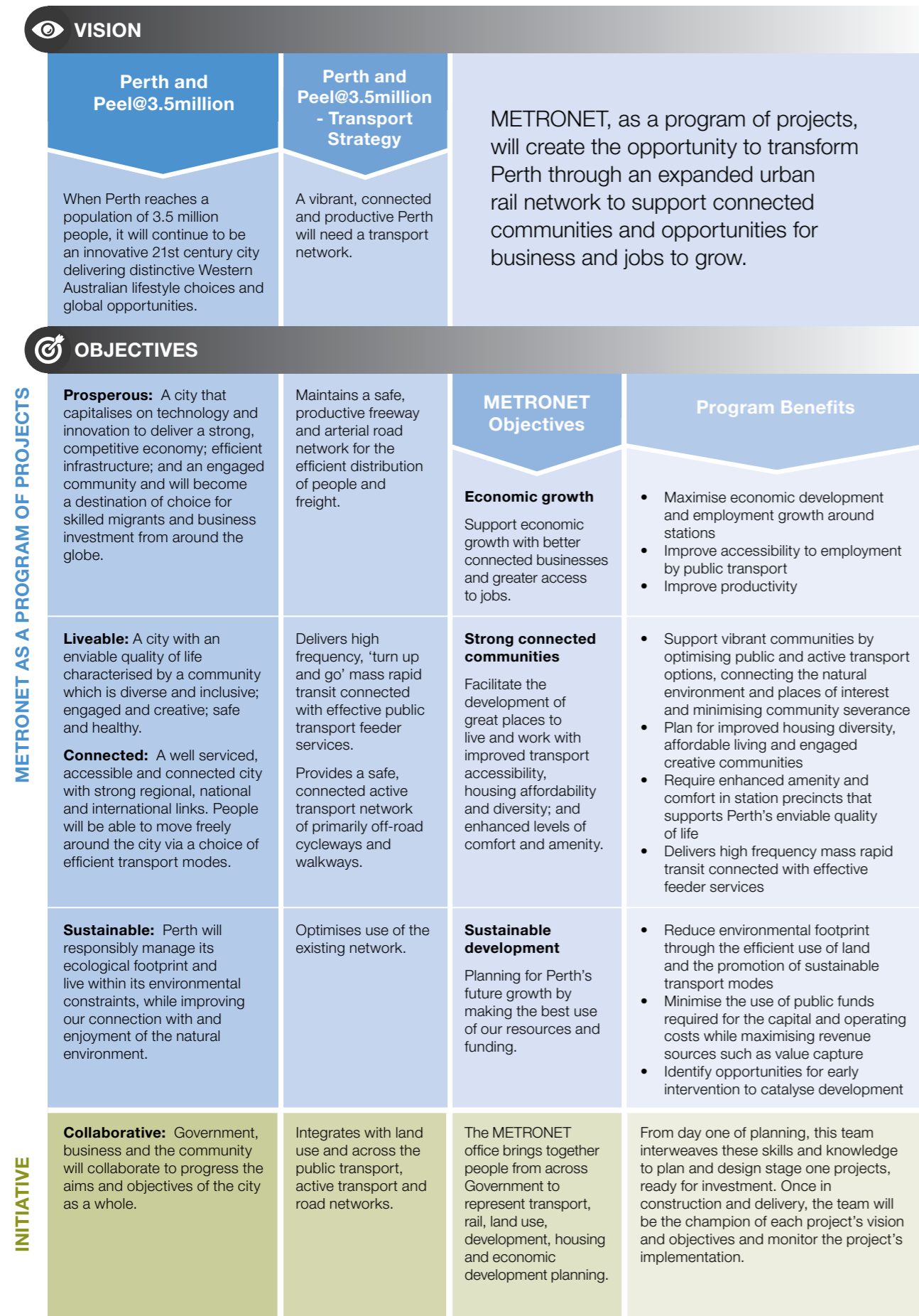


Figure 6: Perth's Population and forecasted population, 1988-2026



Source: Historical data (1988-2016) Australian Bureau of Statistics (2017) Cat No 3218.0 – Regional Population Growth, Australia, 2016, accessed 1/12/2017; Forecasts\*: Based on the assumption that Perth will reach 3.5 million people by 2050 as outlined in Perth and Peel@3.5million

Figure 7: METRONET alignment with metropolitan growth strategies



### 3.2 Supporting Metropolitan Growth

The State Government's growth strategy, *Perth and Peel @3.5 million*, estimates the greater metropolitan population will increase from 2.02 million in 2017 to 3.5 million by 2050. To accommodate this projected population growth, and to protect lifestyle values into the future, the strategy is focussed on creating a connected city that is liveable, prosperous and collaborative, linking metropolitan centres with priority transport network that:

The companion strategy, *Perth and Peel @3.5million - Transport Strategy*, seeks to create an integrated transport system that:

- focuses on connecting centres and encouraging transit-oriented development that provides for all modes of transport;
- prioritises active and public transport to meet the significant increase in travel demand that population growth will generate; and
- maximises opportunities for integrated land use development to occur.

The METRONET program aligns with the strategic objectives of *Perth and Peel @3.5million* and its supporting transport strategy (Figure 7). Each METRONET project supports shaping of Perth into a more compact urban form, while serving the existing structure of the city in a more sustainable and responsible way.

### 3.3 Supporting Regional Growth

The North-West Metropolitan Sub-Region is expected to accommodate a significant proportion of Perth's projected population growth with an anticipated extra 740,000 people in the area by 2050. The Yanchep-Two Rocks area alone is expected to accommodate two to three per cent of Australia's population growth over the next 40 years due to the availability of relatively affordable urban zoned land, and the continued demand for coastal living (Table 1).

Table 1: Projected population growth

Locality	2011	2021	2031
Yanchep	6,700	15,900	103,000
Eglinton	500	7,000	30,900
Alkimos/Butler	11,600	27,300	40,600
<b>Total</b>	<b>18,800</b>	<b>50,200</b>	<b>174,500</b>

Source: PwC analysis; Department of Planning, Lands and Heritage MLUFS output, April

Planning for the Yanchep-Rail Extension is informed by analysing current and anticipated future profile of the area with key characteristics including:

- high representation of new homebuilders and young families who may face long commutes to work, study or access to specialist medical services;
- households with lower incomes than the broader Perth area;
- higher unemployment levels than the broader Perth area;
- a strong and able labour force - set to increase to 376,386 people by 2050;
- high demand for affordable housing product (low to lower-moderate); and
  - ample provision for appropriately zoned land for employment-generating activities and capacity for high levels of employment self-sufficiency in the future.

In the short to medium term, the transport objectives are to provide efficient movement networks for the current and future population. Without the project road-based congestion will severely impact travel times to places of employment, reduce economic productivity and negatively impact the environment.

The Yanchep-Two Rocks area alone is expected to accommodate two to three per cent of Australia's population growth over the next 40 years.

### 3.4 Addressing Transport Service Gaps

An analysis of current transport modes in the area revealed there are currently relatively low levels of public transport connectivity and identified car use was high. Private vehicle trips accounted for 72 per cent of all transport modes for people who lived in Yanchep and travelled to work in 2016. The generalised journey time from Yanchep to the Perth CBD was 99 minutes.

Transportation within the northern section of the North-West Sub-Region is characterised by high levels of car use relative to public transport for both travel within the corridor and for travel to other areas. The primary routes are Marmion Avenue, Wanneroo Road and Mitchell Freeway (which stops south of Butler at Hester Avenue), with future planned extensions of the Mitchell Freeway to Alkimos (Romeo Road) and Yanchep likely to occur by 2031.

These routes are highly congested in the morning and afternoon peaks. The stretch of the Mitchell Freeway between Stirling and towards Osborne Park currently suffers from the greatest levels of congestion. During peak periods, this congestion can see the typical 50 minute drive time from Yanchep to the Perth CBD increase by up to 30 minutes. With Yanchep's population increasing, the road network connecting the northern suburbs to central Perth will be less able to accommodate the increase in demand for car trips.

Public transportation options are limited and include two bus routes and a rail service from Butler, being the current northern end of the Joondalup Line, to Perth.

Theoretically passengers can travel all the way into the CBD by bus, but this would involve several

transfers and would take much longer than travelling via the Joondalup Line. Therefore public transport users to the CBD from Yanchep are currently best served by catching a bus to Butler and then commuting via rail.

While areas north of Butler still have significant future growth projections, Butler Station is already the seventh busiest on the line (Figure 8), indicating its popularity. Forecasts illustrate the station will not be able to cope in the medium to long term without the Yanchep Rail Extension and new stations.

Demand for park and ride trips in north-western Perth is significant. There are 879 parking bays at Butler Station. PTA data for March 2017 showed 68 per cent utilisation of the bays.

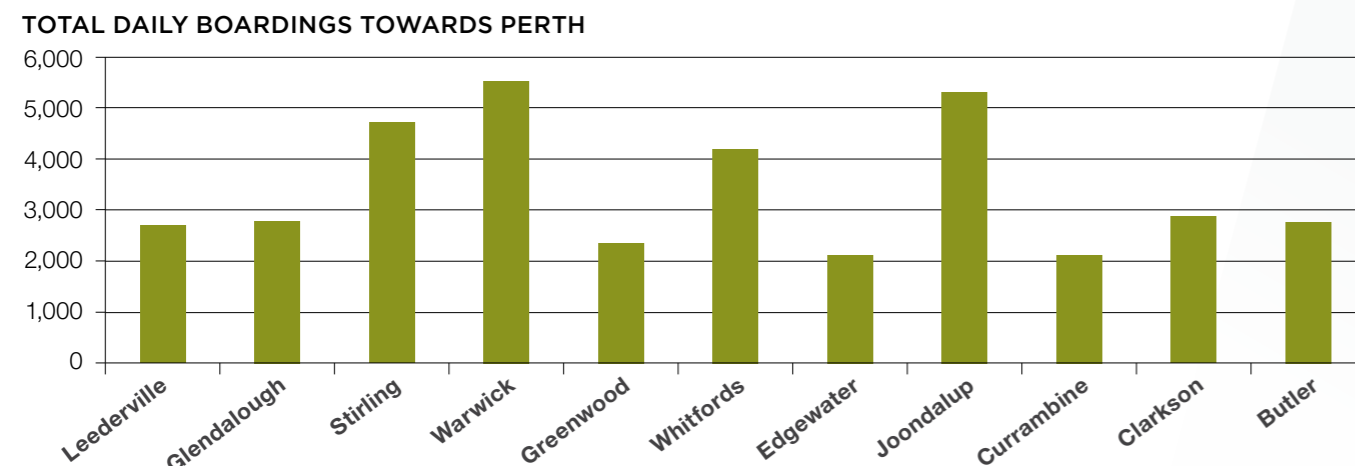
In the longer term, there is an opportunity to support the development of local activity centres in a way that stimulates new employment opportunities, vibrancy, higher density land use and better environmental outcomes. As the project helps to stimulate the local economy and attract places of employment to the area, there will be less need to travel to Perth, which will further alleviate congestion in the northern corridor.

