METRONET THORNLIE - COCKBURN LINK

Nicholson Road Station

Prepared for

PUBLIC TRANSPORT AUTHORITY AND NEWEST ALLIANCE

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URBIS

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INTRODUCTION

METRONET is a program of projects of the Western Australian State Government that represents an unprecedented investment and commitment to developing, improving and expanding Perth's public transport network. It is a city shaping initiative to facilitate sustainable growth of the Perth Metropolitan Area for current and future generations.

Urbis acts as the planning consultants on behalf of the NEWest Alliance, the appointed contractor to deliver the METRONET Thornlie-Cockburn Link (**TCL**) on behalf of the Public Transport Authority (**PTA**). The TCL project comprises 14.5km of new passenger rail between Thornlie and Cockburn Central stations within the existing rail freight corridor, with two new stations at Nicholson Road and Ranford Road.

This development application seeks approval for the Nicholson Road Station (**the station**), which is to be located in the suburb of Canning Vale. The proposed station is adjoining the Nicholson Road bridge over the existing freight rail line and the new passenger railway, between the residential and industrial areas of Canning Vale. The site is located within the City of Gosnells (**the City**) and directly borders the City of Canning (north of station). This multi-modal station will comprise of the following:

- The main station building, including the station entry building, pedestrian overpass and platform level. The station is an 'up-and-over' station design, comprising an at grade station entry building, elevating to the pedestrian overpass, and then descending to the island platform. The pedestrian overpass will be 'future proofed' to enable a future linkage to the north-west when the existing 'General Industry' zoned (former Coles Distribution Centre) site is redeveloped.
- Bus interchange to the south of the station building, which includes 7 bus stands and 3 layover bays.
- Private vehicle parking, including a dedicated kiss-and-ride pick-up/drop-off area and separate long-term parking area designed for Transperth park-and-ride patrons. All vehicle access is provided from Panama Street / Tulloch Way (which will be modified/upgraded as part of this project).
- The station precinct shared pathway connection between Tulloch Way and Nicholson Road.
- Bicycle and pedestrian facilities including bicycle parking and shelters, passenger toilets, kiosk, station administration offices and ticketing areas, and universal access considerations.
- Associated landscaping and water sensitive urban designed drainage areas.

The TCL project will provide a passenger rail network connection between the existing Thornlie and Cockburn Central stations, in order to bridge the gap in rail infrastructure in the south east corridor and provide a public transport service to the surrounding communities. A key objective in the station design is to encourage non-private vehicle use for connection trips and apply principles which support opportunities for future transit-oriented development (**TOD**).

Given the current context of the site within a service commercial setting and fronting a major road, the bus-and-ride patronage is viewed as the greatest commuter opportunity for the Nicholson Road Station in the short to medium term. The station design recognises this opportunity, and focusses on maximising bus service convenience between the bus interchange and station building. Passenger comfort is also considered in the design, with weather protection provided between the station and bus interchange, and over all active bus stands.

The design of the station and precinct considers the locality's infill opportunities, having regard for the existing land use patterns in transition whilst encouraging more transit orientated forms of development over time. In particular, the station's future context has been considered during the design's development including consideration of the:

- Potential redevelopment of the adjoining distribution centre to the north of the rail corridor, by ensuring that the design of the station building and its connections to the wider area are able to be adapted to connect seamlessly to the northern side of the railway line.

- Department of Communities' land (Lot 801 on P411643), by ensuring an appropriate interface treatment with this future medium density residential development site, in a manner that encourages passive surveillance through dwelling design that orientates major and minor openings to overlook the station precinct.
- Potential transitioning of the light industrial area to the southwest of the station, by providing a linking shared pathway within the station boundary limits as an opportunity to connect into a future pathway along Tulloch Way by others.

This report provides the planning context and merit of the proposed development, and outlines an assessment of the application against the relevant planning frameworks, including the requirements of State Planning Policy No. 7 Design of the Built Environment and the METRONET Station Precinct Design Guide. As demonstrated through this report, the thorough technical reporting, stakeholder consultation and careful design consideration have all come together through the Nicholson Road Station design process to produce a transformative public transport infrastructure asset for the wider suburb of Canning Vale.

1. PROJECT BACKGROUND

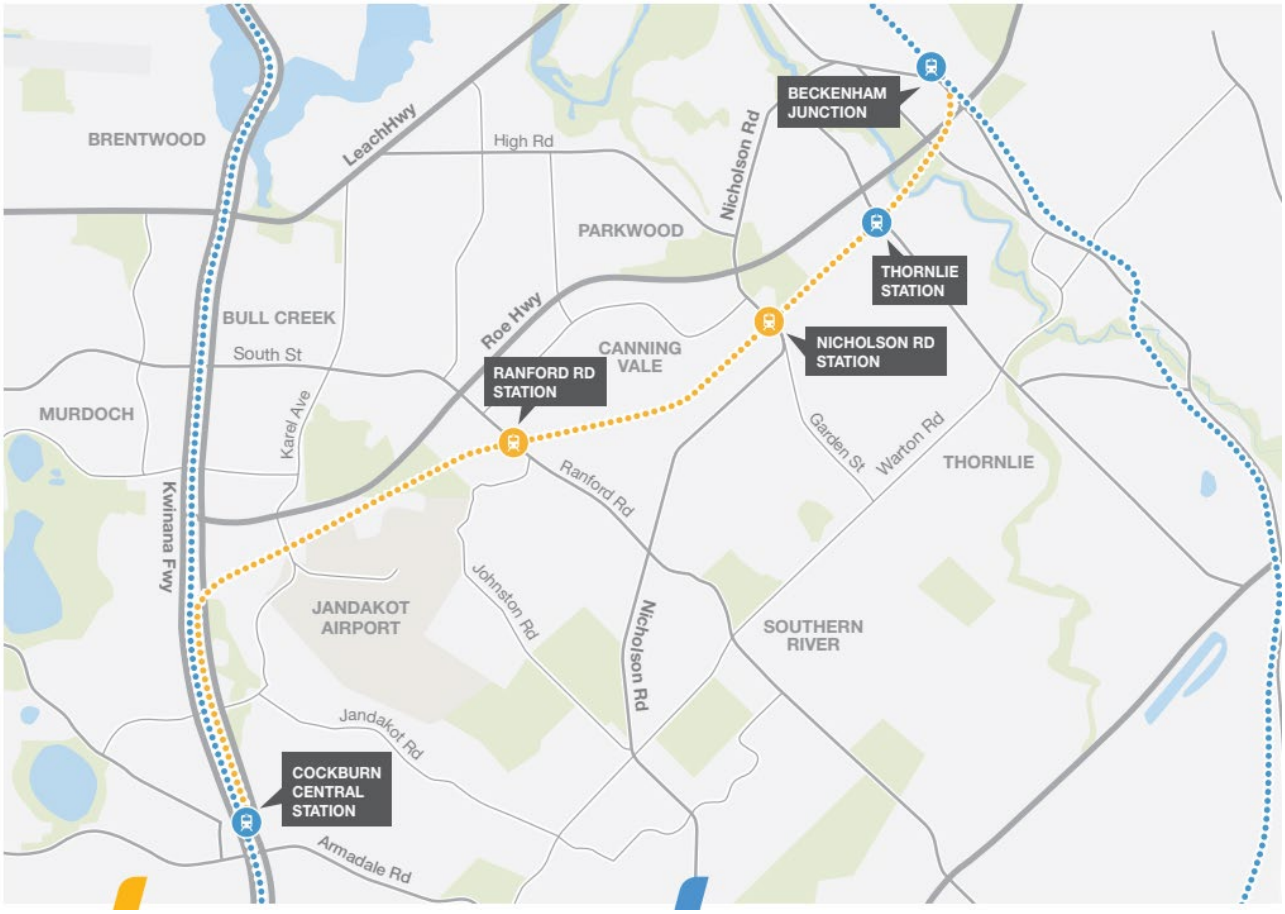
1.1. THORNLIE-COCKBURN LINK BACKGROUND

METRONET is a program of projects by the State Government that includes the single largest investment in public transport that Perth has seen. METRONET will provide a series of job-creating projects during construction but most importantly will also positively change how people live and travel in Perth into the future and create a more liveable and sustainable city.

Nicholson Road Station is being delivered as part of the METRONET Thornlie-Cockburn Link (**TCL**) project. The TCL project will see the construction of approximately 17.5km of passenger rail from Beckenham Junction, connecting the existing Thornlie and Cockburn Central train stations (Figure 1). The TCL project will become an important transport link, designed to bridge the gap in rail infrastructure within the south east corridor of the Perth metropolitan area, alleviate capacity constraints on the existing Mandurah and Armadale lines and provide new direct links to key destinations like Stadium Station.

The TCL project will deliver two new stations, being this one at Nicholson Road (Canning Vale) and one at Ranford Road (Jandakot). Connecting the Mandurah and Armadale/Thornlie lines will improve accessibility and thereby create new opportunities for future development around the proposed Nicholson Road Station. The TLC project is included within the Stage 1 works of the METRONET program, with early works on the station underway currently and the main construction work expected to commence in late-2020. Further information on the TLC project is provided at **Appendix A**.

Figure 1: Thornlie to Cockburn Link.



Source: METRONET 2019.

1.2. NICHOLSON ROAD STATION BACKGROUND

The future Nicholson Road Station will be located southwest of the Nicholson Road bridge. A key objective of the new station is to provide more convenient public transport services to the surrounding suburbs of Canning Vale, Thornlie, Parkwood, Lynwood, Langford and Ferndale. The proposed station will enhance existing services to the area and will act as a catalyst for urban renewal in support of medium to higher density residential and employment development in Canning Vale.

Although a review by METRONET found limited opportunities for immediate landside redevelopment (based on current land values and residential demand), a medium to long term view has been taken in identifying future development and redevelopment options. Development opportunities to increase the density and infill of existing residential areas within walking distance from the station include the, redevelopment of approximately 45ha of State Government-owned land, redevelopment of the adjoining distribution centre, and the transitioning of the existing light industrial/service commercial area to the southwest of the proposed station.

Patronage estimates calculated by METRONET project that there will be between 2,500 and 3,100 daily boarding's at the Nicholson Road Station by 2031. The station will also reduce the up to 1hr private vehicle peak hour journey to the Perth CBD, reducing the journey to approximately 26 minutes, providing direct and tangible incentives for commuters to consider public transport over private vehicle use.

1.3. PROJECT CONTEXT

The delivery arrangements under METRONET for the TCL project are structured as an Alliance contract. In December 2019, the NEWest Alliance, with CPB Contractors, Downer Group and the PTA, was formed and selected as the contractor to deliver the TCL project.

Funding for the project has been allocated by the State and federal governments, with the scope of the project approved by Western Australian Parliament in the form of a Project Definition Plan. The scope of the project is captured within the contractual arrangements, including the METRONET specified Scope of Work and Technical Criteria (**SWTC**). The SWTC document sets the design criteria, standards and guidelines that the station design is required to comply with and establishes the building blocks for the delivery of a highly functional and contemporary multi-modal train station.

The role of the NEWest Alliance is to interpret these basic requirements and apply them to the detailed station design and construction as proposed through this development application, including:

- Specification that the station must incorporate one island platform at rail level with an elevated walkway over and walkway at ground level providing access to the bus interchange.
- Required quantities of short and long-term car parking bays, as well as motorcycle/scooter bays.
- Bicycle parking requirements, including specification to provide one secure bicycle parking bay shelter and u-rails located adjacent to the station building entrance.
- A requirement to provide 7 active bus bays and 3 layover bays.
- Platform sizing, which is to be 150m long and cater for 6 train carriages with a minimum of 50% weather protection.

The station development envelope is also strictly defined by a number of factors, including stakeholder engagement and environmental constraints. In terms of the development approvals process, this essentially means that there are some fixed aspects to the project, and as a result there are limitations on the ability to make fundamental changes to the design scope and requirements. However, the opportunity to make pragmatic changes which remain within the scope of the SWTC and environmental approvals may still be considered.

2. SITE LOCATION & CONTEXT

2.1. SUBJECT SITE – EXISTING

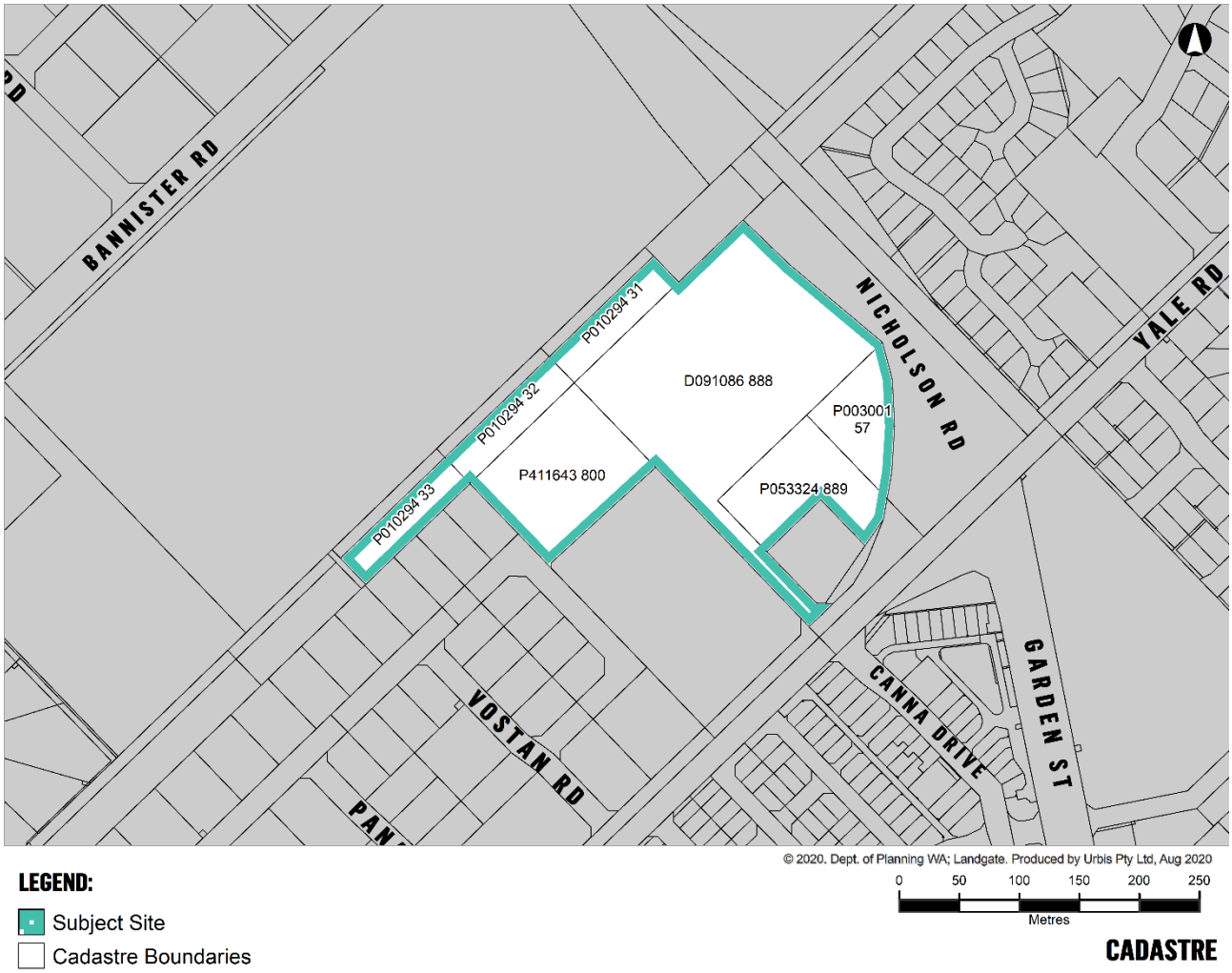
This development application affects 7 lots. The legal details of the lots directly affected by the station works and requiring approval are detailed in Table 1 and Figure 2. Aerial imagery of the site is provided at Figure 4, and copies of the Certificates of Title are provided at **Appendix B**.

All land is located within the City of Gosnells; however, the site borders the City of Canning local government area on the northern side of the railway line.

Table 1: Lot Details.

Lot No.	Plan No.	Vol / Folio	Landowner	MRS Zone
31	P010294	2935/118	State of WA	Railways Reserve
32	P010294	2935/119	State of WA	Railways Reserve
33	P010294	2935/120	State of WA	Railways Reserve
888	D091086	2094/376	WAPC	Railways Reserve Other Regional Roads Reserve (portion)
889	P053324	2662/398	WAPC	Railways Reserve
57	P003001	2094/377	WAPC	Railways Reserve Other Regional Roads Reserve (portion)
800	P411643	2942/299	WAPC	Urban Zone

Figure 2: Cadastral Plan – Existing Lot Boundaries.

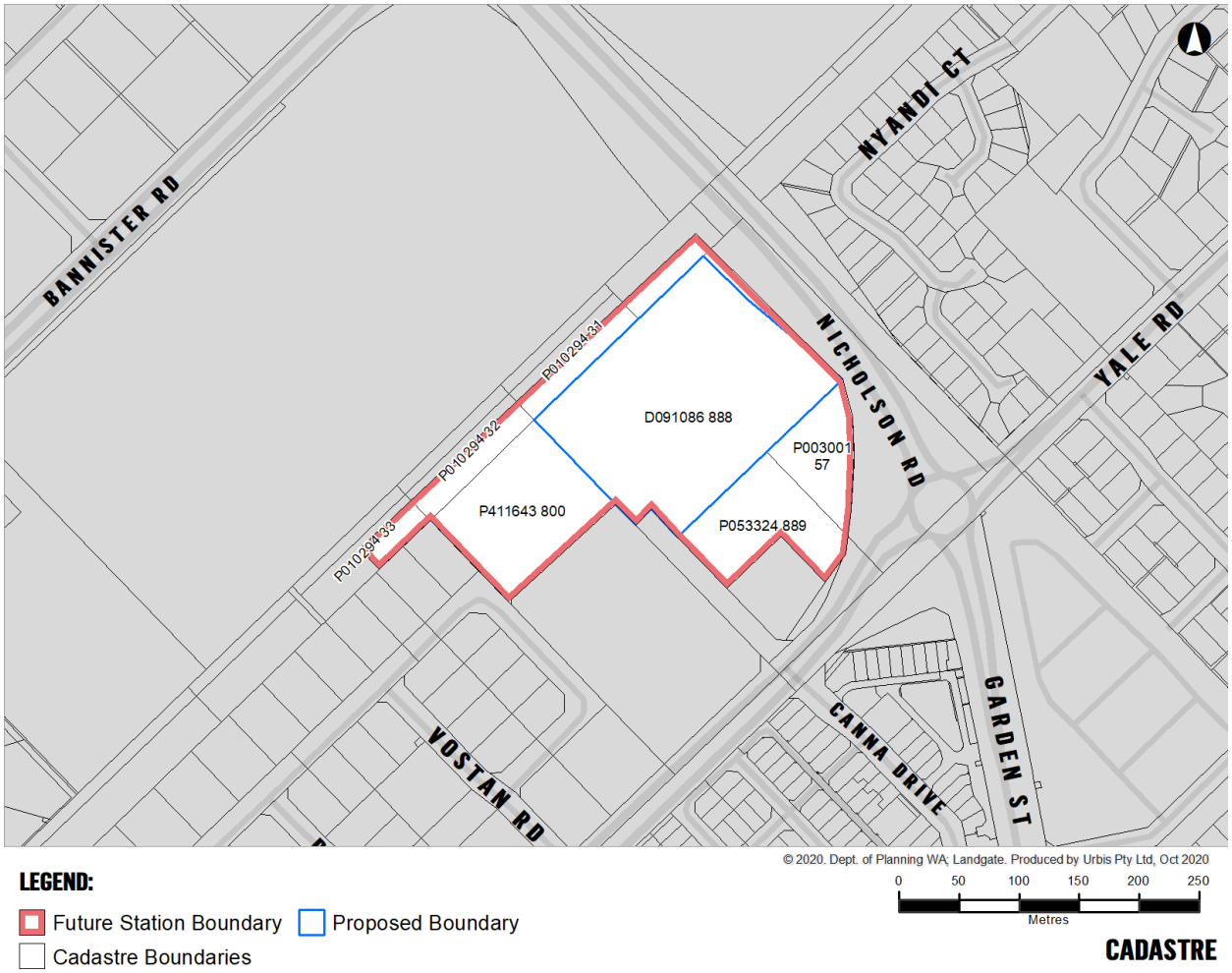


2.2. SUBJECT SITE – FUTURE

A subdivision application progressed by Bode Property Pty Ltd was granted approval in March 2020 (WAPC Ref. 158829). This subdivision approval resulted in Canna Drive being excised from existing Lot 888 and ceded as a public road.

The new Canna Drive road reservation is required to be upgraded by Bode Property through a condition of subdivision approval. Detailed design of Canna Drive is currently being progressed by the subdivider Bode Property. The below figure outlines the subdivision lot boundaries with Canna Drive excised. A copy of approved plan of subdivision is provided at **Appendix C** of this report.

Figure 3: Cadastral Plan – Future Lot Boundaries.



2.3. CONTEXTUAL CONSIDERATIONS

The proposed station is adjoining the Nicholson Road bridge over the existing freight rail line between the residential and industrial areas of Canning Vale. The site is located approximately 14km south-east of the Perth CBD. The future Nicholson Road train station will be located within the railway alignment reserved as 'Railways' under the Metropolitan Region Scheme (**MRS**) and abutting 'Urban Zone'. This area is identified as Planning Control Area No. 133 (**PCA**) which was established to facilitate the development of the land for railway and related public purposes.

As seen in Figure 4 the land surrounding the site is predominantly:

- Low density residential development to the north, east and south (suburbs of Thornlie and Canning Vale).
- Industrial development to the north-west and service-industrial/mixed-business development to the west.
- Recreation and public open space to the north, including the Perth Harley-Davidson Baseball Park, the Tom Bateman Sporting Complex Reserve and the Tom Bateman Wetlands.

Table 2 and Figure 4 provide insights to the immediate contextual considerations that are directly applicable to this application.

Figure 4: Aerial Plan.

Figure 5: Context Reference Plan.

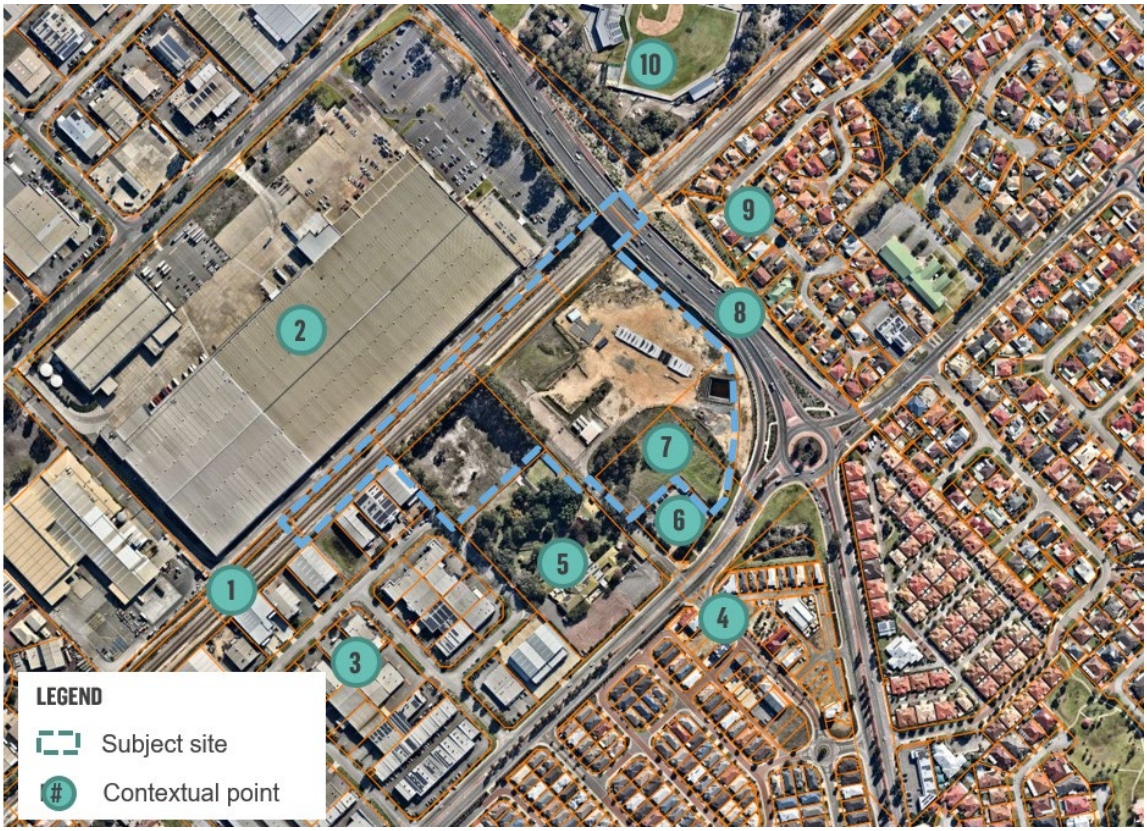


Table 2: Contextual Considerations.

Contextual Feature	Details
1. Existing ARC Infrastructure Freight Rail	The existing freight corridor will be utilised for the TCL trackwork alignment. Additional train lines will be installed in this freight corridor to service the passenger rail and acoustic walls will be installed where the corridor abuts residential development. Importantly, construction of the Nicholson Road Station will be coordinated to ensure the freight corridor will remain in operation during construction. Figure 6 below demonstrates the existing freight rail alignment.
2. Canning Vale Distribution Centre	The former Coles Distribution Centre is located to the north of the rail line, within the Canning Vale Industrial Area. The distribution centre is privately owned and identified by the City of Canning as a key location that could be potentially redeveloped for mixed-use purposes in the future. The station has been designed to enable a future connection to the north, should this site be redeveloped. Future discussions will be required between the State and the landowner to ensure appropriate connections and development interface is provided to/from the north side of the station.
3. Light Industrial Area	To the southwest of the site is an established light industrial area that contains a variety of warehouse, service commercial, storage and large format retail uses. The bus and vehicle access to the proposed Nicholson Road Station is via Panama Street and Tulloch Way. To accommodate the increases in traffic volume and bus movements, road upgrades and traffic management will be required which include the installation of new traffic lights at the intersection of Panama Street and Nicholson Road. Existing informal on-street parking will need to be removed with new parking bays installed. Following the development of the station and commencement of operation of the train and bus services, it is anticipated this area will experience increased development pressure for residential and retail type uses (based on access and exposure). The transition to a mixed-use precinct needs to be planned and accommodated by the City of Gosnells via its strategic planning and scheme review processes. This transition will be supported by the Nicholson Road Station infrastructure and a future Department of Communities residential project adjoining the station site, which will act to test demand in the short term.
4. Canna Drive Activity Centre	To the southeast of the proposed Nicholson Road Station, the Canna Drive local mixed-use activity centre has been planned and developed. The land currently comprises of a town square, and various business, food and beverage and retail land uses (many in shop top form) surrounded by residential development. As noted in section 2.2 of this report, the extension of Canna Drive road reserve north of Nicholson Road will be ceded through subdivision application no. 158829. A pelican crossing pedestrian linkage across Nicholson Road will also be constructed as part of the TCL project to ensure a continuous, safe pedestrian linkage is provided for the Canna Drive extension across Nicholson Road. Whilst this pelican crossing is part of the

Contextual Feature	Details
	TCL scope of works, the crossing is exempt from requiring planning approval and is therefore outside of the scope of this development application. Further detail on the pelican crossing is provided at section 3.3 of this report. As the Nicholson Road Station does not rely on Canna Drive for vehicle access, the involvement of NEWest / PTA in the ongoing negotiations on Canna Drive is limited to pedestrian movements between the station precinct and Canna Drive, and the use of consistent (or complementary) materials and landscape treatments between Canna Drive and the Nicholson Road Station precinct. For the purposes of this development application, it is proposed that the final hard landscaping material selection for the station precinct is provided through a condition of approval, to ensure consistency between the station site and the Bode upgrades to Canna Drive. The PTA and NEWest Alliance are undertaking fortnightly meetings with both Bode Property and Department of Communities so as to ensure the Canna Drive works align with the detailed alignment of the Nicholson Road pedestrian pathway networks.
5. Willow Ponds Development Site	The former Willow Pond Reception Centre is located to the south of the subject site (Lot 801 on P411643). The Department of Communities will be developing the rear portion of this site for medium density housing, and private developer (i.e. Bode Property) intends to develop service commercial, fast food and service station uses fronting Nicholson Road. To ensure an appropriate interface is reached between the Nicholson Road Station and these future development sites, the NEWest Alliance is undertaking fortnightly meetings with Bode Property.
6. WA Police Station	The WA Police building will remain in its current location and will not be impacted by the proposal.
7. Indigenous Heritage ('Waterhole')	The site is listed as the 'Nicholson Road Waugal Site' (Place ID 37225), which is identified as 'stored data / not a site'. 'Stored data / not a site' are places that have been assessed as not meeting section 5 of the *Aboriginal Heritage Act 1972* which details the application of the Act to significant places. However, through stakeholder engagement undertaken to inform the development of the station design, this site was identified as possessing indigenous cultural heritage significance and seen as an opportunity for the project to respond to the framework and targets of METRONET's Gnarla Biddi Strategy. The site has therefore been protected and incorporated into the station precinct's landscaping, to ensure any heritage values associated are maintained. Further detail on the design progression and engagement on the waterhole is provided in section 3.4 of this report.
8. Nicholson Road Pedestrian Underpass	An underpass was constructed as part of the Nicholson Road bridge construction works to provide for future pedestrian connection to/from the future station to the residential areas of Thornlie to the east of Nicholson Road, and to the existing path along Yale Road. The underpass is currently bricked up (refer to Figure 9 below) and not accessible from either side; nor is

Contextual Feature	Details
	there a local path connection immediately linking the underpass on the Thornlie side. Opening this connection and providing a shared path on the eastern side of Nicholson Road would provide connectivity to the new station for the wider pedestrian and cycling network in this local area. While this land falls outside of the project boundary and is therefore outside of the applicant's direct control and current scope of works, completing this connection has been identified as a 'best for project and community' opportunity. The PTA is therefore leading discussions with relevant parties, to resolve this matter in parallel to the station development approval process. Further discussion on this pedestrian network is provided at section 3.4 of this report.
9. Thornlie West	The established residential area bound by Nicholson Road, Yale Road and the existing freight rail is the closest residential development to the station. The opportunity to improve access to this residential area has been identified via the potential pedestrian shared path beneath Nicholson Road (east). Further discussions on this pedestrian network is provided at section 3.4 of this report.
10. Tom Bateman Reserve	The site is diagonally opposite a large regional 'Parks & Recreation' reservation, known as Tom Bateman Reserve. This land is utilised for recreational and public open space purposes and contains facilities including the Perth Harley-Davidson Baseball Park and the Tom Bateman Sporting Complex Reserve. Beyond these facilities, the Tom Bateman Wetlands exists. Access to the regional facilities will be enhanced by the delivery of the station, and access to the surrounding residential area is maintained through a new pedestrian footbridge at Elliott Place / Cameron Street. The TCL project will provide a grade separated pedestrian crossing to replace the existing at-grade crossing; however, this is not within the scope of the Nicholson Road Station development application.

Figure 6: Existing Freight Rail Track North of Nicholson Station.

Figure 7: Existing Nicholson Road Bridge Over Freight Rail.

Figure 8: Existing Canna Drive, as viewed from the Nicholson Station site looking south towards Nicholson Road.

Figure 9: Existing Nicholson Road pedestrian underpass (bricked up).

Figure 10: Existing Lot 169 on P019650 49 Nyandi Court (owned by WAPC).

2.4. AGENCY & STAKEHOLDER CONSULTATION

Since the formal announcement of the TCL project, the rail extension and associated stations have been the subject of significant public consultation and stakeholder sessions via METRONET, the PTA, and NEWest Alliance. The Nicholson Road Station is a project well known to the local community, with METRONET having undertaken various consultation efforts since the project's announcement. A detailed summary of these consultations including key outcomes is provided at **Appendix D** of this report.

These consultations included a development application focussed pre-lodgement meeting conducted by Urbis on 13 July 2020, where the following key matters were further discussed:

- Canna Drive treatment and extension.
- Connections and accessibility with the residential area to the south-east (across Nicholson Road).
- The incorporation and enhancement of the 'waterhole', including potential landscape and passive recreational improvements proposed to this area.
- The potential opening of the Nicholson Road underpass and the connectivity of the station proposal with the wider pathway network beyond the site.
- Upgrades (traffic lights) to Nicholson Road / Panama Street and improvements to the local road network, to improve station access and accommodate new bus services.
- Future upgrades planned by Main Roads Western Australia (MRWA), incorporating grade separated intersection for Garden Street and Nicholson Road.
- The public advertising requirements of the application – noting that the application would be the subject of a public consultation period conducted by the METRONET Office of the Department of Planning, Lands and Heritage (DPLH), and on this basis, no consultation period was required to be conducted by the local government directly.

Importantly, the NEWest Alliance will continue to conduct regular public and stakeholder consultation sessions throughout this project, which will occur independent of this development application assessment process.

3. PROPOSED WORKS

The following objectives have applied to the development of new METRONET stations, including this proposed station at Nicholson Road:

- Uphold functional, operational and amenity standards, and achieve overall excellence in design.
- Minimise environmental impacts.
- Optimisation of quality and value for money of public transport services.
- Providing benefit to the community, and ensure access, comfort and usability to the general public and stakeholders.
- Maintenance and life cycle cost risk minimisation, including a minimum 120-year design life of station structures and whole of life consideration in selection of materials.
- Provision for increase in patronage and provision of a high level of passenger amenity.
- Improving public security at the station through passive surveillance design.

These objectives have informed the overall station design, as outlined in the following sections of this report.

3.1. STATION WORKS SUBJECT TO THIS APPLICATION

The new stations for the TCL project are designed as an at-grade station entrance with 'up and over' access to the station platform. A summary of the works proposed by this development application include the following:

- The station building and entry building, connected via a pedestrian overpass located over the rail line and shared path. Within the entry building, an entry lobby is provided which provides access patron services, toilets and amenities, and to both platforms via stairs and lifts.
- A station platform of 150m length. Seating, bins, toilets, staff offices and mechanical areas are provided, along with lifts and stairs.
- A bus interchange adjacent the station entry which includes one-way circulation from Tulloch Way. This interchange includes 7 active bus stands for passenger pick-up/drop-off. The busway also contains 3 layover bus bays, allowing buses to park between services, and quickly recirculate as required.
- A drop off/pick up area adjacent the bus interchange which includes 24 short term parking bays.
- Associated staff, short-term and long-term parking bays (4 service bays, 142 short-term bays and 816 long-term bays), provided access from Tulloch Way.
- 11 motorcycle/scooter bays in an enclosed shelter. The bays will include 300mm high 'u-rail' hitching rails at the front of each motorcycle bay to securely chain the motorcycles to.
- Bicycle parking and end of trip facilities internally and externally located. 10 short-term bays are provided external to the station entry building via U-rails, and 96 long-term bays are provided for within an internal bike shelter within the station entry building equipped with a two-tier bicycling parking system.
- A new shared path network within the station precinct, which will provide a connection from Tulloch Way to the station building and continues along the eastern perimeter of the station site. This perimeter path will ultimately form part of the wider shared path network to be delivered by MRWA as part of the future Nicholson Road grade separated upgrades. Further discussion on this network is provided at section 3.4 of this report.
- Associated landscaping and drainage areas.

Artist imagery of the future station is shown in the below figures. The above key works are further detailed in the following sections. Development plans are provided at **Appendix E**.

Figure 11: Artist impression of Nicholson Road Station (looking to the east from the bus interchange).

Source: NEWest Alliance. Images are included for illustrative purposes only.

Figure 12: Artist impression of Nicholson Road Station (inside the entry building).

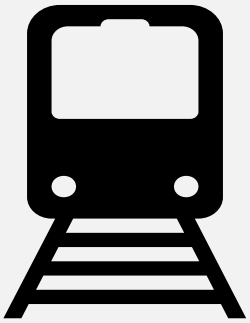
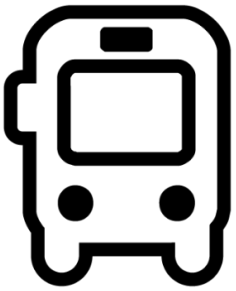
Source: NEWest Alliance. Images are included for illustrative purposes only.


Survey trees # that have potential to be retained, subject to further investigation and design.
#17
#18
#19
#20
NICHOLSON ROAD
INFO
INFO
PLATFORM
Garden Bed
Station Information Board
Landscape Seating
Car Park Entry Road
Entry Plaza with Feature Paving
Bus Interchange
Entry Building
Shared Path
Station Building / Platform

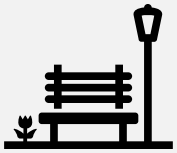
3.2. STATION DESIGN PRINCIPLES & INTENT

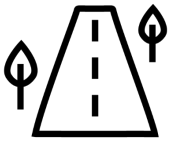
The scope of works set by METRONET also includes a number of qualitative design measures which have informed the final design of the stations. Table 3 below provides detailed information on how these qualitative design measures have been interpreted and applied to the station design.

Table 3: Proposed Works for Nicholson Road Station.

Proposed	Details
Station Design & Functionality 	The station will be designed with an 'at grade' integrated station entry building on the southern side of the rail line, and an island platform connected by a pedestrian overpass. The station entry building and pedestrian overpass link provide distinct and clearly identifiable entry points to the station and support intuitive wayfinding. Upon arrival, patrons will be welcomed into the station by an open entry lobby comprising various amenities, ticketing and information areas. The pedestrian overpass is fully enclosed and is located to facilitate simple access for passengers. It has been designed to accommodate the potential for a future extension of the overpass to the north west of the station and across the existing ARC rail tracks to facilitate future potential development of the Canning Vale Distribution Centre site by others. A variety of robust and visually appealing materials and textures have been included in the architectural design of the station, with a focus on providing for minimum maintenance needs and a long-life development. The architectural design maximises the potential for natural light and ventilation.
Bus Interchange Design & Functionality 	Nicholson Road Station is a multi-modal station, which includes a dedicated bus interchange located adjacent to the station entry building. Buses access will be provided via the Panama Street / Nicholson Road intersection, and then continue on to access the interchange via Tulloch Way. This intersection will be upgraded to a signalised intersection, but these upgrades are beyond the scope of this application. As bus-and-ride patronage is identified as the greatest opportunity for alterative (non-car) transport to the Nicholson Road Station, the bus station has been placed immediately adjacent to the station entrance. The bus interchange is designed to accommodate 10 bus bays in total including 7 active bus stands and 3 layover bays. The configuration of the bus interchange provides internal roundabouts to enable buses to circulate in a one-way clockwise direction between active stands and layover bays within the station precinct. The arrangement at each bus stand incorporates stainless steel seats, bins, lighting, CCTV coverage and information displays under continuous canopy. To deliver an integrated transport solution which connects the key areas within the station, a comprehensive and supportive feeder bus network will be delivered. A number of future bus routes have been considered to service the surrounding suburbs; however, these routes and services are yet to be confirmed and will be finalised prior to operation of the station.

Proposed	Details
Pedestrian / Cyclists Infrastructure and Wayfinding 	It is acknowledged that the current service commercial context of this area has resulted in limited existing pedestrian networks in this locality, particularly to the north and west. However, the station layout does pay consideration to potential future pedestrian and cycling networks, through the following: ▪ Tulloch Way: as this area transitions from light industry / service commercial to more urban intensive activities, it is expected that investment will be made into upgrading the pedestrian and cyclist infrastructure along this network as development progresses. In light of this, the station layout provides a shared path connection from the station building entrance to the point of interface with Tulloch Way. ▪ Nicholson Road (east): the potential for a continuation of the shared path connection beneath the Nicholson Road bridge has been identified. The station works subject to this application will include construction of the shared path network along the eastern perimeter of the station site. The intent is that this network will ultimately be completed as part of the Main Road scope of works for the Nicholson Road grade separated upgrades. Further information on this arrangement is provided at section 3.4 of this report. ▪ Canna Drive: Canna Drive will be excised from the station precinct and ceded as a road by third party developers (BODE) – refer to section 2.2 of this report. A condition of this subdivision approval will require upgrades to Canna Drive, which will include a pedestrian pathway. As Canna Drive will form a key pedestrian link to the Nicholson Road Station building, the station design will provide a direct pedestrian connection from Canna Drive to the station building entrance. Cyclists are provided options for both short-term parking outside of the station entry, and long-term secure parking inside the entry building. Parking facilities accommodate 106 bikes in total (96 within the internal bike store, 10 externals via U-rails), which meets the SWTC requirements. Space has also been provided to the south of the station entry building for future expansion of an additional bike shelter if and when required.
Station Parking 	To ensure the parking facilities do not undermine TOD principles, the long-term park-and-ride bays are located outside of the immediate station forecourt. This design serves the purpose of encouraging pedestrians, cyclists and bus transport ahead of private vehicle use, encouraging the shift to more sustainable modes of transit. Notwithstanding, it is noted that the Nicholson Road Station is best categorised as a 'Transit Node' station under the METRONET Station Precinct Design Guide, meaning some provision of 'park-and-ride' facilities are expected. To ensure this balance is met, the station provides for a range of short- and long-term parking facilities accommodating to cars, motorbikes and scooters, as well as universal parking requirements. The long-term parking area is located within the southern portion of the site, fronting Nicholson Road. This is an intentional measure, as this section of the site is identified as a low amenity area impacted by vehicle noise and hard barriers in the form of large retaining structures. In accordance with the Transperth operational requirements, the car parking will only be made available to the Transperth patrons (similar to the management of all Transperth dedicated parking facilities across Perth).