The project is therefore as much about capturing an economic and social development opportunity as it is about solving the problems of congestion and inadequate accessibility. This is recognised in WA's planning framework, for example in the North-West Sub-regional Planning Framework, which states:

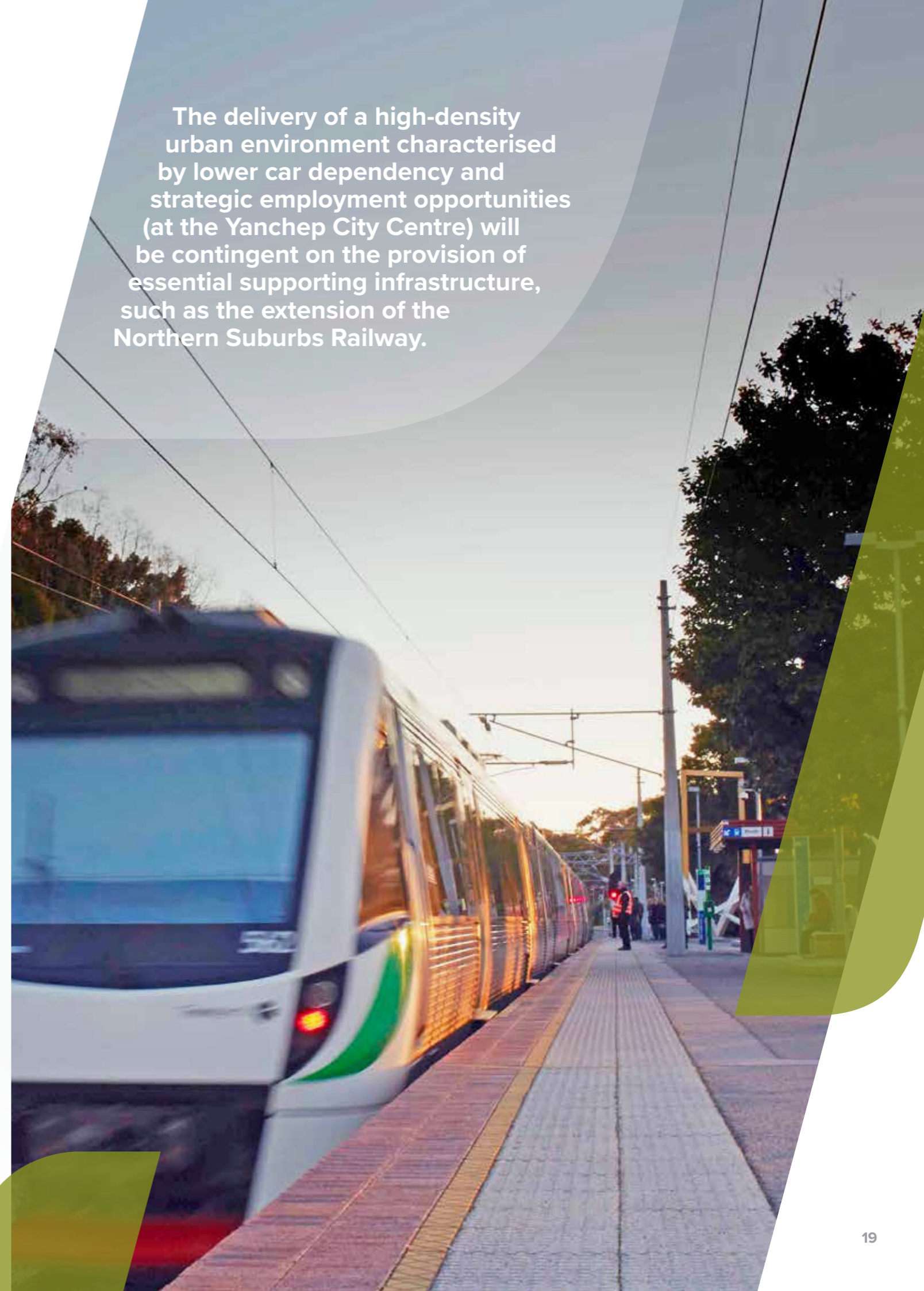
*"The delivery of a high-density urban environment characterised by lower car dependency and strategic employment opportunities (at the Yanchep City Centre) will be contingent on the provision of essential supporting infrastructure, such as the extension of the Northern Suburbs Railway."*

The delivery of a high-density urban environment characterised by lower car dependency and strategic employment opportunities (at the Yanchep City Centre) will be contingent on the provision of essential supporting infrastructure, such as the extension of the Northern Suburbs Railway.

Figure 8: Train boardings by station on an average weekday for the period 19 - 23 March 2018



Source: EY analysis of PTA boardings data



# 4 Route Corridor

## 4.1 Route and Station Locations

Typically the corridor for the 14.5 kilometre long extension will be 40 metres wide, with majority of the route in a cutting, traveling under road-over-rail bridges to facilitate connections on either side of the proposed rail reserve, reduce noise and improve amenity and integration (Figure 9).

The Yanchep Rail Extension starts north of Butler Station, travelling under the planned realigned Romeo Road to Alkimos Station, in the proposed secondary centre at Alkimos.

North of Alkimos, the route passes through a parks and recreation reserve almost at surface level before diving under Alkimos Drive. The route then curves north-westward where it then passes under Eglinton Avenue to Eglinton Station, just south of Pipidinny Road.

Most of this section will be in a cutting, excluding 190 metres in the parks and recreation reserve where the tracks will run on an embankment, which also allows for a fauna underpass to be created.

North of Pipidinny Road, the route passes through land reserved for parks and recreation and containing Bush Forever (site 289) before passing under Yanchep Beach Road to Yanchep Station in the city centre.

Every effort was made to minimise impact on the Bush Forever site, including considering an alignment along the edge of the area. However, the undulating landscape, tight rail curve (not conforming to railway design standards) and impact on existing and future residents meant this option was not viable.

Through the Bush Forever area, every effort will be made to balance the quantity of cut and fill earthworks in this section to minimise impacts. Four fauna underpasses will be provided along this section of track.

The rail corridor will travel in a cutting through existing urban developments as it reaches Yanchep Beach Road and continue to a station within the future Yanchep City Centre area. Just pass this station the track will continue north to turn and stow trains as required.

As detailed, the route passes under nine road bridges, which will be delivered as part of the Yanchep Rail Extension. These crossing have been prioritised based on their strategic significance in the broader transport network and/or their role in supporting access and early staging of development outcomes around the stations. A further 11 potential bridge crossings have been identified through consultation with stakeholders as part of longer-term development intentions, which have been future proofed in the design, but are subject to further planning and delivery by third parties.

From Butler to Yanchep stations, a 13.8 kilometre principal shared path (PSP) will be built on the western side of the rail reserve and follow the natural surface of the land form, except where it passes under rail crossing bridges.

## 4.2 Environmental Considerations

### 4.2.1 Regional Setting

The project area is located on the northern Swan Coastal Plain, which is a low lying coastal plain mainly covered with woodlands and containing a complex series of seasonal wetlands. The mean annual rainfall measured at the nearest weather station to the project area is 666.9 millimetres, with most recorded between June and August. The project area is located on the Quindalup Dunes and Spearwood Dunes landforms, in contrast to the Perth Sub-region, which is composed of Quaternary marine dunes of various ages, colluvial and Aeolian sands, alluvial river flats and coastal limestone.

### 4.2.2 Environmental considerations

State Government takes its environmental obligations very seriously.

METRONET will play a key role in meeting Perth's future growth by connecting people in a sustainable way by providing an environmentally friendly transport option.

Infrastructure projects require land to build them on, and while every effort is made to construct new transport facilities in established corridors, sometimes this is not practical.

Figure 9: Environmental Constraints



Every opportunity is made to avoid, minimise or rehabilitate as much as possible.

Key environmental issues identified for the Yanchep Rail Extension include:

- clearing of conservation significant vegetation, including:
- Banksia Woodlands of the Swan Coastal Plain and *Melaleuca huegelii* - *M. acerosa* shrublands on limestone ridges;
- through a Parks and Recreation Reserve and Bush Forever site;
- black cockatoo habitat.
- fragmentation of local ecological east-west linkages, which will be addressed with up to five fauna underpasses along the route;
- localised impacts to neighbouring residential areas from noise and vibration.

METRONET and the PTA will continue to work closely with the Environmental Protection Authority (EPA) and other State and Commonwealth environmental agencies to adequately identify and assess the environmental values of the area and further refine the project's footprint.

#### 4.2.3 Noise and Vibration

The project will comply with *State Planning Policy 5.4 - Road and Rail Transport Noise and Freight Considerations in Land Use Planning (2009)* (SPP5.4).

An operational noise and vibration assessment, conducted in 2017, found noise mitigation will be required as part of the project implementation to meet SPP5.4 target criteria.

To minimise noise and other impacts on the surrounding proposed residential developments, the rail line will be predominantly constructed in a cutting. In addition, developers neighbouring the route will be required to have appropriate setbacks from the rail reserve via road reserves or public open space.

Noise walls will only be constructed as required. In these cases, negotiations will be undertaken with land developers to confirm the type of noise walls required and the party responsible for construction.

Vibration mitigation measures will also be required adjacent to all existing and approved future residential developments to reduce vibration levels below the vibration criterion. As a result of 'lessons learned' from the Butler rail extension, sub-ballast matting will be installed in all areas adjacent to existing and future residential developments.