Proposed	Details
	However, as parking is applied on a ‘day-rate’ basis, this management measure enables patrons to undertake incidental multi-purpose trips within the locality combined with their commute.
Other Station Amenities 	Other station amenities that are noted within the entry building and/or on the platform include ticketing and information areas, passenger toilets, staff toilets and amenities, end of trip facilities and bicycle storage, internal signage, seating, bins, staff offices and other amenities/services such as vending machines and information displays.
Landscaping 	The landscaping concept for the site involves provision of a variety of hard and soft features within the following key areas: ▪ Within the station forecourt, which generally provides low lying vegetation and ground cover to ensure sightlines and CCTV surveillance is maintained. ▪ Throughout and surrounding the car parking area, adjacent to the shared path and along the perimeter of the site, where trees are planted to achieve canopy coverage. ▪ Landscaped drainage areas; located to the south of the station building (adjacent the Department of Communities site) and the southernmost end of the car park site (comprising the waterhole area of indigenous significance). The landscaping design provides a variety of water-wise and endemic species that will be arranged within garden beds. Forecourts are located immediately adjacent to the station entry and will include a hard-urban landscape with raised planter boxes, seating, shade and public activation (including potential public art installations). Connecting to this forecourt is a clear pedestrian spine which is flagged by landscaping and provides a key connection and wayfinding route to/from the station from the car parking areas and the future pedestrian connection to Canna Drive to the south-east of the site. In terms of the two larger areas identified for drainage and landscaping purposes, these areas will have a revegetation style finish but remain low-maintenance and accessible for periodic drainage system maintenance. The planting in these areas will be non-irrigated and comprise species suited to summer drought and winder inundation. Refer to the Landscaping Plan provided at **Appendix F**.

Crime Prevention Through Environmental Design (CPTED) 	Designing out crime and the creation of a perception of safety is recognised as an important consideration in the delivery of a contemporary public transport node. Whilst a thorough surveillance system and security presence is an important part of this, the design of the physical environment to incorporate CPTED principles also plays an important role in providing basic foundations to discourage crime. In light of this, the following CPTED design recommendations have been followed: ▪ Landscaping, vegetation and proposed external structures do not limit natural surveillance from within or at close proximity to the station precinct. ▪ Features in the forecourt and approach areas that may restrict the natural surveillance from the area surroundings are minimised. ▪ Vegetation is scoped and designed to avoid hiding points. ▪ Lighting complements the effective use of CCTV surveillance. ▪ Low maintenance structures, vegetation, easy cleaning fabrics and structures or fabrics and structures that cannot be easily damaged or marked (e.g. anti- graffiti finishes) are used for items that may be an easy target. ▪ Wall layout avoids 'dead zones' from the alignment of noise walls to allow for clear lines of sight. ▪ Open, clear-stemmed trees and the avoidance of bushy vegetation next to places of congregation, access ways, paths and building and retaining walls allowing visibility from and into these zones. ▪ The design has physical features to delineate private and semi-private spaces reducing the ambiguity of space ownership. ▪ Groundcover landscape: vegetation between shared path and surrounding areas will be low growing, maximising the opportunities for passive surveillance to monitor cyclist and pedestrians.
Streetscape and Road Works 	The Nicholson Station will be supported by the following key changes to the adjacent road network: ▪ The upgrade of the Panama Street / Nicholson Road intersection to a signalised intersection, to support safe bus movements and accommodate the station traffic volumes; and ▪ Installation of a pelican crossing to allow for pedestrian crossing across Nicholson Road (near Warrilow Loop). These works are exempt from requiring development approval. Further discussion on these exemptions is provided at section 3.3 of this report.
Public Art 	Public art within the station will be delivered in accordance with the requirements of the WA State Government Percent for Art Scheme, which requires 1% of the construction budget for new works over $2 million to be spent on artwork. This artwork will be delivered to be consistent with the themes of the wider METRONET Public Art Strategy and associated Yanchep Rail Extension & Thornlie-Cockburn Link Projects Public Art Strategy, with the thematic framework strongly built around the Gnarla Biddi story of 'Our Pathways'. A

	summary of the scope of works for public art is provided at **Appendix F** of this report. The integration of this artwork into the station design will be further developed through the detailed design phase, and it is expected that an associated standard condition of approval will be applied requiring further development and approval of a public art concept.

3.3. SUPPORTING WORKS (NOT SUBJECT TO THIS APPLICATION)

A number of supporting upgrades have been identified within the TCL project scope, which are designed to improve the safety and functionality of bus, vehicle and pedestrian movements into the station precinct. For the Nicholson Road Station specifically, these upgrades include the following:

- Construction of a pelican crossing across Nicholson Road (near Warrilow Loop) to provide a safe pedestrian connection across Nicholson Road, connecting the Nicholson Road Station and the Canning Vale mixed use and residential area to the south; and
- Signalisation of the Panama Street / Nicholson Road intersection, which will form the primary vehicle access point for the Nicholson Road Station.

These works will occur within the Nicholson Road, which is reserved as an 'Other Regional Roads Reserve' under the Metropolitan Region Scheme (MRS). As a result, the works are exempt from requiring development approval under clause 16(1a) of the MRS, which states that development approval is not required for:

> *works on land reserved for Primary Regional Roads or Other Regional Roads for the purpose of or in connection with a road within the meaning of the Main Roads Acts 1930.*

These upgrades are thereby outside of the scope of this development application. Regardless of this exemption, it was agreed during pre-lodgement consultation with the METRONET Office that a basic level of information for exempt works should be provided within the development application report, for context only and not part of the formal approval documentation. The package of information for these items is provided at **Appendix H** of this report.

3.4. ONGOING DESIGN DEVELOPMENT

As noted earlier in this submission, the Nicholson Road Station has been the subject of a 'site walk through' and stakeholder workshop, which included representation from the NEWest Alliance, PTA, City of Gosnells, Bode Property / Department of Communities and Office of Major Transport Infrastructure Delivery (OMTID).

Three key points of discussion from these stakeholder sessions, including the proposed action to be undertaken as part of this application is presented in Table 4 below and Figure 15.

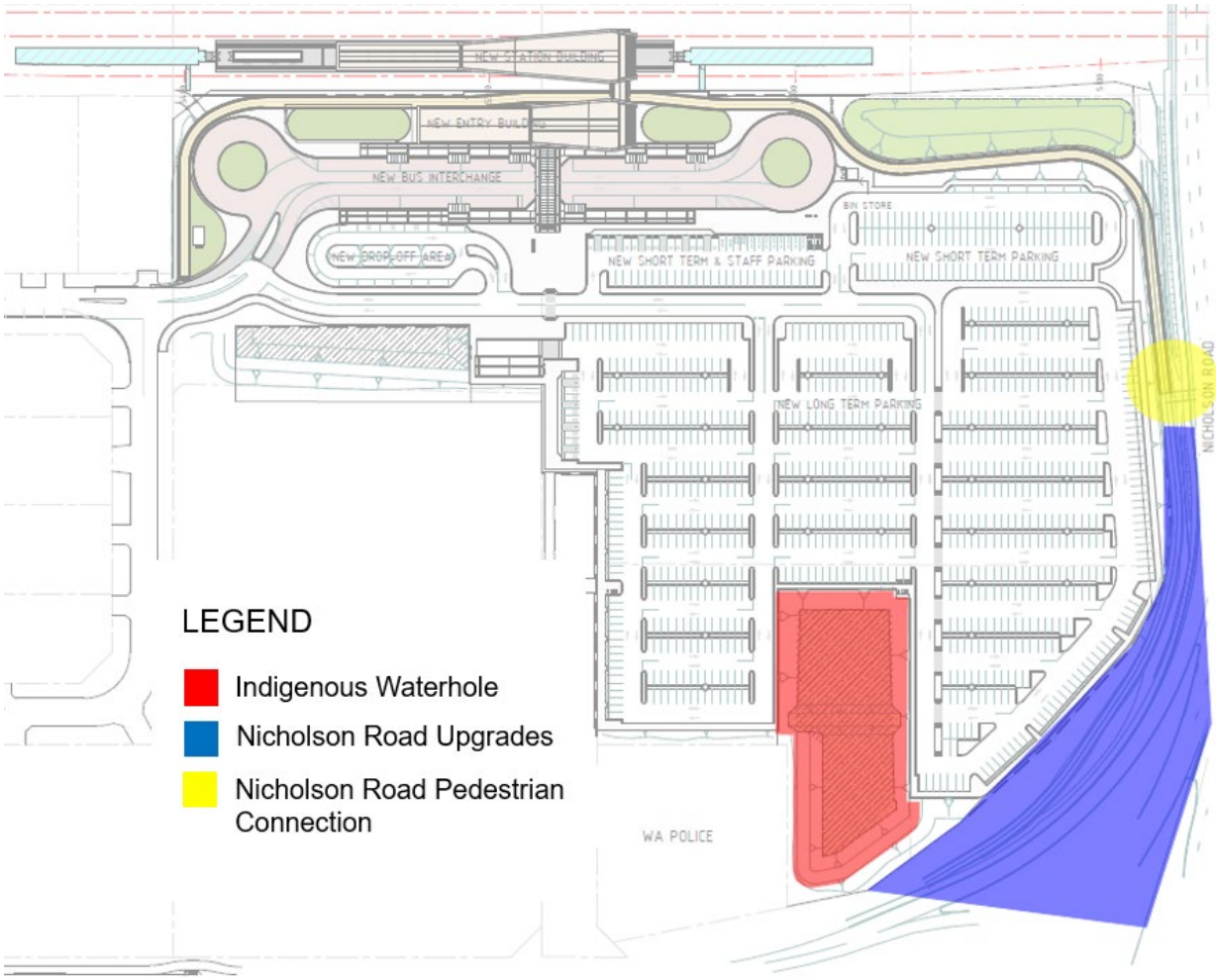
Table 4: Ongoing Design Development Areas.

AREA	ONGOING ACTIONS
Indigenous Waterhole (as shown in Red in Figure 14 below).	The retention and inclusion of the existing waterhole on the Nicholson Road Station site is an outstanding example of METRONET's endeavour to protect and enhance sites of Aboriginal cultural heritage within their projects' jurisdiction as part of the overarching Gnarla Biddi ('Our Pathways') Strategy. The initial planning intention was to have this waterhole removed to allow for a larger footprint of the station's car park. However, in consultation with PTA's environmental and civil team, and METRONET and NEWest's Aboriginal

AREA	ONGOING ACTIONS
	Engagement Coordinators, the project team developed an alternative design solution which allowed for the conservation of this natural site of indigenous cultural significance within the car park. The project team understands that the waterhole is not meant to be an open place for people, but is a habitat for the local flora and fauna that provides an essential source of food and water for birds during summertime, and forms part of the indigenous story telling. To increase wider understanding of its significance to this place, interpretative signage is considered to be essential and will be incorporated into the landscape design, as well as the opportunity for integrated artwork to the fencing if it is deemed to be appropriate. The landscape architects are consulting with NEWest's Aboriginal Engagement Coordinators in their specification of any new planting to ensure that it is both culturally appropriate and suits the PTA's environmental and drainage requirements for the adjacent drainage basin which services the station car park. Where possible, NEWest will endeavour to transplant or replace existing vegetation that carries Aboriginal significance, and which may be removed during construction of the car park or drainage basin. The Aboriginal Engagement Coordinators and the Noongar Reference Group will be consulted at the start of the drainage basin construction to identify any opportunities for cultural ceremony, and to ensure minimal disruption to the waterhole. The ability to incorporate paved areas and benches around the waterhole has also been explored through the landscaping design, the current status of which is shown below in Figure 15 and 16 below. This current design has been presented to and is supported by the METRONET Noongar Reference Group. The scope of works for this development application will include a 1.4m high fence surrounding the waterhole and adjacent drainage basin. This is required by the PTA specification requirements as a safety measure, given the area will remain under the ownership of and maintained by the PTA. Any required maintenance will be considered in consultation with METRONET's Aboriginal Engagement Coordinators with the view to an agreement that enables PTA access within the culturally significant site for maintenance purposes. The conservation of the waterhole is a remarkable outcome for the project and a result of the NEWest Alliance and the PTA working with the Noongar cultural engagement and placemaking initiatives as outlined in the Gnarla Biddi Strategy.
Nicholson Road Pedestrian Connection (Yellow) and **Nicholson Road Upgrades** (Blue) as shown in Figure 14 below	The scope of works as currently defined by the SWTC does not include for the completion of the shared path connections from the underpass to the Garden Street roundabout, as this area sits outside of the PTA's station precinct boundary. However, it is acknowledged that opening the existing Nicholson Road bridge underpass and providing path connections on the eastern side would improve connectivity of the pedestrian network into the station. For the purposes of this development application, the following must be noted: ▪ The completion of the shared path network to the east of Nicholson Road as part of the TCL project has become impacted by recent proposed additional works by Office of Major Transport Infrastructure Delivery (OMTID) for the Nicholson Road grade separation intersection. This upgrade of the Nicholson Road intersection to a grade separated standard

AREA	ONGOING ACTIONS
	is identified as a priority item for MRWA and is expected to receive State government funding in the short term. ▪ It has been identified that the best opportunity to complete the Nicholson Road pedestrian underpass connection to and from the station precinct is during the OMTID Nicholson Road grade separation works. The intent behind this is to prevent abortive works where the pathway is constructed as part of the TCL project and subsequently demolished when the OMTID grade separation works proceed. ▪ The benefits of this connection are well understood and supported by the PTA and METRONET, As such, ongoing conversations are occurring between PTA and MRWA / OMTID regarding the potential to incorporate a pedestrian underpass connection as part of the METRONET works; or providing an alternatively designed solution to complete the path network on this eastern side of Nicholson Road through a separate State government contract. Overall, the benefits of the Nicholson Road underpass pedestrian connection are well understood and supported by the TCL project team and OMTID. However, using State government funds to complete works which will likely be demolished in the short term is not best practice. Instead, the proposed approach of incorporating the Nicholson Road pedestrian underpass into the scope of works for the OMTID Nicholson Road grade separation upgrades is the most responsible approach to this pedestrian connection. A condition requiring these works should the grade separation not proceed may be considered appropriate should additional clarity and certainty be required.

Figure 14: Ongoing Design Elements.



GOVERNMENT OF WESTERN AUSTRALIA

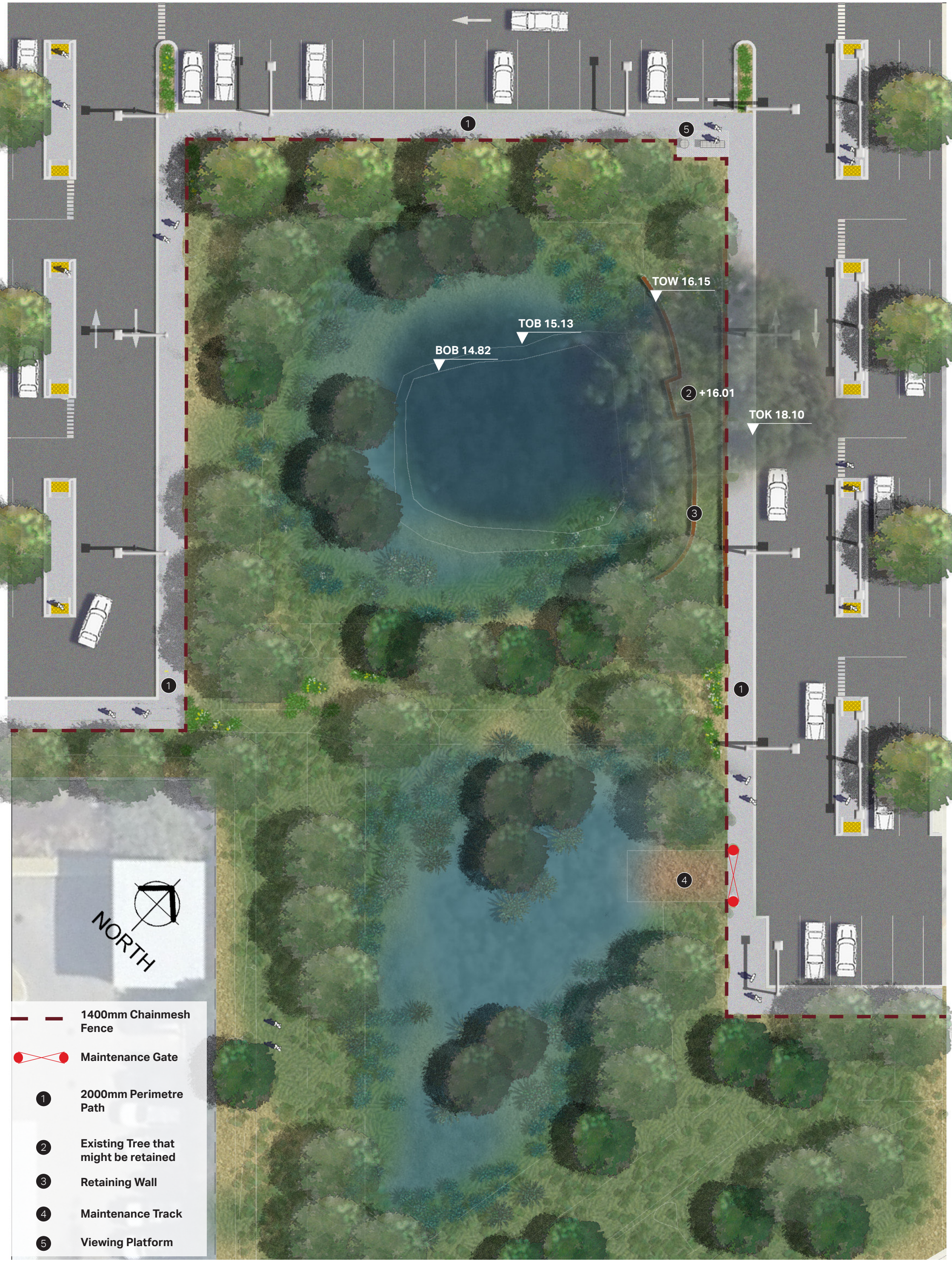
METRONET

AECOM

METRONET I TCL_Nicholson Road Station

WATER HOLE AND SURROUNDING AREA FENCE ALIGNMENT

CONCEPT PLAN NTS
DRAWING NO: SK_01
PROJECT NO: 60635935
DATE : 2020.10.19



GOVERNMENT OF WESTERN AUSTRALIA

METRONET

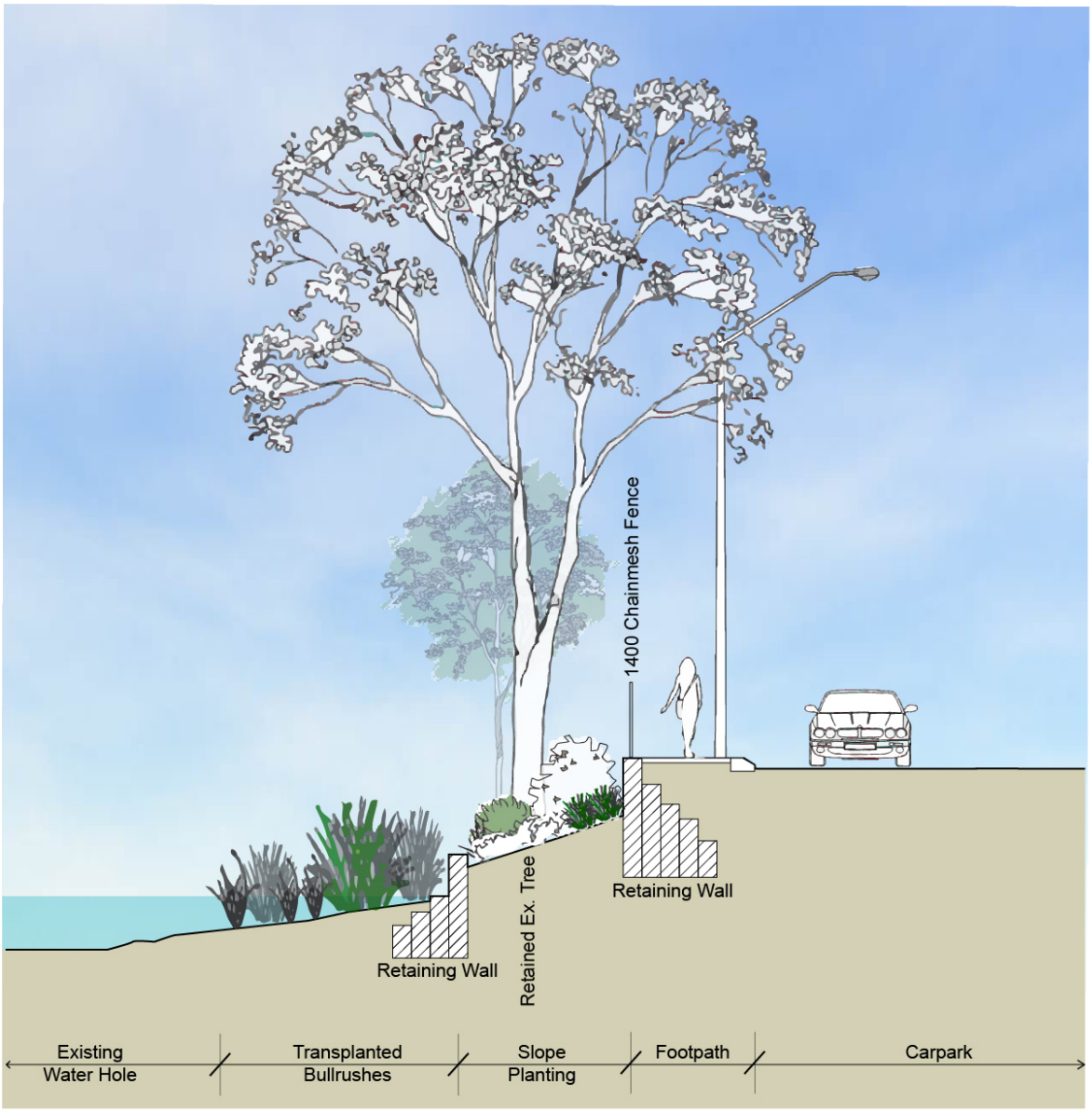
AECOM

METRONET I TCL_Nicholson Road Station

WATER HOLE LANDSCAPE CONCEPT

CONCEPT PLAN 1:250@A3
DRAWING NO: SK_02
PROJECT NO: 60635935
DATE : 2020.08.26

Figure 16: Section Plan of Indigenous Waterhole.



4. TECHNICAL REPORTS

4.1. TRANSPORT IMPACT ASSESSMENT

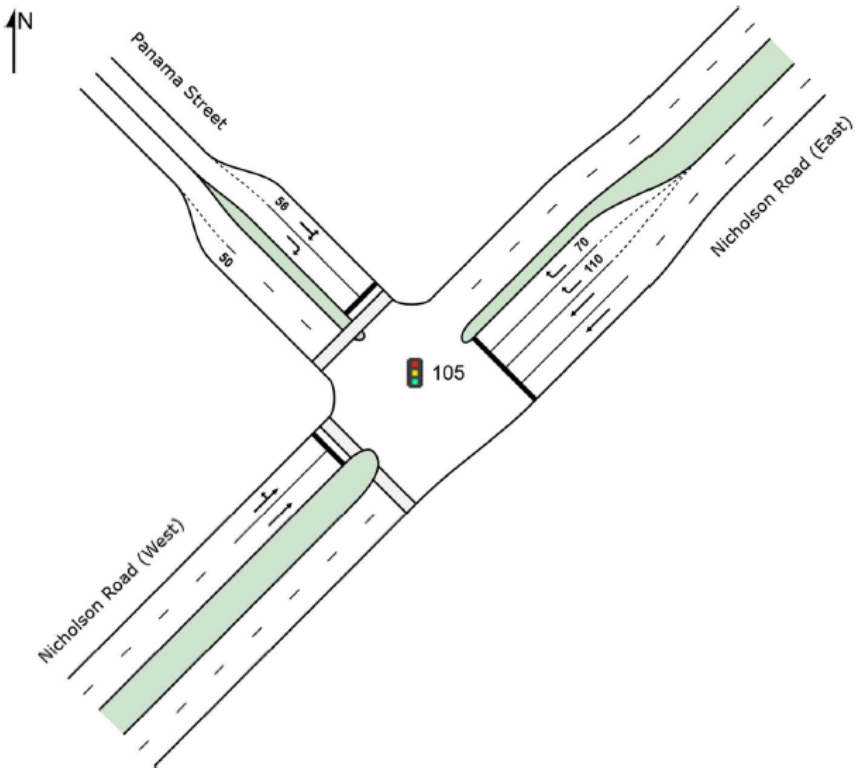
A Transport Impact Assessment (**TIA**) has been prepared to support the proposed Nicholson Road Station, including the station's impact on the established supporting road network. This TIA is provided at **Appendix I** of this report.

This TIA has been prepared in accordance with the framework established within the WAPC guidelines and examines the function and operation of access to/from the new Nicholson Road Station site for all modes of transport.

The TIA provides the following key conclusions:

- Access to/from the site for all vehicles (private vehicles and buses) is provided via Tulloch Way to the south-west of the site. It is noted that the intersection of Nicholson Road and Panama Street needs to be upgraded to a signalised intersection to accommodate the increase demand for turning vehicles. However, as noted in section 3.3 of this report, the signalisation of the intersection is exempt from requiring planning approval. The proposed design of the signalised and upgraded Panama Street / Nicholson Road (East) intersection is displayed in Figure 17 below.
- The TIA observed the AM and PM peak period to be 7:45am - 8:45am and 4:30pm – 5:30pm respectively. To ensure a robust traffic assessment, it was assumed that the peak flows from the station coincide with the peak road traffic background traffic flows along Nicholson Road.
- The SIDRA Intersection analysis of the proposed signalised treatment indicates some delays in the AM opening year (2021) scenario. By the future year scenario of 2031, the analysis shows that forecast growth in background traffic demand on Nicholson Road, in combination with patronage growth at the Station, is expected to result in some instances of LoS F during the AM peak period.
- Analysis of the Nicholson Road / Canna Drive signalised pelican crossing indicates that the addition of signals at the proposed crossing location is unlikely to add significant delay to vehicle movements along Nicholson Road, due to the upstream coordination with the Panama Street signals. Main Roads WA has also provided 'Stage 1 – Control Type Selection' signalised intersection treatment approval for the proposed pelican crossing signals along Nicholson Road, with the Stage 2 approvals process underway.

Figure 17: Proposed Panama Street / Nicholson Road (East) Intersection Design.



It is acknowledged that the modelling suggests some congestion is likely to be observed along Nicholson Road which will cause delay to the proposed signalised intersection by the year 2031, as background traffic levels increase. While the outcomes of the modelling exceeds the PTA target performance metrics for intersection movements, it has been concluded that adding extra traffic lanes would require resumption of surrounding land. As the impact of such works would be significant and costly, it was concluded that this was outside of the scope of works for the METRONET Nicholson Road Station project.

The alternative solution to manage this congestion is through manipulation of the traffic signalling sequencing at the Panama Street / Nicholson Road signalised intersection. These changes to the signalling pattern will give a longer cycle length to the station traffic (including PTA bus services). This approach will vary the MRWA default maximum cycle length of 120 seconds, and will be subject to approval of the 'Stage 2 Signals Approval' by MRWA Networks Operations Division.

The planned future Main Roads WA planned upgrade of the Nicholson Road / Garden Street / Yale Road roundabout into a grade separated interchange will likely also improve traffic flow along Nicholson Road, particularly in the AM peak. Local traffic management will continue to be monitored by OMTID to ensure appropriate traffic flows are achieved along Nicholson Road in the medium-to-long term.

4.2. CATCHMENT AND MODE SHARE REVIEW

NEWest Alliance has been commissioned by METRONET to undertake a review of the catchment analysis for the TCL line, based on the most recent land use, infrastructure and station design assumptions. **Appendix M** of this report summarises the data used, the methodology adopted and the findings of the analysis.

This note first considers the existing and forecast land use data and transport network to assess the potential catchments and associated patronage for each mode (car, bus, cycle and walk). This is followed

by a review of the likely mode split, which, along with the forecast patronage volumes, will inform parking requirements.

The review indicated the following likely patronage volumes for each mode share for the years 2021 and 2031, as presented in Table 5 below.

Table 5: Modelled Patronage Volumes.

Patronage by Mode	2021	2031
Walking	180	202
Cycling	90	101
Bus	1,013	1,139
Drop Off (Kiss ‘n’ Ride)	338	380
Parking (Park ‘n’ Ride)	630	708

As the land use within the station catchments not expected to change significantly between the future forecast (2031) and opening day (2021) years, the mode shares are expected to be similar for both scenario years. Although some TOD is expected to take place within the immediate station area no significant intensification within the wider catchment is expected. Therefore, it is expected that the active mode patronage will only increase incrementally over time, with potentially greater growth than forecast for areas within the bus and car catchments, such as Southern River.

Based on the above, long-term parking supply requirements for Nicholson Road Station have been assessed, using an assumed 1.1 parking space turnover rate and 1.2 vehicle occupancy rate. The analysis suggests that the current design provides a comfortable supply of parking for both the anticipated 2021 and 2031 demand, based on the patronage forecasts adopted for the TCL project. In practice, it is expected that the Nicholson Station will thereby provide a complementary source of parking for the local area and neighbouring station catchments.

4.3. ACOUSTIC REPORT

The key acoustic issues associated with the proposed station are predominantly environmental noise emission from station and entry buildings (including public address announcements and passenger movements), noise emission from car parking areas and bus movements. The supporting acoustic report provided at **Appendix J** outlines the outcomes of this assessment. A summary of the acoustic issues relevant to the station operations are as follows:

Noise emission – mechanical plant

Environmental noise levels from the Nicholson Road Station due to building services noise have not been assessed as the mechanical design has not sufficiently progressed to establish equipment selections. However, it is expected that standard noise control measures will be sufficient to control mechanical services plant noise in order to meet the required environmental noise criteria at adjacent noise-sensitive receivers.

Noise emission – car parking areas

The noise from the proposed car parks south of the station has been assessed, based on the car park layout and pavement design undertaken by the civil consultant. The predicted noise levels at the noise-sensitive receivers nearest the car park were found to be below both the daytime and night-time environmental noise criteria.

Noise emission – public address system

Noise levels at nearby noise-sensitive receivers from the station's PA system have not been assessed as the PA design has not sufficiently progressed to establish equipment selections. However, a limiting sound power level for the equipment has been established which should enable the environmental noise criteria to be achieved.

Noise emission – new station entry road and bus movements

The new Nicholson Road Station is to be accessed via the existing road network in the surrounding area. Nicholson Road will serve as the major distributor road which services the site. It is anticipated that the majority of vehicles will access the site via the intersection of Panama Street with Nicholson Road, before proceeding to Tulloch Way which leads to the main access point for the site. Key elements of the station access that are required to be assessed against the road traffic requirements of the SPP 5.4, including the station access road between the proposed new car park and these roads, associated car park, vehicles and buses using these roads, as well as the bus movements within the internal station area.

The noise from the proposed new car park connection roads, associated vehicles on the future road network and bus routes accessing the new bus station has been assessed. The predicted noise levels are predicted to achieve the SPP5.4 traffic noise targets at the nearest potentially affected receivers to the north east and west, but exceed the daytime and night-time targets at the nearest receivers to the south.

However, for this receiver location, it is noted that these station-related traffic noise levels are also to be considered in the context of the existing road traffic noise levels. With traffic volumes of approximately 32,000 vehicles per day (VPD) on Nicholson Road, 23,000 VPD on Garden Street and 16,000 VPD on Yale Road, traffic noise levels from station vehicle movements is expected to increase overall road traffic noise levels by around 1 dB at residential receivers to the south, which is considered to be imperceptible. Therefore, no further consideration of noise control measures is required.

4.4. INDIGENOUS HERITAGE

A wetland of indigenous significance has been identified within the Nicholson Road Station project area. The site is listed as the 'Nicholson Road Waugal Site' (Place ID 37225) and classified as 'stored data / not a site'. 'Stored data / not a site' are places that have been assessed as not meeting section 5 of the *Aboriginal Heritage Act 1972*, which details the application of the Act to significant places. Given this status, a formal heritage assessment is not a statutory requirement to inform a development application.

Regardless of the status of 'stored data', the PTA is committed to best practice aboriginal heritage practices and ongoing engagement with indigenous representatives. The Indigenous Heritage Survey provided at **Appendix N** of this report identifies these key measures, with the following recommendations of note:

- A notice pursuant to section 18 of the *Aboriginal Heritage Act 1972* to the Aboriginal Cultural Material Committee in respect of proposed works associated with the future Nicholson Road Station.
- A heritage information submission form should be submitted to the DPLH in respect of the wetland area at the future Nicholson Road Station - nominated as an Aboriginal cultural heritage site by the Whadjuk survey participants.
- The wetland at the proposed Nicholson Road Station site is treated as an Aboriginal cultural heritage site because it is a manifestation of the Waugal, and should therefore be protected by incorporation into a landscaped area.
- Arrangements for access to the Nicholson Road Station development area to convene meetings of the Whadjuk representatives onsite before construction commences. These processes (including monitors engaged by NEWest Alliance to attend on site for initial ground disturbance) will continue to occur independent of the development application assessment process.

As such, the above recommendations will be implemented in accordance with the METRONET Aboriginal Engagement Strategy (January 2019), and specifically in relation to Engagement Stream Five which deals with Land Access and Sites Management. This stream acknowledges existing processes in place to protect Aboriginal cultural heritage sites and aims to comply with the following framework of legislation, licences and agreements:

- *Aboriginal Heritage Act 1972*;
- *Native Title Act 1993*;
- *Noongar Recognition Act 2016*;
- PTA Noongar Standard Heritage Agreement (NSHA); and
- The South West Native Title Settlement.

4.5. STORMWATER MANAGEMENT

The Nicholson Road Station drainage strategy involves storing and infiltrating the entirety of the flows generated within the station precinct within two drainage basins. The first basin is located south of the station carpark as this is the lowest point of the station precinct and the second basin is located at the entrance near Tulloch Way.

Southern Basin and Waterhole

The southern stormwater drainage basin has been designed to cater for the majority of flows within the station precinct. This includes flows from the station carpark, short-term parking areas and a small section of the bus interchange. The base of the drainage basin is located 0.3m above design groundwater level (DGWL) and outlets via infiltration. Given the close proximity of the DGWL, the shallow water table model has been run using the PC Sump software in order to size the basin. A hydraulic infiltration rate of 2m/day has been adopted taking into account the geotechnical advice received as well as a safety factor of ‘2’ as per PTA requirements. Batter slopes of 1 in 3 have been adopted, as batter slopes of 1 in 6 would substantially reduce the capacity of the basin and would warrant numerous detention tanks throughout the station precinct.

The drainage basin will store the critical 10% Annual Exceedance Probability (AEP) events and storms exceeding this event will overtop the southern edge of the basin. It is proposed to collect this overflow within a cut off drain at the base of the basin embankment and to connect into the existing drainage infrastructure on Nicholson Road. Discussions with the City of Gosnells has determined that this design approach is feasible given the adequate capacity of the existing assets within the Nicholson Road drainage network. The top of the basin is proposed to be 0.15m above the low points within the station

carpark. This allows for the carpark to pond between 150 to 200mm prior to water overtopping the basin and out-letting into Nicholson Road reticulated drainage network.

The reconstructed waterhole is to be located adjacent to the proposed stormwater drainage basin and will be integrated with the basin's hydrological design. Given the cultural sensitivity of this site, an earthworks bund has been provided separating the waterhole from the actual drainage basin. The area south of the bund will be sufficient in size to cater for frequent storm events and will trap gross pollutants that may bypass the system of gross pollutant traps (GTP).

During larger storm events, the drainage basin will fill up and overtop this bund, and therefore the stormwater management strategy is to utilise the waterhole as additional storage capacity for the basin. The current waterhole is located below DGWL, and therefore, in order to hydrologically integrate this area with the basin, it is proposed to raise the waterhole to be 0.3m above DGWL. As the waterhole will no longer be located below DGWL, it is expected that the waterhole will be mainly inundated during winter months and major storm events. Maintenance access for both the drainage basin and the waterhole is provided on the eastern side of the basin.

Northern Basin

The northern drainage basin has been designed to predominantly cater for flows from the bus interchange, including hydraulic connections from the bus shelters and station building. Given the close proximity of the boundary line bordering the Department of Communities' site, this drainage basin is designed to have maximum batter slopes of 1 in 3, with the northern edge of the basin being walled. Maintenance access is provided from the eastern edge of the basin through the motorcycle parking area.

The base of the basin is 0.3m above DGWL and due to this, a shallow water table model has been used to size the basin. Based on geotechnical advice received, a hydraulic infiltration rate of 115m/day was tested on-site; however, a hydraulic infiltration rate of 8m/day has been adopted as per PTA requirements. The basin will store the critical 10% AEP event and storms greater than this will overtop the southern edge of the basin.

The overflow will be collected via a cut off drain at the base of the basin embankment and will connect into the City's existing Tulloch Way drainage infrastructure via a piped connection. Subsequent design stages will further investigate removing the walled side of the basin and battering down at a 1 in 3 grade.

Drainage Collection System

The bus interchange is proposed to drain towards the centre of the road in order to mitigate splashing of water onto pedestrians. The area to the north-east of the station building, is a trapped low point and ponding and therefore the pipe network has been designed to contain the 1% AEP event in this area. It is proposed to outlet this area into the southern drainage basin, as continuing this pipe to run down the centre of the bus interchange and out-letting it into the northern drainage basin would require the pipes to be graded at 0.2% in order to achieve minimum cover requirements. This would not comply with MRWA's supplement to AGRD part 5A which requires a 0.26% minimum pipe slope. Given the little opportunity to provide a water sensitive urban design (WSUD) treatment within this area, a HumeCeptor system has been proposed upstream of the basin.

The drainage within the drop-off parking zone utilises a bioretention swale within the central median. 300mm high drain blocks are proposed within the swale to promote storage and infiltration. Stormwater flow within the long-term car parking area is collected via aggregate trenches located between each bay. Further geotechnical advice is required to determine the hydraulic infiltration rate for each of these trenches; however, based on preliminary geotechnical advice, a conservative 1m/day has been assumed in the interim.

Given this infiltration rate, the majority of the trenches fail to cater for the first flush event and instead will overflow into the pits provided within the low point of the trench. Further investigation into the integration

of the pits within the trench is required at subsequent design stages. Given that these trenches fail to cater for the first flush event, HumeCeptor systems have been proposed at the outlet of each pipe prior to discharging into the basin. There is an opportunity to remove these HumeCeptor systems should the trench be able to cater for the first flush event.

All pits are typically either grated gully pits or manholes as per MRWA standard details. Cut off drains are provided at the base of the carpark batters. These cut-off drains are proposed to outlet either into soak wells where possible, or into catchpits and connect into the existing drainage network. Further investigation is required to determine the extent of cut-off drains along the eastern batter of the station precinct. There may be an option to integrate this drainage with the underpass drainage system pending further information.

4.6. BUSHFIRE RISK

The site is partially identified within a bushfire risk prone area which is triggered by the large area of public open space and recreational space to the north of the site following Nicholson Road (Figure 18). The proposed development does not include any habitable buildings within this area. In accordance with section 78D of the Planning and Development (Local Planning Scheme) Regulations 2015, before commencing development on a development site a Bushfire Attack Level (BAL) Assessment is to be prepared if the building envelope of habitable buildings is within the bushfire prone area.

Given the above, no BAL assessment or Bushfire Management Plan (BMP) has been undertaken to inform this proposal.

Figure 18: Bushfire Risk Mapping Extract.

Source: Department of Fire and Emergency Services, 2020 (DFES).

5. SUPPORTING APPROVALS AND MANAGEMENT PLANS

A number of environmental approval processes and associated management measures required to deliver the station have been progressed, which has occurred independent of this development application approval process. The following table provides a summary of those approvals.

Table 6: Summary of Supporting Approvals and Management Measures.

CONSIDERATION	DETAIL
Environmental Approvals	State Environmental Approval (under the Environmental Protection Act 1986) was granted via Ministerial Statement No. 1114 was issued on 23 September 2019. This approval has granted approval for the clearing and disturbance of vegetation associated with the entire TCL line, including the Nicholson Road Station. Commonwealth approval under the *Environment Protection and Biodiversity Conservation Act 1999* was granted on 20 Jan 2020. A summary of the TCL Environmental Management Strategy is provided at **Appendix K** of this report.
Noise Monitoring Program	A noise monitoring program will be implemented within three months of the opening of the TCL line, and again at 18 months, to assess the effectiveness of noise mitigation. Specifically, the program will: • Confirm the as built and operating railway achieves the Policy target LAeq (Day) 55 dB and LAeq (Night) 50 dB unless higher levels are permitted due to the incorporation of specified house facade protection. • Assess the accuracy of the pre-construction noise modelling predictions that were used to determine noise reduction treatments. The PTA also has existing procedures for receiving noise complaints, which will be extended to the TCL operations.
Out of Hours Work	Due to the nature and scale of the project, it is likely that some degree of 'out of hours' and 'night shift' work will be required during the construction stage of this project. An Out of Hours Construction Noise and Vibration Management Plan will be provided to the City prior to the out of hour's works occurring. Acceptance of this Construction Noise and Vibration Management Plan will meet the notification / approval requirements as required by the Environmental Noise Regulations. For the purpose of the planning approval process, we request that any condition of approval related to construction hours is worded in a manner that does not restrict the out of hour's works (subject to acceptance of the Construction Noise and Vibration Management Plan).

Construction Management Plan	A construction management plan will be delivered by the PTA / NEWest Alliance prior to works commencing on site, which is expected to be reflected through a condition of development approval. A summary of the TCL Construction Program is provided at **Appendix L** of this report.

6. DESIGN REVIEW

Prior to the lodgement of this development application, the applicant has worked with the Office of the Government Architect (**OGA**) and procured a design review of the station by the OGA in July and September 2020. Table 7 below includes a summary of the OGA comments and the project architect's (**CAAMPS**) response to each of the comments.

Table 7: Applicant Response to OGA Comments.

	OGA Comment	Applicant Response
Station Precinct		
1.	It is unclear how the arrangement of the precinct will enable/integrate with future development of adjacent areas particularly the proposed mixed-use centre to the south-west of the site and the anticipated extension of Canna Drive. It would have been beneficial to see how future development opportunities and anticipated infrastructure have been accommodated/responded to within the design, particularly for the south-west edge of the main carpark and the arrival forecourt. Also, valuable would have been an indication of the expected design life of key precinct elements (e.g. how permanent/temporary) noting the intent to 'bank' land within the station precinct for future development opportunities.	NEWest and the PTA are holding fortnightly interface meetings with BODE / Department of Communities to ensure an appropriate interface is reached between these developments. At this point in time, the development has considered the potential future of these sites and connection points to/from and has provided adaptable interfaces that can enable appropriate transitions of these areas to take place in the near future, which will be further considered as the surrounding area is developed.
2.	We note that the Station design has accommodated the potential for a future pedestrian link with the north side of the train line, which is supported.	Noted Flexibilities to extend the station building concourse overpass and the island platform arrangement have been accommodated in the design to enable this in the future if and when the Canning Vale Distribution Centre is redeveloped by others.
3.	Opportunities should be explored to integrate the 'kiss and ride' area into the main cross street, with consideration given to reducing the number of bays. This would free-up space within the precinct for high quality landscape treatments and future development opportunities.	The provision of a kiss-and-ride pick up/drop off area is a key PTA requirement for station precincts, and the quantity of bays proposed have been provided in accordance with the minimum quantity specifies in the SWTC. There may be future opportunities to relocate this drop off area elsewhere within the site once future development occurs, however at this point in time the facilities have been located nearby the entry to the station to encourage more sustainable forms of transit to/from the station, in lieu of private vehicles.
4.	Pedestrian journeys between the Station and main carpark require further consideration. A safe, legible and amenable pedestrian access network that separates pedestrians from the road space and provides appropriate	CPTED principles have highly informed the development of the design for the station. Various measures have been considered such as low-scale landscaping, lighting in accordance with AS, transparent materials, consideration for

	OGA Comment	Applicant Response
	crossings to link with destinations should be provided. This network should also be supported by appropriate lighting to ensure after-hours safety and comfort of use.	sight-lines, CCTV cameras and other safety and security measures have been included in the design to ensure the safety and wellness of the stations users and the transport infrastructure.
5.	METRONET has made a strong commitment to WSUD however there is limited demonstration of these principles beyond a 'business as usual' approach despite the site possessing unique water features and characteristics. Issues include: ▪ It is unclear from the drawings whether the original profile of the waterhole is being retained and how it integrates with the proposed landscape. The existing form of the waterhole should be retained following general principles of culturally sensitive design and WSUD. Additional consideration should be given to providing an appropriate spatial/vegetation buffer and public access paths to the waterhole to better enable its use by the local community and afford it an identity that is not overwhelmed by the presence and impact of the carpark. ▪ There is a lack of localised stormwater retention elements corresponding to areas that will produce the largest amounts of stormwater (e.g. the main carpark). This suggests a stormwater strategy that relies on significant subterranean civil infrastructure for conveyance. ▪ It is unclear from the drawings what is proposed as the Controlled Groundwater Level. Sections would have been helpful to show the position of infrastructure in relation to this level.	The stormwater basin fronting Nicholson Road will serve a dual purpose of accommodating stormwater and preserving the identified indigenous heritage waterhole. This dual function is achieved by combining the two functions into one area, but deliberately separating the stormwater infiltration area from the spaces of heritage value. This approach ensures that water infiltration does not occur and potentially damage existing heritage values of the area. As noted in section 3.4 of this report, the final design of the drainage basin will be subject to ongoing consultation with the METRONET Aboriginal Engagement Coordinators.
Built Form		
6.	The built form indicates a clear conceptual diagram consisting of a concourse element, raking forms to platforms and horizontal canopies. We encourage further work to ensure the conceptual intent transposes clearly to drawings/documentation and that major formal elements integrate well with each other. Areas for further improvement and resolution include: ▪ The concourse volume/built form so that it reads as a distinct element while integrating with surrounding built fabric through simple,	These detailed design comments are acknowledged and will be incorporated in the in the 85% design phase of the project.

	OGA Comment	Applicant Response
	clear and robust detailing and junctions. Renders and drawings (e.g. elevations) are slightly inconsistent in how the concourse sits within the overall built form. ▪ The cross-over roof canopy, particularly where it meets the built form of the Station Entry. ▪ The maintenance access ledge and fascia that skirts the Station's concourse glazing.	
7.	Extensive glazing is proposed for the facades of the concourse and entry lobby. To ensure internal amenity and comfort for users, consideration should be given to minimising heat loads through the integration of shading and passive ventilation measures (e.g. louvres) within the composition of facades, particularly on the north-west elevations.	Passive ventilation measures are being incorporated into the design and are being captured in the 85% design.
Materials and Finishes		
8.	Fibre Cement Sheet is proposed as cladding for the concrete piers at the platform level (below the overpass section of the concourse). If there are no service riser requirements consideration could be given to pursuing a natural concrete surface finish to these piers, with detailing to ensure a robust surface finish is achieved, or else, a textured finish that relates to the overall design intent. We note a similar approach proposed for Ranford Road Station where piers are 'boxed out', however the drawings specifically note 'Vitrapanel' as the cladding. Consistency in approach and materials for various architectural elements across different Stations is encouraged where possible, however, we recommend only hard wearing pre-finished products be utilised to support long-term performance of materials and minimise maintenance over the Station's life-span.	Prefinished Vitrapanel cladding is being used at Nicholson Road Station to provide a consistency of approach and to provide a higher quality hard wearing and prefinished fibre cement sheet product that will support long-term performance of materials and minimise maintenance over the station's life-span
Landscape Design		
9.	The existing topography of the site and the levels of the proposed landscape are not documented within reporting or drawings. It is therefore difficult to assess how the proposed landscape has considered the directions of stormwater flow, potential impacts of the shallow ground water conditions (e.g. the	A site survey has now been provided in the development plan package. Detailed stormwater design including consideration of the shallow ground water conditions will be delivered through a condition of approval.

OGA Comment		Applicant Response
	Design Ground Water Level) and the interface with the existing waterhole.	Further design refinement has also been made to the indigenous waterhole, as outlined in section 3.4 of this report.
10.	Consideration should be given to pursuing more localised stormwater retention elements for the main carpark area (e.g. such as the swale strategy used in the Kiss and Ride area). Alternatives to the retaining structure proposed within a large swale located on the west side of the site should also be investigated. More localised swales elsewhere may enable this revision.	The design includes considerations for on-site stormwater management and proposes to direct runoff from roads, buildings and other structures to swales and basins within the site.
11.	See further comments above regarding the waterhole.	Refer to the above response.
Public Art		
12.	We have tentative support for the public art concept, particularly the potential for a work of art to help signal the main arrival point to the Station and for the opportunity for art to link from the public realm into and through the Station. We encourage the Alliance team to utilise the METRONET Gnarla Biddi Aboriginal Engagement Strategy to ensure appropriate cultural recognition and input from Aboriginal stakeholders is sought. We also encourage appointment of a public art consultant so that a public art concept can be developed early within the next project stage and properly integrated.	Public art within the station will be delivered in accordance with the requirements of the WA State Government Percent for Art Scheme and will be further developed through the detailed design phase. It is expected that an associated standard condition of approval will be applied requiring further development and approval of a public art concept. Refer to the Public Art Summary provided in **Appendix G** of this report for an overview of how the Yanchep Rail Extension & Thornlie-Cockburn Link Projects Public Art Strategy (April 2020) is being implemented in this proposal.

7. PLANNING ASSESSMENT

This section of the report provides a planning assessment against the relevant state and local planning frameworks, in addition to the METRONET Station Precinct Design Guide.

7.1. STATION DESIGN PRINCIPLES

State Planning Policy No. 7 Design of the Built Environment (**SPP7**) suite of documents provides the overarching urban design and placemaking goals for the station, and its integration with the surrounding urban environment. SPP7 details 10 guiding design principles, which are used as metrics in the consideration of quality design.

The proposed station has been assessed against these 10 guiding design principles to demonstrate its compliance with SPP7 (refer to Table 8).

Table 8: SPP7 Design Principle Assessment.

Design Principle	Summary of Design
1. Context and character *Good design responds to and enhances the distinctive characteristics of a local area, contributing to a sense of place.*	The site has been identified by METRONET as a strategic site to accommodate the future Nicholson Road Station. The proposal responds to its strategic context by delivering a multi-modal station. The new station also allows for changes to take place in the surrounding area to support medium to long term residential and employment development in Canning Vale in line with the objectives of the Perth and Peel @ 3.5 Million and the Sub-Regional planning framework. The design of the station has responded to its local context via consideration of the future intent for the areas nearby including Canna Drive and future interfacing developments. The design of the station has considered the wider impact of the new station on the current road network, by providing vehicle and bus access from Tulloch Way. The new dual path has considered the wider pedestrian and cyclist network beyond the site by connecting with Tulloch Way to the west, Canna Drive to the south, and the underpass tie in point to the east at Nicholson Road.
2. Landscape quality *Good design recognises that together landscape and buildings operate as an integrated and sustainable system, within a broader ecological context.*	Two areas of existing vegetation on the site have been largely maintained and incorporated into the stations landscaping and drainage areas. This includes the area that is understood to contain indigenous cultural heritage values. Additional landscaping features are also proposed surrounding the station to contribute to positive environmental outcomes. A series of hard landscaping areas are provided surrounding the station entry building to provide amenity and create

Design Principle	Summary of Design
	a sense of arrival whilst also responding to the functional and operational needs of the station.
3. Built form and scale *Good design ensures that the massing and height of development is appropriate to its setting and successfully negotiates between existing built form and the intended future character of the local area.*	The station building and entry building is 10.6m in height when measured from the top of the planform and 11.3m in height when measured from ground level adjacent the entry building. It could be considered that the station building presents at the scale of a two story building, which considered to be in accordance with the scale and built form of the existing adjacent developments and the intended future character of development (medium density residential and commercial development) of the adjacent Department of Communities site.
4. Functionality and build quality *Good design meets the needs of users efficiently and effectively, balancing functional requirements to perform well and deliver optimum benefit over the full life cycle.*	As noted above, the design of the station has been established with reference to the SWTC which includes a number of requirements in order to achieve the intended operations of the station and passenger rail functionality. The station has been designed in accordance with METRONET and PTA requirements and guidelines and reflects the key objective of the station's design, to encourage non-private vehicle use for connection trips and apply principles which support opportunities for TOD.
5. Sustainability *Good design optimises the sustainability of the built environment, delivering positive environmental, social and economic outcomes.*	The key sustainability benefit of the proposal is that it is delivering a multi-modal station, and pedestrian and cyclist infrastructure which provides for various alternative transportation modes for the local population to utilise in lieu of their private vehicles. The delivery of this station is key to achieving the State government's objectives to increase the usage of public transport services and reduce private automobile use. Key objectives of new METRONET stations includes ensuing a minimum 120-year design life of station structures, and whole of life consideration in the selection of materials. A variety of robust and visually appealing materials have been included in the architectural design of the station. The architectural design maximises the potential for natural light and ventilation, and allowance has been made for future provision of a PV power supply system to be installed at a later stage.

Design Principle	Summary of Design
	Two areas of existing vegetation on the site have been maintained and additional landscaping features are proposed surrounding the station to contribute to positive environmental outcomes.
6. Amenity *Good design provides successful places that offer a variety of uses and activities while optimising internal and external amenity for occupants, visitors and neighbours, providing environments that are comfortable, productive and healthy.*	The design of the station provides for various amenities related to the provision of public transport services. A variety of other amenities including features such as seating, shelter, toilets, cyclist facilities and landscaping features provide for a sense of comfort and visual appeal whilst providing for the needs of patrons.
7. Legibility *Good design results in buildings and places that are legible, with clear connections and easily identifiable elements to help people find their way around.*	As noted in section 3.2 of this report, the design of the station has given careful consideration for pedestrian and cyclist comfort, connectivity and wayfinding. The design layout of the station has focused on ensuring pedestrian priority particularly between the train station and the bus interchange adjacent, with a priority pedestrian crossing and paths under continuous canopy provided from the station entry building, to and between the bus stands and the station carpark. Similarly, the location of the shared path also ensures pedestrians and cyclists are given priority and direct access to the station entry. A key objective of the design has been to maintain clear pedestrian sightlines to/from and within the stations buildings, highlight entry points and movement pathways throughout the site and within the station building. This is demonstrated through the direct connection from the station entry to the integrated pedestrian network within the station, and the connection of the shared path to the wider pedestrian and cycling network. The station design also supports uninterrupted pedestrian connectivity to both sides of the platforms during operational hours and universal access considerations.
8. Safety *Good design optimises safety and security, minimising the risk of personal harm and supporting safe behaviour and use.*	Maintaining security and comfort of patrons is a key objective of the station design, and an overarching principle that PTA staff respect and abide by. As noted in section 3.2 of this report in depth consideration has been given to CPTED principles during design development. This has concluded in a proposed design which optimises the safety of

Design Principle	Summary of Design
	patrons by installing a variety of CPTED objectives into the design.
9. Community *Good design responds to local community needs as well as the wider social context, providing environments that support a diverse range of people and facilitate social interaction.*	The proposed development delivers a public transport service – a service which facilitates opportunities for social interaction during daily commutes. The proposal delivers a much need station in accordance with the METRONET obligations. The design of the station has considered all access needs within the community, including consideration of all abilities through universal access features, and consideration of various modes of transport that patrons may take to/from the station whether that be via train, bus, bike, foot, motorcycle/scooter, ride-share or private automobile.
10. Aesthetics *Good design is the product of a skilled, judicious design process that results in attractive and inviting buildings and places that engage the senses.*	The proposed station buildings include contemporary architectural design features, a variety of robust materials and a natural colour palette that presents an aesthetically pleasing design that integrates with the existing built form and style of development surrounding the site. The design presents unique characteristics important to identifying the site as a public transportation facility. Various materialistic and landscaping features contribute to key public areas surrounding the station entry building, bus interchange and dual use path to provide amenities that contribute to the overall design quality of the site. Areas nearby the entry of the station provide opportunities for public art, which will be explored further as the design continues to develop, which further provide for an attractive and inviting station.

As noted in this table, the interaction between the train station and surrounding area is key to addressing a number of the design principles of SPP7. As such, Figure 19 below outlines and demonstrates how the guiding design principles of SPP7 have been directly applied to the station's design layout.

LEGEND:

- DA Boundary
- Destination: Train Station
- Destination: Bus Station
- Destination: Park & Ride / Kiss & Ride
- Town Square
- Employment Centre
- Future Residential
- Future Mixed-Use
- Active Core
- Active Edges
- Main Street Precinct
- Pedestrian Link
- Local Pedestrian & Cycle Route
- Signalised Intersection
- Primary Station Access
- High Speed Frontage
- Indigenous Heritage Site
- Potential Future Link
- Potential Future Interface
- Important Interface
- Retaining wall
- Significant level change

DESIGN PRINCIPLES:

1 INTEGRATED TRANSIT NODE

- Intermodal transit station connects train and bus services with existing pedestrian and cycle routes and adjacent park and ride facility

2 CONNECTED AND LEGIBLE

- The station serves as a connection point for future redevelopment to the north and south of the rail corridor
- Transit station provides pedestrian and cycle links to the employment centre
- Controlled access point off Nicholson Road provides a clear route to the transit station
- Provide clear and legible pedestrian connections to adjacent neighbourhoods
- Provide a clear visual and movement connection between the station and Canna Drive
- Future pedestrian connection to be established as part of OMTID upgrades to Nicholson Road

3 ACTIVATION AND SAFETY

- Promotes transitioning uses and intensity throughout surrounding development
- Encourages residential uses to provide activation and passive surveillance
- Encourages movement between transit hub and surrounding active uses
- Unimpeded visual links between transport modes

4 AMENITY

- Co-located land uses provide mutual positive benefit
- Station provides a sheltered zone for bus and vehicle pick up and drop off
- Provides pedestrian connection from the park and ride to key pedestrian corridors accessing the station

5 SUSTAINABILITY AND COMMUNITY

- Opportunity to provide a future connection through re-purposing the drainage area into public open space

6 AESTHETIC AND LANDSCAPE

- Retain and utilise existing vegetation on site to provide ready made shade and amenity
- Use new planting to bridge the connection between the existing employment centre and the station

7 CONTEXT AND SCALE

- Provide clear wayfinding across the site to connect the different areas to each other
- Identify opportunities to break down large blocks or identify pedestrian connections to improve permeability

URBIS

NICHOLSON ROAD STATION
DESIGN PRINCIPLES PLAN

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JOB NO: P0022083
DWG NO: 03
REV:

7.2. METRONET STATION DESIGN GUIDE

The METRONET Station Design Guide provides principles, objectives and specific design advice to be considered in the design and planning for stations across Perth as part of the METRONET program. It was prepared by the METRONET Office, to inform and guide decision making across the program, and includes the tools and design guidelines to help understand the station specific outcomes sought.

The Station Precinct Design Guide sets out 8 critical element objectives which require the specific planning and design response to support successful long-term station development. These requirements vary depending on the station precinct type.

The proposed Nicholson Road Station in its current context is best classified as a 'SP6 – Transit Node' station, which is defined as follows:

> *Transit node precincts primary role is to provide access to stations for a **wide catchment with provision of park and ride** and/or transit interchange from other services. Transit nodes are generally located where intensive urban development is constrained due to proximity to other centres or other factors. They may be **located adjacent to an existing or emerging urban centre** to support its development, and **may support non centre based development like large format retail and light industrial uses.***
>
> *[emphasis added]*

Given the new Nicholson Road Station is to be located adjacent to large format retail and service commercial type development along Tulloch Way, and the potential of the surrounding land to be transformed to an urban centre, the context of the Nicholson Road Station is entirely consistent with this classification.

Many of these 'critical elements' are most applicable to the development surrounding the new station, and is beyond the scope of the station development itself; however, the following aspects are considered to be applicable to some extent:

- Critical Element 3: Street Design and Movement Priority;
- Critical Element 4: Intersections and Crossings;
- Critical Element 5a: Transit Integration – Rail;
- Critical Element 5b: Transit Integration – Bus;
- Critical Element 6: Station Type; and
- Critical Element 7a: Station Dedicated Parking.

Table 9 considers these critical elements against the proposed Nicholson Road Station design.

Table 9: Nicholson Road Station Design Principles.

Station Critical Element	Details
Critical Element 3: Street Design and Movement Priority	
Bus & car priority, the bike and pedestrian	The bus-and-ride patronage is identified as the greatest alternative travel opportunity for the site. This has resulted in providing the bus interchange at highest convenience – being directly adjacent to the station building entrance. Kiss-and-ride is also identified as an area of importance, as it strikes the balance of providing transport convenience without dedicating large areas of the station precinct to vehicle parking. The resultant

Station Critical Element	Details
	design response thereby places the kiss-and-ride area immediately adjacent to the station entrance. This approach is consistent with the role of the 'transit node' station.
Shared zone (station interface area): 20km/hr	The design speed for the internal roads within the station is 15km per hour, which is slower than outlined within the Station Design Guide.
Local/ urban streets: up to 40km/hr *Urban Arterials (frame): 50km/hr*	Upgrades to the local road network throughout the service industrial area, and at the intersection of Nicholson Road and Panama Street are required to facilitate the station. These works are included as part of the TCL project, but are exempt from requiring planning approval, and so are outside the scope of this development application. Further discussion on these exempt works is provided at section 3.3 of this report.
Critical Element 4: Intersection and Crossings	
Preferred: controlled four-way intersection, no splitter lanes. *Micro roundabout*	All intersections within the PTA car park and busway are sign-controlled intersections with no splitter lanes.
Critical Element 5a: Transit Integration - Rail	
Preferred minimum rail integration type:  Underground Tunnel  Cut and Cover  Open Cut Considered minimum rail integration type:  Elevated on berm  At grade  Elevated on Viaduct	Nicholson Road Station will be a 'at-grade' rail integration design, which is capable of being considered for a 'transit node' station precinct. This was determined to be the most suitable design given that it is the least disruptive to the natural ground plane, and would cause the least disruption to the existing freight alignment. The 'at-grade' station design is also consistent with the SWTC specifications, which envisioned an 'up and over' station design for access to the station platform.
Critical Element 5b: Transit Integration – Bus	
Preferred: on street. Integrated/stacked interchange loop at grade	The new station provides an at grade bus interchange immediately adjacent to the station entry building. This is consistent with the intent for the preferred on-street approach.

Critical Element 6: Station Type	
Preferred: Active Pavilion *Considered: Canopy*	The station provides a ground level station entrance building, for exclusive access to the station platform. This is best described as a 'canopy' station design, which is capable of being considered for a transit node station. Importantly, the station entrance building provides a clear and defined entry point, meaning the station can be clearly identified from the surrounding area, along with clear and simple wayfinding to entry points. The station building has been designed to be extended to the north of the rail corridor, providing opportunity to transform the station to an 'active pavilion' station when the Canning Vale Distribution Centre site is redeveloped by others or other development to the north allows for this activation. The Station Design Principles Plan at Figure 19 of this report further illustrates how the surrounding context has influenced the design of the station.
Critical Element 7a: Station Dedicated Parking	
Preferred: moderate adjacent park'n'ride (ok at grade) *Considered: substantial adjacent park'n'ride ok at grade*	The Nicholson Road Station includes at grade park-and-ride car parking. This is considered to be an acceptable outcome for a contemporary railway station, which as a 'transit node' station is expected to attract a higher degree of park-and-ride patronage. The opportunities to deliver a more consolidated form of car parking may be reviewed in the future once the surrounding area is redeveloped and further opportunities for TOD surrounding the station precinct are unlocked.

7.3. ASSESSMENT PROCESS & APPROVAL REQUIREMENTS

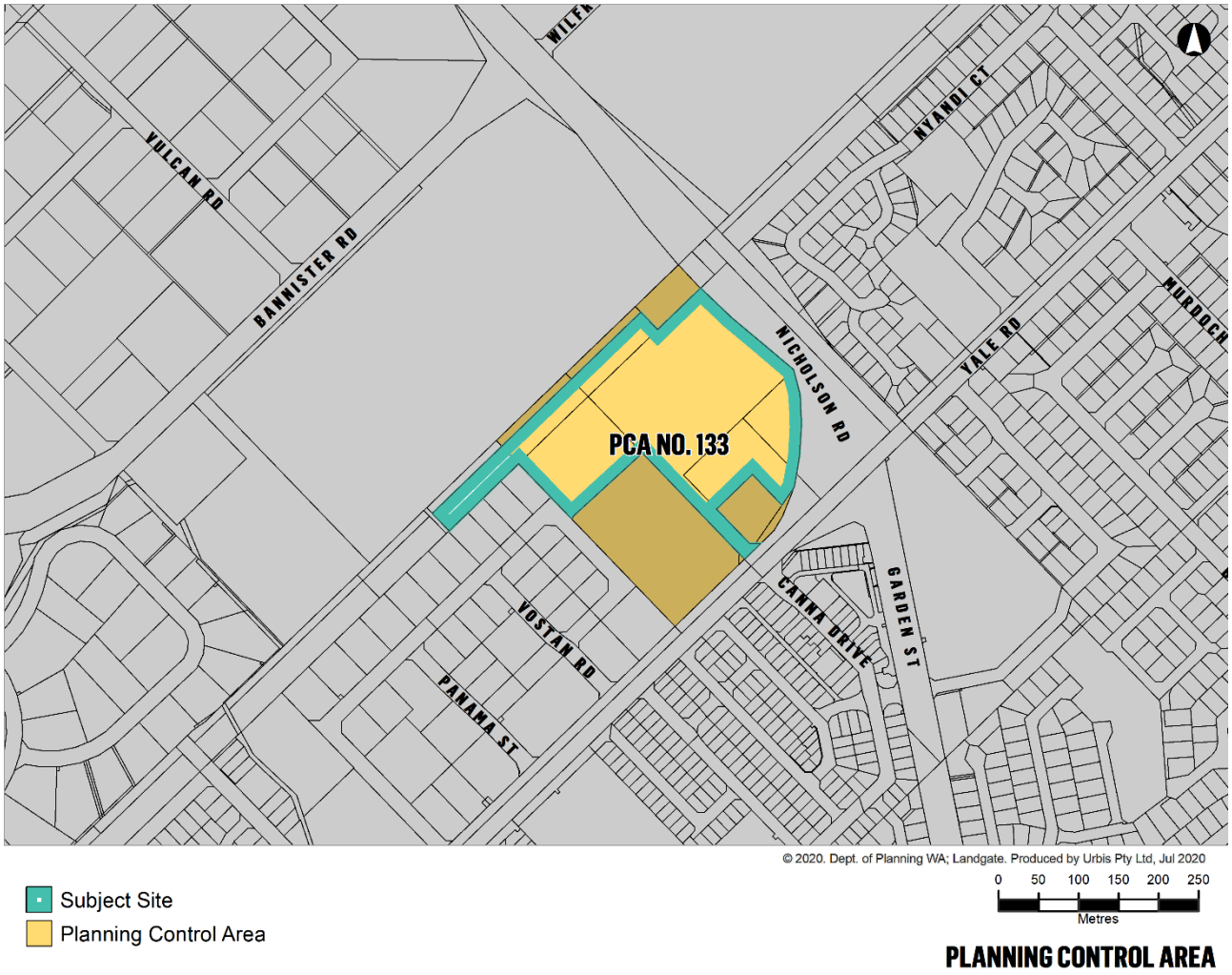
7.3.1. Planning Control Area No. 133 (PCA 133)

The proposed Nicholson Road Station works are wholly located within PCA 133, which has been established with the aim of facilitating the development of the land for the purpose of railways and related public purposes (Figure 20).

The *Planning and Development Act 2005* (**PD Act**) outlines the planning processes for a PCA. This process is summarised as follows:

- The development application is to be lodged with the local authority. The local authority is to forward the application and its recommendation to the WAPC within 30 days of receiving the application (section 115(3) of the PD Act).
- The DPLH then have 60 days from receiving the application to make a determination (section 250(3) of the PD Act).

Figure 20: PCA 133 Map Extract.



7.3.2. Railway (METRONET) Act 2018

The *Railway (METRONET) Act 2018* (**METRONET Act**) is the enabling legislation applicable to the construction of the METRONET railway extensions. Section 3 specifically provides the authority to construct the TCL line. The legislation constitutes a special Act for the purposes of the *Public Works Act 1902*.

From a statutory planning perspective, this enabling legislation introduced a number of exemptions from planning approval beyond what is provided for within the PD Act and MRS. Specifically, section 6 of the METRONET Act provides the following exemption applicable to this application:

> *Despite anything in the Metropolitan Region Scheme, the following development may be commenced or carried out without the approval of the Planning Commission —*
>
> *…*
>
> *(b) METRONET works on non-railway land.*

This clause will provide an exemption from planning approval for METRONET works which extend beyond the 'Railways' reservation. Importantly, for 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, the requirements under the *Planning and Development Act 2005* and the MRS will apply.

As this development application fundamentally involves the construction of a railway station, a development application is required. However, some works ancillary to the station will be exempt from approval under this

clause. For completeness and transparency, we have included detail on the full scope of works reasonably associated with the Nicholson Road Station within this application.

7.3.3. Section 6 Public Works

Section 6 of the PD Act provides exemption from the requirement to obtain planning approval under the relevant local planning scheme for 'public works' or the taking of land associated with that public work.

To achieve this public works test, the following two criteria must be met:

1. The authority undertaking the work is an agent of the Crown; and
2. The scope of works meet the definition of 'public work' as defined by the *Public Works Act 1902*.

The PTA is considered an 'agent of the Crown', and the NEWest Alliance acts on behalf of the PTA. The proposed forward works will therefore meet the first test of public works.

Section 2 of the *Public Works Act 1902* includes the following within the definition of 'public work':

> *(2) any railway authorised by special Act or any work whatsoever authorised by any Act;*
>
> *(20) any road, stock route, viaduct, or canal;*

Given the proposed Nicholson Road Station works are included within the scope of the METRONET Act enabling legislation, the proposed works also meet this second test.

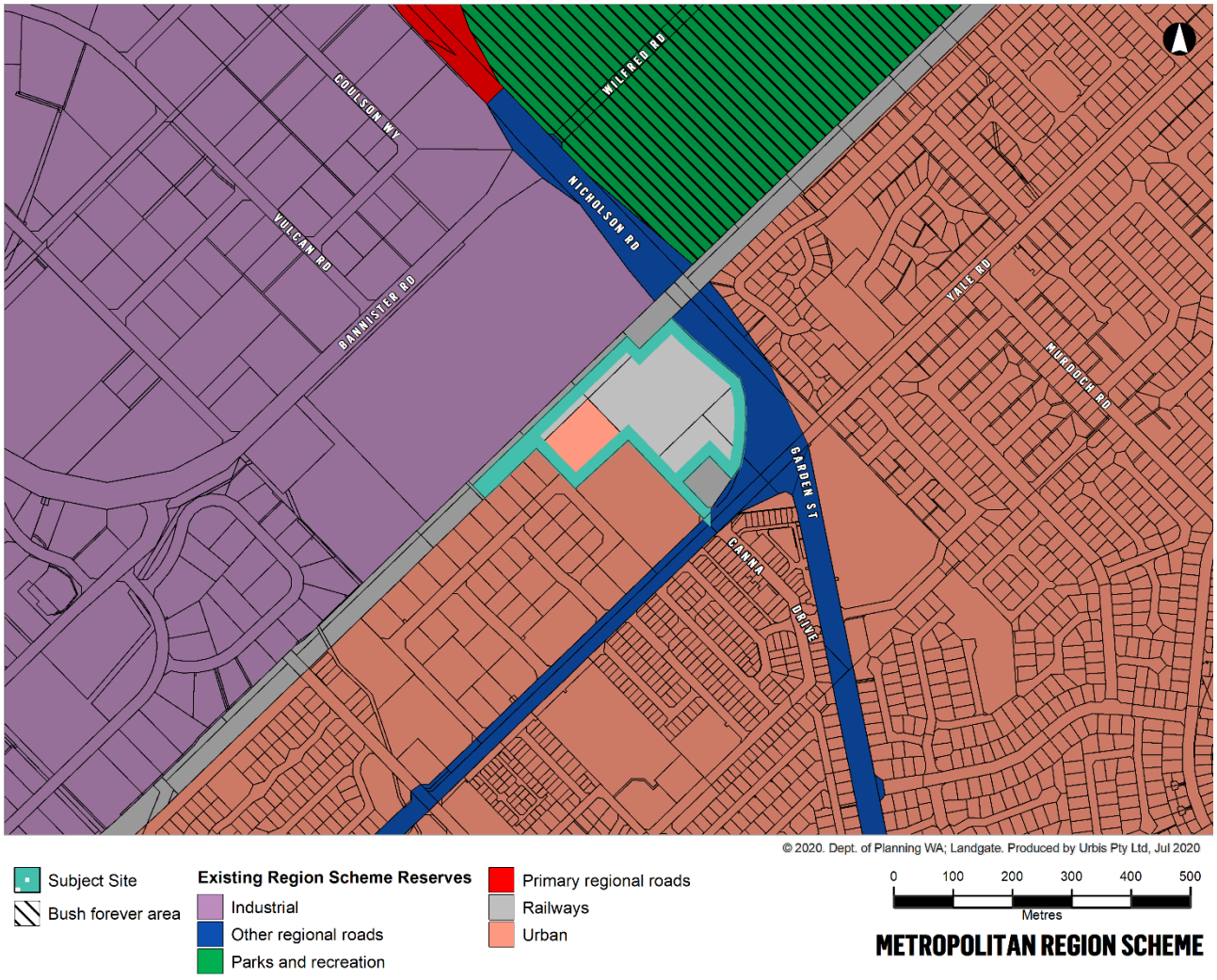
The station works will thereby meet the section 6 exemption, and does not require approval under the City of Gosnells local planning scheme. We do however note that public works may still require approval under the region planning scheme, unless further exemptions are deemed appropriate as outlined in the section below.

7.3.4. Metropolitan Region Scheme (MRS) Exemptions

The subject site is included in the 'Railways Reserve' and 'Urban Zone' under the MRS (Figure 21). Exemptions available under the MRS are provided through the following clauses:

- Reserved Land: clause 16(1a), where the development is 'permitted development' or expressly authorised under an Act to be commenced or carried out without the approval of the WAPC.
- Zoned Land: clause 24, which broadly enables a public authority to complete works in a local road.

Figure 21: MRS Zoning Map Extract.



7.3.5. Summary of Exemptions

Table 10 provides a summary of the METRONET Act and MRS exemptions, and associated conclusions regarding the scope of works which require formal development approval.

Table 10: Summary of Exemptions.

MRS Zone / Reservation	Exemption	Conclusion
'Railways Reserve'	Clause 16(1a) of the MRS states that development approval is **not** required for development on reserved land owned or vested in a public authority, and are: *works on land reserved for railways for the purpose of or in connection with a railway, not including 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;*	The conclusion drawn from this is clause as follows: ▪ The railway track works and any associated noise walls within a 'Railways' reservation will not require planning approval. ▪ The majority of the remaining station works which are available for public access will require approval.

MRS Zone / Reservation	Exemption	Conclusion
'Other Regional Roads Reserve'	Clause 16(1a) of the MRS states that development approval is **not** required for development on reserved land owned or vested in a public authority, and are: *works on land reserved for Primary Regional Roads or Other Regional Roads for the purpose of or in connection with a road within the meaning of the Main Roads Acts 1930;*	As noted in section 3.3 of this report, the Nicholson Road pelican crossing and Panama Street / Nicholson Road intersection upgrades are considered exempt from requiring planning approval.
'Urban Zone'	*Despite anything in the Metropolitan Region Scheme, the following development may be commenced or carried out without the approval of the Planning Commission —* *…* *(b) METRONET works on non-railway land.* 'METRONET Works' are defined as: *means works for the purpose of, or in connection with, a METRONET railway but does 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;*	The conclusion drawn from this clause is as follows: ▪ Station works which are available for public access will require approval; and ▪ Any other works included within the scope of this METRONET project will not require formal approval.

7.4. PLANNING FRAMEWORK ASSESSMENT

Table 11 below includes an assessment against other applicable state and local planning frameworks and the requirements relevant.

Table 11: State & Local Planning Framework Assessment Summary.

Planning Framework	Details
Perth and Peel @ 3.5 Million (PP@3.5)	PP@3.5 and the associated Sub-regional Framework identifies the site for 'Railway' and 'Urban' purposes consistent with the MRS.
AND **Sub-Regional Planning Framework**	The Sub-regional Framework identifies all METRONET Stage 1 works within the framework, including the Nicholson Road Station. This proposal is therefore entirely consistent with the outcomes sought through the Sub-regional Framework.

Metropolitan Region Scheme **(MRS)**	As noted in section 5.3.4 above, the proposed station will be located within the 'Railways' reservation and 'Urban' zone under the MRS. Nicholson Road Station is appropriately placed within these reserves and zones for the following reasons: ▪ The development of land included in the 'Railways Reserve' for a railway station is consistent with the intent of the reserve. ▪ The construction of a multi-modal railway station within the 'Urban Zone' is also entirely complementary with contemporary urban development principles, as it enables development to progress without creating a reliance on the private vehicle. This transport orientated development is widely accepted as best practice planning for a contemporary urban area.
Development Control Policy No. 1.6 – Planning to Support Transit Use and Transit Oriented Development **(DCP1.6)**	The purpose of the policy is to guide the development or redevelopment within transit orientated precincts. The policy applies as the site is identified within a future transit orientated precinct associated with the new station. The proposal directly reflects the intentions of DCP 1.6 as it provides for a highly connected multi-modal train station with new bus services, cycling infrastructure and pedestrian paths and amenities to encourage sustainable transit to/from the station. The Nicholson Road Station will also form a catalyst to support the transition of the surrounding service commercial area to a more urbanised outcome, without creating sole reliance on the private vehicle.

8. CONCLUSION

We trust this application contains all information necessary to make a timely determination. This development application seeks approval for one of two new stations as part of METRONET's TCL project. The new Nicholson Road Station will be a multi-modal station providing train, bus interchange, cycling and pedestrian amenities and will become an important transport link that has been designed to bridge the gap in rail infrastructure in the south-east corridor and support a shift towards more sustainable modes of transit for local residents. The station will also reduce the up to 1hr private vehicle peak hour journey to the Perth CBD to approximately 26 minutes providing the community with enhanced transit options and convenience.

The new station also allows for changes to take place in the surrounding urban area in order to support medium to long term residential and employment development in Canning Vale. Urban renewal opportunities in this regard include increasing the density and infill of existing residential areas within walking distance from the station, the redevelopment of State government owned land, the redevelopment of the adjoining distribution centre and the transitioning of the existing light industrial / service commercial area to the south and west of the station.

With site context, and the potential future redevelopment of the surrounding area in mind, the new station has been designed with a focus on the following elements:

- Encourage non-private vehicle use for connection trips and apply principles which support opportunities for transit-oriented development, whilst providing a pragmatic amount of car parking facilities to support the station particularly in the short-term.
- Ensuring safe and comfortable access and usability to the general public and stakeholders via consideration for wayfinding, CPTED design requirements, and through the provision of associated amenities such as landscaping, seating, weather protection and end of trip facilities.
- Providing a durable and easily maintained design and achieving a minimum 120 year design life.
- Consideration for connectivity of the station and its facilities with the surrounding area including Canna Drive to the south via a future pedestrian pathway; the service industrial area to the west via vehicle access and a new dual used path; Thornlie residential area to the east via the Nicholson Road underpass; and the Canning Vale Distribution Centre to the north - via an adaptable pedestrian overpass design that can be extended once this site is redeveloped.
- Minimising environmental impact and optimising quality of public transport infrastructure (including via noise mitigation methods).
- Integrating with the surrounding road network and minimising the stations impact from a traffic perspective.
- Achieving the station's functional brief whilst achieving excellence in design.

Considerable pre-lodgement consultation and engagement has been undertaken by the project team to ensure that the station's design has evolved with consideration for relevant stakeholders' requirements. This includes a review by the OGA, whose feedback has been incorporated into the final proposed design.

As a public works project subject to the enabling legislation of the METRONET Act, the statutory assessment against set development standards is limited. In light of this, the measure of suitability and appropriateness of this project is based on the overall design and functionality of the network, including improvements to the pedestrian, cyclist and public transport network. As demonstrated via a planning assessment which has considered SPP7 guiding design principles, the METRONET Station Design Guide and other relevant state and local planning frameworks, the site has been demonstrated to be fit for purpose, and the station design has demonstrated compliance.

We appreciate the City of Gosnells and the DPLH's support in delivering an approval within a timeframe that ensures this can be met. We respectfully request that any issues or additional information requests be

directed to Ray Haeren (rhaeren@urbis.com.au) at Urbis. Alternatively, please do not hesitate to contact the office on 9346 0500 or Ray Haeren on 0418 848 805 should you have any queries or wish to discuss any specific element of the proposal.

DISCLAIMER

This report is dated November 2020 and incorporates information and events up to that date only and excludes any information arising, or event occurring, after that date which may affect the validity of Urbis Pty Ltd **(Urbis)** opinion in this report. Urbis prepared this report on the instructions, and for the benefit only, of Public Transport Authority and NEWest Alliance **(Instructing Party)** for the purpose of DA Report **(Purpose)** and not for any other purpose or use. To the extent permitted by applicable law, Urbis expressly disclaims all liability, whether direct or indirect, to the Instructing Party which relies or purports to rely on this report for any purpose other than the Purpose, and to any other person which relies or purports to rely on this report for any purpose whatsoever (including the Purpose).

In preparing this report, Urbis was required to make judgements which may be affected by unforeseen future events, the likelihood and effects of which are not capable of precise assessment.

All surveys, forecasts, projections and recommendations contained in or associated with this report are made in good faith and on the basis of information supplied to Urbis at the date of this report, and upon which Urbis relied. Achievement of the projections and budgets set out in this report will depend, among other things, on the actions of others over which Urbis has no control.