#### 4.2.4 Light

The project is likely to have light impacts on the surrounding residential developments, particularly in areas adjacent to the stations and associated facilities. These impacts will be assessed during the final detailed design stage to ensure compliance with AS/NZ 1158: 2005 - Lighting for Roads and Public Spaces (including car parks) and AS 4282: 1997 - Control of the Obtrusive Effects of Outdoor Lighting.

### 4.3 Heritage Considerations

#### 4.3.1 Aboriginal Heritage

There are no registered Aboriginal Heritage Sites within, or in close proximity to, the route, based on a search of the Department of Aboriginal Affairs (DAA) Heritage Inquiry database.

An archaeological survey, heritage surveys and Aboriginal consultation has identified an area of limestone outcrops considered to have heritage value to the west of the rail corridor in Alkimos. This site, referred to as the 'Romeo Road Pinnacles,' has been lodged with the DAA as a potential heritage site.

As a result, specialist Aboriginal monitoring personnel will be engaged during the initial stages of vegetation clearing at the station sites to further ensure there are no heritage sites or artefacts located within these areas.

Although there are no registered Aboriginal heritage sites within the vicinity of the project area, a Section 18 approval under the *Aboriginal Heritage Act 1972* will however be sought to provide consent to impact the Romeo Road Pinnacles site that has been lodged with the Department of Aboriginal Affairs as a potential heritage site.

#### 4.3.2 European Heritage

There are no State Heritage Places located within the route corridor, based on a search of the Heritage Council of Western Australia's database. Therefore, no investigations into European heritage will be undertaken for the project.



# 5 Transport Operations and Infrastructure

## 5.1 Rail Operating Strategy

### 5.1.1 Day One Service Frequency

When the Joondalup Line is extended to Yanchep, it is proposed to maintain the frequency of 12 trains per hour (TPH) through Perth including the retention of the Whitfords-Cockburn Shuttle by the following operation:

- a frequency of six TPH from Yanchep, through Perth, to Mandurah (and vice versa); and
- maintain a frequency of six TPH from Whitfords through Perth to Cockburn Central.

### 5.1.2 2031 Service Frequency

Future planning being undertaken by the PTA proposes that the Joondalup-Mandurah Line be operated with a three-tier timetable in the longer term, with higher-frequency services being provided on the inner-tier of the line where demand is greatest.

The infrastructure and stations proposed on the Yanchep Rail Extension have been designed to allow for the proposed future increases in train frequencies, to ensure the line can accommodate patronage demand to 2031 and beyond. At this time, subject to the projected rate of population growth and other factors, it is not envisaged that trains to Yanchep will need to operate beyond six TPH by 2031. However, this will continue to be monitored and reviewed as the region north of Joondalup continues to grow.

### 5.1.3 Rolling Stock Requirements

The current rail operating plan which provides a ten minute frequency from Butler in the peak morning hour, shows that four additional six car trains will be required to service the extension to Yanchep, including a spare. These are being delivered under the METRONET New Railcars Project. This procurement has begun to ensure the new trains are available on day one of operations.

### 5.1.4 Rolling Stock Maintenance and Stabling Facilities

It is not envisaged that additional rolling stock maintenance and stabling facilities will be required to support the Yanchep Rail Extension. Two stowage roads will be positioned north of Yanchep Station with the capacity to store four six-car train sets to meet operational requirements.

### 5.1.5 Turnback Facilities at Yanchep

For operational efficiency and to meet the projected patronage growth for Yanchep Station, the designs provide for an ultimate three platform faces at Yanchep Station.

Ultimately, four single crossovers, collectively with ten sets of points, evenly split north and south of Yanchep Station will be required to turn trains.

However, on day one of operations, only half of these will be required as the two stowage roads north of Yanchep Station will provide adequate turnback infrastructure. The remaining infrastructure can be built in the future when increased train frequencies are needed.

## 5.2 Bus Operating Strategy

### 5.2.1 Current Bus Services

To service the current population along the Joondalup Line, Transperth operates six network feeder bus services (routes 480, 482, 483, 484, 490 and 491) (Figure 10). The routes typically loop between stations and serve the suburbs in between, ending at Butler as the current end-of-line station.

North of Butler Station, two local routes extend into residential developments in south Alkimos and two longer regional routes connect to the suburbs of Yanchep and Two Rocks via Marmion Avenue. Local roads served by these buses are limited due to the under-developed land in the area. The bus frequencies are optimised for peak period travel and schedules provide timed connections to train services for travel to and from the Perth CBD but vary in terms of number and patronage.

### 5.2.2 Day One Service Frequency

To deliver an integrated transport solution, which connects the planned activity centres within the project area, a comprehensive and supportive feeder bus network will be developed.

Figure 10: Existing Transperth Bus Network

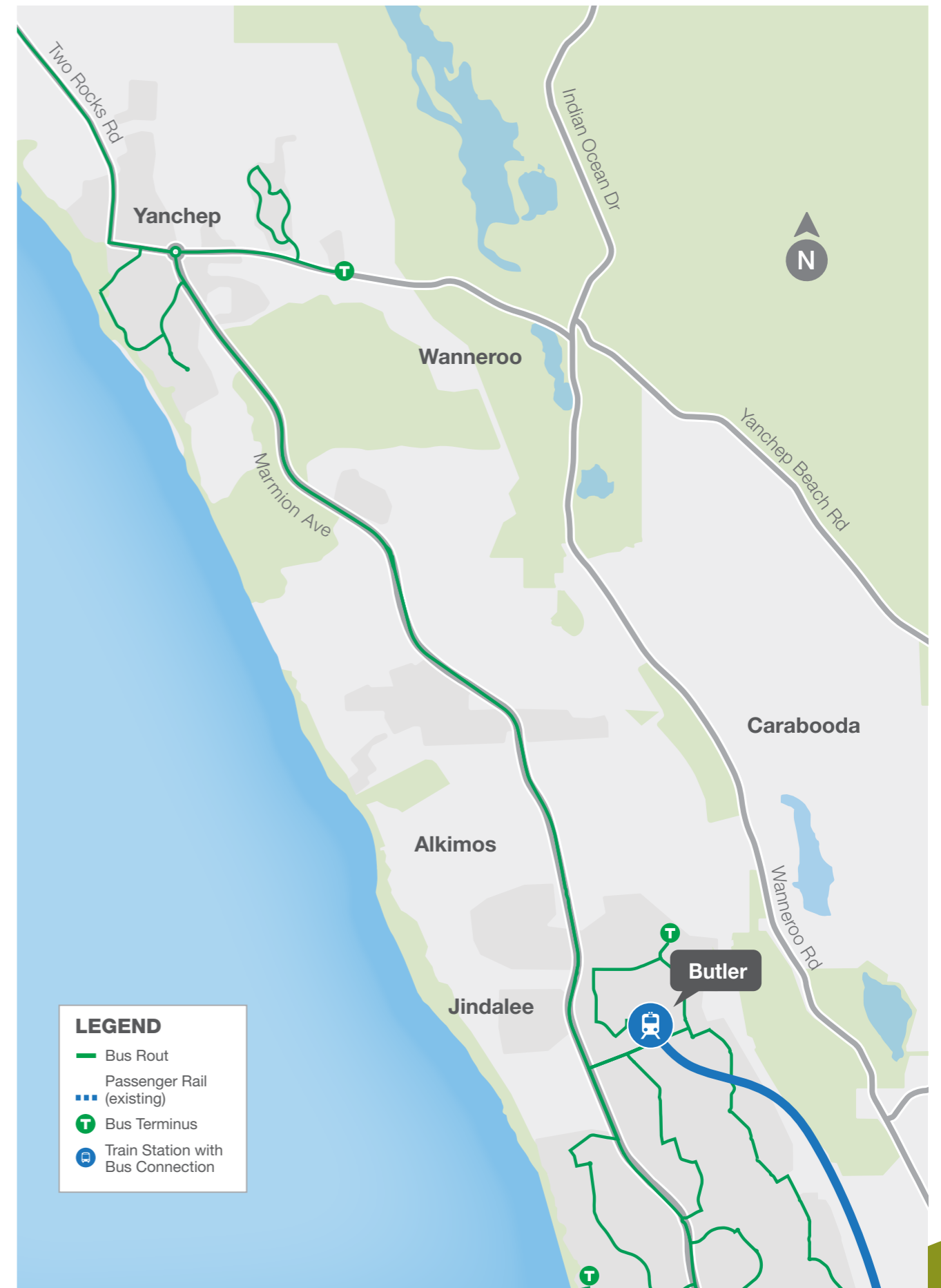
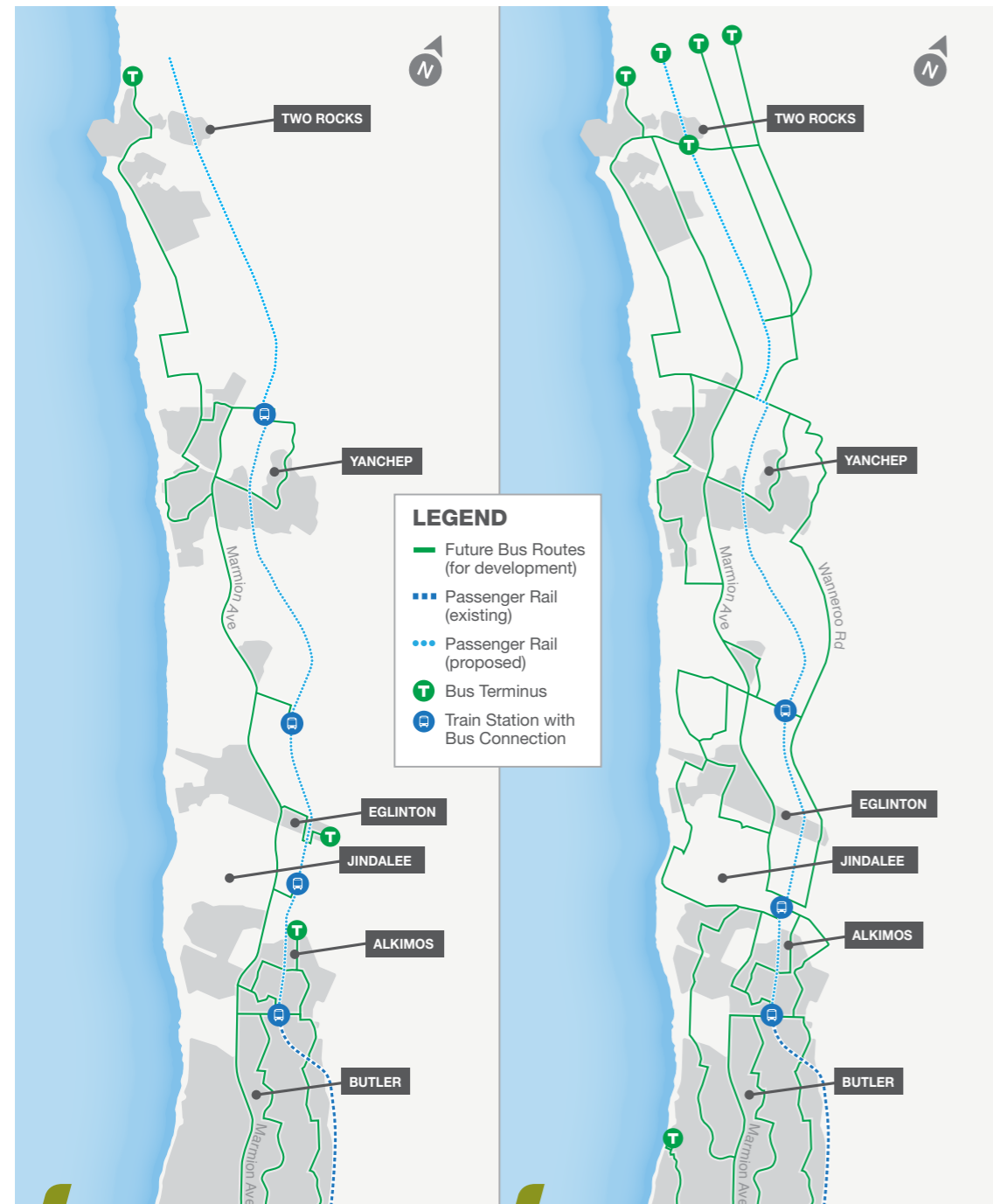