In preparing this report, Urbis may rely on or refer to documents in a language other than English, which Urbis may arrange to be translated. Urbis is not responsible for the accuracy or completeness of such translations and disclaims any liability for any statement or opinion made in this report being inaccurate or incomplete arising from such translations.

Whilst Urbis has made all reasonable inquiries it believes necessary in preparing this report, it is not responsible for determining the completeness or accuracy of information provided to it. Urbis (including its officers and personnel) is not liable for any errors or omissions, including in information provided by the Instructing Party or another person or upon which Urbis relies, provided that such errors or omissions are not made by Urbis recklessly or in bad faith.

This report has been prepared with due care and diligence by Urbis and the statements and opinions given by Urbis in this report are given in good faith and in the reasonable belief that they are correct and not misleading, subject to the limitations above.

APPENDIX B CERTIFICATES OF TITLE

WESTERN AUSTRALIA

REGISTER NUMBER	
888/D91086	
DUPLICATE EDITION **1**	DATE DUPLICATE ISSUED **20/11/2008**

VOLUME **2094** FOLIO **376**

RECORD OF CERTIFICATE OF TITLE

UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

BGRoberts

REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

LAND DESCRIPTION:

LOT 888 ON DIAGRAM 91086

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

WESTERN AUSTRALIAN PLANNING COMMISSION OF 469 WELLINGTON STREET, PERTH
(T G380958) REGISTERED 24/1/1997

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:
(SECOND SCHEDULE)

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.
Lot as described in the land description may be a lot or location.

----------END OF CERTIFICATE OF TITLE----------

STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND:	2094-376 (888/D91086)
PREVIOUS TITLE:	1511-397, 1889-184
PROPERTY STREET ADDRESS:	LOT 888 NICHOLSON RD, CANNING VALE.
LOCAL GOVERNMENT AUTHORITY:	CITY OF GOSNELLS
RESPONSIBLE AGENCY:	WESTERN AUSTRALIAN PLANNING COMMISSION

NOTE 1: J796915 DEPOSITED PLAN 51226 AS TO INTEREST ONLY LODGED
NOTE 2: N250829 DEPOSITED PLAN 408165 LODGED

WESTERN AUSTRALIA

REGISTER NUMBER	
57/P3001	
DUPLICATE EDITION **2**	DATE DUPLICATE ISSUED **3/6/2003**

VOLUME **2094** FOLIO **377**

RECORD OF CERTIFICATE OF TITLE

UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

BGRoberts

REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

LAND DESCRIPTION:

LOT 57 ON PLAN 3001

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

WESTERN AUSTRALIAN PLANNING COMMISSION OF 469 WELLINGTON STREET, PERTH
(T I485561) REGISTERED 19/5/2003

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:
(SECOND SCHEDULE)

1. THE LAND THE SUBJECT OF THIS CERTIFICATE OF TITLE EXCLUDES ALL PORTIONS OF THE LOT DESCRIBED ABOVE EXCEPT THAT PORTION SHOWN IN THE SKETCH OF THE SUPERSEDED PAPER VERSION OF THIS TITLE. VOL 2094 FOL 377.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.
Lot as described in the land description may be a lot or location.

----------END OF CERTIFICATE OF TITLE----------

STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND:	2094-377 (57/P3001)
PREVIOUS TITLE:	1511-397
PROPERTY STREET ADDRESS:	LOT 57 NICHOLSON RD, CANNING VALE.
LOCAL GOVERNMENT AUTHORITY:	CITY OF GOSNELLS
RESPONSIBLE AGENCY:	WESTERN AUSTRALIAN PLANNING COMMISSION

NOTE 1: N250829 DEPOSITED PLAN 408165 LODGED

WESTERN AUSTRALIA

REGISTER NUMBER	
889/DP53324	
DUPLICATE EDITION **1**	DATE DUPLICATE ISSUED **3/7/2007**

VOLUME **2662** FOLIO **398**

RECORD OF CERTIFICATE OF TITLE

UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

BGRoberts

REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

LAND DESCRIPTION:

LOT 889 ON DEPOSITED PLAN 53324

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

WESTERN AUSTRALIAN PLANNING COMMISSION OF 469 WELLINGTON STREET, PERTH
(AF K245233) REGISTERED 27/6/2007

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:
(SECOND SCHEDULE)

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.
Lot as described in the land description may be a lot or location.

----------END OF CERTIFICATE OF TITLE----------

STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND:	DP53324
PREVIOUS TITLE:	2094-378
PROPERTY STREET ADDRESS:	LOT 889 NICHOLSON RD, CANNING VALE.
LOCAL GOVERNMENT AUTHORITY:	CITY OF GOSNELLS
RESPONSIBLE AGENCY:	WESTERN AUSTRALIAN PLANNING COMMISSION

WESTERN AUSTRALIA

REGISTER NUMBER	
31/P10294	
DUPLICATE EDITION	DATE DUPLICATE ISSUED
N/A	12/10/2017

VOLUME 2935 FOLIO 118

RECORD OF CERTIFICATE OF TITLE

UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

BGRoberts

REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

LAND DESCRIPTION:

LOT 31 ON PLAN 10294

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

STATE OF WESTERN AUSTRALIA

(XE A000001A) REGISTERED 1/1/0001

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:
(SECOND SCHEDULE)

1. SAVE AND EXCEPT THE RIGHTS TO MINES OF COAL OR OTHER MINERALS

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.
Lot as described in the land description may be a lot or location.

----------END OF CERTIFICATE OF TITLE----------

STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND:	P10294
PREVIOUS TITLE:	1335-386
PROPERTY STREET ADDRESS:	NO STREET ADDRESS INFORMATION AVAILABLE.
LOCAL GOVERNMENT AUTHORITY:	CITY OF GOSNELLS
RESPONSIBLE AGENCY:	PUBLIC TRANSPORT AUTHORITY OF WESTERN AUSTRALIA

NOTE 1: N739844 NO DUPLICATE ISSUED. THIS LOT/TITLE CREATED FOR THE RESUMED BALANCE OF TITLE VOL 1335 FOL 386.

WESTERN AUSTRALIA

REGISTER NUMBER	
32/P10294	
DUPLICATE EDITION	DATE DUPLICATE ISSUED
N/A	12/10/2017

VOLUME 2935 FOLIO 119

RECORD OF CERTIFICATE OF TITLE

UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

BGRoberts

REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

LAND DESCRIPTION:

LOT 32 ON PLAN 10294

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

STATE OF WESTERN AUSTRALIA

(XE A000001A) REGISTERED 1/1/0001

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:
(SECOND SCHEDULE)

1. SAVE AND EXCEPT THE RIGHTS TO MINES OF COAL OR OTHER MINERALS

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.
Lot as described in the land description may be a lot or location.

----------END OF CERTIFICATE OF TITLE----------

STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND:	P10294
PREVIOUS TITLE:	703-5
PROPERTY STREET ADDRESS:	NO STREET ADDRESS INFORMATION AVAILABLE.
LOCAL GOVERNMENT AUTHORITY:	CITY OF GOSNELLS
RESPONSIBLE AGENCY:	PUBLIC TRANSPORT AUTHORITY OF WESTERN AUSTRALIA

NOTE 1: N739844 NO DUPLICATE ISSUED. THIS LOT/TITLE CREATED FOR THE RESUMED BALANCE OF TITLE VOL 703 FOL 5.

WESTERN AUSTRALIA

REGISTER NUMBER	
33/P10294	
DUPLICATE EDITION	DATE DUPLICATE ISSUED
N/A	12/10/2017

VOLUME 2935 FOLIO 120

RECORD OF CERTIFICATE OF TITLE

UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

BGRoberts

REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

LAND DESCRIPTION:

LOT 33 ON PLAN 10294

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

STATE OF WESTERN AUSTRALIA

(XE A000001A) REGISTERED 1/1/0001

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:
(SECOND SCHEDULE)

1. SAVE AND EXCEPT THE RIGHTS TO MINES OF COAL OR OTHER MINERALS

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.
Lot as described in the land description may be a lot or location.

----------END OF CERTIFICATE OF TITLE----------

STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND:	P10294
PREVIOUS TITLE:	721-47
PROPERTY STREET ADDRESS:	NO STREET ADDRESS INFORMATION AVAILABLE.
LOCAL GOVERNMENT AUTHORITY:	NO LOCAL GOVERNMENT AUTHORITY INFORMATION AVAILABLE
RESPONSIBLE AGENCY:	PUBLIC TRANSPORT AUTHORITY OF WESTERN AUSTRALIA

NOTE 1: N739844 NO DUPLICATE ISSUED. THIS LOT/TITLE CREATED FOR THE RESUMED BALANCE OF TITLE VOL 721 FOL 47.

WESTERN AUSTRALIA

REGISTER NUMBER	
800/DP411643	
DUPLICATE EDITION **N/A**	DATE DUPLICATE ISSUED **N/A**

VOLUME **2942** FOLIO **299**

RECORD OF CERTIFICATE OF TITLE

UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

BGRoberts

REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

LAND DESCRIPTION:

LOT 800 ON DEPOSITED PLAN 411643

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

WESTERN AUSTRALIAN PLANNING COMMISSION OF 140 WILLIAM STREET PERTH WA 6000
(T N808821) REGISTERED 15/1/2018

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:
(SECOND SCHEDULE)

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.
Lot as described in the land description may be a lot or location.

----------END OF CERTIFICATE OF TITLE----------

STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND:	DP411643
PREVIOUS TITLE:	2692-932
PROPERTY STREET ADDRESS:	NO STREET ADDRESS INFORMATION AVAILABLE.
LOCAL GOVERNMENT AUTHORITY:	CITY OF GOSNELLS
RESPONSIBLE AGENCY:	WESTERN AUSTRALIAN PLANNING COMMISSION

NOTE 1: DUPLICATE CERTIFICATE OF TITLE NOT ISSUED AS REQUESTED BY DEALING J078865.

APPENDIX C BODE PROPERTY APPROVED PLAN OF SUBDIVISION

ATTACHMENT A

APPLICATION SKETCH LEGEND

- Boundary of Subject Land
- Existing Boundaries
- Proposed Boundaries
- Sewer
- Water
- Power
- Contour - Major
- Contour - Minor
- Contour - Interval (XXX)
- Spot Height
- Existing Tree

NICHOLSON ROAD

PROPOSED ROAD

TULLOCH WAY

C
3.0147ha

888
3.3131ha

801
2.2387ha

A
8569m²

B
1.3818ha
Building To Be Demolished

2984m²

74.64
53.66
100.8
120.71
131.7
97.54
190.14
31.38
69.4
117.76
4.2
69.54
120.73
104.8
150
(118.62)
14.14
28
14.15
(184.46)
114.92
(110.80)

Telstra Cable

800
889
890
57
93
94
95
60
61
25
732
733
734
731
730
729
707
708
706
705

DEPARTMENT OF PLANNING, LANDS AND HERITAGE

DATE	FILE
12-Mar-2020	158829

DETAIL LEGEND

WATER
- STOP VALVE
- HYDRANT
- WATER METER

DRAINAGE
- SW MANHOLE
- GRATE
- SIDE ENTRY PIT

SEWERAGE
- SEWER MANHOLE

GAS
- GAS METER
- GAS MARKER

POWER
- CONSUMER POLE
- POWER POLE
- LIGHT POLE
- STAY POLE
- CABLE DOME

TELECOMMUNICATIONS
- TELECOMMUNICATION PIT

FEATURES
- STREET SIGN
- BORE COVER

SUMMARY

Lot 801 & 888 Nicholson Road, CANNING VALE

Application Type	*Subdivision*
Parent Lot A	*801*
Parent Graphic	*DP 411643*
Certificate of Title	*Volume 2942 Folio 300*
Total Area	*2.2387ha*
Parent Lot B	*888*
Parent Graphic	*D 91086*
Certificate of Title	*Volume 2094 Folio 376*
Total Area	*3.3131ha*
Local Authority	*City of Gosnells*
TPS	*Urban*
Zoning	*N/A*
Original No. of Lots	*2*
Proposed No. of Lots	*4*

This plan, which was prepared by MNG for NICHOLSON CENTRAL PTY LTD, shows the proposed subdivision of LOTS 801 & 888 NICHOLSON ROAD, CANNING VALE and is intended to accompany an application to the Western Australian Planning Commision (WAPC) for approval to subdivide. All information relating to the subdivision, including lot dimensions and areas are subject to approval by the WAPC, the Local Authority and other servicing authorities having an interest in the land.

Existing boundaries shown heron are a graphical representation only, they have been extracted from Landgate's Spatial Cadastral Database, which is only a model of the cadastre, and has not been re-established by survey. MNG does not guarantee position unless stated otherwise.

Existing easements, encumberances and interests are not necessarily depicted on the planand a current title search is recommended to check this information prior to sale and development of proposed lot(s).

The use of this plan for other than the purpose for which it is commissioned is strictly prohibited. In particular, the information shown on the plan in not relied upon for financial dealings involving the land either in the whole or in the part.

The contents of this plan are current and correct as of the date stated within the revision panel. All consultants and persons wishing to utilise this data should satisfy themselves of this plans currency by contacting the McMullen Nolan Group.

Contours are compiled from MNG Survey Data and Landgate SLIP Data and are subject to change without notice.

This plan is not to be distributed without this note, which is an integral part of the plan.

N

PROPOSED SUBDIVISION
LOTS 801 & 888 NICHOLSON ROAD, CANNING VALE (SUBDIVISION)

CLIENT:

NICHOLSON CENTRAL PTY LTD

SCALE 1 : 1250 @ A3

12.5 0 50

ALL DISTANCES ARE IN METRES

For a true to scale reproduction of this plan, plot it to A3 with the Paging Scaling set to None.

FILES
mapCOGO:-
Control Register:-
File Name:-
102269ap-002c.dgn

MNG

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www.mngsurvey.com.au
ABN 90 009 363 311

Offices in: Broome, Bunbury, Kununurra, Newman, Port Hedland

Project Mngr	Nigel Simpson	Datum	AHD

102269- 02 - C
Job Number | Plan Number | Version

APPENDIX D COMMUNITY & STAKEHOLDER CONSULTATION SUMMARY

NEWest Alliance

TCL Community and Stakeholder Consultation Summary Statement for DA Planning Reports

DRAFT 1.1, 14 Aug 20

Overview

The NEWest Alliance strategic approach to engagement is based on the International Association of Public Participation (IAP2) Consultation Spectrum. Stakeholders are profiled and the engagement methodology tailored to provide the appropriate level of involvement in the project's designing and decision-making processes.

Since the 2017-18 State Budget announcement confirming funding for the Thornlie-Cockburn Link (TCL) and Yanchep Rail Extension (YRE), engagement with stakeholders has been undertaken by the Public Transport Authority (PTA) and the METRONET Office of the Department of Planning, Lands and Heritage (DPLH).

Since the awarding of the contract in November 2019, NEWest Alliance has further developed the reference designs for each station in consultation with the community and key stakeholders through a series of briefings, technical workshops, reference groups and responses to enquiries.

Key Statistics

Between 1 November 2019 to 31 July 2020, the NEWest Alliance had 193 interactions with 179 distinct stakeholders.

The greatest proportion of stakeholders consulted were from local government authorities (19%), community members (19%) and local residents (16%), followed by state government (7%) and organisations/institutions (6%).

The main mechanisms for engagement were email enquiries (28%), email responses (14%), phone enquiries (10%) and phone responses (8%).

Meetings with stakeholders, key stakeholders and residents made up another 13% collectively.

Consultation Program Summary

Level	Engagement	Stakeholder/s	Topic/Discussion	Timing
Strategic	METRONET Local Government Reference Group – executive level	City of Cockburn, City of Gosnells, City of Canning, METRONET Office, NEWest Alliance	Introduction to the NEWest Alliance Project interface, statutory planning, development applications, communications	Quarterly
	METRONET Noongar Reference Group	Whadjuk Noongar community representatives, METRONET Office, NEWest Alliance	Introduction to the NEWest Alliance Thornlie Cockburn Link design workshop	Quarterly and as required

Level	Engagement	Stakeholder/s	Topic/Discussion	Timing
	METRONET Access and Inclusion Reference Group	METRONET Office, Department of Communities, Housing Advisory Unit, PTA, AIRG representatives	Introduction to the NEWest Alliance Lifts, respite seating, accessibility of car bays, drop off areas	Quarterly and as required
	Local member engagement	Yaz Mubarakai Chris Tallentire Terry Healey	Construction, Design, Environment, Community	Quarterly (briefing packs delivered as alternative depending on preferences)
Operational	Local Government Briefings – officer level	City of Cockburn City of Melville City of Canning City of Gosnells City of Melville Town of Victoria Park	Construction, Design, Environment, Community, Approvals	Quarterly (briefing packs were delivered as alternatives to those LGA briefings impacted by COVID)
	Technical / targeted workshops	Water Corporation Telstra Western Power ATCO Gas Environmental Protection Agency DevelopmentWA Transperth DFES Urban Quarter Eglinton Estates Friends of Ken Hurst Park	Design, Construction Staging, Approvals	Fortnightly, Monthly or as required
	Targeted Station Working Groups	Nicholson Road Ranford Road Thornlie Station	Design – civil, structures, access arrangements	Fortnightly, Monthly or as required
	Technical / targeted workshops	Water Corporation Telstra Western Power ATCO Gas APO BP	Design, Construction Staging, Approvals	Fortnightly, Monthly or as required

Level	Engagement	Stakeholder/s	Topic/Discussion	Timing
		Vocus Environmental Protection Agency DevelopmentWA Transperth DFES Main Roads WA		
Tactical	Thornlie Cockburn Link Community Reference Group (East)	City of Gosnells, local residents and schools	Construction, Design, Communications	Quarterly
	Thornlie Cockburn Link Community Reference Group (West)	City of Cockburn, local residents and schools	Construction, Design, Communications	Quarterly
	Thornlie-Cockburn Link Communications Coordination Meeting	City of Gosnells, City of Canning, City of Cockburn, Main Roads WA, METRONET Office, PTA, NEWest Alliance	Communications / cross promotional opportunities	Quarterly

Face to face engagement has been supported by communication campaigns and response to enquiries. Approximately 3755 notifications have been distributed to local residents and business to inform them of early works, geotechnical investigation, and temporary traffic changes with a further 178 properties directly engaged via doorknocks.

Pre-Lodgement Meetings for Station Planning and Development Approval

Station	Responsible Authority	Date
Perth Stadium	Town of Victoria Park / DPLH for JDAP	3 Aug 20
Nicholson Road*	City of Gosnells / DPLH for WAPC*	13 Jul 20
Thornlie	City of Gosnells / DPLH for JDAP	7 Jul 20
Ranford Road*	City of Canning / DPLH for WAPC*	20 Jul 20
Cockburn Central	City of Cockburn / DPLH for JDAP	2 Jul 20

Note: * Project development site is located within a Planning Control Area (PCA).

Upcoming Alliance Communication and Engagement

- Community Drop-In sessions planned to be held locally over two Saturdays, 10 October 2020 (venue Lakeside Recreation Centre Function Hall, Bibra Lake) and 17 October 2020 (venue

Mills Park Centre Function Hall, Beckenham)

The drop-in sessions will give the community an opportunity to find out more about the project's progress and plans, ask specific questions and raise concerns as well as understand how the project will help revitalise Perth's southern suburbs.

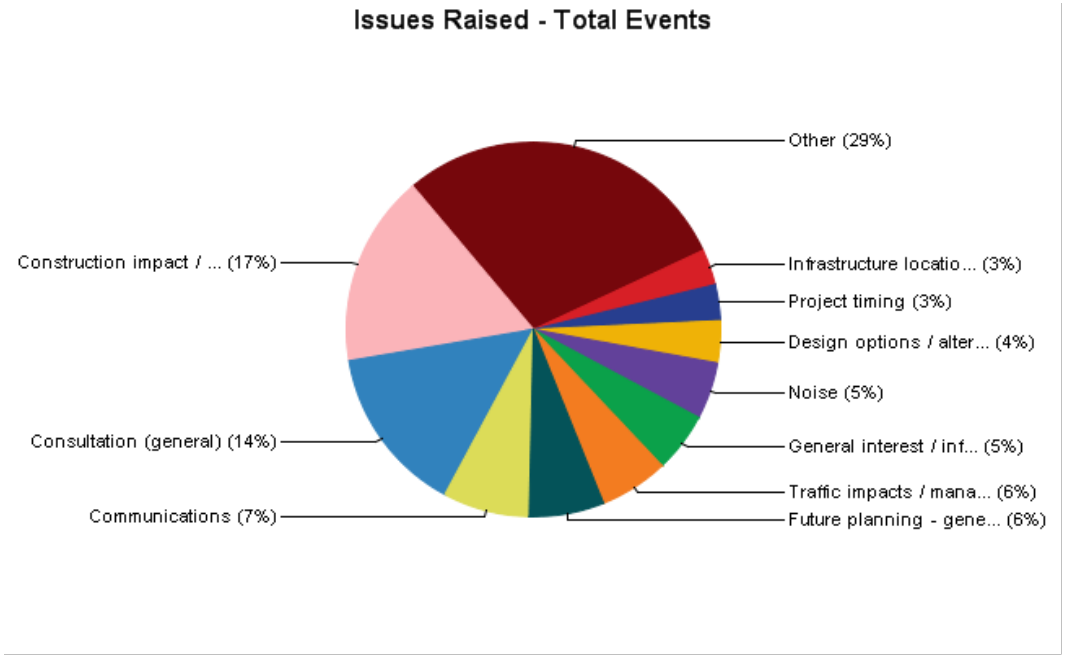
- Business readiness workshops
- Targeted resident engagement re design impacts (e.g. noise walls and footbridge)
- Fact sheets/construction updates (by zone) / release of renders and Augmented reality
- Property precondition surveys to 50 metres
- Site mobilisation engagement
- Quarterly briefings October 2020
- Postcode wide distribution of Project Updates planned for September 2020, to the following suburbs: Cockburn Central, South Lake, Bibra Lake, Jandakot, Leeming, Canning Vale, Thornlie, Beckenham
- METRONET Local Government Reference Group – TCL Design Workshop.

Thornlie-Cockburn Link (TCL) Consultation Outcomes Statistics

Date Range 1 November 2019 to 31 July 2020

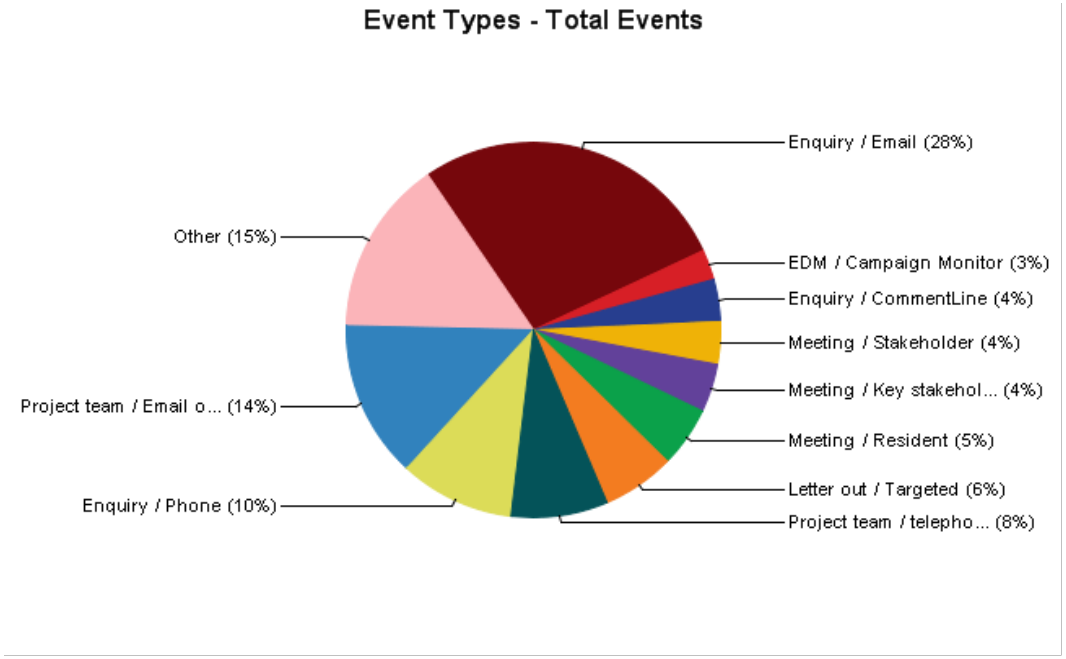
Key Issues Raised

Issues	Events	Stakeholders	
		Distinct	Total
Construction impact / notices	64	53	66
Consultation (general)	56	85	124
Communications	29	50	63
Future planning - general	25	30	37
Traffic impacts / management	23	16	20
General interest / information	20	16	18
Noise	19	18	19
Design options / alternatives	14	12	14
Project timing	12	18	18
Infrastructure location	12	12	13
Other	113	127	134
[No Issues]	4	3	3
Total Events	**193**	**179**	**271**



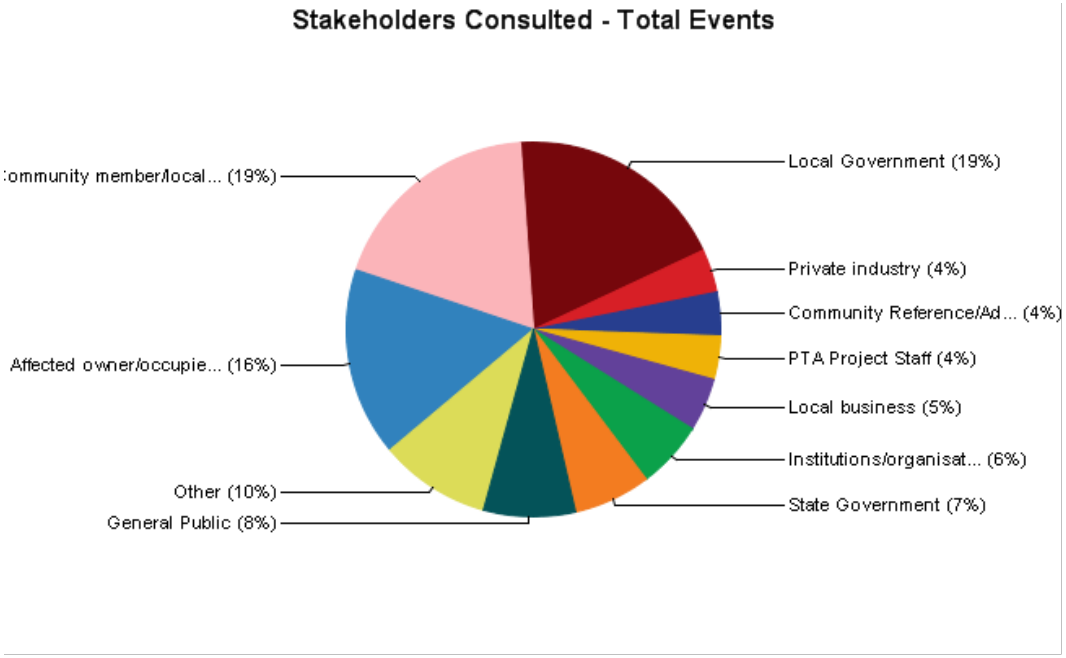
Event Types

Event Types	Events	Stakeholders	
		Distinct	Total
Enquiry / email	53	47	66
Project team / email out	26	45	50
Enquiry / Phone	19	16	19
Project team / telephone out	16	20	23
Letter out / targeted	12	0	0
Meeting / resident	10	14	15
Meeting / key stakeholder	8	21	27
Meeting / stakeholder	7	12	14
Enquiry / CommentLine	7	7	7
EDM / Campaign Monitor	5	0	0
Other	29	42	44
[No Event Types]	1	6	6
Total Events	**193**	**179**	**271**



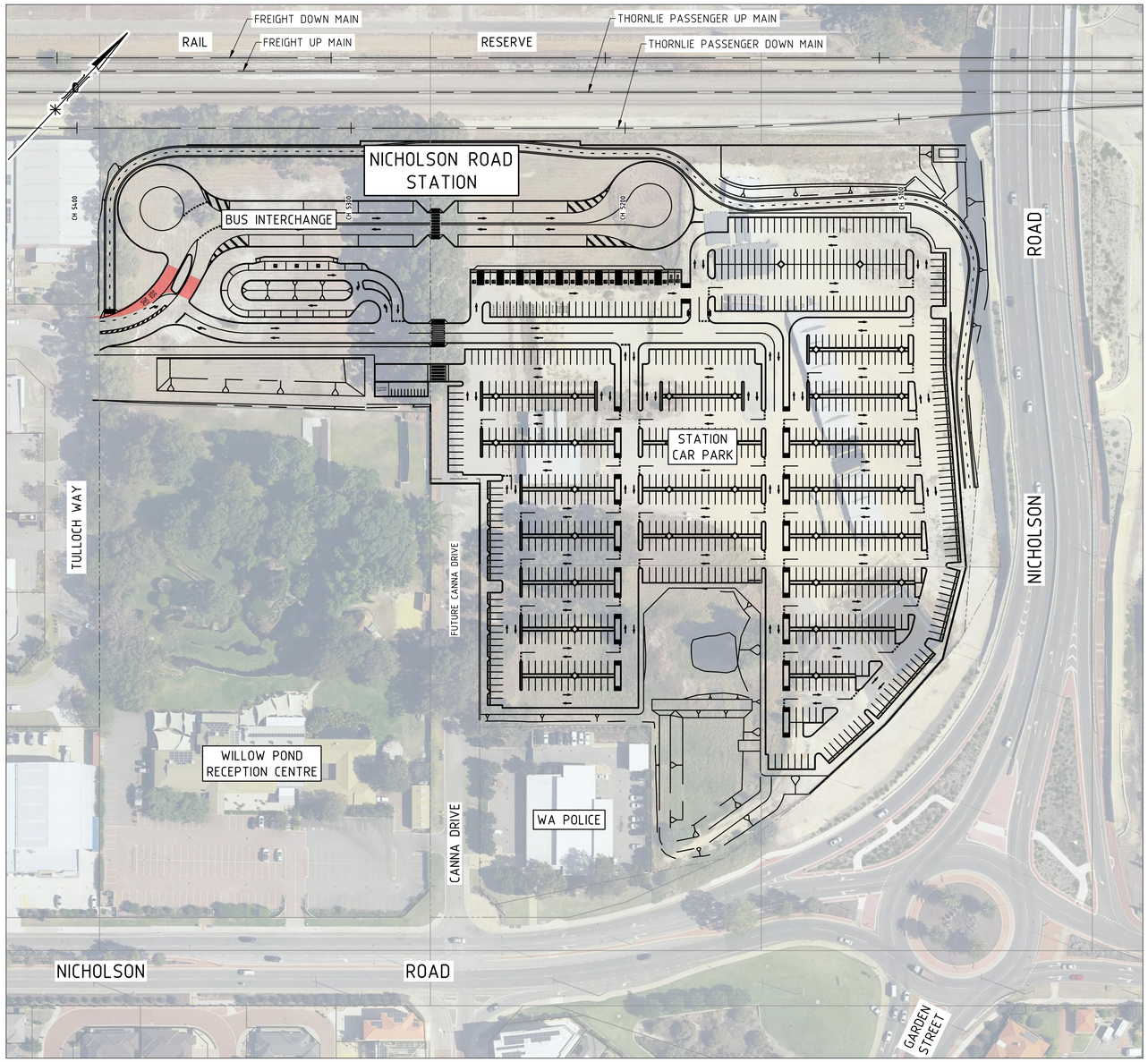
Stakeholders Consulted

Stakeholder Groups	Events	Stakeholders	
		Distinct	Total
Local Government	46	38	69
Community member / local resident	45	50	71
Affected owner/occupier	39	28	40
General public	19	16	19
State Government	16	13	25
Institutions / organisations	14	7	16
Local business	11	15	15
Community Reference / Advisory Group member	9	21	34
Private industry	9	5	9
PTA project staff	9	4	10
Other	23	21	25
[No Stakeholder Groups]	16	36	48
Total Events	**193**	**179**	**271**



APPENDIX E DEVELOPMENT PLANS

NEWest ALLIANCE
THORNLIE COCKBURN LINK
PACKAGE 007A - NICHOLSON ROAD STATION CIVIL WORKS



LOCALITY PLAN
1:1000

REV No.	DRAWING NUMBER		DRAWING TITLE
	NEWest	PTA	
A	TCY-DJV-TSB-CI-DRG-0001		DRAWING INDEX AND LOCALITY PLAN
GENERAL ARRANGEMENT			
A	TCY-DJV-TSB-CI-DRG-0050		GENERAL ARRANGEMENT - KEY PLAN
A	TCY-DJV-TSB-CI-DRG-0051		GENERAL ARRANGEMENT PLAN - SHEET 1 OF 5
A	TCY-DJV-TSB-CI-DRG-0052		GENERAL ARRANGEMENT PLAN - SHEET 2 OF 5
A	TCY-DJV-TSB-CI-DRG-0053		GENERAL ARRANGEMENT PLAN - SHEET 3 OF 5
A	TCY-DJV-TSB-CI-DRG-0054		GENERAL ARRANGEMENT PLAN - SHEET 4 OF 5
A	TCY-DJV-TSB-CI-DRG-0055		GENERAL ARRANGEMENT PLAN - SHEET 5 OF 5

0 10 20 30 40 50 100
SCALE (m) 1:1000 (A1) ; 1:2000 (A3)

DEVELOPMENT APPLICATION

REV	DATE	AMENDMENT	DSN	DRN	CHKD	APP
AA	15.10.20	ISSUED FOR DEVELOPMENT APPLICATION	DH	GC	BS	PT
A	16.07.20	ISSUED FOR 15% DESIGN	DH	GC	BS	PT
A1	29.04.20	ISSUED FOR REFERENCE DESIGN	DH	GC	BS	PT

ORIG SIZE A1 — 0 10 20 30 40 50 100mm AT ORIGINAL PLOT SIZE

NEWest Alliance

TCY-DJV-TSB-CI-DRG-0001

REFERENCES
TCY-DJV-TSB-CI-REF-0001_AER
TCY-DJV-T00-CI-REF-0001_RAIL
TCY-DJV-TSB-CI-REF-0001_DES-7A
TCY-DJV-TSB-CI-REF-0001_CAD
TCY-DJV-TKC-TR-REF-0001_TRACKWORK-PCG20
TCY-DJV-TLC-TR-REF-0001_TRACKWORK-PCG20

SCALE : 1:1000 (@ A1)
DATUM :
HORIZONTAL: PCG94
VERTICAL: AHD71
PTA ACCEPTANCE STAMP

DESIGNED DH
DRAWN GC
CHECKED BS
APPROVED FOR ISSUE
EXECUTIVE DIRECTOR
PTA Division / External Company
DATE

Government of Western Australia Public Transport Authority

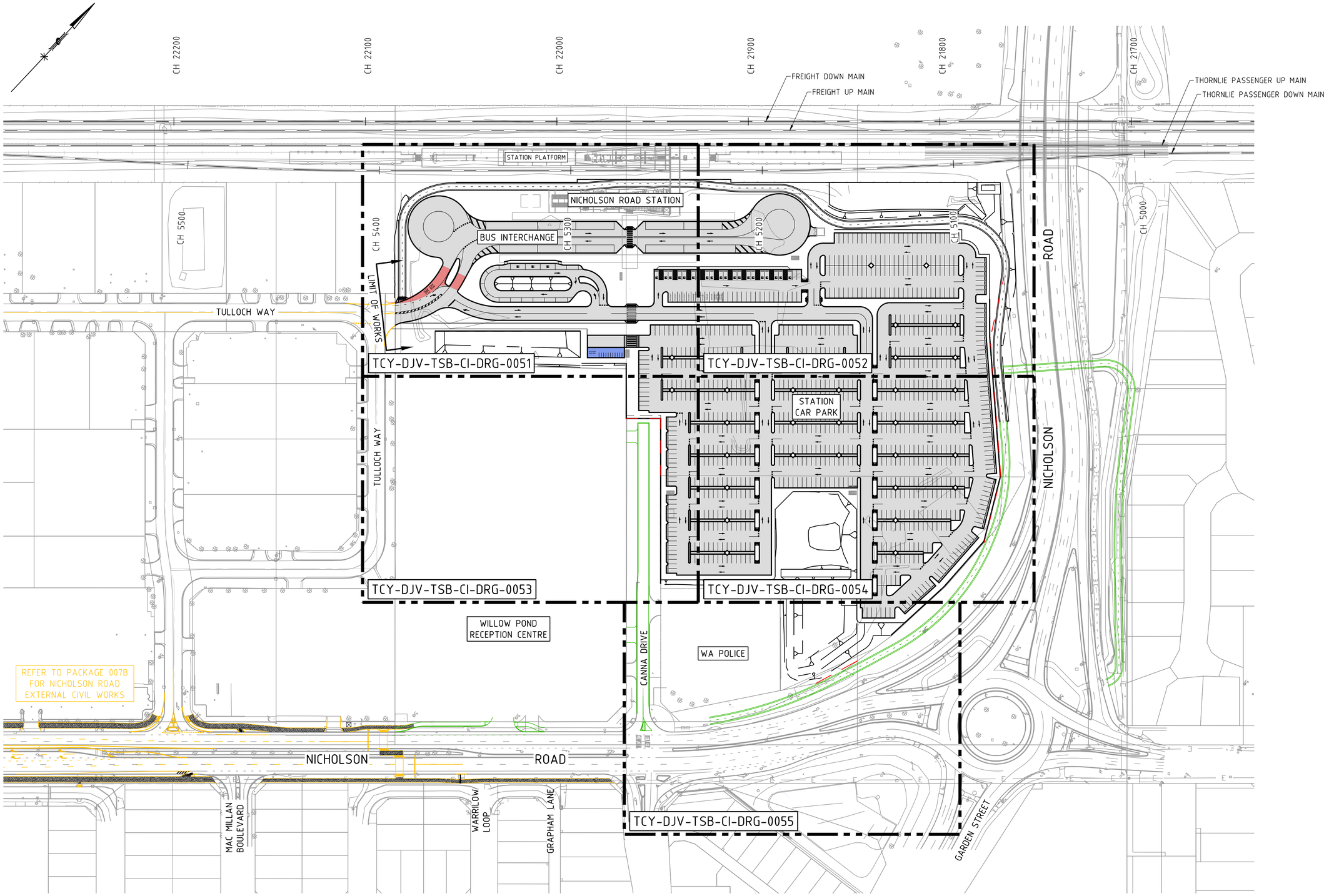
THORNLIE COCKBURN LINK

NICHOLSON RD STATION & PRECINCT
DRAWING INDEX & LOCALITY PLAN

PTA Drawing No:

REV : AA

CAD DRAWING PATHNAME C:\Users\Greg.clarke\Desktop\EXPORTED DRG'S\TCY-DJV-TSB-CI-DRG-0001.dwg



PLAN
1:1000

NOTES

1. ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE.

LEGEND

- NEW RAIL RESERVE BOUNDARY
- MODIFIED SITE BOUNDARY
- WORKS BY OTHERS
- EXTERNAL WORKS (REFER PACKAGE 007B)

0 10 20 30 40 50 100
SCALE (m) 1:1000 (A1) ; 1:2000 (A3)

DEVELOPMENT APPLICATION

REV	DATE	AMENDMENT	DSN	DRN	CHKD	APP
AA	15.10.20	ISSUED FOR DEVELOPMENT APPLICATION	DH	GC	BS	PT
A	16.07.20	ISSUED FOR 15% DESIGN	DH	GC	BS	PT
A1	29.04.20	ISSUED FOR REFERENCE DESIGN	DH	GC	BS	PT

ORIG SIZE A1

0 10 20 30 40 50 100mm
AT ORIGINAL PLOT SIZE

NEWest Alliance

TCY-DJV-TSB-CI-DRG-0050

REFERENCES
TCY-DJV-TLC-TR-REF-0001_RAIL-SURVEY-PCG20
TCY-DJV-TSB-CI-REF-0001_CAD
TCY-DJV-T00-CI-REF-0001_CAD
TCY-DJV-T00-CI-REF-0001_RAIL
TCY-DJV-TSB-CI-REF-0001_DES-7A
TCY-DJV-TSB-CI-REF-0001_PAV-7A
TCY-DJV-TSB-CI-REF-0001_DES-7B
TCY-DJV-TSB-AR-REF-0001_OUTLINE
TCY-DJV-TSB-CI-REF-0001_BNDRY-7A
TCY-DJV-TSB-CI-REF-0001_DES-OTHERS
TCY-DJV-TKC-TR-REF-0001_TRACKWORK-PCG20
TCY-DJV-TLC-TR-REF-0001_TRACKWORK-PCG20

SCALE : 1:1000 (@ A1)
DATUM : HORIZONTAL: PCG94 VERTICAL: AHD71
PTA ACCEPTANCE STAMP

DESIGNED DH
DRAWN GC
CHECKED BS
APPROVED FOR ISSUE
EXECUTIVE DIRECTOR PTA Division / External Company
DATE

Government of Western Australia Public Transport Authority

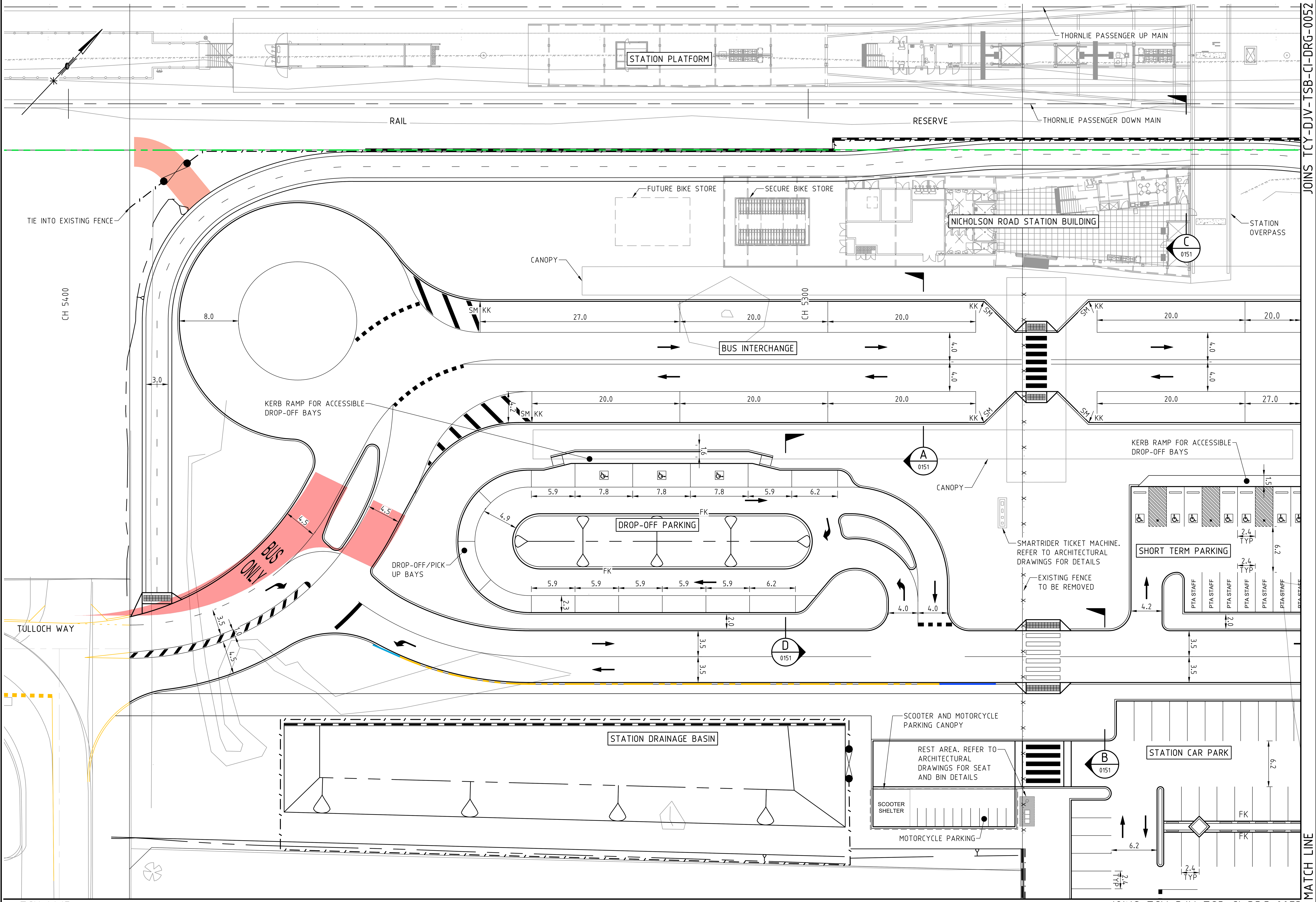
THORNLIE COCKBURN LINK

NICHOLSON RD STATION & PRECINCT
GENERAL ARRANGEMENT KEY PLAN

PTA Drawing No:

REV : AA

CAD DRAWING PATHNAME C:\Users\Greg.clarke\Desktop\EXPORTED DRG'S\TCY-DJV-TSB-CI-DRG-0050.dwg



MATCH LINE

JOINS TCY-DJV-TSB-CI-DRG-0053

NOTES

1. ALL DIMENSIONS IN METRES (m) UNLESS NOTED OTHERWISE.
2. ALL KERBING TO BE SEMI-MOUNTABLE UNLESS STATED OTHERWISE.
3. BARRIER KERB IN BUS INTERCHANGE TO BE PTA SOFT KERB PROFILE. REFER DRAWING 0201 FOR DETAILS.
4. REFER TO ELECTRICAL DRAWINGS FOR LIGHTING LAYOUT AND DETAILS.
5. REFER TO LANDSCAPE DRAWING FOR PAVING AND LANDSCAPING DETAILS.
6. DESIGN MODEL TO BE ISSUED ELECTRONICALLY AT 100% DESIGN REVIEW.

LEGEND

RAIL RESERVE BOUNDARY
CADASTRAL BOUNDARY
MODIFIED SITE BOUNDARY
WORKS BY OTHERS
NEW KERB
RETAINING WALL
TYPE 4 - 1800mm BLACK PLASTIC COATED CHAINWIRE FENCE WITH BLACK POWDER COATED POSTS
TYPE 5 - 1200mm BLACK PLASTIC COATED CHAINWIRE FENCE WITH BLACK POWDER COATED POSTS
ACCESS GATE
W-BEAM BARRIER
ZEE PARK CARPARK BARRIER
ET2000 PLUS TL2
TRAILING TERMINAL
BUS LANE
MAINTENANCE / EMERGENCY ACCESS TRACK
SM | KK — KERB TRANSITION
SM — SEMI MOUNTABLE KERB
KK — KASSEL KERB
FK — FLUSH KERB

PLAN
1:250

SCALE (m) 1:250 (A1) ; 1:500 (A3)

DEVELOPMENT APPLICATION

REV	DATE	AMENDMENT	DSN	DRN	CHKD	APP
AA	15.10.20	ISSUED FOR DEVELOPMENT APPLICATION	DH	GC	BS	PT
A	16.07.20	ISSUED FOR 15% DESIGN	DH	GC	BS	PT
A1	29.04.20	ISSUED FOR REFERENCE DESIGN	DH	GC	BS	PT

ORIG SIZE A1 — 0 10 20 30 40 50 100mm AT ORIGINAL PLOT SIZE

NEWest Alliance

TCY-DJV-TSB-CI-DRG-0051

REFERENCES
TCY-DJV-TLC-TR-REF-RAIL-SURVEY-PCG20
TCY-DJV-TSB-CI-REF-0001_LEG-GA-7A
TCY-DJV-T00-CI-REF-0001_CAD
TCY-DJV-T00-CI-REF-0001_RAIL
TCY-DJV-TSB-CI-REF-0001_DES-7A
TCY-DJV-TSB-CI-REF-0001_FEN-7A
TCY-DJV-TSB-CI-REF-0001_BAR
TCY-DJV-TSB-CI-REF-0001_DES-7B
TCY-DJV-TSB-AR-REF-0001_OUTLINE
TCY-DJV-TSB-CI-REF-0001_BNDRY-7A
TCY-DJV-TSB-CI-REF-0001_DES-OTHERS
TCY-DJV-TLC-TR-REF-0001_TRACKWORK-PCG20
TCY-DJV-TLC-TR-REF-0001_RAIL-RESERVE-PCG20

SCALE : 1:250 (@ A1)

DATUM :
HORIZONTAL: PCG94
VERTICAL: AHD71

PTA ACCEPTANCE STAMP

DESIGNED DH
DRAWN GC
CHECKED BS

APPROVED FOR ISSUE
EXECUTIVE DIRECTOR
PTA Division / External Company
DATE

Government of Western Australia
Public Transport Authority

THORNLIE COCKBURN LINK

NICHOLSON RD STATION & PRECINCT
GENERAL ARRANGEMENT PLAN
SHEET 1 OF 5

PTA Drawing No:

REV : AA

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JOINS TCY-DJV-TSB-CI-DRG-0052

RAIL

THORNLIE PASSENGER UP MAIN

THORNLIE PASSENGER DOWN MAIN

RESERVE

RAIL DRAINAGE BASIN

BIN STORE. REFER TO ARCHITECTURAL DRAWINGS FOR DETAILS

E 0151

CH 5200

CH 5100

20.0

KK | SM

8.0

MK

3.0

BUS INTERCHANGE

4.0

4.0

27.0

KK | SM

REST AREA. REFER TO ARCHITECTURAL DRAWINGS FOR SEAT AND BIN DETAILS

KERB RAMP FOR ACCESIBLE DROP-OFF BAYS

PROVISION FOR 2x FUTURE ELECTRIC VEHICLE PARKING AND CHARGING STATION

1.5

6.2

2.4 TYP

SHORT TERM PARKING

PTA STAFF

SERVICE

SERVICE

TRANSIT POLICE AMBULANCE

TRANSIT POLICE AMBULANCE

3.1

3.5

STATION CAR PARK

FK

ROAD

NICHOLSON

F 0151

MATCH LINE

MATCH LINE

JOINS TCY-DJV-TSB-CI-DRG-0054

PLAN
1:250

SCALE (m) 1:250 (A1) ; 1:500 (A3)

NOTES

1. ALL DIMENSIONS IN METRES (m) UNLESS NOTED OTHERWISE.
2. ALL KERBING TO BE SEMI-MOUNTABLE UNLESS STATED OTHERWISE.
3. BARRIER KERB IN BUS INTERCHANGE TO BE PTA SOFT KERB PROFILE. REFER DRAWING 0201 FOR DETAILS.
4. REFER TO ELECTRICAL DRAWINGS FOR LIGHTING LAYOUT AND DETAILS.
5. REFER TO LANDSCAPE DRAWING FOR PAVING AND LANDSCAPING DETAILS.
6. DESIGN MODEL TO BE ISSUED ELECTRONICALLY AT 100% DESIGN REVIEW.

LEGEND

- RAIL RESERVE BOUNDARY
- CADASTRAL BOUNDARY
- MODIFIED SITE BOUNDARY
- WORKS BY OTHERS
- NEW KERB
- RETAINING WALL
- TYPE 4 - 1800mm BLACK PLASTIC COATED CHAINWIRE FENCE WITH BLACK POWDER COATED POSTS
- TYPE 5 - 1200mm BLACK PLASTIC COATED CHAINWIRE FENCE WITH BLACK POWDER COATED POSTS
- ACCESS GATE
- W-BEAM BARRIER
- ZEE PARK CARPARK BARRIER
- ET2000 PLUS TL2
- TRAILING TERMINAL
- BUS LANE
- MAINTENANCE / EMERGENCY ACCESS TRACK
- SM | KK KERB TRANSITION
- SM SEMI MOUNTABLE KERB
- KK KASSEL KERB
- FK FLUSH KERB

DEVELOPMENT APPLICATION

REV	DATE	AMENDMENT	DSN	DRN	CHKD	APP
AA	15.10.20	ISSUED FOR DEVELOPMENT APPLICATION	DH	GC	BS	PT
A	16.07.20	ISSUED FOR 15% DESIGN	DH	GC	BS	PT
A1	29.04.20	ISSUED FOR REFERENCE DESIGN	DH	GC	BS	PT

ORIG SIZE A1

0 10 20 30 40 50 100mm
AT ORIGINAL PLOT SIZE

NEWest Alliance

TCY-DJV-TSB-CI-DRG-0052

REFERENCES

- TCY-DJV-TLC-TR-REF-RAIL-SURVEY-PCG20
- TCY-DJV-TSB-CI-REF-0001_LEG-GA-7A
- TCY-DJV-T00-CI-REF-0001_CAD
- TCY-DJV-T00-CI-REF-0001_RAIL
- TCY-DJV-TSB-CI-REF-0001_DES-7A
- TCY-DJV-TSB-CI-REF-0001_FEN-7A
- TCY-DJV-TSB-CI-REF-0001_DES-OTHERS
- TCY-DJV-TSB-AR-REF-0001_OUTLINE
- TCY-DJV-TSB-CI-REF-0001_BNDRY-7A
- TCY-DJV-TLC-TR-REF-0001_TRACKWORK-PCG20
- TCY-DJV-TLC-TR-REF-0001_RAIL-RESERVE-PCG20

SCALE : 1:250 (@ A1)

DATUM :
HORIZONTAL: PCG94
VERTICAL: AHD71

PTA ACCEPTANCE STAMP

DESIGNED	DH
DRAWN	GC
CHECKED	BS

APPROVED FOR ISSUE

EXECUTIVE DIRECTOR
PTA Division / External Company
DATE

Government of Western Australia Public Transport Authority

THORNLIE COCKBURN LINK

NICHOLSON RD STATION & PRECINCT
GENERAL ARRANGEMENT PLAN
SHEET 2 OF 5

PTA Drawing No:

REV : AA

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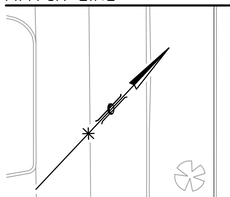
MATCH LINE

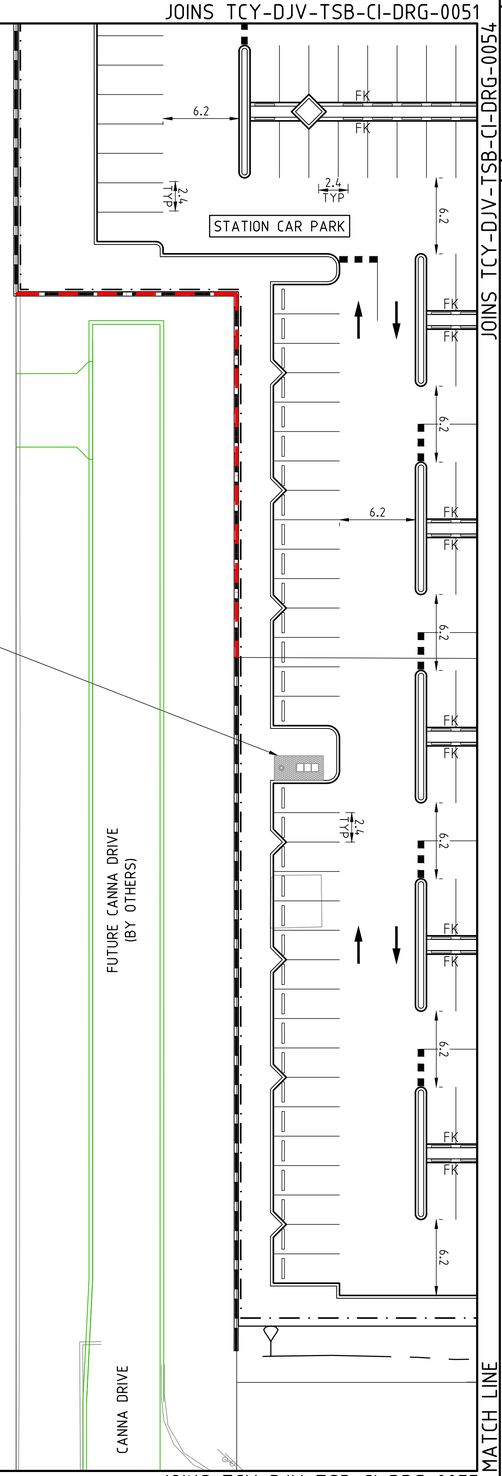
JOINS TCY-DJV-TSB-CI-DRG-0051

JOINS TCY-DJV-TSB-CI-DRG-0054



TULLOCH WAY

WILLOW POND
RECEPTION CENTRE



REST AREA. REFER TO ARCHITECTURAL DRAWINGS FOR SEAT AND BIN DETAILS

FUTURE CANNA DRIVE (BY OTHERS)

CANNA DRIVE

MATCH LINE

JOINS TCY-DJV-TSB-CI-DRG-0055

MATCH LINE

PLAN
1:250

0 2.5 5 7.5 10 12.5 25
SCALE (m) 1:250 (A1) ; 1:500 (A3)

NOTES

1. ALL DIMENSIONS IN METRES (m) UNLESS NOTED OTHERWISE.
2. ALL KERBING TO BE SEMI-MOUNTABLE UNLESS STATED OTHERWISE.
3. BARRIER KERB IN BUS INTERCHANGE TO BE PTA SOFT KERB PROFILE. REFER DRAWING 0201 FOR DETAILS.
4. REFER TO ELECTRICAL DRAWINGS FOR LIGHTING LAYOUT AND DETAILS.
5. REFER TO LANDSCAPE DRAWING FOR PAVING AND LANDSCAPING DETAILS.
6. DESIGN MODEL TO BE ISSUED ELECTRONICALLY AT 100% DESIGN REVIEW.

LEGEND

- RAIL RESERVE BOUNDARY
- CADASTRAL BOUNDARY
- MODIFIED SITE BOUNDARY
- WORKS BY OTHERS
- NEW KERB
- RETAINING WALL
- TYPE 4 - 1800mm BLACK PLASTIC COATED CHAINWIRE FENCE WITH BLACK POWDER COATED POSTS
- TYPE 5 - 1200mm BLACK PLASTIC COATED CHAINWIRE FENCE WITH BLACK POWDER COATED POSTS
- ACCESS GATE
- W-BEAM BARRIER
- ZEE PARK CARPARK BARRIER
- ET2000 PLUS TL2
- TRAILING TERMINAL
- BUS LANE
- MAINTENANCE / EMERGENCY ACCESS TRACK
- SM | KK KERB TRANSITION
- SM SEMI MOUNTABLE KERB
- KK KASSEL KERB
- FK FLUSH KERB

DEVELOPMENT APPLICATION

REV	DATE	AMENDMENT	DSN	DRN	CHKD	APP
AA	15.10.20	ISSUED FOR DEVELOPMENT APPLICATION	DH	GC	BS	PT
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A1	29.04.20	ISSUED FOR REFERENCE DESIGN	DH	GC	BS	PT

ORIG SIZE A1

0 10 20 30 40 50 100mm
AT ORIGINAL PLOT SIZE

NEWest Alliance

TCY-DJV-TSB-CI-DRG-0053

REFERENCES

TCY-DJV-TLC-TR-REF-RAIL-SURVEY-PCG20
TCY-DJV-TSB-CI-REF-0001_LEG-GA-7A
TCY-DJV-T00-CI-REF-0001_CAD
TCY-DJV-TSB-CI-REF-0001_DES-7A
TCY-DJV-TSB-CI-REF-0001_FEN-7A
TCY-DJV-T00-CI-REF-0001_RAIL
TCY-DJV-TSB-CI-REF-0001_DES-OTHERS
TCY-DJV-TSB-AR-REF-0001_OUTLINE
TCY-DJV-TSB-CI-REF-0001_BNDRY-7A

SCALE : 1:250 (@ A1)

DATUM :
HORIZONTAL: PCG94
VERTICAL: AHD71

PTA ACCEPTANCE STAMP

DESIGNED	DH
DRAWN	GC
CHECKED	BS

APPROVED FOR ISSUE

EXECUTIVE DIRECTOR
PTA Division / External Company
DATE

Government of Western Australia
Public Transport Authority

THORNLIE COCKBURN LINK

NICHOLSON RD STATION & PRECINCT
GENERAL ARRANGEMENT PLAN
SHEET 3 OF 5

PTA Drawing No:

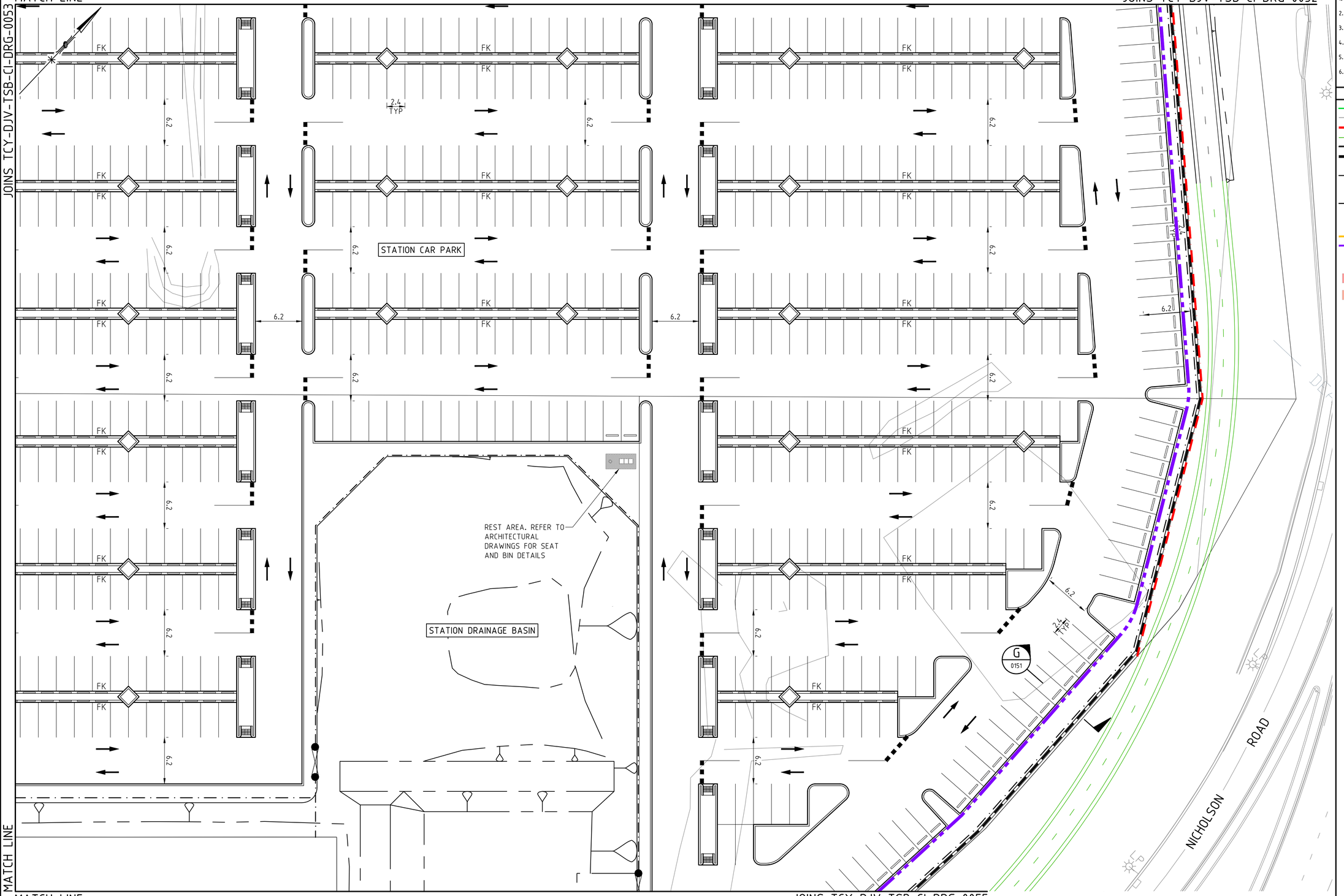
REV : AA

CAD DRAWING PATHNAME C:\Users\Greg.clarke\Desktop\EXPORTED DRG'S\TCY-DJV-TSB-CI-DRG-0053.dwg

MATCH LINE

JOINS TCY-DJV-TSB-CI-DRG-0052

JOINS TCY-DJV-TSB-CI-DRG-0053



MATCH LINE

JOINS TCY-DJV-TSB-CI-DRG-0055

PLAN
1:250

SCALE (m) 1:250 (A1) ; 1:500 (A3)

NOTES

1. ALL DIMENSIONS IN METRES (m) UNLESS NOTED OTHERWISE.
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4. REFER TO ELECTRICAL DRAWINGS FOR LIGHTING LAYOUT AND DETAILS.
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LEGEND

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- CADASTRAL BOUNDARY
- MODIFIED SITE BOUNDARY
- WORKS BY OTHERS
- NEW KERB
- RETAINING WALL
- TYPE 4 - 1800mm BLACK PLASTIC COATED CHAINWIRE FENCE WITH BLACK POWDER COATED POSTS
- TYPE 5 - 1200mm BLACK PLASTIC COATED CHAINWIRE FENCE WITH BLACK POWDER COATED POSTS
- ACCESS GATE
- W-BEAM BARRIER
- ZEE PARK CARPARK BARRIER
- ET2000 PLUS TL2
- TRAILING TERMINAL
- BUS LANE
- MAINTENANCE / EMERGENCY ACCESS TRACK
- SM | KK KERB TRANSITION
- SM SEMI MOUNTABLE KERB
- KK KASSEL KERB
- FK FLUSH KERB

DEVELOPMENT APPLICATION

REV	DATE	AMENDMENT	DSN	DRN	CHKD	APP
AA	15.10.20	ISSUED FOR DEVELOPMENT APPLICATION	DH	GC	BS	PT
A	16.07.20	ISSUED FOR 15% DESIGN	DH	GC	BS	PT
A1	29.04.20	ISSUED FOR REFERENCE DESIGN	DH	GC	BS	PT

ORIG SIZE A1

0 10 20 30 40 50 100mm
AT ORIGINAL PLOT SIZE

NEWest Alliance

TCY-DJV-TSB-CI-DRG-0054

REFERENCES

TCY-DJV-TLC-TR-REF-RAIL-SURVEY-PCG20
TCY-DJV-TSB-CI-REF-0001_LEG-GA-7A
TCY-DJV-T00-CI-REF-0001_CAD
TCY-DJV-TSB-CI-REF-0001_DES-7A
TCY-DJV-TSB-CI-REF-0001_FEN-7A
TCY-DJV-TSB-CI-REF-0001_BAR
TCY-DJV-TSB-CI-REF-0001_DES-OTHERS
TCY-DJV-TSB-AR-REF-0001_OUTLINE
TCY-DJV-TSB-CI-REF-0001_BNDRY-7A

SCALE : 1:250 (@ A1)

DATUM :
HORIZONTAL: PCG94
VERTICAL: AHD71

PTA ACCEPTANCE STAMP

DESIGNED	DH
DRAWN	GC
CHECKED	BS

APPROVED FOR ISSUE

EXECUTIVE DIRECTOR
PTA Division / External Company
DATE

Government of Western Australia
Public Transport Authority

THORNLIE COCKBURN LINK

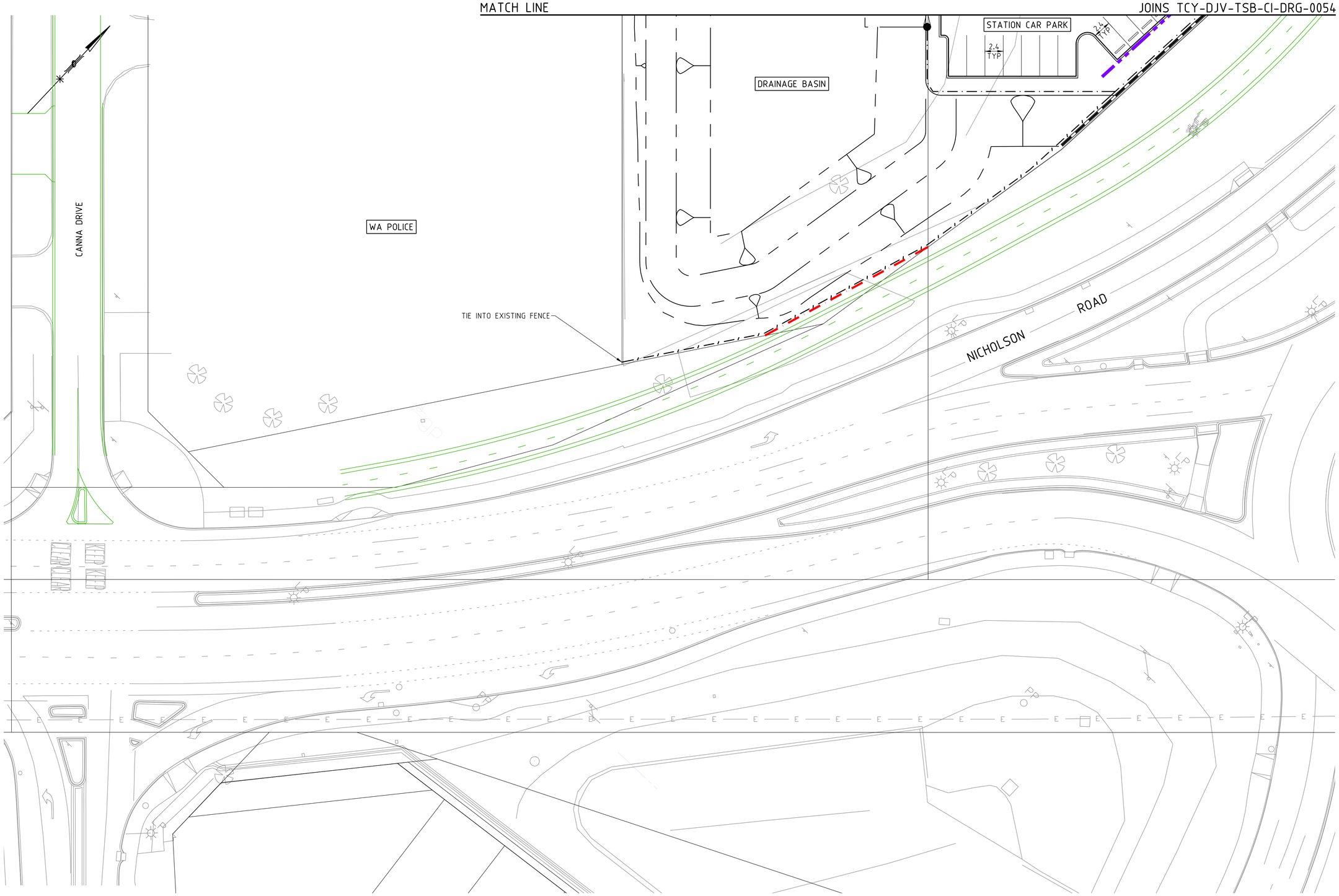
NICHOLSON RD STATION & PRECINCT
GENERAL ARRANGEMENT PLAN
SHEET 4 OF 5

PTA Drawing No: REV : AA

CAD DRAWING PATHNAME C:\Users\Greg.clarke\Desktop\EXPORTED DRG'S\TCY-DJV-TSB-CI-DRG-0054.dwg

MATCH LINE

JOINS TCY-DJV-TSB-CI-DRG-0054



PLAN
1:250

NOTES

1. ALL DIMENSIONS IN METRES (m) UNLESS NOTED OTHERWISE.
2. ALL KERBING TO BE SEMI-MOUNTABLE UNLESS STATED OTHERWISE.
3. BARRIER KERB IN BUS INTERCHANGE TO BE PTA SOFT KERB PROFILE. REFER DRAWING 0201 FOR DETAILS.
4. REFER TO ELECTRICAL DRAWINGS FOR LIGHTING LAYOUT AND DETAILS.
5. REFER TO LANDSCAPE DRAWING FOR PAVING AND LANDSCAPING DETAILS.
6. DESIGN MODEL TO BE ISSUED ELECTRONICALLY AT 100% DESIGN REVIEW.

LEGEND

- RAIL RESERVE BOUNDARY
- CADASTRAL BOUNDARY
- MODIFIED SITE BOUNDARY
- WORKS BY OTHERS
- NEW KERB
- RETAINING WALL
- TYPE 4 - 1800mm BLACK PLASTIC COATED CHAINWIRE FENCE WITH BLACK POWDER COATED POSTS
- TYPE 5 - 1200mm BLACK PLASTIC COATED CHAINWIRE FENCE WITH BLACK POWDER COATED POSTS
- ACCESS GATE
- W-BEAM BARRIER
- ZEE PARK CARPARK BARRIER
- ET2000 PLUS TL2
- TRAILING TERMINAL
- BUS LANE
- MAINTENANCE / EMERGENCY ACCESS TRACK
- SM | KK — KERB TRANSITION
- SM — SEMI MOUNTABLE KERB
- KK — KASSEL KERB
- FK — FLUSH KERB

0 2.5 5 7.5 10 12.5 25
SCALE (m) 1:250 (A1) ; 1:500 (A3)

DEVELOPMENT APPLICATION

REV	DATE	AMENDMENT	DSN	DRN	CHKD	APP
AA	15.10.20	ISSUED FOR DEVELOPMENT APPLICATION	DH	GC	BS	PT
A	16.07.20	ISSUED FOR 15% DESIGN	DH	GC	BS	PT
A1	29.04.20	ISSUED FOR REFERENCE DESIGN	DH	GC	BS	PT

ORIG SIZE A1

0 10 20 30 40 50 100mm
AT ORIGINAL PLOT SIZE

NEWest Alliance

TCY-DJV-TSB-CI-DRG-0055

REFERENCES
TCY-DJV-TSB-CI-REF-0001_LEG-GA-7A
TCY-DJV-T00-CI-REF-0001_CAD
TCY-DJV-TSB-CI-REF-0001_DES-7A
TCY-DJV-TSB-CI-REF-0001_FEN-7A
TCY-DJV-TSB-CI-REF-0001_BAR
TCY-DJV-TSB-CI-REF-0001_DES-OTHERS
TCY-DJV-TLC-TR-REF-0001_RAIL-SURVEY-PCG20
TCY-DJV-TSB-AR-REF-0001_OUTLINE
TCY-DJV-TSB-CI-REF-0001_BNDRY-7A

SCALE : 1:250 (@ A1)
DATUM :
HORIZONTAL: PCG94
VERTICAL: AHD71
PTA ACCEPTANCE STAMP

DESIGNED DH
DRAWN GC
CHECKED BS
APPROVED FOR ISSUE
EXECUTIVE DIRECTOR
PTA Division / External Company
DATE

Government of Western Australia Public Transport Authority

THORNLIE COCKBURN LINK

NICHOLSON RD STATION & PRECINCT
GENERAL ARRANGEMENT PLAN
SHEET 5 OF 5

PTA Drawing No:

REV : AA

CAD DRAWING PATHNAME C:\Users\Greg.clarke\Desktop\EXPORTED DRG'S\TCY-DJV-TSB-CI-DRG-0055.dwg

APPENDIX F LANDSCAPE PLAN

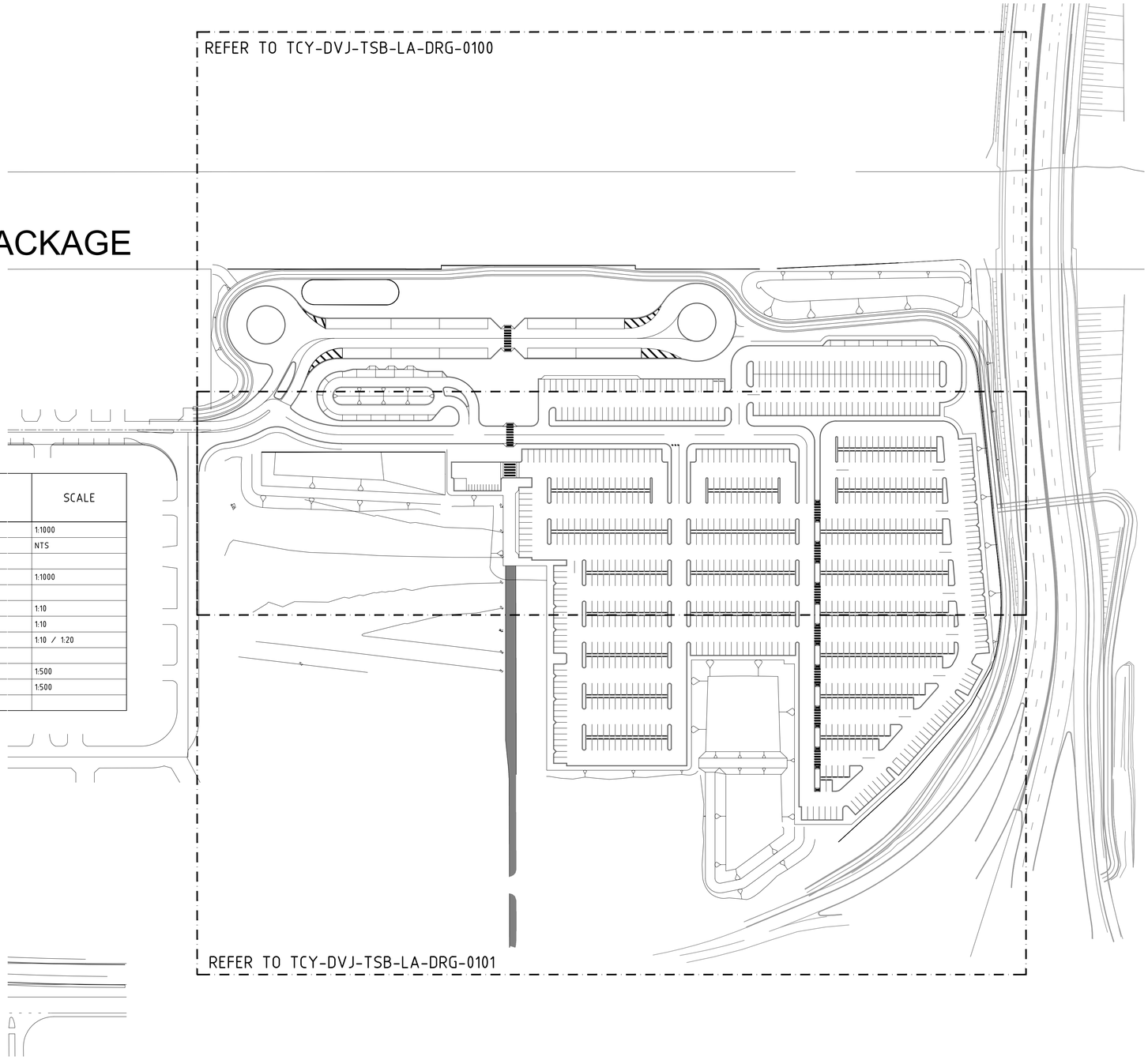
NEWest ALLIANCE
THORNLIE COCKBURN LINK

NICHOLSON ROAD STATION - LANDSCAPE PACKAGE
TSB LANDSCAPE - DETAILED DESIGN

REV No.	DRAWING NUMBER		DRAWING TITLE	SCALE
	NEWest	PTA		
A	TCY-DJV-TSB-LA-DRG-0001		NICHOLSON ROAD STATION - LANDSCAPE MASTERPLAN - COVER SHEET / DRAWING INDEX	1:1000
A	TCY-DJV-TSB-LA-DRG-0002		NICHOLSON ROAD STATION - LANDSCAPE MASTERPLAN - PLANTING LIST / CONCEPT MATERIALS	NTS
A	TCY-DJV-TSB-LA-DRG-0011		NICHOLSON ROAD STATION - LANDSCAPE MASTERPLAN - OVERALL PLAN	1:1000
A	TCY-DJV-TSB-LA-DRG-0050		NICHOLSON ROAD STATION - LANDSCAPE MASTERPLAN - TYPICAL LANDSCAPE DETAILS - SHEET 1	1:10
A	TCY-DJV-TSB-LA-DRG-0051		NICHOLSON ROAD STATION - LANDSCAPE MASTERPLAN - TYPICAL LANDSCAPE DETAILS - SHEET 2	1:10
A	TCY-DJV-TSB-LA-DRG-0052		NICHOLSON ROAD STATION - LANDSCAPE MASTERPLAN - TYPICAL LANDSCAPE DETAILS - SHEET 3	1:10 / 1:20
A	TCY-DJV-TSB-LA-DRG-0100		NICHOLSON ROAD STATION - LANDSCAPE MASTERPLAN - SURFACE FINISHES - SHEET 1	1:500
A	TCY-DJV-TSB-LA-DRG-0101		NICHOLSON ROAD STATION - LANDSCAPE MASTERPLAN - SURFACE FINISHES - SHEET 2	1:500

NOTE:

MASTER PLAN AND SURFACE FINISHES WERE COMPLETED IN AUTOCAD (MODEL STILL BEING TRANSFERRED TO REVIT). REMAINING SHEETS ALREADY IN REVIT.