Figure 11: Ultimate bus feeder network (Two Rocks to Butler)

Proposed day one bus operations

Proposed 2031 bus operations



Note the above bus network is heavily reliant on developers agreeing to build local road connections, the plan is constrained and subject to potential change. Negotiation with developers along the YRE has commenced and the bus feeder service routes will be constantly reviewed and refined until the YRE begins operating. Final service specifications will be subject to detailed planning and community consultation.

The proposed 2031 (Ultimate) bus network includes nine new routes providing feeder services to Yanchep Town Centre, nine routes for Eglinton and six routes for Alkimos. Existing bus services will be extended from Butler Station to Alkimos Station and new routes introduced to link Alkimos Station with Eglinton Station, then with Yanchep Station, operating under the standard 'station-to-station loops' model, parallel to the rail line. This strategy will remove existing remote terminus locations in residential streets - improving passenger and bus driver amenity and providing bus operational flexibility. Bus routes to the north of Yanchep Station will serve the Two Rocks area and terminate in suburban locations, which will be determined as land development and the road network progresses.

This network will increase the number of passengers arriving at Alkimos, Eglinton and Yanchep stations via public transport and reduce demand on station parking to support better land use opportunities, both around the stations and along the new bus routes.

The proposed bus feeder network is based on the successful Joondalup and Mandurah lines model where bus routes 'loop' between train stations and bus-train connections are provided at the station closest to Perth, as the major direction of travel.

The longer regional bus routes will become local feeder services providing quicker journeys for most passengers connecting to train services. By creating local bus routes in areas previously not serviced, the feeder network will promote growth of residential and business development in and around Yanchep and proposed key activity centres.

As many of the proposed bus routes are on road networks yet to be finalised and constructed, introducing new bus services will take place in stages as these developments progress,

As a result, METRONET has prepared two bus operating strategies:

1. Proposed minimum day one network; and
2. Proposed ultimate bus network (assumed 2031).

Final service details will be determined 12-18 months before operations begin following detailed planning and community consultation to ensure the bus network best aligns with local development and community needs.





## 5.3 Infrastructure Requirements

### 5.3.1 Civil works

The track is designed to sit within a cutting for majority of the alignment, to facilitate connections within the station precincts and communities on either side of the proposed rail reserve, excluding the small section through the Bush Forever and parks and recreation reserve.

A maintenance road commences after Alkimos Station, and continues for the majority of the rail alignment, with the exception at station precincts. Maintenance roads and PSP within the Bush Forever do not necessarily follow the rail alignment.

### 5.3.2 Track Alignment

The track and associated infrastructure design will be consistent with the existing passenger rail network to conform to the desirable limits of the Narrow Gauge Code of Practice. Rail will typically be 50kg rail ballasted track structure throughout. The exception being the section of line beneath Yanchep Station cut and cover tunnel, which requires a track slab arrangement and 60kg rail.

Crossovers are designed to the south of Yanchep Station and two stow roads to the north. These roads are each 360m long to allow for a total of four 6-car trains to be stowed (two trains per stowage road).

### 5.3.3 Traction Power and Overhead Line Equipment

The existing OLE equipment for the Joondalup Line is a 25 kV 50 Hz AC booster transformer system and an auto-tensioned catenary system (sagged catenary). The OLE design has been developed to be compatible with the existing network. The concept design has been undertaken utilising the existing 7/3.75 HD Cu catenary and 107mm<sup>2</sup> solid HD Cu contact wires for all new wire runs.

Western Power feasibility reports identified that there is sufficient capacity in the existing 132kV feeds to Nowergup substation to also feed the new 25MVA transformer. It is noted that a Power Load Study should be undertaken at the commencement of the next stage of design to validate the High Voltage design.

Traction power supply will be integrated with the existing system – a 25kV, 50Hz, single-phase booster-less return earth wire system – which will require:

- an upgrade to the Nowergup substation to a 2-transformer site; and
- installation of a new track sectioning cabin and associated neutral section at Burns Beach, south of Currambine Station.

### 5.3.4 Signals and Systems

The signalling system will include three-aspect colour light signals, supplemented with ASTS L10000 automatic train protection, in keeping with the PTA's current standards and Codes of Practice.

PTA's existing train control system will be modified to incorporate the extra signalling and systems. Capacity already exists at the PTA Train Control Centre to accommodate the extra control workload.

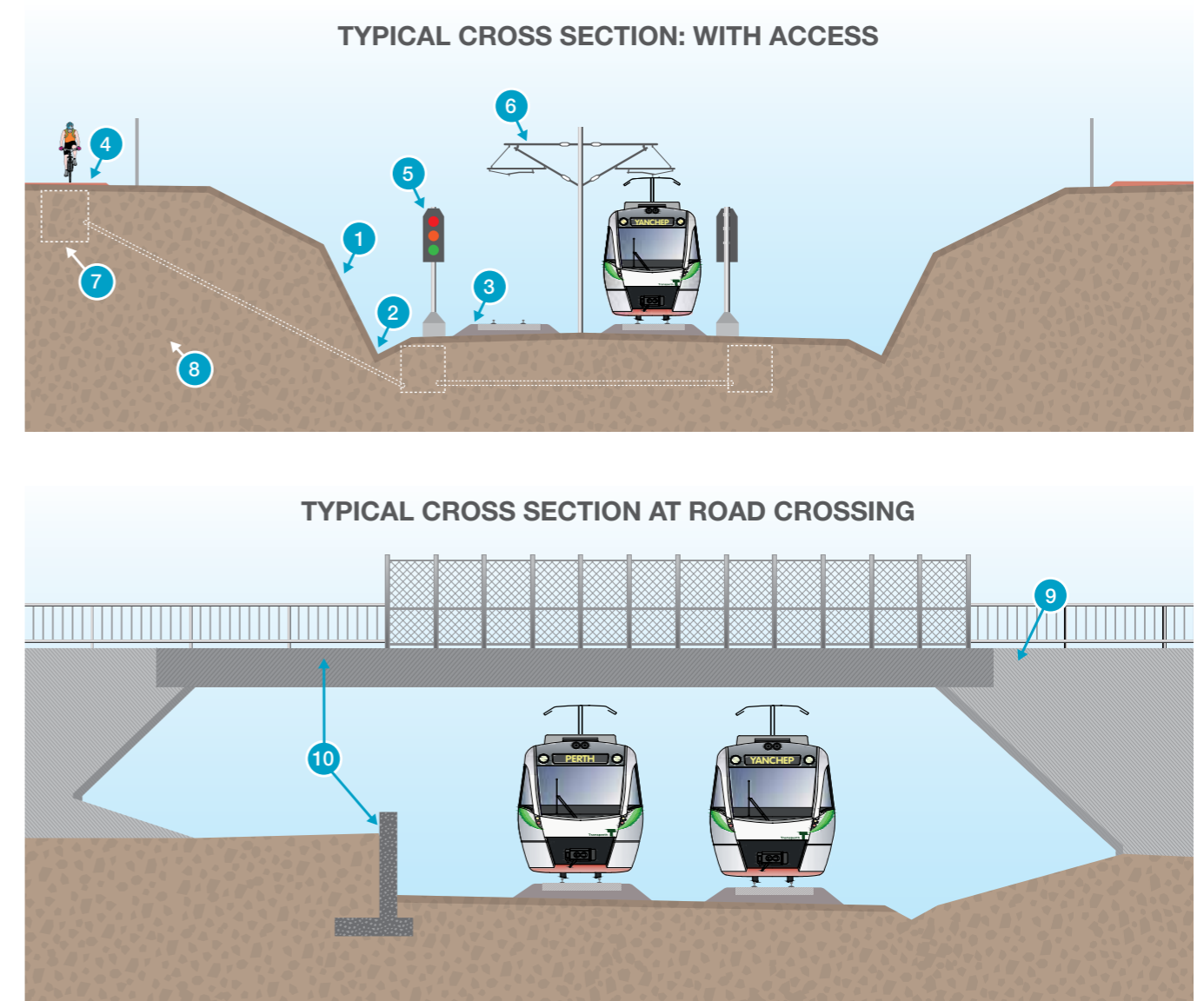
A digital radio system will support the PTA's network-wide Radio System Replacement project and will interconnect all new communications, signals and control systems including:

- train control;
- traction power supervisory control and data acquisition (SCADA)
- station SCADA;
- station services; and
- radio and signals control and indications sites.