NICHOLSON STATION - COVER SHEET
SCALE 1:1000

0 10 20 30 40 50 100
SCALE (m) 1:1000 (A1) ; 1:2000 (A3)

DETAILED DESIGN

REV	DATE	AMENDMENT	DSN	DRN	CHKD	APP
A	15.07.20	15% DESIGN ISSUE	TL_PF	TL_PF	FM	
A1	29.04.20	REFERENCE DESIGN ISSUE	TL	TL	FM	

ORIG SIZE A1

0 10 20 30 40 50 100mm
AT ORIGINAL PLOT SIZE

NEWest Alliance

TCY-DJV-TSB-LA-DRG-0001

REFERENCES
TCY-DJV-TSB-LA-REF_KEYMAP
TCY-DJV-TSB-LA-REF-DRAWING-INDEX

SCALE : 1:1000 (@ A1)
DATUM :
HORIZONTAL: PCG20
VERTICAL: AHD71
PTA ACCEPTANCE STAMP

DESIGNED TL
DRAWN TL
CHECKED FM
APPROVED FOR ISSUE
EXECUTIVE DIRECTOR
PTA Division / External Company
DATE

Government of Western Australia
Public Transport Authority

THORNLIE COCKBURN LINK
NICHOLSON ROAD STATION
LANDSCAPE MASTERPLAN
COVER SHEET / DRAWING INDEX

PTA Drawing No:
REV : A

CAD DRAWING PATHNAME C:\Users\boylep\Desktop\Nicholson\TCY-DJV-TSB-LA-DRG-0001.dwg

NICHOLSON ROAD STATION

Landscape Concept (Place of Emu)

FEATURE COLOUR FOR LANDSCAPE - NATURAL CLAY PAVERS

Ground Covers

Acacia saligna prostrate
Acacia Springtime Cascade
Type: Ground cover
Full Sun / Part Shade
Flower: Spring
Soil Type: All soils including coastal
Size: 30-40cm (H) x 3m (W)
(Available Benara Nursery)

Atriplex cinerea
Coastal Saltbush
Type: Ground Cover
Full Sun / Part Shade
Flower: Spring
Soil Type: All soils including coastal
Size: 25cm (H) x 2m (W)
(Available Lullfitz Nursery)

Grevillea crithmifolia (prostrate)
Green Carpet
Type: Ground cover
Full Sun / Part Shade
Flower: Spring
Soil Type: All Soils
Size: 0.6cm (H) x 3m (W)
(Available Lullfitz Nursery)

Hardenbergia comptoniana
Native Wisteria
Type: Ground cover / Climber
Full Sun / Part Shade
Flower: Spring
Soil Type: All Soils (well drained)
Size: 0.3cm (H) x 1.5m (W)
(Available Benara Nursery)

Hemiandra pungens
Snakebush (Green leaf form)
Type: Ground cover
Full Sun / Part Shade
Flower: Summer
Soil Type: All Soils
Size: 0.2cm (H) x 2m (W)
(Available Lullfitz Nursery)

Grasses

Dianella caerulea 'DCNC0' Breeze
Blue Flax Lily
Type: Grass
Full Sun / Part Shade / Shade
Flower: Spring
Soil Type: All soils including coastal
Size: 60cm (H) x 60cm (W)
(Available Benara Nursery)

Conostylis candicans
Type: Strappy Leaf
Full Sun
Flower: Winter / Spring
Soil Type: All soils
Size: 30cm (H) x 30cm (W)
(Available Benara Nursery)

Lepidosperma longitudinale
Pithy Sword Sedge
Type: Sedge - Stripy Leaf
Full Sun
Flower: Winter
Soil Type: All Soils
Size: 1m (H) x 50 cm (W)
(Available Benara Nursery)

Orthosanthus multiflorus
Morning Flag
Type: Stripy Leaf
Full Sun / Part Shade
Flower: Spring
Soil Type: All Soils
Size: 50cm (H) x 30cm (W)
(Available Lullfitz Nursery)

Patersonia occidentalis
Native Iris
Type: Grass
Full Sun / Part Shade
Flower: Spring / Summer
Soil Type: All soils including coastal
Size: 80cm (H) x 80cm (W)
(Available Lullfitz Nursery)

Shrubs

Agonis flexuosa nana
Dwarf Willow Peppermint
Type: Compact Shrub
Full Sun / Part Shade
Flower: Spring
Soil Type: All Soils
Size: 1m (H) x 1m (W)
(Available Benara Nursery)

Beaufortia elegans
Elegant Beaufortia
Type: Medium Shrub
Full Sun
Flower: Summer
Soil Type: All Soils
Size: 1m (H) x 1m (W)
(Available Lullfitz Nursery)

Boronia Crenulata 'Pink'
Aniseed Boronia
Type: Medium Shrub
Full Sun / Part Shade
Flower: Spring / Winter
Soil Type: All soils including coastal
Size: 1m (H) x 1m (W)
(Available Benara Nursery)

Eremophila nivea
Emu Bush
Type: Medium Shrub
Full Sun
Flower: Winter to Summer
Soil Type: All Soils (well drained)
Size: 1.2m (H) x 1.5m (W)
(Available Benara Nursery)

Leucophita brownii 'Canal Rocks'
Silver Cushion Bush
Type: Medium Shrub
Full Sun
Flower: Spring / Winter
Soil Type: All soils including coastal
Size: 1m (H) x 1.5m (W)
(Available Benara Nursery)

Feature / Hedges / Swale

Calothamnus quadrifidis
One sided Bottlebrush
Type: Large Shrub (Hedge)
Light Shade / Full Sun
Flower: Spring / Summer
Soil Type: All soils
Size: 2.5m (H) x 2.5m (W)
(Available Benara Nursery)

Adenanthos sericeus
Woolly Bush - 'Pencil Perfect'
Type: Large Shrub (Hedge)
Full Sun / Parte Shade
Flower: Spring / Summer
Soil Type: All soils
Size: 3 m (H) x 1 m (W)
(Available Lullfitz Nursery)

Ficinia nodosa
Knotted Club Rush
Type: Rush / Sedge
Light Shade / Full Sun
Flower: Summer to Winter
Soil Type: All soils including Coastal
Size: 1m (H) x 1m (W)
(Available Lullfitz Nursery)

Juncus krausii
Sea Rush
Type: Rush / Sedge
Light Shade / Full Sun
Flower: Spring / Summer
Soil Type: All soils including Coastal
Size: 1m (H) x 50cm (W)
(Available Lullfitz Nursery)

Baumea Juncea
Rush Rush
Type: Rush / Sedge
Light Shade / Full Sun
Flower: Spring / Summer
Soil Type: All soils including Coastal
Size: 1m (H) x 1m (W)
(Available Lullfitz Nursery)

Trees

Allocasuarina fraseriana
Western Sheoak
Type: Large Tree
Full Sun / Part Shade
Flower: Autumn / Winter
All soils
Size: 10m (H) x 6m (W)
(Available Benara Nursery)

Corymbia calophylla
Marri
Type: Large Tree
Full Sun
Flower: Spring
All soils
Size: 12 m (H) x 8-10 m (W)
(Available Benara Nursery)

Cupaniopsis anacardioides
Tuckeroo
Type: Medium Tree
Full Sun
Flower: Summer/Autumn
All soils including Coastal
Size: 8 m (H) x 6 m (W)
Root ball size:
(Available Ellenby Tree Farm)

Eucaliptus rudis
Flooded Gum
Type: Large Tree
Full Sun
Flower: Winter / Spring
All soils and wetlands
Size: 15 m (H) x 8 m (W)
(Available Ellenby Tree Farm)

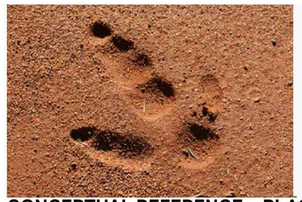
Eucaliptus todtiana
Coastal Blackbutt
Type: Medium Tree
Full Sun
Flower: Summer / Autumn
All soils
Size: 6 m (H) x 5 -10 m (W)
(Available Ellenby Tree Farm)

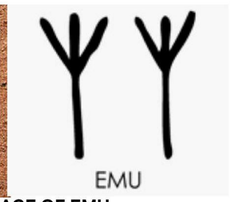
Melaleuca preissiana
Modong / Stout
Type: Small Tree
Full Sun
Flower: Autumn
All soils and wetlands
Size: 5-6m (H) x 4-5 m (W)
(Available Benara Nursery)

CLAY PAVER MIX

NICHOLSON ROAD STATION LANDSCAPE PAVING MIX TO BE COMPOSED OF A MIX OF CLAY PAVER INTERCEPTED BY ENGINEERED STONE PAVER BANDS.

PAVING PATTERNS TO DEFINE THE OVERALL SPACES AROUND THE STATION AND PROVIDE VISUAL CLUES THAT CONTRIBUTE TO WAYFINDING TOWARDS THE STATIONS MAIN ENTRANCES.





CONCEPTUAL REFERENCE - PLACE OF EMU

EMU FOOTPRINT TO BE INTERPRETED WITHIN THE FEATURE BANDING PAVING LAYOUT IN ORDER TO PROVIDE A PATTERN THAT GUIDES PEDESTRIANS TOWARDS THE MAIN ENTRANCES OF THE STATION.

NICHOLSON ROAD WATER HOLE
LANDSCAPE CONCEPTUAL LAYOUT

Feature Natives for Nicholson Road Station Landscape

DETAILED DESIGN

REV	DATE	AMENDMENT	DSN	DRN	CHKD	APP
A	15.07.20	15% DESIGN ISSUE	TL_PF	TL_PF	FM	

ORIG SIZE A1

0 10 20 30 40 50 100mm
AT ORIGINAL PLOT SIZE

NEWest Alliance

TCY-DJV-TSB-LA-DRG-0002

REFERENCES

SCALE : 1 : NTS (@ A1)

DATUM : HORIZONTAL: PCG20
VERTICAL: AHD71

PTA ACCEPTANCE STAMP

DESIGNED TL_PF
DRAWN TL_PF
CHECKED FM

APPROVED FOR ISSUE

EXECUTIVE DIRECTOR
PTA Division / External Company

DATE

Government of Western Australia
Public Transport Authority

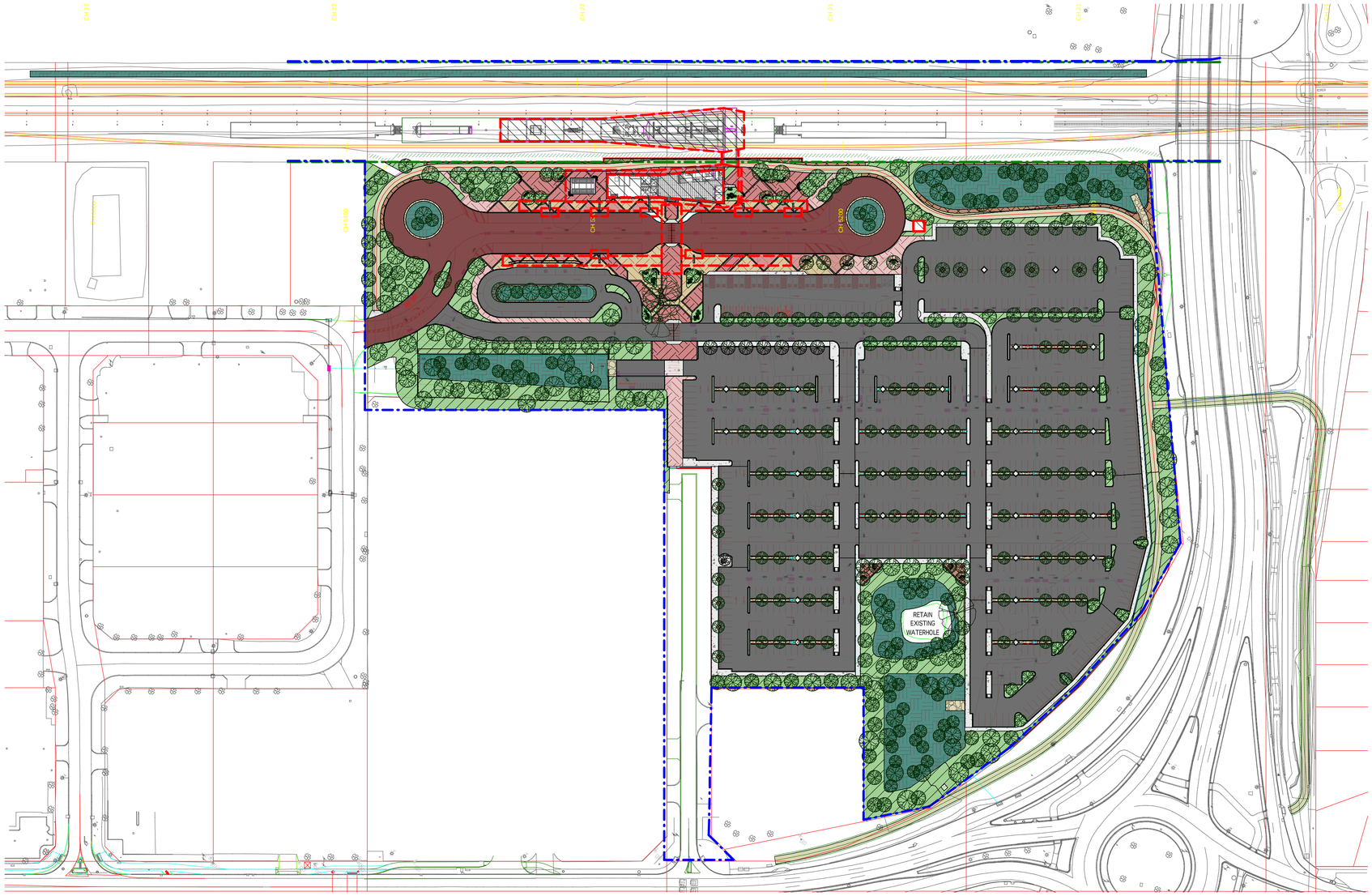
THORNLIE COCKBURN LINK

NICHOLSON ROAD STATION
LANDSCAPE MASTERPLAN
PLANTING LIST / CONCEPT MATERIALS

PTA Drawing No:

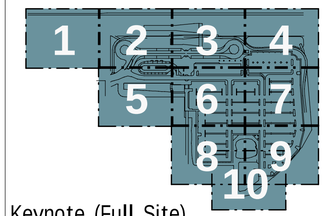
REV: A

CAD DRAWING PATHNAME BIM 360://Metronet - TCY/TCY-DJV-TSB-LA-MOD-0001_NICHOLSON RD STATION.rvt



LA_NICHOLSON ST_Masterplan 1/1000

SCALE 1 : 1000



Keynote (Full Site)

SCALE 1 : 5000

LANDSCAPE LEGEND

- PV1 - MIDLAND BRICKS CLAY PAVERS
  230mm x 114mm x 60mm
  4 Colour Mix - Red 40%_Others 20%
- PV2 - MIDLAND BRICKS CLAY PAVERS
  230mm x 114mm x 60mm
  2 Colour Mix - Red 85%_Yellow 15%
- PV3 - MIDLAND BRICKS CLAY PAVERS
  230mm x 114mm x 60mm
  2 Colour Mix - Red 15%_Yellow 85%
- PV4 - MIDLAND BRICKS CLAY PAVERS
  230mm x 114mm x 60mm
  1 Colour - Sentosa 100%

NOTE: PV1 to PV4 to be composed of a mix of different coloured Brick Pavers. All main Pavers to be CLAY PAVERS.
Refer to TCY-DJV-TSB-LA-DRG-0050 for more details.

- PV5 - Urbanstone Engineered Stone Silver Grey Shotblast 400 Series - 400mm x 200mm x 60mm
- CP - Standard Grey Brushed Insitu Concrete Paths
- EP - Tree Wells with Epoxy-Bonded Agreegates
- MU - Mulched Areas Only
- GV - Gravel Areas Only
- GB - Garden Beds (Overall Areas)
- SM - Garden Beds (Basin /Swale Plant Mix)
- GC - Garden Beds (Station Corridor Mix)
- New Trees
- Existing Trees to Retain
- RW - Limestone Retaining Walls
  REFER TO CIVIL DOCUMENTATION PACKAGE
- Nicholson Road Station
  REFER TO ARCHITECTURAL & STRUCTURAL DOCUMENTATION PACKAGE
- Architectural Shade Structures
  REFER TO ARCHITECTURAL & STRUCTURAL DOCUMENTATION PACKAGE
- Other Structural Elements
  REFER TO ARCHITECTURAL & STRUCTURAL DOCUMENTATION PACKAGE
- Principal Shared Path
  REFER TO CIVIL & RAIL DOCUMENTATION PACKAGE
- Rail Maintenance Tracks
  REFER TO CIVIL & RAIL DOCUMENTATION PACKAGE
- DEVELOPMENT ENVELOPE BOUNDARY
- RAIL RESERVE BOUNDARY

NOTES:

- ALL DIMENSIONS IN MILIMITRES UNLESS NOTED OTHERWISE.
- OVERALL LAYOUTS, SHEETS AND MODELS ARE STILL TO BE TAKEN AS WORK IN PROGRESS

DISCLAIMER:

- THESE DESIGNS AND PLANS ARE OWNED BY NEWest ALLIANCE AND CANNOT BE REPRODUCED WITHOUT WRITTEN PERMISSION.
- DO NOT SCALE OFF THESE DRAWINGS.

0 10000 20000 30000 40000 50000 100000

SCALE (mm) 1:1000 (A1) ; 1:2000 (A3)

DETAILED DESIGN

REV	DATE	AMENDMENT	DSN	DRN	CHKD	APP
AA	19.10.20	ISSUED FOR DEVELOPMENT APPLICATION	TL	TL	FM_PF	
A	15.07.20	15% DESIGN ISSUE	TL_PF	TL_PF	FM	
A1	29.04.20	REFERENCE DESIGN ISSUE	TL	TL	FM	

ORIG SIZE A1

0 10 20 30 40 50 100mm

AT ORIGINAL PLOT SIZE

NEWest Alliance

TCY-DJV-TSB-LA-DRG-0011

REFERENCES

SCALE : 1 : 1000 (@ A1)

DATUM : HORIZONTAL: PCG20 VERTICAL: AHD71

PTA ACCEPTANCE STAMP

DESIGNED TL_PF

DRAWN TL_PF

CHECKED FM

APPROVED FOR ISSUE

-

EXECUTIVE DIRECTOR
PTA Division / External Company

DATE -

Government of Western Australia
Public Transport Authority

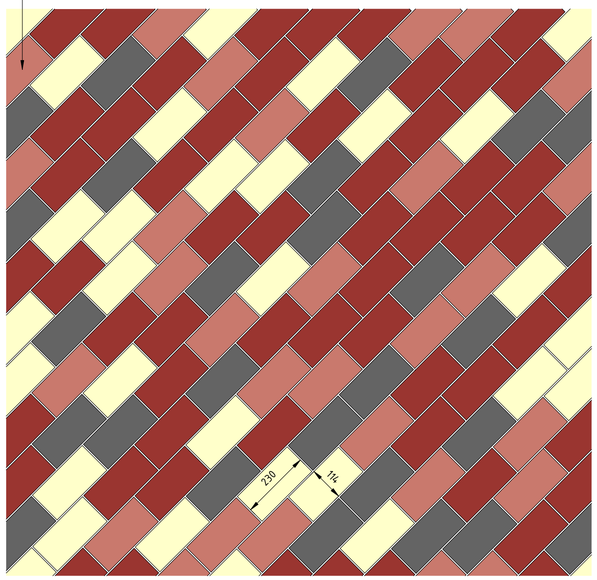
THORNLIE COCKBURN LINK

NICHOLSON ROAD STATION
LANDSCAPE MASTERPLAN
OVERALL PLAN

PTA Drawing No: 05-A-76-LA0004 REV: AA

CAD DRAWING PATHNAME BIM 360://Metronet - TCY/TCY-DJV-TSB-LA-MOD-0001_NICHOLSON RD STATION.rvt

FEATURE PV1 MIX TO BE COMPOSED OF 230mm x 114mm x 60mm CLAY BRICK PAVERS LAYED IN RUNNING BOND FORMAT



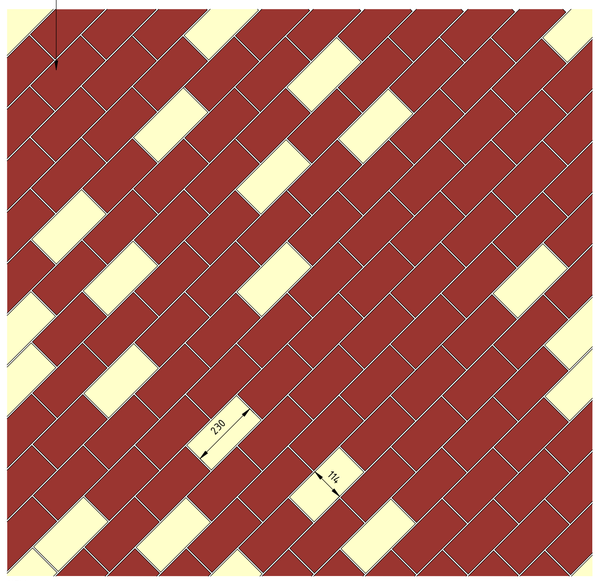
KEY:

	MIDLAND BRICK PAVESTONE CLASSIC CHARCOAL 230X114X60MM	20% MIX
	MIDLAND BRICK HEAVY DUTY RED 230X114X60MM	40% MIX
	MIDLAND BRICK HEAVY DUTY SENTOSA RED 230X114X60MM	20% MIX
	MIDLAND BRICK HEAVY DUTY GOLDEN DUNE 230X114X60MM	20% MIX

1 TCL PAVING DETAIL 1 - PV1 FEATURE MIX

SCALE 1 : 10

FEATURE PV2 MIX TO BE COMPOSED OF 230mm x 114mm x 60mm CLAY BRICK PAVERS LAYED IN RUNNING BOND FORMAT



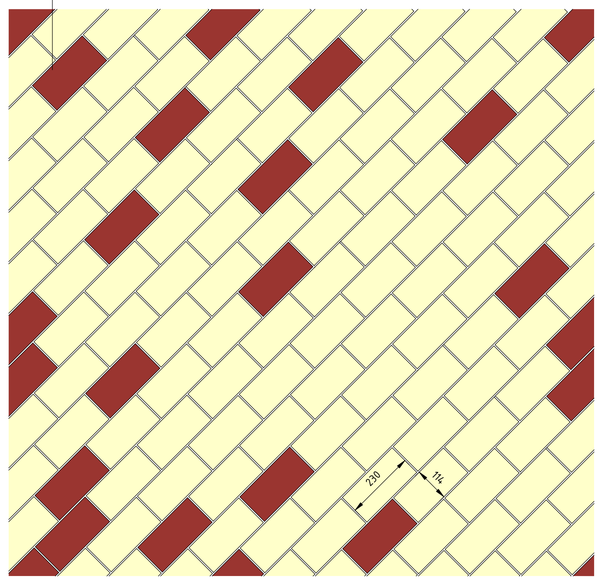
KEY:

	MIDLAND BRICK HEAVY DUTY RED 230X114X60MM	85% MIX
	MIDLAND BRICK HEAVY DUTY GOLDEN DUNE 230X114X60MM	15% MIX

2 TCL PAVING DETAIL 2 - PV2 FEATURE MIX

SCALE 1 : 10

FEATURE PV3 MIX TO BE COMPOSED OF 230mm x 114mm x 60mm CLAY BRICK PAVERS LAYED IN RUNNING BOND FORMAT



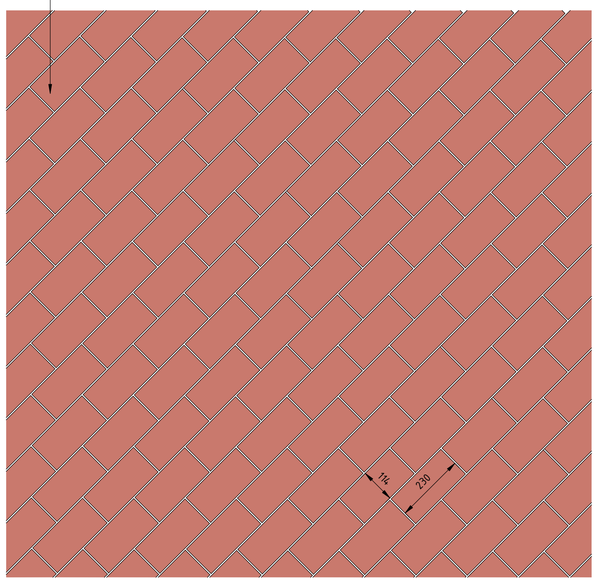
KEY:

	MIDLAND BRICK HEAVY DUTY RED 230X114X60MM	15% MIX
	MIDLAND BRICK HEAVY DUTY GOLDEN DUNE 230X114X60MM	85% MIX

3 TCL PAVING DETAIL 3 - PV3 FEATURE MIX

SCALE 1 : 10

FEATURE PV4 TO BE COMPOSED OF 230mm x 114mm x 60mm CLAY BRICK PAVERS LAYED IN RUNNING BOND FORMAT



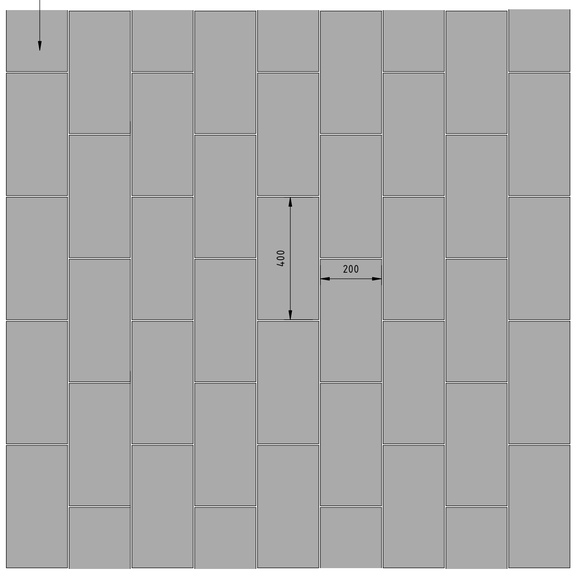
KEY:

	MIDLAND BRICK HEAVY DUTY SENTOSA RED 230X114X60MM	100% MIX

4 TCL PAVING DETAIL 4 - PV4 FEATURE MIX

SCALE 1 : 10

FEATURE PV5 TO BE COMPOSED OF 400mm x 200mm x 60mm URBANSTONE ENGINEERED STONE 400 SERIES IN SILVER GREY LAYED IN RUNNING BOND FORMAT - SHOTBLAST FINISH



KEY:

	URBANSTONE SILVER GREY - SHOTBLAST FINISH 400X200X60MM	100% MIX

5 TCL PAVING DETAIL 5 - PV5 FEATURE MIX

SCALE 1 : 10

0 100 200 300 400 500 1000

SCALE (mm) 1:10 (A1) ; 1:20 (A3)

DETAILED DESIGN

REV	DATE	AMENDMENT	DSN	DRN	CHKD	APP
A	15.07.20	15% DESIGN ISSUE	TL_PF	TL_PF	FM	
A1	29.04.20	ISSUED FOR REFERENCE DESIGN	TL	TL	FM	

ORIG SIZE A1

0 10 20 30 40 50 100mm

AT ORIGINAL PLOT SIZE

NEWest Alliance

TCY-DJV-TSB-LA-DRG-0050

REFERENCES

SCALE : 1 : 10 (@ A1)

DATUM :
HORIZONTAL: PCG20
VERTICAL: AHD71

PTA ACCEPTANCE STAMP

DESIGNED TL_PF
DRAWN TL_PF
CHECKED FM

APPROVED FOR ISSUE

EXECUTIVE DIRECTOR
PTA Division / External Company

DATE

Government of Western Australia Public Transport Authority

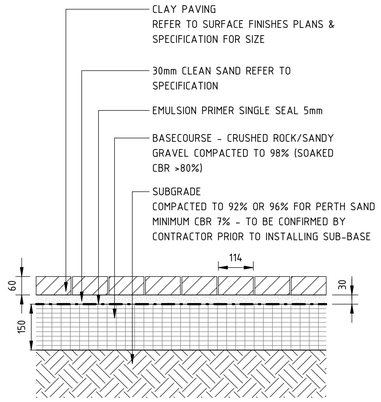
THORNLIE COCKBURN LINK

NICHOLSON ROAD STATION
LANDSCAPE MASTERPLAN
TYPICAL LANDSCAPE DETAILS - SHEET 1

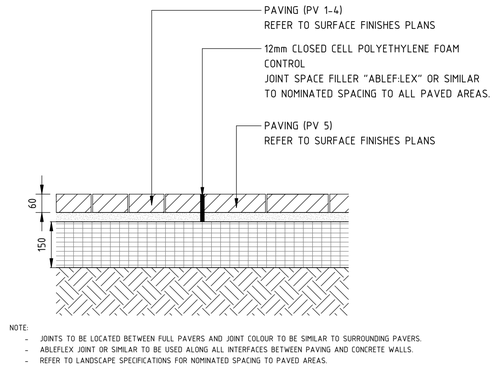
PTA Drawing No:

REV: A

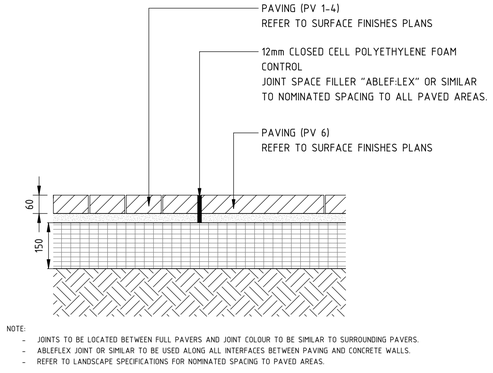
CAD DRAWING PATHNAME BIM 360://Metronet - TCY/TCY-DJV-TSB-LA-MOD-0001_NICHOLSON RD STATION.rvt



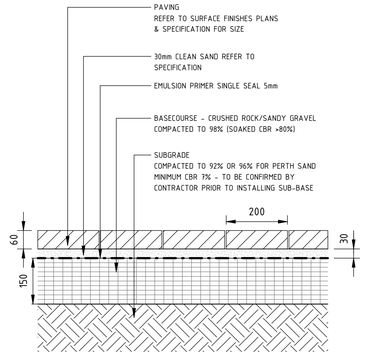
1 PV 1-4 (FOR TRAFFICABLE AREAS)
SCALE 1 : 10



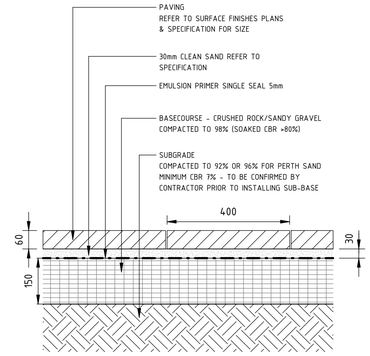
2 PV 1-4 TO PV 5 JOINTS
SCALE 1 : 10



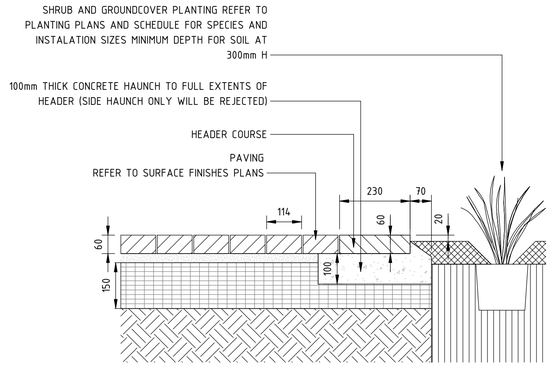
3 PV 1-4 TO PV 6 JOINTS
SCALE 1 : 10



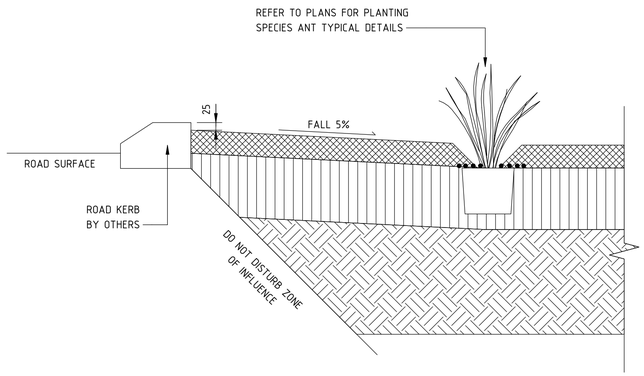
4 PV 5 (FOR TRAFFICABLE AREAS)
SCALE 1 : 10



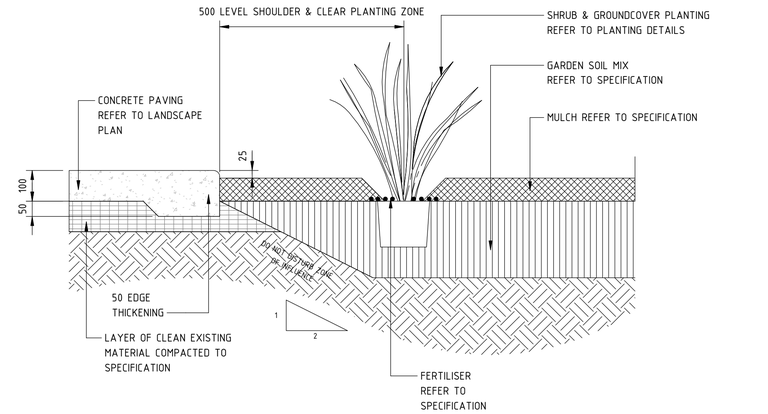
5 PV 6 (FOR TRAFFICABLE AREAS)
SCALE 1 : 10



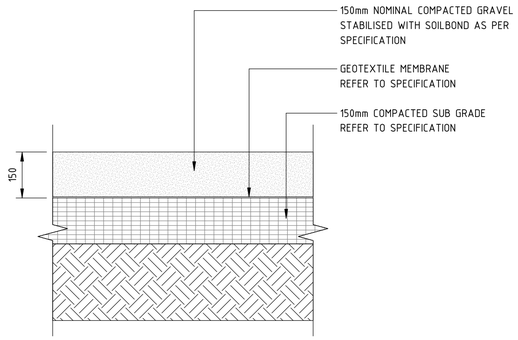
6 TYPICAL CONCRETE HAUNCH PAVING
SCALE 1 : 10



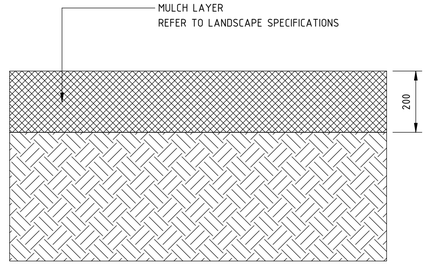
7 TYPICAL DETAIL SPADE CUT EDGE
SCALE 1 : 10



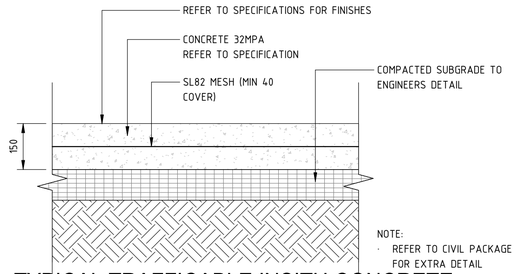
8 TYPICAL CONCRETE TO GARDEN BED
SCALE 1 : 10



9 TYPICAL GRAVEL SURFACE
SCALE 1 : 10



10 TYPICAL MULCH SURFACE
SCALE 1 : 10



11 TYPICAL TRAFFICABLE INSITU CONCRETE PATH
SCALE 1 : 10

0 100 200 300 400 500 1000
SCALE (mm) 1:10 (A1) ; 1:20 (A3)

DETAILED DESIGN

REV	DATE	AMENDMENT	DSN	DRN	CHKD	APP
A	15.07.20	15% DESIGN ISSUE	TL_PF	TL_PF	FM	
A1	29.04.20	ISSUED FOR REFERENCE DESIGN	TL	TL	FM	

ORIG SIZE A1 — 0 10 20 30 40 50 100mm — AT ORIGINAL PLOT SIZE

NEWest Alliance

TCY-DJV-TSB-LA-DRG-0051

REFERENCES

SCALE : 1 : 10 (@ A1)

DATUM : HORIZONTAL: PCG20 VERTICAL: AHD71

PTA ACCEPTANCE STAMP

DESIGNED TL_PF
DRAWN TL_PF
CHECKED FM

APPROVED FOR ISSUE

EXECUTIVE DIRECTOR
PTA Division / External Company

DATE

Government of Western Australia Public Transport Authority

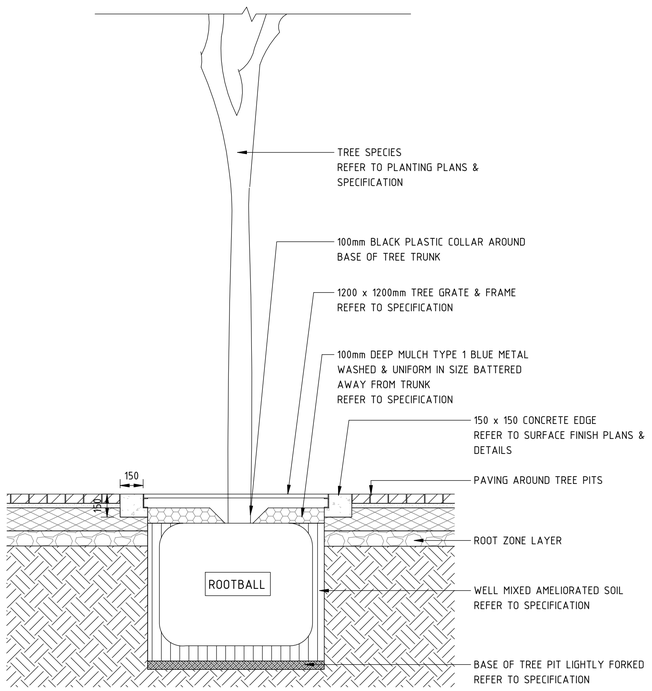
THORNLIE COCKBURN LINK

NICHOLSON ROAD STATION
LANDSCAPE MASTERPLAN
TYPICAL LANDSCAPE DETAILS - SHEET 2

PTA Drawing No:

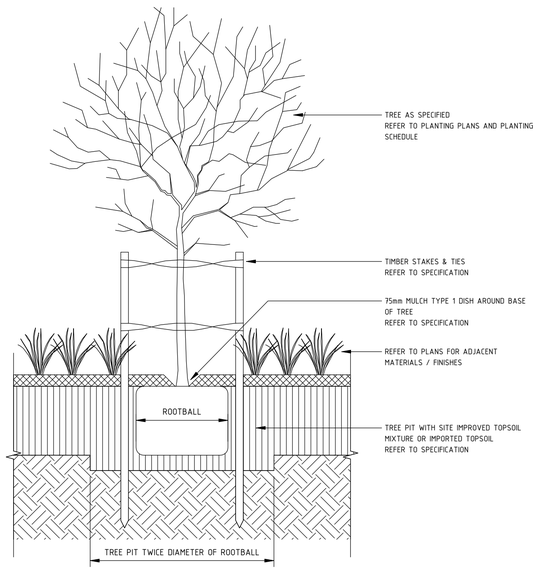
REV: A

CAD DRAWING PATHNAME BIM 360://Metronet - TCY/TCY-DJV-TSB-LA-MOD-0001_NICHOLSON RD STATION.rvt



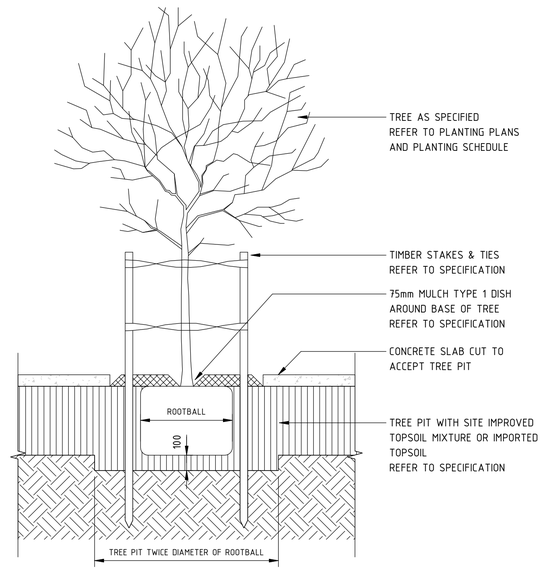
1 TYPICAL TREE IN PAVING - SQUARE TREE PIT - SECTION

SCALE 1 : 20



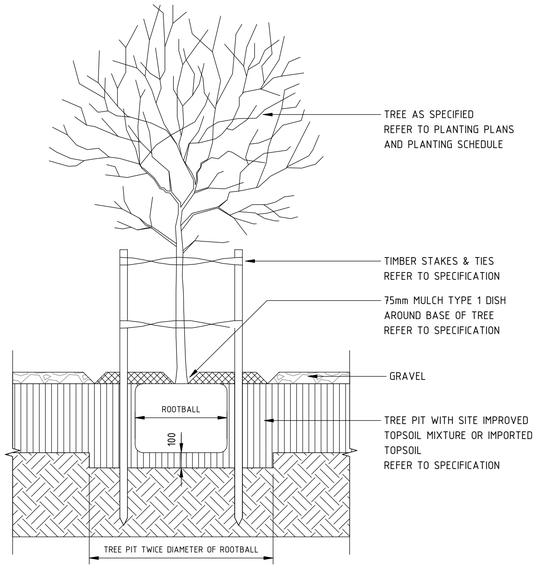
2 TYPICAL TREE IN PLANTING

SCALE 1 : 20



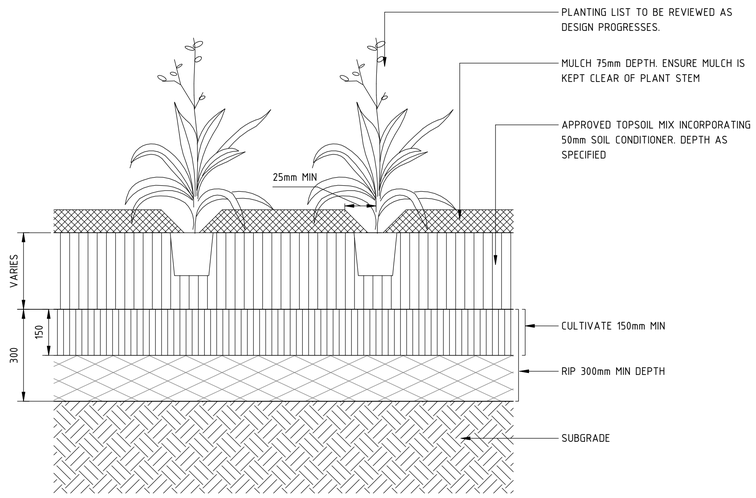
3 TYPICAL TREE IN CONCRETE

SCALE 1 : 20



4 TYPICAL TREE IN GRAVEL

SCALE 1 : 20



5 TYPICAL CONTAINER STOCK PLANTING

SCALE 1 : 10

0 100 200 300 400 500 1000
SCALE (mm) 1:10 (A1) ; 1:20 (A3)

0 200 400 600 800 1000 2000
SCALE (mm) 1:20 (A1) ; 1:40 (A3)

DETAILED DESIGN

REV	DATE	AMENDMENT	DSN	DRN	CHKD	APP
A	15.07.20	15% DESIGN ISSUE	TL_PF	TL_PF	FM	

ORIG SIZE A1

0 10 20 30 40 50 100mm
AT ORIGINAL PLOT SIZE

NEWest Alliance

TCY-DJV-TSB-LA-DRG-0052

REFERENCES

SCALE : 1 : 10 / 1:20 (@ A1)

DATUM :
HORIZONTAL: PCG20
VERTICAL: AHD71

PTA ACCEPTANCE STAMP

DESIGNED TL_PF
DRAWN TL_PF
CHECKED FM
APPROVED FOR ISSUE

EXECUTIVE DIRECTOR
PTA Division / External Company
DATE

Government of Western Australia Public Transport Authority

THORNLIE COCKBURN LINK

NICHOLSON ROAD STATION
LANDSCAPE MASTERPLAN
TYPICAL LANDSCAPE DETAILS - SHEET 3

PTA Drawing No:

REV: A

CAD DRAWING PATHNAME BIM 360://Metronet - TCY/TCY-DJV-TSB-LA-MOD-0001_NICHOLSON RD STATION.rvt

APPENDIX G PUBLIC ART SUMMARY

NEWest Alliance

TCY Public Art Summary Statement for DA Planning Reports

DRAFT 1.2, 12 Aug 20

For inclusion into the following applicants:

- Thornlie Station
- Yanchep Station
- Eglinton Station
- Alkimos Station
- Nicholson Road Station
- Ranford Road Station.