Depending on the final project design, modifications may be needed to the existing fire monitoring system to add new sites for remote management.

Railway infrastructure, tunnel, station buildings and structures, systems and services, will be earthed and bonded in accordance with PTA standard to ensure safety and asset protection.

Figure 12: YRE track design cross section



## LEGEND

- |   |   |
|---|---|
| 1 Earthworks (Maintainability)                  | 9 Bridges (Maintainability)                   |
| 2 Stormwater Drainage (Maintainability)         | 10 Boundary Walls & Fencing (Maintainability) |
| 3 Trackworks (Operability)                      |   |
| 4 Principal Shared Path (Public Connectivity)   |   |
| 5 Signalling (Operability)                      |   |
| 6 OLE & Traction Power (Operability)            |   |
| 7 Electrical Works (Operability)                |   |
| 8 Communication & Control Systems (Operability) |   |



### 5.3.5 Bridges

To maintain or enhance connections between communities on either side of the Yanchep Rail Extension, 20 potential road-over-rail crossings have been identified. Nine of these crossings are included in the project scope, to accommodate existing and future primary roads and key links needed to support the station and surrounding developments, with the remaining 11 to be delivered by other parties.

To accommodate the road approach gradients, and comply with Main Roads WA standards, the design boundary for the nine bridge crossings will be the back of wing walls at each abutment, or any ground retention structures outside of the rail corridor.

**Table 2: Road Crossings Parameters**

Bridge Name	Proposed No. of Traffic Lanes
Santorini Promenade	1 lane each way + 1.2m median (3m footpath each side)
Yanchep Beach Road	2 lanes each way + 6.0m median (3m footpath each side)
Pipidinny Road	1 lane each way + 1.2m median (3m footpath each side)
LWP2	1 lane each way + 1.2m median (3m footpath each side)
Romeo Road	2 lanes each way + 6.0m median (3m footpath each side)
Alkimos Drive	2 lanes each way + 6.0m median (3m footpath each side)
Eglinton Avenue	2 lanes each way + 6.0m median (3m footpath each side)
Tokyu-3	2 lanes each way + 6.0m median (3m footpath each side)
Toreopango Avenue	2 lanes each way + 6.0m median (3m footpath each side)

The bridge design package has assumed a minimum clearance (top of rail to bridge base) of 5.8m. The next design stage should look at finalising bridge height requirements.

Bridge spans have been determined to allow sufficient clearance for the rail structure gauge clearance requirements as well as drainage, signal and communications positioning as well as any maintenance access walkways/roadways/cycle path requirements.

The proposed design recommends bridge construction using tee-roff precast prestressed girders. This is one of the most common forms of construction in Western Australia, as it is proven to be an effective and economical solution, while using relatively simple construction methodologies.

### 6.6.2 Rail Corridor Access Points

Along the rail corridor, access points will be provided for personnel to:

- undertake regular maintenance activities within the rail corridor; and
- access (and egress) the area in the event of an emergency.

The points will be located no more than every 750 metres. They will either provide vehicle access or pedestrian access via a staircase, with the public able to use the staircases only in the event of an emergency.

A continuous safe walking route has been planned adjacent to the track to connect the staircases and vehicle ramps.

A 3.5 metre wide access track for vehicles has also been accommodated at track level on the east side of the rail line for the majority of the extension. A 1.5 metre wide walkway will be provided where there is insufficient space to provide a 3.5 metre wide vehicle access track.

### 5.3.6 Utility Interfaces

Third-party utilities that interface with the project have been identified and engagement commenced with these service providers to assess the impact of the works on their assets, develop concept schemes for relocation or protection, and estimate costs.

Where existing services cross the railway corridor, they will be installed under the railway formation. Due to the profile of the corridor, the depth of new and relocated services may be up to eight metres lower than they currently exist. Alternatively, some services will be accommodated in the bridge structures used for road crossings.

Protection or relocation of these utilities may be as forward/enabling works, to avoid any impact on the main construction program.

### 5.3.7 Fencing and Guard Rail/Road Vehicle Sa

Allowance has been made for 1.8 metre-high, bi-wire fencing along the rail alignment, to prevent unauthorised access to the railway infrastructure. Within the station vicinity, appropriate fencing of lower heights will be used.

Palisade fencing will be provided around high-security areas where required. Fauna fencing will be used through the Bush Forever and parks and recreation reserve.

As majority of the alignment is in a cutting, crash barriers/guard rails are not required.

**Nine road-over-rail bridges are included in the project scope**



## 6 Stations and Precincts

The Yanchep Rail Extension includes three new stations at Alkimos, Eglinton and Yanchep and some modifications to Butler Station.

As well as offering a faster transport option for people living nearby, the stations are a catalyst for high-density, high-amenity land use in the surrounding precinct – maximising the social and economic returns delivered by the project's transport investment.

The stations will be designed to:

- integrate with the planned, future precincts to maximise connections and development potential;
- meet Rail Safety Management Standard AS 4292;
- minimise environmental impacts;
- optimise quality, value for money and benefit to the community;

- provide access, comfort and usability for the public and stakeholders;
- minimise maintenance and life cycle cost; and
- minimise capital costs and contractual risks.

The station precincts are being planned in consultation with landowners and developers to ensure an appropriate mix of land uses, densities, urban form and amenity are delivered to support the area's growth needs and the intended role and function of each location under planning policy, i.e. Yanchep as an emerging strategic metropolitan centre, Alkimos as a secondary centre, and Eglinton as a district centre.



## 6.1 Yanchep Station and Precinct

Yanchep Station, at the end of the Joondalup Line, will service the planned Yanchep Strategic Metropolitan Centre. The station is located south of the future Toreopango Avenue (north of Yanchep Beach Road, east of Marmion Avenue and west of Wanneroo Road), positioning it centrally to the future Yanchep City Centre's main retail and commercial areas, making it easily accessible for visitors and residents.

### 6.1.1 Station Design

The early Yanchep Station design (Figure 13) work determined the location, scale and general features of the future station. This work detailed how the end-of-line station fits within the planned development and caters for passengers from day one of public transport operations.

A ground-level concourse and station building will include an unpaid zone to connect both sides of the development, with two platforms located in a cutting. The railway approach will be built as a cut and cover tunnel to maximise the development potential.

The universally accessible station will have:

- **Passenger amenity:** public toilets, public services (such as vending machines), kiosk, passenger ticketing/information, staff amenities, station administration offices, storage/cleaning and operational facilities.
- **Pedestrian/cycle access:** well connected to a principal-shared path west of the station, with two secure bicycle parking shelters, bike u-rails and ability to add two additional secure bicycle parking shelters in the future.
- **Bus interchange:** 14-stands with weather protection, seating and information facilities. Its flexible design could see buses dropping off passengers either internally to the bus station or externally next to commercial development to maximise the surrounding development potential. The interchange includes seven layover bays.
- **Vehicle access:** dedicated passenger drop-off area and approximately 1,000 parking bays.

The station architecture and final design will be developed when a contractor is appointed.

Figure 13: Yanchep Station and potential surrounding development



The station, at the end of the Joondalup Line, will service the planned Yanchep Strategic Metropolitan Centre.



### Yanchep Station Facilities



### 6.1.2 Precinct Opportunities

The Yanchep Station precinct covers the majority of the planned Yanchep City Centre, which is to be progressively developed on land privately owned by the Yanchep Beach Joint Venture (YBJV). The METRONET Office has collaborated with YBJV to ensure the proposed station and rail infrastructure design supports and responds to the State Government and landowner's vision for the area.

Once fully developed, the Strategic Centre of Yanchep will provide a full range of economic and community services. This includes strategic employment and regional facilities, such as a primary regional hospital, tertiary education and regional sporting facilities to serve the population in the northern portion of the North West Sub-region and hinterland regional communities that access this centre.

Without the constraint of pre-existing urban structures and conditions, the Yanchep planning framework provides a unique opportunity for the project to contribute to, and exceed, area growth targets set out in the State policy frameworks and local planning frameworks.

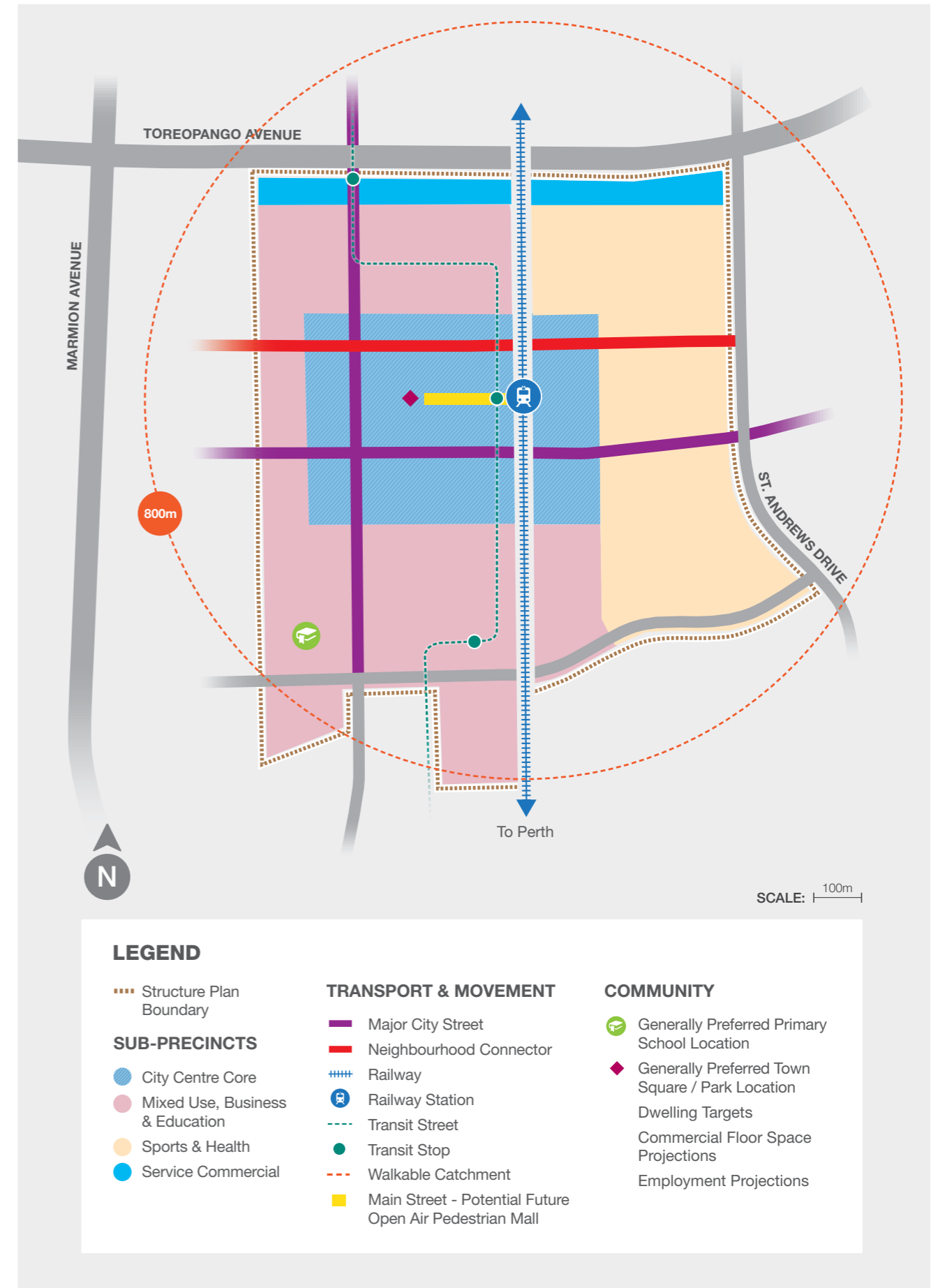
### 6.1.3 Planning Status and Development Staging

Private development of the Yanchep precinct is anticipated to occur shortly after the start of operations. This first stage of development will focus around the station and main street, providing a point of focus, access and activation. Subsequent staging will facilitate commercial activity along Toreopango Avenue, residential development to the north, and major facilities such as tertiary education facilities at suitable sites.

The METRONET Office will continue to work with YBJV to consider development staging options that enable development intensity to evolve as the centre matures. For example, initial site development will be planned and delivered in a way that enables further site development and intensification over time in response to market conditions. This will support early investment and development without compromising longer-term opportunities.

Engagement and coordination with other landowners in the precinct on planning and delivery of land development and rail infrastructure will continue to ensure land use and density opportunities are maximised.

Figure 14: Yanchep City Centre Plan



## 6.2 Eglinton Station

Eglinton Station will be located within the future Eglinton District Centre (Figure 16), south of Pipidiny Road, east of Marmion Avenue and west of Wanneroo Road, and is designed to support a more localised catchment and patronage base.

### 6.2.1 Station Design

The early station design work looked into the location, scale and general features of the future station. This work detailed how the station fits within the planned 'neighbourhood' precinct type and caters for passengers on day one of operations.

Accessed via a station building at ground-level, the two platforms will be located in a cutting with at least 50 per cent coverage. The universally accessible station will have:

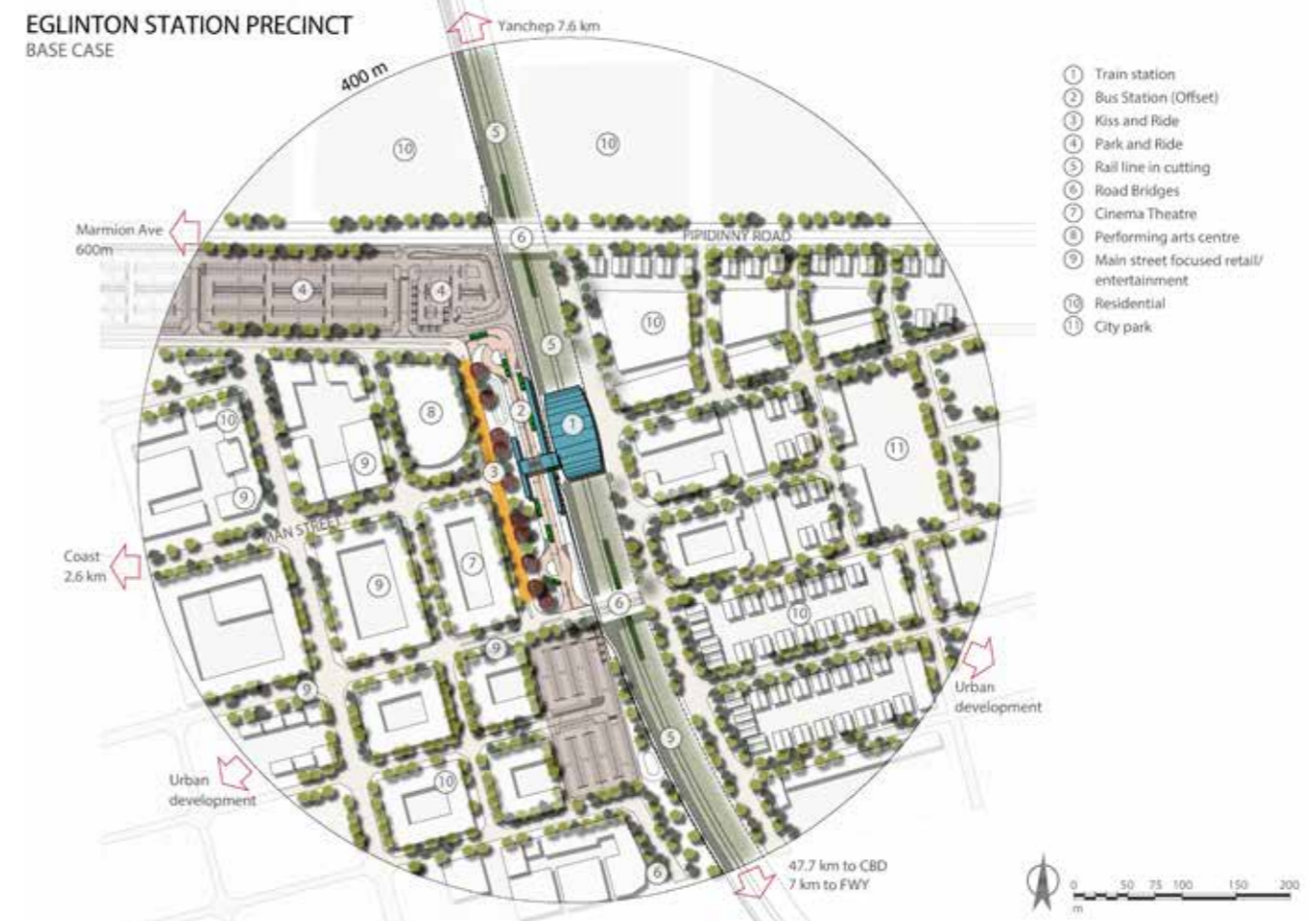
- **Passenger amenity:** public services (such as vending machines), passenger ticketing/information, storage/cleaning and operational facilities.

- **Pedestrian/cycle access:** well connected to a principal-shared path west of the station, with two secure bicycle parking shelters, bike u-rails and ability to add two additional secure bicycle parking shelters in the future.
- **Bus interchange:** eight-stands with weather protection, seating and information facilities. The interchange includes four layover bays.
- **Vehicle access:** dedicated passenger drop-off area and approximately 400 parking bays. As future demand increases, the parking can expand up to approximately 1,000 bays.

The station architecture and final design will be developed when a contractor is appointed.

Eglinton Station is designed to support a more localised catchment and patronage base.

Figure 15: Eglinton Station and Precinct



### Eglinton Station Facilities

\*With future expansion to 1,000 bays



### 6.2.2 Precinct Opportunities

The Eglinton station precinct is on land privately owned by Eglinton Estates.

The precinct's structure plan is in its preliminary stages and proposes between 25,000 and 35,000 square metres of commercial floor space, with approximately half used for retail purposes including street-based retail. To create a comfortable, safe and active pedestrian environment in and around Eglinton Station, 'main street' principles will be applied.

The station precinct is planned to support a predominately residential community, with services, facilities and jobs that reflect the immediate needs of the local catchment.

Landowner consultation will continue to ensure

the plan and proposed station design supports and responds to the State Government and landowner's vision for the area.

### 6.2.3 Planning Status and Development Staging

Eglinton Estates is in the preliminary stages of precinct planning. Initial development is anticipated to begin in 2021 to coincide with the opening of Eglinton Station.

The METRONET Office will continue to work with the developer to ensure land use planning aligns with the Yanchep Rail Extension's project objectives, and to coordinate the timely delivery of development in conjunction with the station.

Eglinton Estates is in the preliminary stages of precinct planning.



Figure 16: Eglinton District Centre Structure Plan



### 6.3 Alkimos Station

Alkimos Station, located north of Romeo Road, east of Marmion Avenue and west of Wanneroo Road, is within LandCorp's Alkimos Central development. As a State Government land delivery agency, this land ownership provides a positive opportunity for State Government to coordinate the timely delivery of development in conjunction with the station.

The station and surrounding precinct is identified as the future Alkimos Secondary Centre and provide public transport access from surrounding areas to the emerging Strategic Metropolitan Centre of Yanchep.

#### 6.3.1 Station Design

The early station design work considered the location, scale and general features of the future station. This work detailed how the station fits within LandCorp's planned development and caters for passengers on day one of operations.

That is why the station's flexible design allows consideration for:

- **Option A** - bus stands located in the centre of the interchange, providing convenient access to a northern train station entrance by crossing the bus way; and
- **Option B** - integration within the broader community with a southern station entrance facing the main street, which will serve as the primary pedestrian route and mixed-use development corridor.

A ground-level concourse and station building will include an unpaid zone to connect both sides of the development, with two platforms located in a cutting.