Public Art in new Stations

Scope of Work for Public Art

The State Government's Percent for Art Scheme encourages art in the built environment by using a percentage of a development's overall budget to commission art on new public buildings such as schools, hospitals and railway stations. As such, the Percent for Art Scheme requires up to 1% of the construction budget for new works over $2 million to be spent on artwork.[1]

METRONET Stage 1 program of works is supported by an endorsed Yanchep Rail Extension & Thornlie-Cockburn Link Projects Public Art Strategy (April 2020), which is itself informed by the overarching METRONET Public Art Strategy (October 2019). These strategies draw inspiration from and respond to Perth's rich Aboriginal and local culture, history, landscape and place, with a thematic framework built around the Gnarla Biddi story of 'Our Pathways'.

The purpose of the Public Art Strategy for METRONET Stage 1 is to provide the NEWest Alliance with direction regarding the procurement, management and funding of public art installations for the Yanchep Rail Extension (YRE) and Thornlie-Cockburn Link (TCL) projects. The role of public art in these projects will be to enhance the physical public realm of the new stations, as well as providing the opportunity to contribute to a community's identity and 'sense of place' through responding to its cultural, historical, and environmental narratives.

In approaching the designing and development of the new railway stations, as both important public buildings and major transport hubs, it is acknowledged that public art that responds to the uniqueness of its site and is creatively integrated within the public realm has the ability to celebrate and connect with its local people, as well as attract, inform and educate commuters from the wider community.

The principles and objectives of METRONET'S Public Art Principles and Strategy Framework that will be applied to the public art developed in each new station are as follows:

METRONET Public Art Principles

- Place making: public art is to contribute to the place making of a location and the interpretation

[1] Actual budgetary allowance will be reassessed by the PTA upon the engagement of, and with input from, the Public Art Coordinator and pending responses from the artists' concept proposal submissions.

of a place. It can aid the understanding of history or cultural heritage, assist how people currently understand or use the space, or provide new meanings.

- Site specific: artworks are to be designed specifically for the site and are to be responsive to the site context - its surrounds, its use and users, and reflecting the relevant precinct art themes from the Public Art Guide.
- Scale and fit: the scale of artwork needs to be consistent with the artwork brief/intent - i.e. it could be a landmark piece, a series or pieces, or a small element of surprise. Artwork scale also needs to be responsive to the site context - such as the surrounding landscape and buildings and pedestrian circulation.
- Universal accessibility: public art should be made accessible to all members of the community, irrespective of their age, abilities or cultural background.
- Attractor: public art can be used as an "attractor" for visitors and tourists – particularly places with landmark artworks or seasonal art programmes.
- Sustainable: art is designed considering key environmental, social and economic opportunities for both procurement/delivery and ongoing function and use.
- Well considered and managed: artworks must be designed and constructed with best practice risk and asset management, being mindful of public safety, straightforward and low cost maintenance, resistance to vandalism, and constructed with robustness appropriate for the lifespan of the artwork.

METRONET Public Art Strategy Objectives

- Drive the delivery of a diverse program of high quality progressive, bold, meaningful and inspiring public art that is valued by the community.
- Support the appeal and legibility of public spaces connected to stations and other transport infrastructure by creating points of interest, supporting walkability and building a sense of adventure.
- Showcase local culture, build place identity and animate public spaces to make them a more enjoyable.
- Celebrate, respect and acknowledge Australia's First People by promoting, engaging and responding to local Aboriginal culture, community, heritage and history.
- Encourage creativity and innovation and support the development of creative capital and sustainability of the local arts sector.
- Leave a positive project legacy to acknowledge the significance of METRONET.

In addition, the Gnarla Biddi METRONET Aboriginal Engagement Strategy also critically informs all landscaping and architectural design elements including the creation of public art at each new station, as guided by the following interrelated context setting documents:

- METRONET Noongar Cultural Context – Wadjup Thornlie-Cockburn Link Project; and
- METRONET Noongar Cultural Context – Yanchep (Mooroo) Rail Extension Project.

Public art for Placemaking

The brief for the development of public art in any station is that it must be integral to vibrant, usable and activated spaces, that aids understanding of place, history, cultural heritage (Noongar and non-Noongar) and provides new interpretations. As such, the design of public artworks is to fulfil the following objectives and guiding principles of:

- To promote community engagement

- To enable community capacity building
- To ensure safety
- To support wayfinding.

METRONET public art guiding principles

Delivery Program for Public Art

The Public Art Strategy for TCL and YRE is to guide the engagement of the Public Art Coordinator, which will have responsibility for implementing the strategy into the development of each new station project. The scope of the Public Art Coordinator's role in implementing the strategy includes:

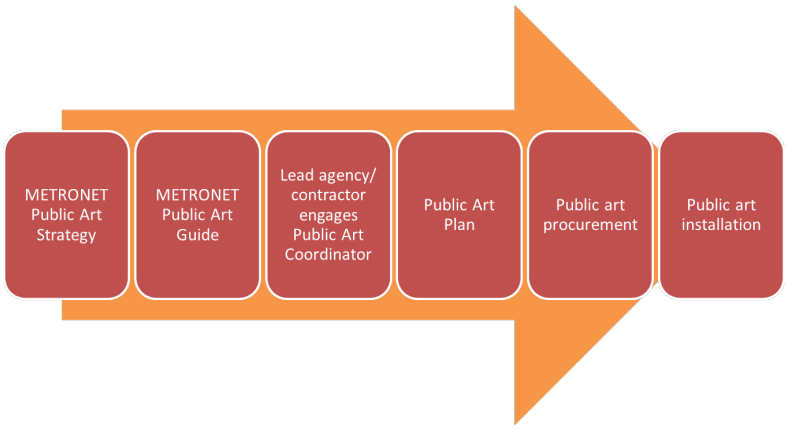
- Coordination and management of all aspects of the artist procurement, design, development, installation and commissioning of all station artwork projects.
- Producing a Public Art Plan each for the YRE and TCL that are in line with the METRONET Public Art Strategy and Gnarla Biddi METRONET Aboriginal Engagement Strategy.

  Public Art Plans are to include a Sense of Place Statement (n.b. may be a separate document) for each station that draws on the different cultural, geographical, sociological, environmental and historical narratives from the surrounding local area. The Sense of Place Statement sets the curatorial vision for each station's artwork, parameters for its integration, a delivery guide, fabrication details and budget for the artwork at each station.
- Preparation of tender documentation, which will include Artwork Brief and Expression of Interest (EOI) documents; and then coordination of artists during the design and development process, to ensure that the public art produced for the project satisfies the requirements as described in the EOI and briefing documents.
- Collaboration and liaison with relevant internal and external stakeholders, the design and construction project teams, and public consultation if required. Key stakeholders that have been identified include, but are not limited to, the following:
  - PTA,
  - METRONET Office,
  - METRONET Noongar Reference Group, and
  - the Local Government specific to each station's locality.
- Assisting the artist with preparing any documentation for building certification and permits, if required.

For artwork to be successfully integrated within the station's landscaping, infrastructure and building design - the Public Art Coordinator and artist(s) will be engaged during the project's detailed design phase. The proposed timeframe for delivery of artwork is to be in line with the project's construction program, an in summary involves the following stages:

- engagement of Public Art Coordinator
- production and approval of Public Art Plans, EOI and Artwork Brief documents

- advertising of EOI and shortlisting of artist's concept proposal submissions for selection
- commissioning of artists
- 50% design assessment
- fabrication completion
- installation of artwork.



METRONET public art process

Timing of Implementation for Planning and Building Development Approvals

Given the robustness and timeframe of the public art delivery program, it is recommended that the public art component of the project be delivered prior to the commissioning and opening of the new station, as this enables synchronisation with other nontangible community development actions associated with leading up to and on Day One Operations.

As such, details of the ultimate public art installations proposed will be documented for the purposes of satisfying the condition in plan and elevation drawings, along with an associated artist design report. Together, the drawings and report materials will need to demonstrate that the proposed public art installations can be properly integrated with the approved architecture and landscaping of the station precinct.

Consequently, the following draft condition is provided for consideration in any resulting development approval:

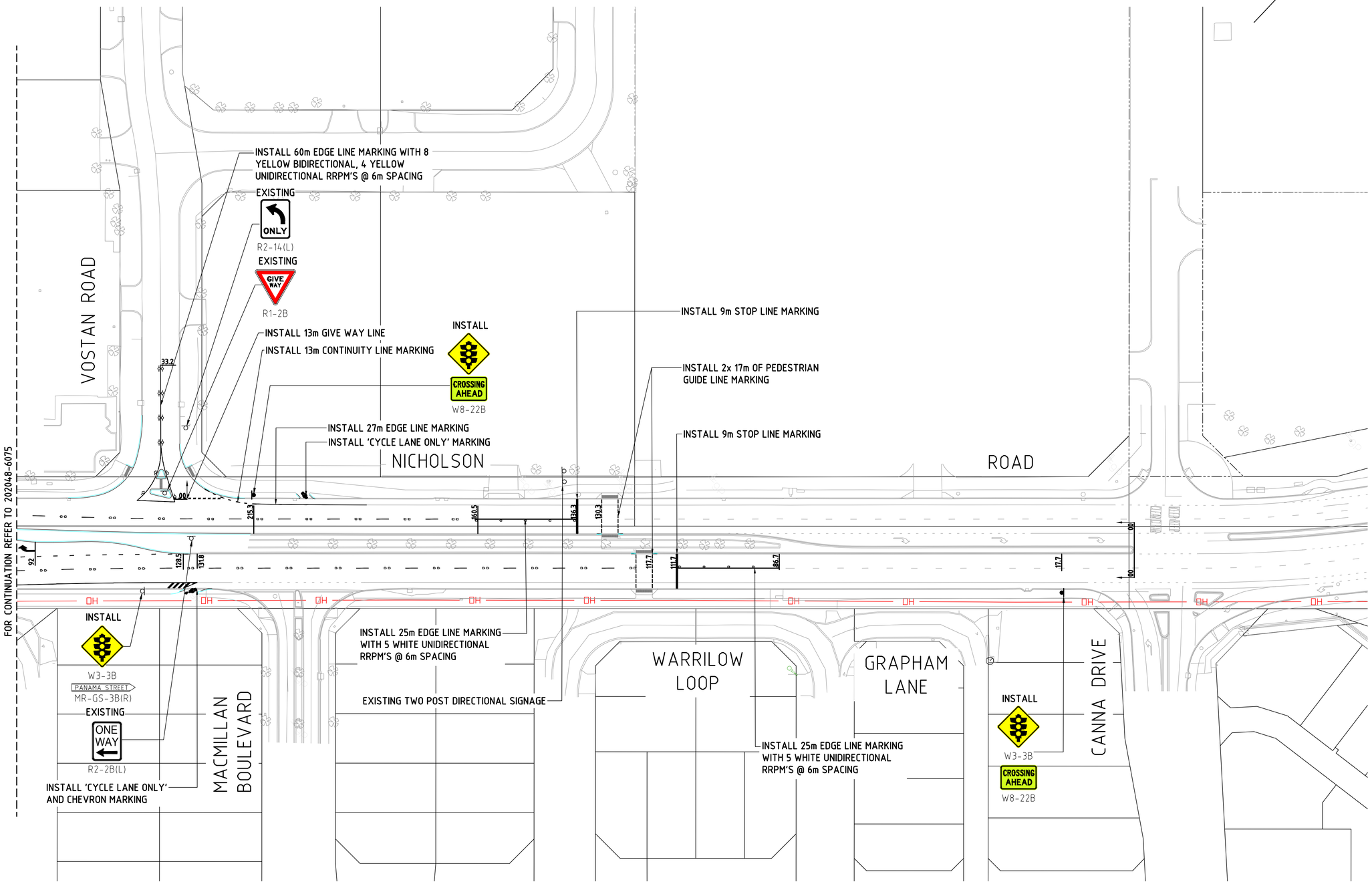
> *Public art is to be provided in accordance with the State Government's Percent for Art Scheme, details of which are to be submitted prior to occupation, to the satisfaction of the WAPC in consultation with the Local Government.*

APPENDIX H PLANS FOR SUPPORTING WORKS

EXISTING SERVICES KEY

OH EXISTING OVERHEAD POWER LINE

NOTE: EXISTING SERVICES DATA SHOWN IS INCOMPLETE



AMENDMENTS

No.	DESCRIPTION	APPROVED & DATE
1	PRELIMINARY ISSUE	08/09/2020

NOTES

LEGEND

- EXISTING PAINTED LINE
- NEW PAINTED LINE
- NEW PAVEMENT ARROW
- EXISTING TWO POST SIGN
- EXISTING ONE POST SIGN
- NEW OR REPOSITIONED ONE POST SIGN
- WHITE UNIDIRECTIONAL RETRO-REFLECTIVE RAISED PAVEMENT MARKER
- YELLOW UNIDIRECTIONAL RETRO-REFLECTIVE RAISED PAVEMENT MARKER
- YELLOW BIDIRECTIONAL RETRO-REFLECTIVE RAISED PAVEMENT MARKER

PRELIMINARY PLAN ONLY SUBJECT TO ALTERATION

METADATA

GROUND SURVEY STANDARD:
DATE OF CAPTURE:
MAPPING SURVEY STANDARD:
DATE OF CAPTURE:
MAIN ROADS PROJECT ZONE:
HEIGHT DATUM: AHD

GTAconsultants

DRAWING NUMBER/DOCUMENT ID
DESIGNED / DRAWN S. PANDAY
VERIFIED T. MORAN
DIRECTOR T. MORAN

mainroads WESTERN AUSTRALIA
PLANNING AND TECHNICAL SERVICES DIRECTORATE
ROAD AND TRAFFIC ENGINEERING BRANCH
WATERLOO CRESCENT East Perth 6004
Telephone (08) 9323 4111 Fax (08) 9323 4430

SCALES 1:500

A 1

MRWA FILE NUMBER 202048

APPROVED (MRWA)

CITY OF GOSNELLS

NICHOLSON ROAD/PANAMA STREET INTERSECTION

SLK 4.98

15% PAVEMENT MARKING & SIGNAGE PLAN

LOCAL AUTHORITY (104) CITY OF GOSNELLS

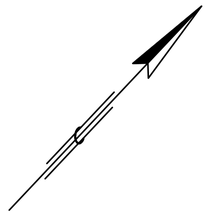
MRWA DRAWING NUMBER

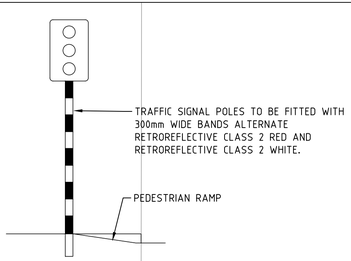
202048-6076

NOTE: ALL DRAWINGS ARE CONSIDERED UNCONTROLLED UNLESS STAMPED 'CONTROLLED COPY' IN RED

POLE CABLE ROUTE

CONTROLLER — DIBD1 — P1 — P2
DIBD1 — P8
DIBD2 — P3 — P7 — P4
DIBD3 — P6 — P5





DETAIL - TRAFFIC SIGNAL POLE

EXISTING SERVICES KEY

OH — EXISTING OVERHEAD POWER LINE

NOTE: EXISTING SERVICES DATA SHOWN IS INCOMPLETE

TRAFFIC SIGNAL POLE LOCATIONS		
POLE No.	CO-ORDINATES	
	EASTING	NORTHING
1	61234.937	351022.459
2	61242.680	351030.259
3	61250.026	351022.299
4	61262.325	351029.861
5	61269.479	351022.262
6	61262.365	351014.859
7	61254.821	351022.877
8	61242.540	351015.294

CONTROLLER & CABLE PIT LOCATIONS		
PIT	CO-ORDINATES	
	EASTING	NORTHING
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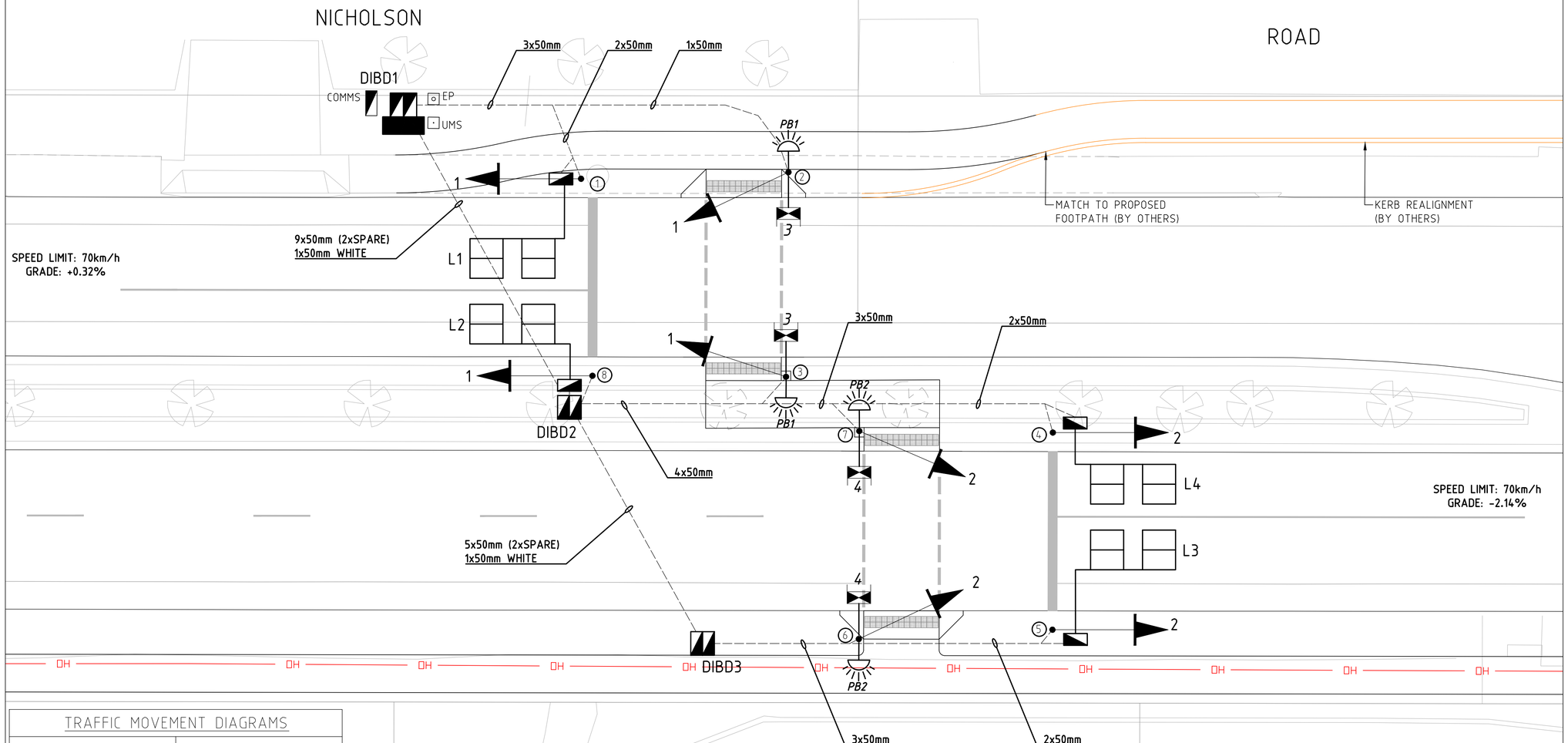
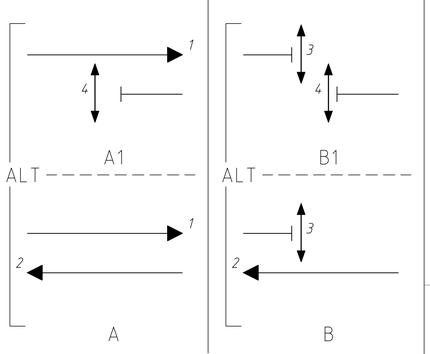
DIBD2	61242.801	351013.240
DIBD3	61256.514	351009.003



TRAFFIC MOVEMENT DIAGRAMS



* A1 & B1 ARE ALTERNATIVES THAT ALLOW PED 2 TO OPERATE INDEPENDENTLY FROM THE PHASES

WARRILOW LOOP

LOOP FEEDER CABLE ROUTE

CONTROLLER — DIBD1 — L1
DIBD1 — DIBD2 — L2
DIBD2 — L4
DIBD2 — DIBD3 — L3

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AMENDMENTS

No.	DATE	DESCRIPTION	APPROVED
1	10/09/2020	PRELIMINARY ISSUE	

NOTES

CONSTRUCTION NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH MRWA SPECIFICATIONS 712 - TRAFFIC SIGNALS.
2. CONTRACTOR TO ARRANGE WITH WESTERN POWER FOR AN UNDERGROUND POWER SUPPLY (UMS).
3. USE STAR WIRING SYSTEM WITH 19 CORE POST CABLES WIRED INDIVIDUALLY TO THE CONTROLLER.
4. CONTRACTOR RESPONSIBLE FOR PURCHASING AND ARRANGING THE COMMUNICATIONS SYSTEM CONNECTION TO THE CONTROLLER AND NECESSARY EQUIPMENT. DETAILS ON COMMUNICATIONS SYSTEM AND CONNECTIONS REQUIRED SHALL BE OBTAINED FROM THE MAIN ROADS ASSET MANAGEMENT ELECTRICAL SECTION - CONTACT NUMBER: 93234826.
5. NEW ATSC4 CONTROLLER TO BE INSTALLED WITH NEW BASE IN ACCORDANCE WITH MRWA DWG 200431-0123.
6. ELECTRICAL CONTRACTOR TO INSTALL TRAFFIC SIGNALS IN COORDINATION WITH CIVIL CONTRACTOR.
7. COMMUNICATIONS PITS TO BE P4 SIZE TO FACILITATE FIBRE OPTIC ENTRY WITH COMMUNICATIONS LID. BENDS TO BE OF SWEEPING TYPE WITH 50mm MINIMUM DIAMETER CONDUITS.
8. 1 X 50mm WHITE CONDUIT TO BE INSTALLED ON ALL CROSSINGS FOR COMMUNICATIONS IF REQUIRED; CONDUIT ENDS TO BE SHOWN ON "AS CONSTRUCTED" DRAWING.
9. ELECTRICAL CONTRACTOR TO INSTALL TRAFFIC SIGNALS IN COORDINATION WITH CIVIL CONTRACTOR. SURVEY CONTROL POINTS TO BE DETERMINED BY CIVIL CONTRACTOR.
10. THIRD PARTY SERVICES TO BE LOCATED BY SURVEY PRIOR TO COMMENCEMENT OF CONSTRUCTION. CLEARANCE ZONES TO THIRD PARTY SERVICES MUST BE MAINTAINED AT ALL TIMES.
11. CONTRACTOR TO ADJUST LOCATION OF PITS AND POLES TO AVOID SERVICES AND ACCOMMODATE CHANGES IN RAMP SET OUTS.
12. NEW CONDUITS TO BE INSTALLED BY BORING METHOD WHERE POSSIBLE.
13. ALL LOOP PITS TO BE AT LEAST 1.2m FROM FACE OF KERB.
14. VEHICLE DETECTORS MUST BE INSTALLED IN ACCORDANCE WITH MRWA VEHICLE DETECTOR LOOPS INSTALLATION DETAILS DWG NO. 200431-0167-1.
15. ALL LANTERNS ARE TO BE 200mm LED.

SITE SPECIFIC NOTES:

16. CENTRE OF PUSHBUTTON 1063mm ABOVE FOOT LEVEL. PUSH BUTTONS TO BE POSITIONED TO THE FRONT OF THE POST WITH THE ARROW POINTING UP. AUDIO-TACTILE DRIVER UNITS ARE TO BE INSTALLED.
17. PEDESTRIAN COUNTDOWN LANTERNS (PCT) TO BE INSTALLED ON POLES 2, 3, 6 & 7.

NEW SITE LM00XXX	
CONTROLLER	ATSC4
LANTERNS	LED
COMMUNICATIONS	3G/4G

REFERENCES

DESCRIPTION	DRAWING No.
LEGEND (TRAFFIC SIGNALS)	8320-0400
CONDUITS (STANDARD)	8420-0700
RAISED PAVEMENT MARKERS	201031-0026
PEDESTRIAN RAMP DETAILS	9831-5649
KERBING TYPE	9331-0376
TRAFFIC SIGNAL POLE AND LOOP LAYOUT	9831-3297
MINOR SIGNING AND PAVEMENT MARKINGS	8720-3480

SCALE 1:125

Government of Western Australia
mainroads WESTERN AUSTRALIA

METROPOLITAN REGION

WATERLOO CRESCENT EAST PERTH 6004
Telephone (08) 9323 4111 Fax (08) 9323 4684

		DATE
SURVEYED		
DRAWN	S. PANDAY	10.09.2020
CHECKED	C. PARIS	10.09.2020
AUTHORISED		
RECOMMENDED		

MICROFILM DATE

A1

NICHOLSON ROAD NEAR CANNA DRIVE
SIGNALISED MID-BLOCK PEDESTRIAN CROSSING

NEW SITE
TRAFFIC SIGNALS

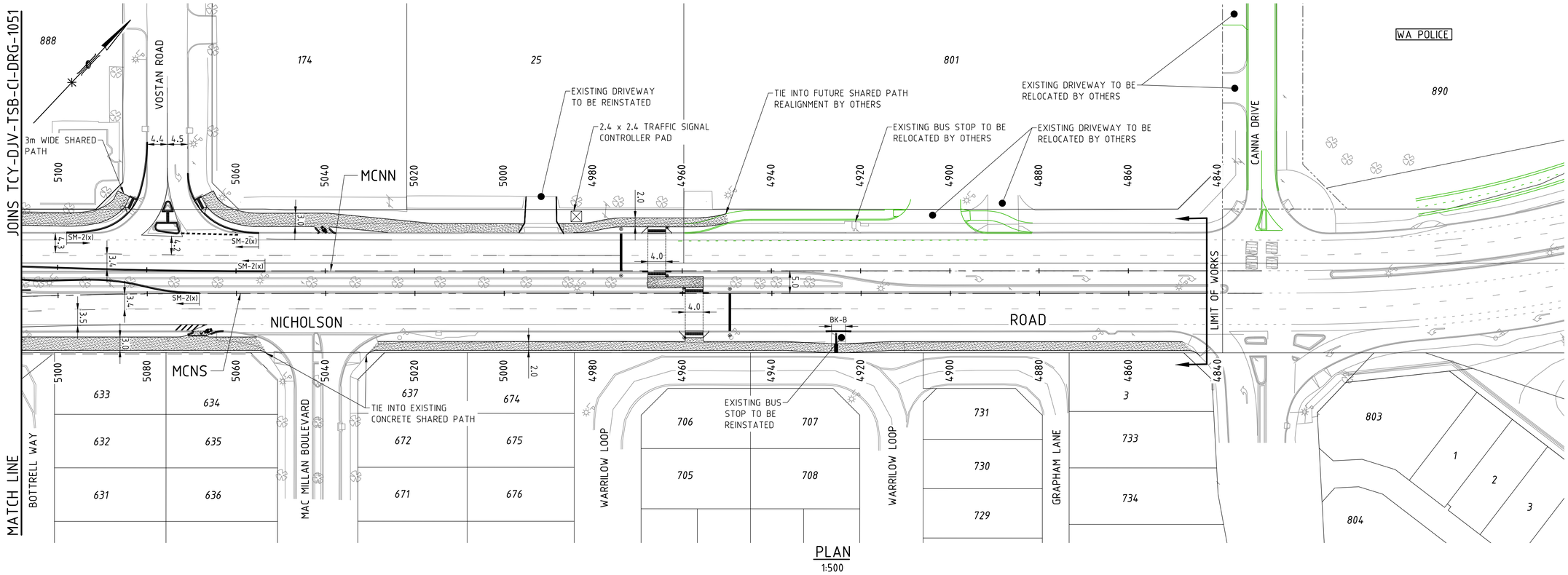
LOCAL AUTHORITY (104) CITY OF GOSNELLS

COMMISSIONED xx.xx.xxxx

DRAWING NUMBER 202048-6078

REV. A

LMxxx



PLAN
1:500

NOTES

1. ALL DIMENSIONS IN METRES (m) UNLESS NOTED OTHERWISE.
2. FOR KERB DETAILS REFER TO DRAWING TCY-DJV-TSB-CI-DRG-1171.
3. ALL BATTERS SHOWN ARE 3 HORIZONTAL TO 1 VERTICAL UNLESS NOTED OTHERWISE.
4. ALL PAVEMENT MARKINGS TO CONFORM TO MRWA STANDARD DRAWINGS 9931-0198, 201031-0026 AND AS 1742.12.
5. REFER TO UTILITIES COORDINATION DRAWINGS TCY-DJV-TSB-CI-DRG-1701 - 1705 FOR EXISTING AND PROPOSED UTILITIES. DETAILED UTILITIES DESIGN & RELOCATIONS ARE DOCUMENTED IN PACKAGE TCL-022.
6. REFER TO DRAINAGE DRAWINGS TCY-DJV-TSB-CI-DRG-1401 TO 1405 FOR DRAINAGE DETAILS.
7. REFER TO PACKAGES TCL-007A FOR NICHOLSON ROAD STATION DESIGN.
8. REFER TO LIGHTING DRAWINGS TCY-DJV-TSB-EL-DRG-1101 TO 1105 FOR LIGHTING LAYOUT.
9. REFER TO LANDSCAPING PLAN TCY-DJV-TSB-LA-DRG-1801 TO 1805 FOR LANDSCAPING.
10. TRAFFIC SIGNAL POLE LOCATIONS ARE INDICATIVE ONLY. FOR SETOUT POINTS REFER TO DRG No. 202048-6077

LEGEND

- CADASTRAL BOUNDARY
- EASEMENT
- MODIFIED ROAD RESERVE BOUNDARY
- KERB
- ULTIMATE WORKS (BY OTHERS)
- RETAINING WALL
- EXISTING WALL
- 111 — LOT NUMBER
- SM-2(x) | A-2(x) — KERB TRANSITION
- SM-2(x) — MRWA SEMI MOUNTABLE KERB
- A-2(x) — MRWA MOUNTABLE KERB
- BK-B — BUS STOP BARRIER KERB
- CONCRETE SHARED PATH TO CITY OF GOSNELLS SPECIFICATION
- TRAFFIC SIGNAL POLE
- TRAFFIC SIGNAL CONTROLLER PAD

0 5 10 15 20 25 50
SCALE (m) 1:500 (A1) ; 1:1000 (A3)

DETAILED DESIGN

REV	DATE	AMENDMENT	DSN	DRN	CHKD	APP
A	25.09.20	ISSUED FOR 15% DESIGN	DH	CB	BS	PT

ORIG SIZE A1

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AT ORIGINAL PLOT SIZE

NEWest Alliance

TCY-DJV-TSB-CI-DRG-1052

REFERENCES
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TCY-DJV-TSB-CI-REF-0001_CAD
TCY-DJV-TSB-CI-REF-0001_DES-7B
TCY-DJV-TSB-CI-REF-0001_DES-7A
TCY-DJV-TSB-CI-REF-0001_LINE-RD
TCY-DJV-TSB-CI-REF-0001_LEG7B
TCY-DJV-TSB-CI-REF-0001_DES-OTHERS

SCALE : 1:500 (@ A1)
DATUM : HORIZONTAL: PCG20 VERTICAL: AHD71
PTA ACCEPTANCE STAMP

DESIGNED DH
DRAWN CB
CHECKED BS
APPROVED FOR ISSUE
EXECUTIVE DIRECTOR
PTA Division / External Company
DATE

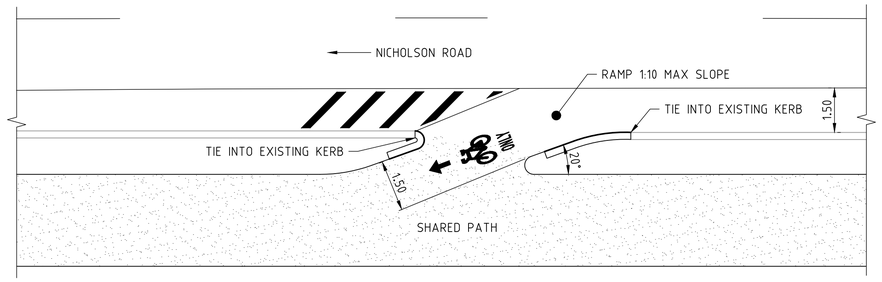
Government of Western Australia Public Transport Authority

THORNLIE COCKBURN LINK
NICHOLSON ROAD REALIGNMENT WORKS
GENERAL ARRANGEMENT PLAN
SHEET 2 OF 4

PTA Drawing No:
REV : A

CAD DRAWING PATHNAME C:\bms\metronettcy\greg.clarke\dms16432\TCY-DJV-TSB-CI-DRG-1052.dwg

NOTES:
1. ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE.



CYCLE EXIT RAMP DETAIL
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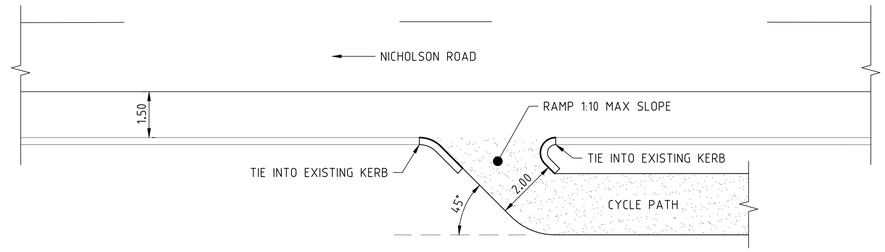
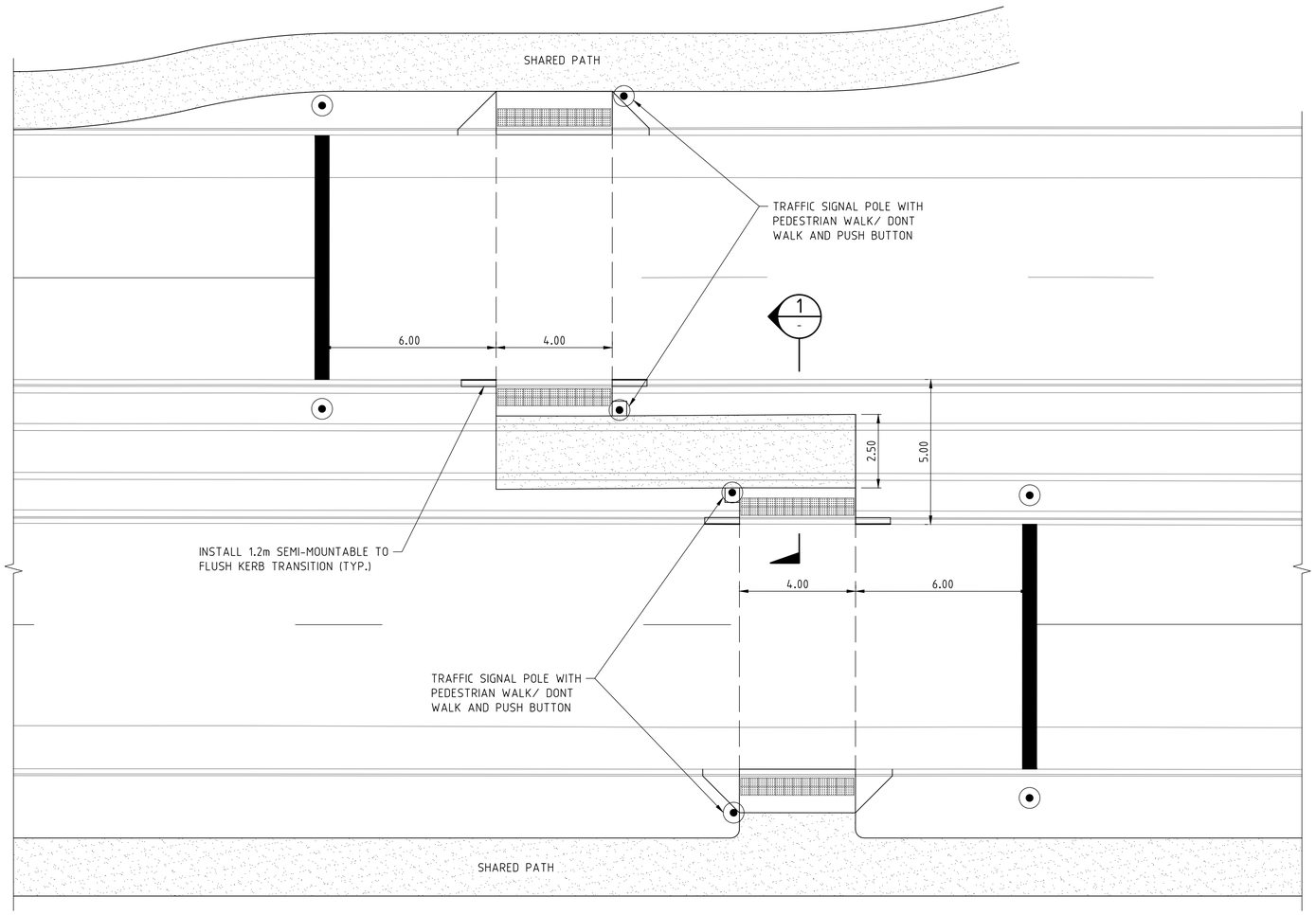
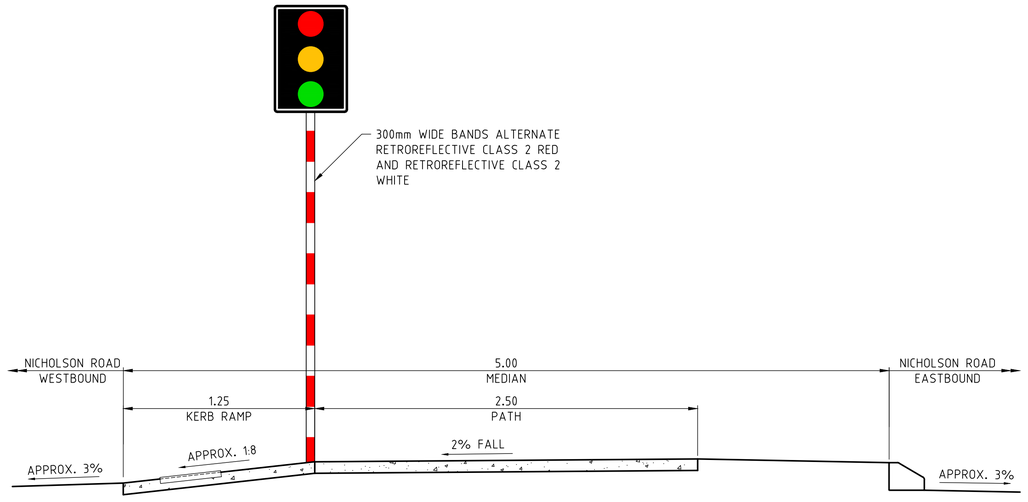


CYCLE ENTRY RAMP DETAIL
SCALE 1:100



PEDESTRIAN CROSSING
SCALE 1:100



SECTION 1
SCALE 1:20

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SCALE (m) 1:200 (A1) ; 1:400 (A3)

DETAILED DESIGN

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A	25.09.20	ISSUED FOR 15% DESIGN	DH	CB	BS	PT

ORIG SIZE A1 — 0 10 20 30 40 50 100mm — AT ORIGINAL PLOT SIZE

NEWest Alliance

TCY-DJV-TSB-CI-DRG-1172

REFERENCES
TCY-DJV-TCY-CI-000-0001-MAST-DET

SCALE : AS SHOWN (@ A1)

DATUM :
HORIZONTAL: PCG20
VERTICAL: AHD71

PTA ACCEPTANCE STAMP

DESIGNED DR
DRAWN CB
CHECKED BS

APPROVED FOR ISSUE

EXECUTIVE DIRECTOR
PTA Division / External Company
DATE

Government of Western Australia Public Transport Authority

THORNLIE COCKBURN LINK

NICHOLSON ROAD REALIGNMENT WORKS
TYPICAL DETAILS
SHEET 2 OF 2

PTA Drawing No:

REV : A

CAD DRAWING PATHNAME C:\bms\metronettcy\greg.clarke\dms16432\TCY-DJV-TSB-CI-DRG-1172.dwg

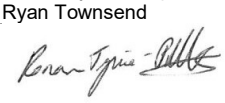
APPENDIX I TRANSPORT IMPACT ASSESSMENT

NEWest Alliance

Nicholson Road Station: Transport Impact Assessment

METRONET Stage 1 Initiatives: Yanchep Railway Extension and Thornlie-Cockburn Link

Document Approval

Rev	Date	Prepared by	Reviewed By	Approved by
A	24-Jul-2020	Ronan Tyrie-Phillips, Ryan Townsend	Shona Gatenby	Chris Deshon
Signature:				
Signature:				
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Signature:				
Signature:				

Document Details

PTA Project:	180093 – METRONET Stage 1 Initiatives: Yanchep Railway Extension and Thornlie-Cockburn Link
PTA Document number:	
NEWest Document number:	TCY-DJV-TSB-TM-RPT-0002
Revision date:	24-Jul-2020
Revision:	A

DETAILS OF REVISION AMENDMENTS AND PLAN TERMINOLOGY

Document Control

The Transport Engineer is responsible for updating this plan to reflect changes as required.