The universally accessible station will have:

- **Passenger amenity:** public toilets, public services (such as vending machines), kiosk, passenger ticketing/information, staff amenities, station administration offices, storage/cleaning and operational facilities.
- **Pedestrian/cycle access:** well connected to a principal shared path west of the station, with two secure bicycle parking shelters, bike u-rails and ability to add two additional secure bicycle parking shelters in the future.
- **Bus interchange:** eight-stands with weather protection, seating and information facilities. The interchange includes four layover bays.
- **Vehicle access:** dedicated passenger drop-off area and approximately 600 parking bays.

The station architecture and final design will be developed when a contractor is appointed.

The station and surrounding precinct is identified as the future Alkimos Secondary Centre.

Figure 17: Proposed Alkimos Station Design



#### Alkimos Station Facilities





**Alkimos is an emerging secondary activity centre.**

### 6.3.2 Precinct Opportunities

Located between the strategic metropolitan activity centres of Joondalup and Yanchep, Alkimos is an emerging secondary activity centre.

The 213 hectare area is owned by LandCorp, providing the State Government an opportunity to coordinate the timely development delivery in conjunction with the station.

With a mix of land uses including retail, office, residential, entertainment and community services, Alkimos will become a main regional activity centre with integrated connection to quality transit and provide a range of employment opportunities.

### 6.3.1 Planning Status and Development Staging

LandCorp has developed two development staging options, with the preferred delivery option to depend on key infrastructure and market conditions coinciding with rail infrastructure provision:

1. **Staging Plan One** – construct a portion of Romeo Road and the development front moving north and east, with the primary land uses being retail and service-commercial.
2. **Staging Plan Two** – construct the road on the northern boundary of the Alkimos retail core, with the development front moving east. The primary land uses would be retail, mixed-use and residential.

Both stages include development adjacent to the Alkimos Station.

Planning frameworks and residential and employment projections have been examined to inform the staging plans and which will continue to guide the development staging.

### 6.4 Precinct Delivery Strategy

Transport projects can be planned and delivered in a relatively defined timeframe of approximately five years.

However, the associated development and build-out of station precincts can take 30 to 40 years (or longer) to reach target densities. In addition, land uses are impacted by planning, investment and policy factors beyond the investment in transport infrastructure alone.

Wider precinct planning and delivery is outside of this project scope. However, within this context, the METRONET Office will continue to work with key stakeholders, including local government, along with landowners, who will play a critical role in supporting land use intensification and ensuring the uplift potential of station precincts is realised.





# 7 Project Cost, Schedule and Delivery

## 7.1 Transport Infrastructure Cost Estimate

The State Budget allocated \$520.2 million to deliver the Yanchep Rail Extension rail infrastructure.

This cost estimate was based on the project schedule, developed through the METRONET Office with internal and external input from:

- PTA's Major Projects Unit, which has expertise in delivering major rail infrastructure projects, and procurement options;
- environmental and legal representatives in ensuring realistic approval timescales are included in the proposed procurement; and
- external specialist consultants to provide constructability and staging recommendations.

The PTA will deliver the rail infrastructure.

## 7.2 Sources of Funds

State and Federal Governments have a shared interest in strategic infrastructure investment that enhances the productivity and liveability of Australian capital cities.

### 7.2.1 User Pays

Average annual revenue projections are typically approximately 30 per cent of total rail operating costs. User pays revenue sources are therefore insufficient to offset any capital costs and an operating subsidy will be required as per the existing PTA rail network. Advertising revenue is considered to be limited.

### 7.2.2 Value Capture

A modest contribution will be sought from landowners who benefit from this transport investment through associated residential and commercial development opportunities near new station precincts. Development contribution plans (DCPs) will be applied on a METRONET program wide basis, through updating of relevant local planning schemes. Alternative implementation pathways are currently being considered, through utilisation of existing planning legislation and powers.

### 7.2.3 Federal Funding

The Federal Government has allocated capital funding subject to a favourable assessment of the business case by Infrastructure Australia. The METRONET Office has been working collaboratively with the Australian Government's Department of Infrastructure and Regional Development and Cities (DIRDC) and Infrastructure Australia since April 2017 and will submit final versions of the required documentation in due course.

### 7.2.4 State Funding

The State Government has allocated capital funding to fund the remaining costs through the normal state budget process. As land values rise around station precincts, State Government will benefit from increased transfer duty, land tax and Metropolitan Region Improvement Tax.

## 7.3 Procurement Strategy

A two stage procurement options analysis (POA) has identified the following transport infrastructure delivery strategy which provides the best value for money:

- bundling the main project works the Yanchep Rail Extension with Thornlie-Cockburn Link, into a single Competitive Alliance contract;
- using individual Design and Construct contracts to procure appropriate forward works on each site; and
- procuring professional services using standard PTA contract processes with the option to include additional projects based on performance.



# 8 Implementation Frameworks

The level of stakeholder engagement and coordination for the Yanchep Rail Extension makes it a challenging project and rigorous management systems are in place to ensure it is delivered efficiently, that risks are successfully managed, and the project's substantial benefits are realised.

## 8.1 Project Governance Structure

As a METRONET project, the Yanchep Rail Extension planning and delivery will operate in accordance with the METRONET Governance Framework, which is endorsed by Cabinet. The fundamental principle underpinning the METRONET governance structure is decision-making at the appropriate management level.

Once Cabinet approves the project investment, responsibility for delivery of the project transfers to the PTA. The METRONET Office will continue to be responsible for monitoring the project and reporting performance to the METRONET Taskforce.

The State Government's proposed joint land development agency (combining the MRA and LandCorp) and/or the Western Australian Planning Commission will be responsible for working in collaboration with local government, communities and stakeholders to establish detailed planning frameworks for each station precinct. The PTA will be responsible for constructing the project's transport infrastructure (and integrating it with the land use planning outcomes), as well as project managing the overall project.

Detailed project reporting and issue resolution will be dealt with by the Project Control Group under delegated authority from the agency members. Issues beyond this delegation, or which involve unresolved and/or conflicting objectives, will be referred to the METRONET Taskforce via the SRO (and through the relevant steering committees) for its endorsement and/or recommendation to Government.

### 8.1.1 METRONET Taskforce

The METRONET Taskforce is responsible for overseeing the planning, design and delivery of the integrated METRONET program of works. As well as monitoring the planning and construction of transport infrastructure and transition to operations, the Taskforce's role includes monitoring the preparation of precinct plans and statutory planning frameworks to guide development around the stations, and the subsequent, progressive development by landowners, developers and nominated delivery agencies across government.

### 8.1.2 METRONET Project Control Group

The Project Control Group (PCG) provides overall leadership for the project and acts as a cross agency forum to discuss and resolve project issues that are unable to be resolved within the project delegations.

The PCG assesses delivery of the project against the approved cost, time, scope and quality parameters. The PCG also acts as a pathway for escalation, via

the SRO, to the METRONET Taskforce (through relevant steering committees), for issues unable to be resolved at this level of governance.

### 8.1.3 Project Working Groups

A number of Project Working Groups (PWGs) may be established based on discipline or issue to communicate and resolve local issues and assist the project team in delivering the required project outputs. PWGs will be formed, as required, and act as a pathway for escalation to the PCG, via the Project Manager.

### 8.1.4 Project Assurance

To assure the State Government's needs are appropriately managed and delivered, the project will be subject to independent review by the WA Department of Finance's Gateway Review Team.

As a minimum, the project will be required to undertake gateway reviews at the following stages:

- readiness for market (completed June 2018);
- tender decision;
- readiness for service; and
- benefits evaluation.

In addition, the METRONET Project Director may initiate independent assessments or 'deep dives' to examine project specific issues, as and when required.

## 8.2 Approvals

To gain the approvals necessary to enable the construction and operation of the Yanchep Rail Extension, State and Commonwealth regulatory processes will be followed.

Preliminary consultation has been undertaken with all of the approving agencies during early planning phase. Approval requirements will be reviewed on an ongoing basis, as the scope of the project is refined.

### 8.2.1 Rail Approvals - Rail Enabling Act

Under current State legislation, railways are required to be made under the authority of a special rail enabling act passed by the Parliament of Western Australia.

The Governor, by Order in Council, is also required to authorise the Public Transport Authority to undertake, construct, or provide railways as a public work, subject to the passage of a special rail enabling act authorising the construction of both the Thornlie-Cockburn Link and Yanchep Rail Extension railways.

Upon enactment and proclamation of the special Act, the PTA will be authorised to commence construction of the Yanchep Rail Extension railway.



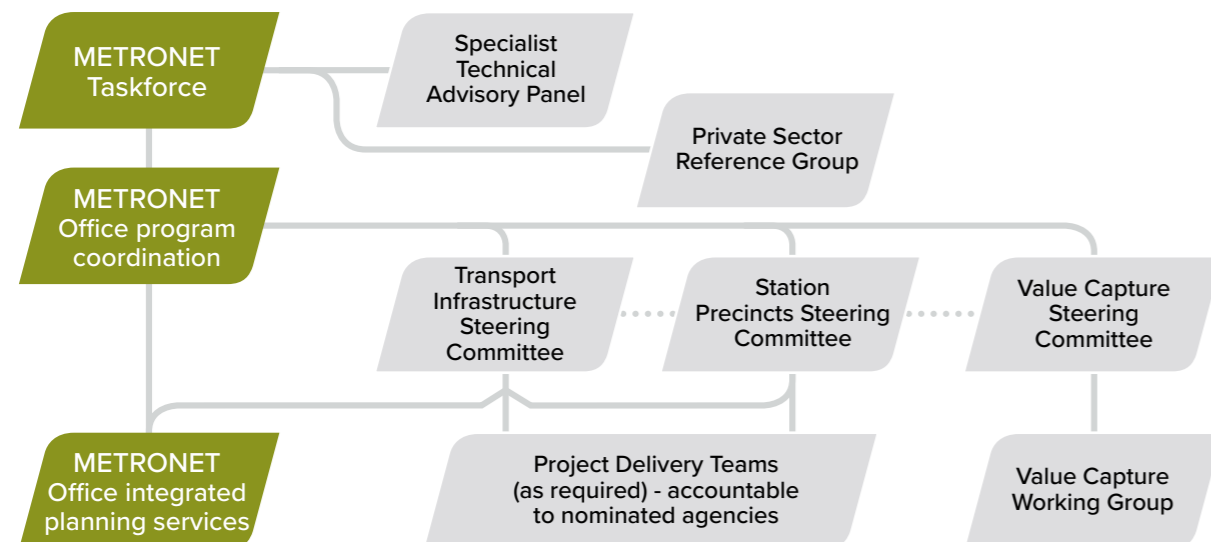
In addition, the passage of the special rail enabling Act will authorise the PTA to compulsorily acquire and pay compensation for any land required for the Yanchep Rail Extension but not acquired by agreement prior to the passing of the special Act.

### 8.2.2 Environmental Approvals

The following environmental approvals are likely to be required for construction of the railway and railway stations:

- Commonwealth environmental approval under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act);
- State environmental approval under the *Environmental Protection Act 1986* (EP Act);
- clearing permit may be required under the EP Act to allow clearing of native vegetation. The requirement for a clearing permit is dependent on the outcome of the State environmental approval process, and may apply to any additional laydown or stockpile areas required.
- A fauna relocation permit under the *Wildlife Conservation Act 1950* to remove the protected fauna species from the project area;
- works approval and licence under the EP Act, to construct and operate concrete batching plants;
- works approval and licence under the EP Act may be required to store excavated material; and
- Noise Management Plan for out of hours work under the *Environmental Protection (Noise) Regulations 1997*.

Figure 18: METRONET Governance structure





The assessment process for these approvals are expected to take between six and 12 months and some will be the responsibility of the construction contractor. Consultation with the approving agencies is ongoing.

### 8.2.3 Planning Approvals – Rail Alignment

The majority of the rail alignment is reserved for railways. Where land is reserved for railways it can generally be developed for the purpose of or in connection with a railway without planning approval, noting that these provision do not include:

- the construction or alteration of a railway station or any related car parks, public transport interchange facilities or associated means of pedestrian or vehicular access, or;
- development of land that involves the clearing of regionally significant vegetation on a site specified as Bush Forever.

Except for limited circumstances, where land is zoned under the MRS, development approval for a public work by a public authority is required from the WAPC (CI 24 MRS).

### 8.2.4 Planning Approvals – Station Precincts

Station precincts within the project will require planning approvals to enable development to proceed, including:

- potential state planning scheme preparation and approval setting out planning outcomes, development control and development contribution arrangements;
- final activity centre structure plan approval;
- required environmental approvals;
- subdivision approvals; and
- development approvals.

Planning approvals for each station precinct are at differing stages (Figure 19, Figure 20 and Figure 21).

### 8.2.5 Section 18 requirements

There are currently no registered Aboriginal heritage sites within the vicinity of the project area. A Section 18 approval under the Aboriginal Heritage Act 1972 will however be sought to provide consent to impact the Romeo Road Pinnacles site that has been lodged with the Department of Aboriginal Affairs as a potential heritage site.

## 8.3 Benefits Management

The project's benefits realisation will be managed by the METRONET Office.

The Australian Transport Assessment and Planning Guidelines (ATAP) defines benefits management (or realisation) as the process of properly identifying, defining, measuring, evaluating and reporting benefits to determine whether an initiative has achieved its intended outcomes and objectives once it is delivered.

The benefits management process will ensure that outcomes from the project are defined, aligned to transport system objectives and managed through to their achievement or realisation. Benefits management will also provide lessons to ensure continuous improvement in transport system benefit management processes.

## 8.4 Risk Management

Risks will be managed in line with the METRONET Risk Management Framework, which is aligned with the International Standard ISO 31000 – Risk Management (Figure 22).

A comprehensive risk assessment process was undertaken for the project in accordance with the METRONET Risk Management Framework, PTA's Risk Management Procedures, Department of Infrastructure and Regional Development (DIRD) and Infrastructure Australia (IA) guidelines.

Figure 19: Yanchep Station Precinct Estimated Process for Approvals

Yanchep Station Precinct - Planning Phase					
Structure Plan	In development	Lodged	Advertised	Modified	Approved
Subdivision (Stage 1 Station Precinct)	Further Information	Lodged	Conditionally Approved	Conditions Satisfied	Titles Issued
Land Sales	Lots released to market	Offer & Acceptance	Settlement		Lots sold
Development	Conceptual Design	DA Lodged	DA Assessment (WAPC)	DA Approved	Construction & Occupation

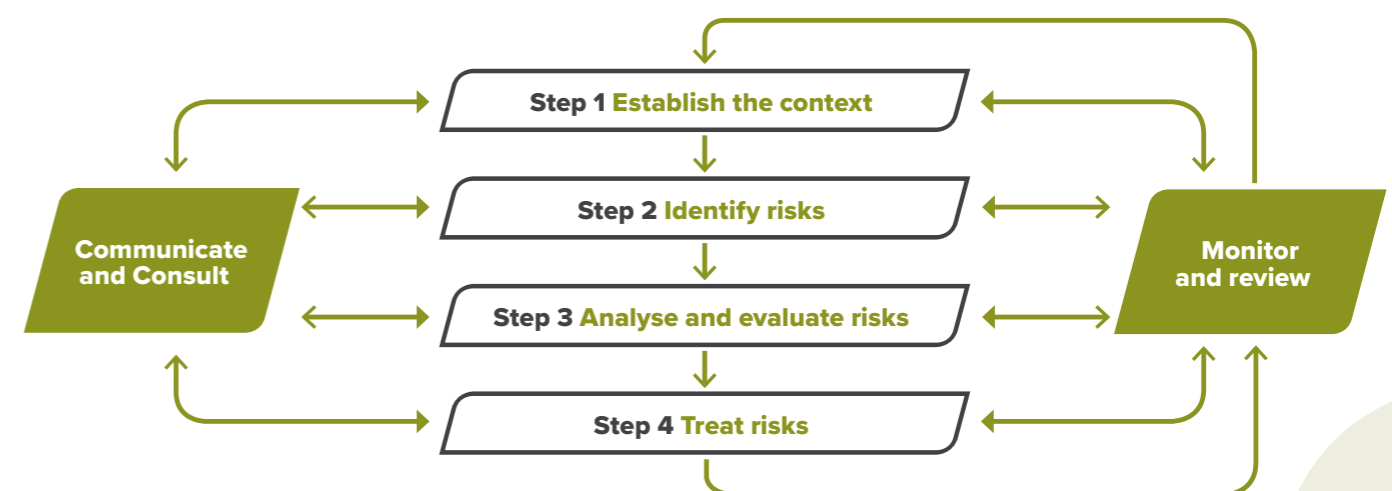
Figure 20: Eglinton Station Estimated Process for Approvals

Eglinton Station Precinct - Planning Phase					
Structure Plan	In development	Lodged	Advertised	Modified	Approved
Subdivision (Stage 1 Station Precinct)	Further Information	Lodged	Conditionally Approved	Conditions Satisfied	Titles Issued
Land Sales	Lots released to market	Offer & Acceptance	Settlement		Lots sold
Development	Conceptual Design	DA Lodged	DA Assessment (WAPC)	DA Approved	Construction & Occupation

Figure 21: Alkimos Estimated Process for Approvals

Alkimos Station Precinct - Planning Phase					
Structure Plan	In development	Lodged	Advertised	Modified	Approved
Subdivision (Stage 1 Station Precinct)	Further Information	Lodged	Conditionally Approved	Conditions Satisfied	Titles Issued
Land Sales	Lots released to market	Offer & Acceptance	Settlement		Lots sold
Development	Conceptual Design	DA Lodged	DA Assessment (WAPC)	DA Approved	Construction & Occupation

Figure 22: AS/NZS ISO 31000 risk assessment framework



## 8.5 Issues Management

Issues will be managed in line with the METRONET Issue Management Guidelines.

The guidelines define risk as a past event or risk that has eventuated and impeded the progress of the project, and the project's ability to deliver the project's objectives. An issue can occur where a risk has been realised, or a concern arises that impedes the immediate progress of a project. If an existing risk is realised, it will be managed via the METRONET issue management process.

As part of the issues management process, issues have been rated and assigned to appropriate owners according to the discipline area. Issue owners will be responsible for identifying resolution strategies and tracking progress towards resolving the issue.

To ensure adequate oversight and visibility, issues will be escalated to the appropriate level of governance according to their rating.

## 8.6 Digital Engineering

Recognising the benefits of digital engineering for large-scale complex infrastructure projects, digital engineering will be applied to the project.

This will create models, data and documentation that will build over the life of a project to capture the knowledge related to the project over its lifetime – efficiently procure, operate and maximise the value of the rail asset.

## 8.7 Communications and Engagement

METRONET projects create benefits for the communities in which they are built, which is why key stakeholders are identified and engaged early in the planning phase to develop mutual understanding of the project objectives.

A Yanchep Rail Extension Communications and Stakeholder Engagement Plan has been developed to:

- build relationships with key stakeholders and foster support for the project by involving stakeholders, where possible, in developing the design and construction impacts;

- communicate the project vision and benefits to allow for a greater understanding of the alignment, station locations and why the line is being extended;
- identify stakeholder and community perceptions of potential risks/impacts/issues associated with the project and use this information to inform project planning;
- establish opportunities for two-way feedback during design and construction to maximise project outcomes by obtaining local knowledge and expertise; and
- provide regular information when and how stakeholders wish to receive it.

The successful implementation of this plan will involve:

- Working together – developing an internal communications plan to provide direction to the project team on branding, development and performance, internal communication, partner communication and industry communication.
- Working with the community – applying the guiding principles to work effectively with communities to minimise impacts, maximise project benefits and deliver value for money for Government and its customers.
- Working with the contractor – understanding roles and responsibilities and aligning the project's community and stakeholder management implementation, at both the program and project levels, with the PTA's key messages, branding and protocols.
- Managing risk – taking a risk-management approach to the development of tailored community engagement and communications plans for each project phase which addresses risks and opportunities and manages stakeholder priorities.

**METRONET projects create benefits for the communities in which they are built.**





**MORE INFORMATION**

- ✉ [info@metronet.wa.gov.au](mailto:info@metronet.wa.gov.au)
- ☎ 9326 3666
- 🌐 [metronet.wa.gov.au](http://metronet.wa.gov.au)