Amendments

Any revisions or amendments must be approved by the Transport Engineer and Design Manager and/or NEWest before being distributed or implemented.

Revision Details

Revision	Details
A	Issued for 15% Design

Terms and Definitions

Term	Meaning
DoS – Degree of Saturation	The DoS is a measure of available capacity at a road intersection and is the ratio of the demand to capacity. The reported figure in this report reflects the maximum forecast DoS at the intersection: - A DoS less than 90 percent indicates that a vehicle movement / intersection can operate within the practical capacity and is less likely to experience significant movement delays. - A DoS over 90 percent indicates a vehicle movement / intersection has exceeded practical capacity and is more likely to experience some delay or congestion, with mitigation measures likely to be required to ensure adequate capacity for priority movements at peak periods. - A DoS of 100 percent or more indicates an intersection has exceeded practical capacity which would likely result in delay for vehicle movements and be generally considered an undesirable outcome.
LoS – Level of Service	The LoS is a measure of the forecast delay for vehicle movements at a road intersection. The LoS measure ranges from A to F, and provides an indicator of the performance of the network or individual movement based on the average delay per passenger car unit (pcu). For the TCL Station Accesses: - LoS D is considered acceptable at peak times. - LoS E or F for a priority movement reflects unacceptable delay and /or queuing at an intersection. For minor movements, this may be acceptable if queuing does not result in safety issues or impact other movements.
LinSig	Transport network modelling software.
SIDRA	Intersection analysis software used to analysis intersection performance.

Abbreviations and Acronyms

Abbreviation/Acronym	Definition
DoS	Degree of Saturation
LoS	Level of Service
PSP	Principle Shared Path
PTA	Public Transport Authority
ROM24	Regional Operations Model version 24– Main Roads strategic transport network model used for forecast road demand
WAPC	Western Australian Planning Commission
TCL	Thornlie-Cockburn Link
ACROD	Australian Council for Rehabilitation of Disabled (i.e. disabled parking bay)
DFES	Department of Fire and Emergency Services

CONTENTS

Tables

Figures

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1.0 INTRODUCTION AND BACKGROUND

1.1 METRONET THORNLIE-COCKBURN LINK BACKGROUND

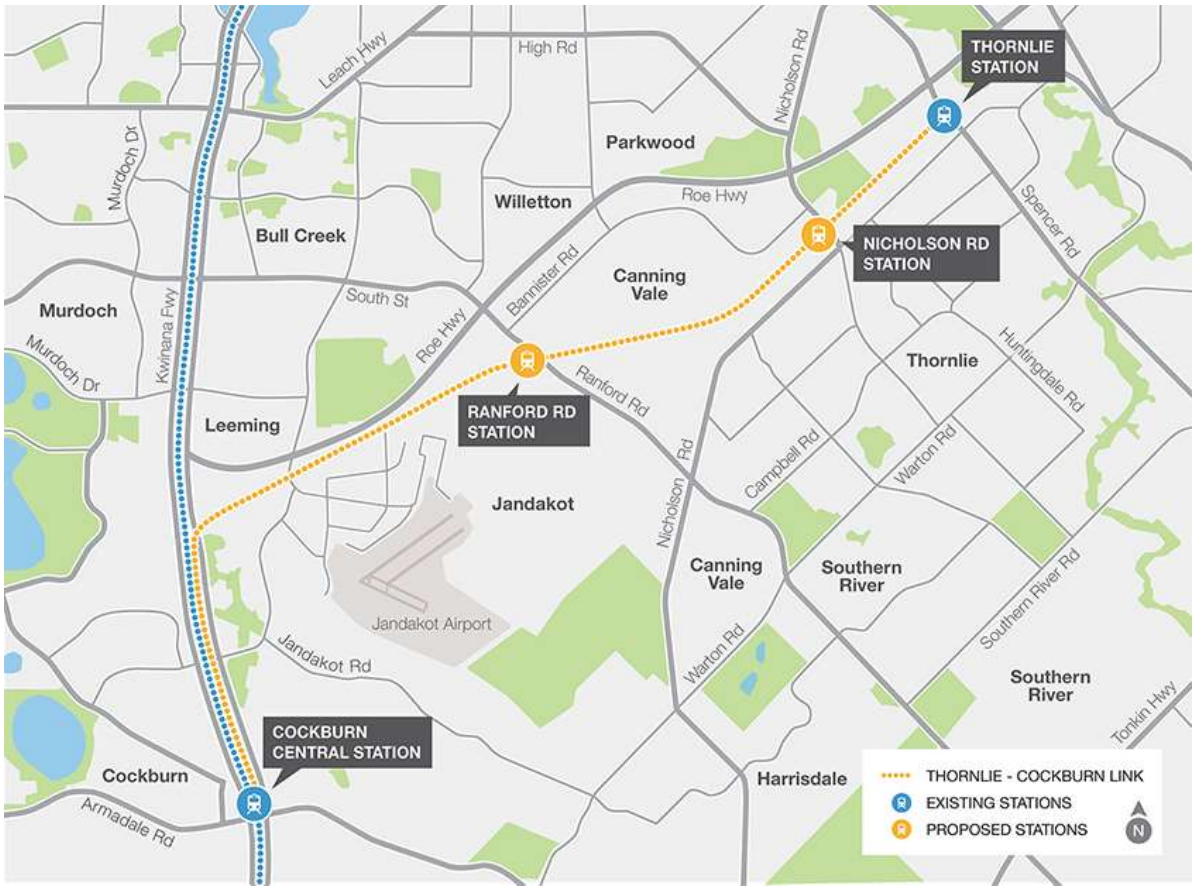
The proposed Nicholson Road Station forms part of the wider METRONET Thornlie-Cockburn Link (TCL) project to deliver a new east-west rail connection in Perth's southern suburbs that links Thornlie Station (on the existing Armadale / Thornlie line) through to Cockburn Central Station (on the Mandurah line).

The project aims to deliver approximately 14.5km of new rail line between Thornlie Station and Cockburn to support the ongoing growth in the region and alleviate traffic congestion along key routes by providing wider reaching public transport services in the southern suburbs Perth.

The TCL project is to be delivered by the NEWest Alliance, on behalf of the Public Transport Authority (PTA).

The primary components of the TCL project include the construction of two new train stations at the key locations of Nicholson Road and Ranford Road, as well as an upgraded station at Cockburn Central. Each of the proposed new train stations will also include a bus interchange for public transport connectivity, plus facilities for Park & Ride, Kiss & Ride and infrastructure for other active modes including walking and cycling.

Figure 1. TCL Project Overview



Source: METRONET

1.2 PROPOSED NICHOLSON ROAD STATION BACKGROUND

The proposed Nicholson Road Station is located along the Thornlie-Cockburn line, approximately 19km south-east of Perth. The proposed station site is to be located south of the existing Nicholson Road elevated crossing over the current freight rail line. The current Roe Highway / Nicholson Road interchange is located approximately 900 metres north of the station site.

The Nicholson Road Station precinct development plan allows for METRONET to continue working with state agencies, Local Governments and the private sector to develop opportunities in the area surrounding the station, promoting the development of a mixed-use centre over time and servicing the multiple land uses in the surrounding precinct.

METRONET identifies the following medium to long term development opportunities around the Nicholson Road Station:

- Longer term redevelopment of approximately 45 hectares of State Government-owned land, the new light industrial area to the west and Canning Vale Distribution Centre.
- Considering multi-decked station parking to develop State Government land.
- Increasing density and infill of existing residential areas within one kilometre of the station.
- A faster rate of infill development in established surrounding suburban areas, further stimulated by zoning changes under current consideration.

The precinct development plan for the METRONET Nicholson Road Station is shown in Figure 2.

Figure 2. Nicholson Road Station – Precinct Development (medium-long term)

Source: METRONET

1.3 PURPOSE OF THIS DOCUMENT

This Transport Impact Assessment (TIA) has been prepared to support the ongoing development application of the proposed Nicholson Road Station and seeks to outline the existing and proposed transport elements associated with the Station, due to be constructed as part of the wider METRONET TCL project.

As per the Western Australian Planning Commission (WAPC) Transport Impact Assessment Guidelines for Individual Developments (Volume 4), it is anticipated that the station will generate in excess of 100 vehicle trips within the development peak hour, resulting in what is considered to be a 'high' level of impact. Therefore, a transport impact assessment level of investigation is deemed to be appropriate for this development.

As such, this document has been prepared in accordance with the framework established within the WAPC guidelines.

2.0 EXISTING SITUATION

2.1 PROJECT SITE

The site of the proposed Nicholson Road Station is located between the existing Nicholson Road alignment and the current freight rail corridor, approximately 3.3 kilometres south-west of the existing Thornlie Station. As Nicholson Road bounds the majority of the station land, this road will serve as the main access point to the external road network, with local access to the site entry via Tulloch Way.

The proposed station is to be located on a largely unoccupied parcel of land just west of the current Nicholson Road / Garden Street / Yale Road roundabout. The site boundary is shown in Figure 3.

Figure 3. Proposed Nicholson Road Station Location

Source: Google Maps

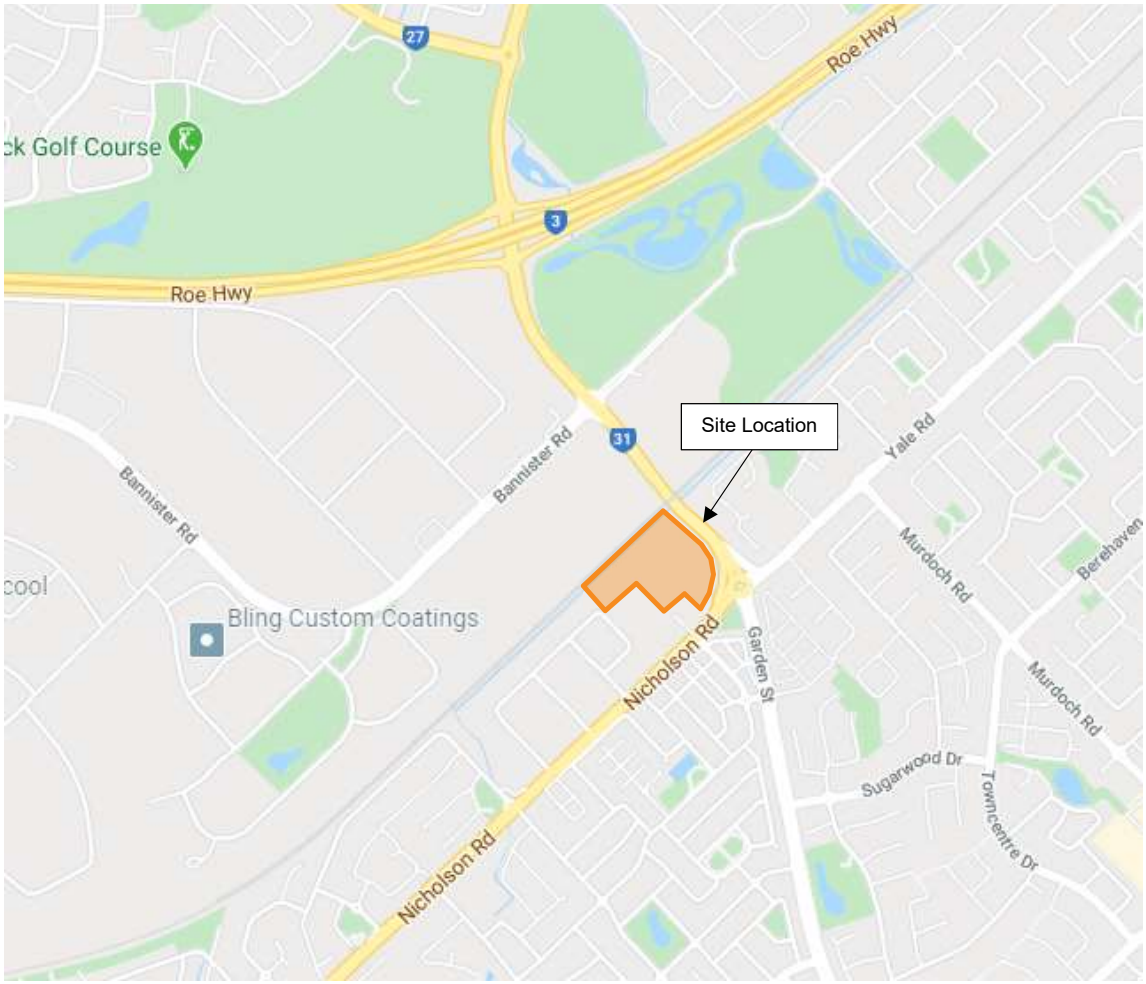
As the site is currently unoccupied, there are no existing land uses or traffic generation associated with site usage in the proposed Nicholson Road Station boundary.

2.2 SURROUNDING ROAD NETWORK

2.2.1 LOCAL ROAD NETWORK

The road network in the area surrounding the proposed Nicholson Road Station site is shown in Figure 4.

Figure 4. Nicholson Road Station – Surrounding Road Network



Source: Google Maps

Nicholson Road Station is expected to be accessed directly via Tulloch Way, which connects to the western part of the site. Connectivity of Tulloch Way to the wider road network shall be via Nicholson Road, where there are several additional local road connections including Panama Street and Vostan Road. As part of the project, the current unsignalised intersection at Nicholson Road / Panama Street is expected to be upgraded to a signalised intersection treatment to accommodate the forecast vehicle demand. The majority of vehicles anticipated to access the station site will utilise this intersection.

Nicholson Road is the primary roadway which bounds the site to the south and to the east. This road provides key regional connectivity from the suburbs in the south, through to Roe Highway north of the site. The road is currently two-lane dual carriageway with sealed shoulders, and includes a 2.0 – 5.0 metre median which runs along much of its length.

Currently, the speed limit along Nicholson Road in the vicinity of the station is limited to 70 km/h (west of Garden Street) and 60 km/h between Yale Street and Roe Highway.

Garden Street and Yale Road are both distributor roads which provide access to multiple surrounding suburbs that ultimately intersect with Nicholson Road at the existing roundabout located on the south-east corner of the station site. This dual lane roundabout is a critical intersection in the local area that services several thousand vehicles during the peak hour and is known to experience varying degrees of traffic congestion during peak periods. As such, this roundabout is likely to be subject to future traffic investigations by State and Local Government authorities. However, significant upgrades to the existing roundabout treatment are not part of the scope of works associated with the METRONET Nicholson Road Station.

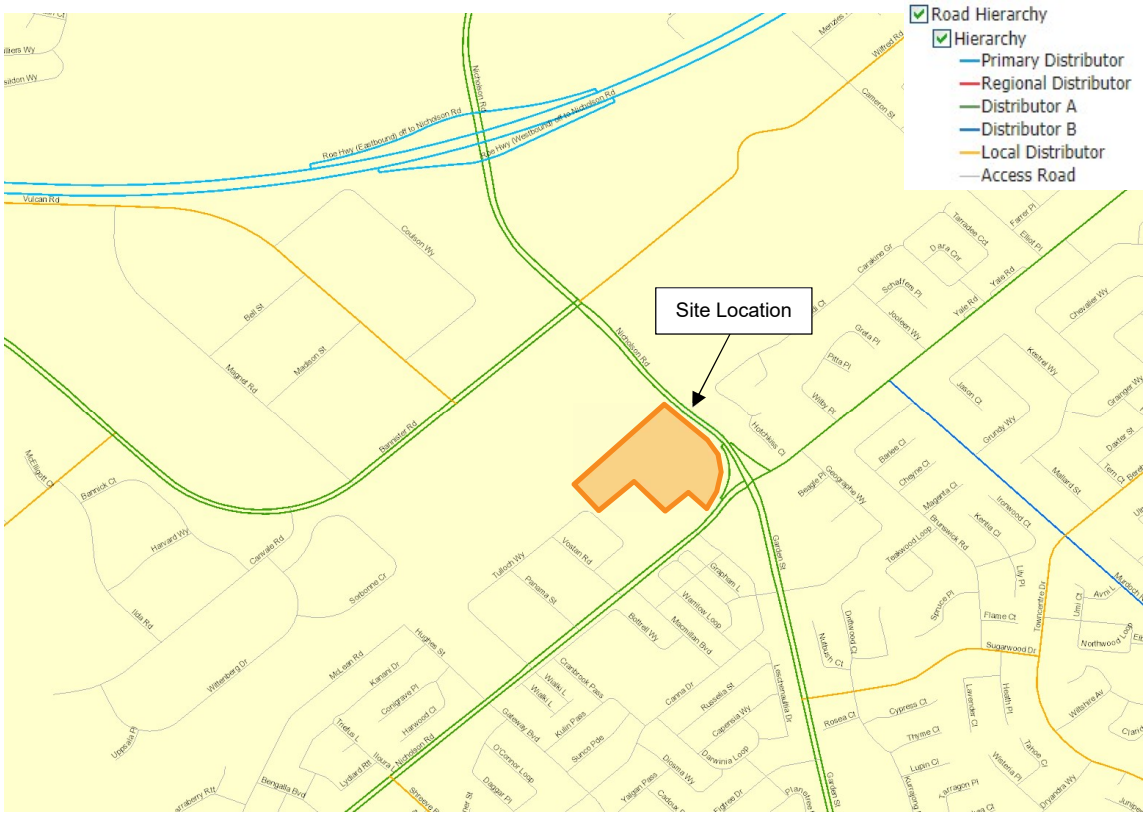
Garden Street is a two-lane dual carriageway with sealed shoulders and a wide median, extending south-east from the station location. Currently, the speed limit along Garden Street is 70 km/h.

Lastly, Yale Street is a one lane per direction dual carriageway with painted median which extends east from the Nicholson Road Station site. This roadway provides distributor access to numerous properties between Nicholson Road and the existing Thornlie Station. Yale Street currently has a speed limit of 60 km/h.

2.2.2 MAIN ROADS WA ROAD HIERARCHY

The road hierarchy system of the surrounding network, as per the Main Roads WA Road Information Mapping System, is shown in Figure 5.

Figure 5. Local Road Hierarchy



Source: Main Roads WA Road Information Mapping System (https://mrwebapps.mainroads.wa.gov.au/publicmaps/rim)

As per the above functional road hierarchy in the vicinity of the proposed site location, it can be seen that Nicholson Road is classified as a District Distributor A, indicating that this route is managed by the Local Government, the City of Gosnells. Similarly, both Garden Street and Yale Road are classified as Distributor A type roads.

Tulloch Way, and the other side roads present adjacent to Nicholson Road near the station, are classified as Access Roads, and are therefore the responsibility of City of Gosnells.

2.2.3 EXISTING TRAFFIC FLOW INFORMATION

Traffic surveys were undertaken along Nicholson Road on Tuesday 9 April 2019 (as part of the earlier WSP *Thornlie-Cockburn Link Transport Assessment*) in order to collect a baseline traffic demand on the roadway adjacent to the station and to assist with upcoming traffic analysis works.

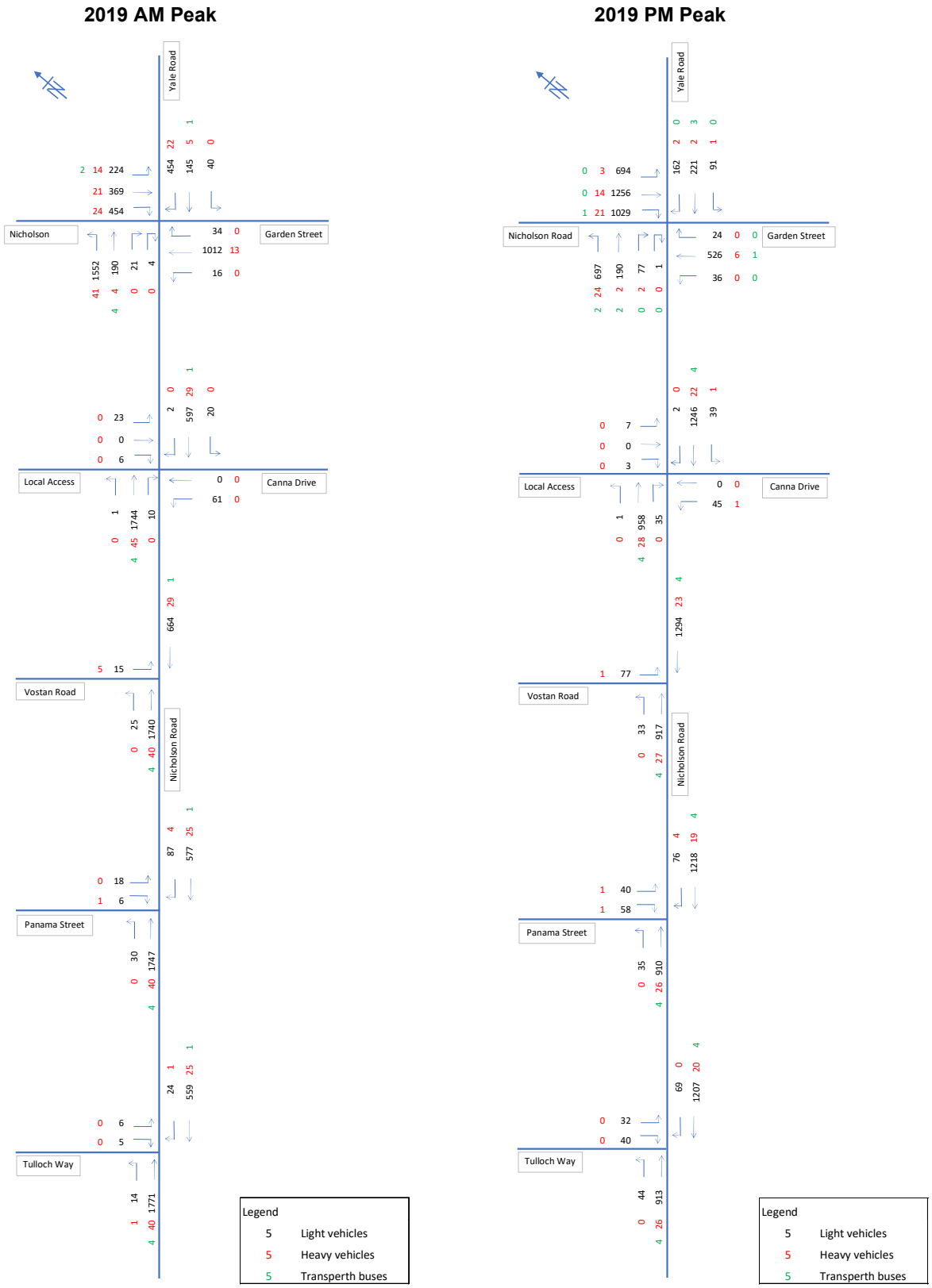
The traffic survey included intersection counts at the following locations:

- Nicholson Road / Garden Street / Yale Road roundabout.
- Nicholson Road / Canna Drive / Local Access priority control intersection.
- Nicholson Road / Panama Street priority control intersection.
- Nicholson Road / Tulloch Way priority control intersection.

The survey was undertaken 06:45 to 08:45 hours during the AM peak period and 16:00 to 18:00 hours during the PM peak period, with the AM peak hour being observed to be 07:45 to 08:45 hours and the PM peak hour observed to be 16:30 to 17:30 hours.

The 2019 peak hour traffic flows are shown in Figure 6. Vehicle volumes have been categorised into ‘light vehicle’ and ‘heavy vehicle’ categories. Note that a detailed vehicle classification breakdown of the 2019 traffic flow information is not available. Transperth bus service frequency along Nicholson Road has also been included.

Figure 6. Nicholson Road – 2019 Peak Period Survey Flows



2.2.4 NICHOLSON ROAD / GARDEN STREET / YALE ROAD ROUNDABOUT

For the purposes of this study, liaison with Main Roads WA confirmed that potential modifications to the existing Nicholson Road / Garden Street / Yale Road roundabout configuration are being examined as part of a separate investigation in the local area.

While the approach flows observed in the surveyed data are useful in understanding the lane utilisation that occurs as vehicles approach the roundabout (particularly in the eastbound direction of Nicholson Road), the traffic performance at this location is not part of the scope of works for the METRONET Nicholson Road Station project.

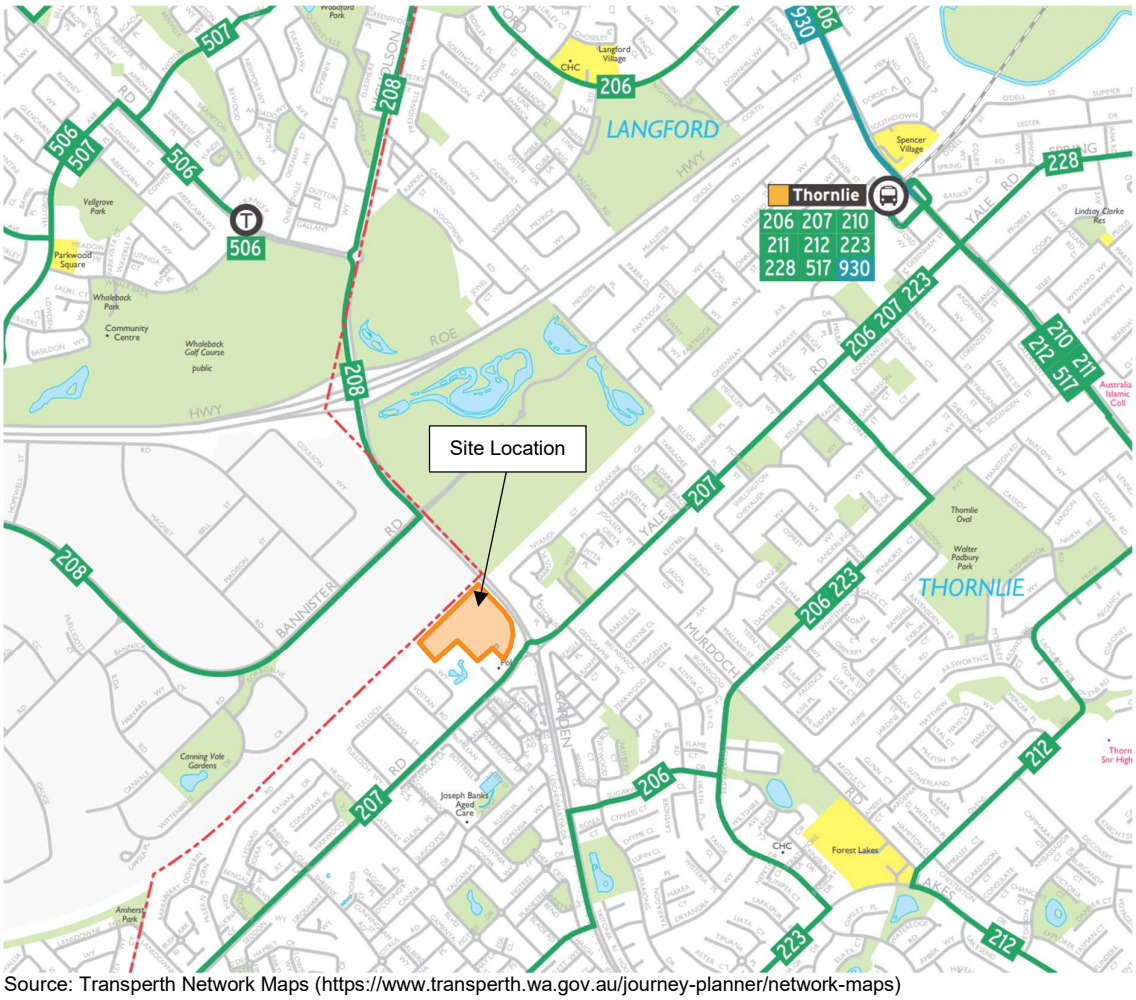
Therefore, for the purposes of this Transport Impact Assessment, there will be no direct analysis of the existing or future performance at the Nicholson Road / Garden Street / Yale Road roundabout.

2.3 EXISTING BUS ROUTES

Current Transperth bus route information for the area surrounding the Nicholson Road Station site has been sourced from Transperth timetables and network mapping.

The bus routes which currently operate in the vicinity are shown in Figure 7.

Figure 7. Existing Transperth Bus Route Map



Source: Transperth Network Maps (https://www.transperth.wa.gov.au/journey-planner/network-maps)

From the Transperth network map, there is presently one bus route which travels past the project site along Nicholson Road (Route 207). Bus frequency information for this route is summarised in Table 1.

Table 1. Existing Transperth Route Information

Route	Direction	Frequency (services per hour)		
		AM Peak	Off-Peak	PM Peak
207	Northbound	3	2	3
	Southbound	3	2	3
Total		6	4	6

2.4 EXISTING PEDESTRIAN AND CYCLING NETWORK

Nicholson Road currently has a footpath facility which runs along the full length of the western side of the carriageway. However, the footpath on the western side of Nicholson Road currently terminates mid-way through the roundabout, before transitioning through to the Yale Road (eastern) side of the roundabout.

Pedestrian connectivity and footpaths along the minor roads adjacent to the future Nicholson Road Station (including Tulloch Way, Panama Street and Vostan Road) is currently poor with little to no dedicated footpaths along these roadways. However, many lots in the area appear to have generous verges which may be able to accommodate improved pedestrian footpath infrastructure.

The ability for pedestrians to cross Nicholson Road is currently limited to a number of pedestrian cut-throughs which are located at several points between Tulloch Way and Canna Drive. However, none of these locations provide dedicated pedestrian crossing facilities which allow for priority crossing over traffic movements.

Discussions with key stakeholders including Department of Transport and City of Gosnells identified that the ability for pedestrians to cross Nicholson Road in order to access the Station is a critical element of the overall accessibility plan for the site. Due to the relatively high traffic flow along Nicholson Road and the absence of any priority pedestrian crossings currently along this section of the network, it was concluded that a signalised mid-block pedestrian crossing point on Nicholson Road near the Station site was a requirement of the overall transport strategy. The implementation of the proposed mid-block pedestrian crossing solution is outlined in further detail within Section 4.3.3.

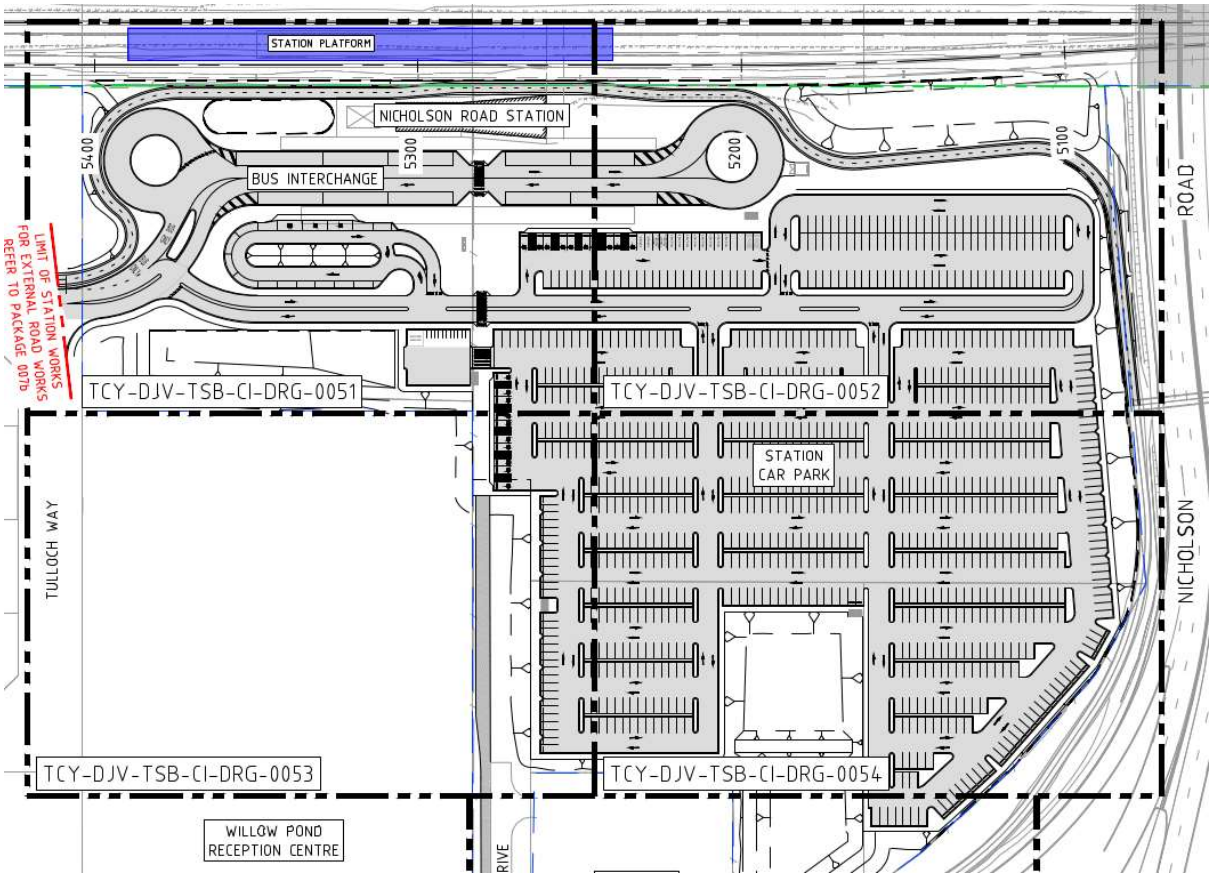
Lastly, the current PSP infrastructure begins from Yale Road at the roundabout and continues north, alongside the eastern side of the Nicholson Road carriageway and over the Nicholson Road bridge. Integration with the existing PSP network and the future station will also be investigated as part of the development proposal.

3.0 DEVELOPMENT PROPOSAL

3.1 STATION LAYOUT

The proposed Nicholson Road Station seeks to provide a single platform train station along the Thornlie-Cockburn rail line, along with supporting infrastructure including a 826 car bay long-term parking area (including 8 accessible bays), 146 bay short-term parking area (including 12 accessible bays), additional motorcycle parking (including shelter), drop-off parking zone, and a bus interchange. The general site layout of Nicholson Road Station is illustrated in Figure 8.

Figure 8. Nicholson Road Station Overall Plan



Vehicle access to the site shall be via the existing road network in the surrounding area. Nicholson Road will serve as the major distributor road which services the site. It is expected that the majority of vehicles will then access the site via the intersection of Panama Street with Nicholson Road, before proceeding to Tulloch Way which will lead to the main access point for the site.

For vehicles to access Tulloch Way via Panama Street, the transport strategy for the site proposes to construct new traffic signal infrastructure at the intersection of Nicholson Road and Panama Street. This signalised intersection will then serve as the major access point from the Station to the wider road network.

The Station plan also includes provision of a bus interchange that is integrated within the site layout. The bus interchange is located immediately adjacent to the main Station building entrance, and provides for a total of 7 active bays and 3 layover bays. The bus interchange has been designed in a dog-bone configuration, allowing buses to re-circulate within the interchange if required.

Bus access to / from the site shall also be via the main site entry on Tulloch Way. Buses will then separate from the remainder of the Station traffic via a bus-only accessway to the interchange.

The long-term parking area (Park & Ride) is located south-east of the main Station building. The car parking seeks to provide a minimum of 826 bays, which includes both long term bays and several accessible (i.e. ACROD parking) bays. The Station plan also provides a further 146 short-term parking bays, including a number of accessible bays plus numerous PTA servicing and staff bays, and two electric car charging bays. Further details on the parking supply are provided in Section 4.7.

Located adjacent to the bus interchange area is the station drop-off area (Kiss & Ride), which provides 16 bays (including 3 accessible drop-off bays) for station pick-ups and drop-offs in a clockwise circulation to allow for safe access to vehicles for passengers.

As part of the station construction, new sections of pedestrian and cyclist shared path infrastructure are to be provided between the rail reserve and the Station building. This connection seeks to join the existing shared path infrastructure east of the site (via an underpass below Nicholson Road), with the new Station building. To the west of the site, new shared path infrastructure is proposed, however this is currently expected to form a separate package of works to be implemented by others. Along with the shared path connectivity, end of trip facilities will be provided, including sheltered bicycle parking, a number of bicycle U-rails, drinking fountain and public toilets, with further details provided in Section 4.6.

3.2 CHANGES TO SURROUNDING TRANSPORT NETWORKS

The development proposal of the Nicholson Road Station does not propose significant changes to the surrounding transport network as part of the project. Primary access to the station site shall be via the existing intersection at Nicholson Road / Panama Street which is proposed to be upgraded to a signalised intersection treatment as part of the station access strategy. Vehicles will then utilise the existing Tulloch Way to access the site.

Whilst it is acknowledged that the current Nicholson Road / Garden Street / Yale Road roundabout experiences some level of congestion along certain approaches during peak periods, upgrades to the existing roundabout are not included as part of the scope of works for the Nicholson Road Station. However, it is understood that Main Roads WA, in conjunction with the City of Gosnells, are investigating longer term upgrades to the roundabout treatment which will seek to address these issues. Any such upgrades are expected to be undertaken as part of a separate package of works and not included as part of the Nicholson Road Station access strategy.

3.3 INTEGRATION WITH SURROUNDING AREA

The proposed Nicholson Road Station is to be located on an area of land adjacent to Nicholson Road and the existing freight rail line, which currently has no significant land use or traffic generation.

The surrounding area (particularly south and east of Nicholson Road) is predominantly residential in nature, while the areas to the west and north of the station are made up on numerous light industrial and commercial lots with associated employment generation. Overall, the area surrounding the proposed station has mixed land use that is well suited to public transport patronage.

As noted in the METRONET long term development opportunities strategy, the area surrounding the station location is expected to support increased infill of development and higher density of land use (such as Transit Oriented Developments) within one kilometre of the station over the medium to long term. This strategy supports the development of the station in this location as a long term transport hub in the area.

3.4 COMMITTED DEVELOPMENTS AND OTHER TRANSPORT PROPOSALS

3.4.1 459 NICHOLSON ROAD TRANSIT ORIENTED DEVELOPMENT (WILLOW POND)

It is understood that a Development Application for a Transit Oriented Development (TOD) has been prepared and submitted by WSP for the lot located at 459 Nicholson Road, Canning Vale. This TOD is in line with the METRONET objectives for the area by increasing both higher density residential housing plus further employment opportunities within the vicinity of the proposed station.

The proposed development at this location includes the provision of 60 dwelling mid-rise residential building, to be developed by the Department of Communities at the rear of the identified site. Further to this, the development is also intended to support several additional land uses including a supermarket, gym, childcare centre, service station and food outlets. These retail and business land uses shall be located toward the front of the lot, in order to provide access directly from Nicholson Road via a new left in / left out crossover.

The subject site and the proposed access strategy for the Willow Pond development are illustrated in Figure 9.

Figure 9. Lot 459 Nicholson Road TOD (Willow Pond) – Site Location and Access Strategy

Source: Lot 459 Nicholson Road, Canning Vale – Transport Impact Assessment (WSP, 19/12/19)

It should be noted that traffic generation and distribution estimates for this development have been sourced from the WSP Transport Impact Assessment and utilised in this report, as part of the development of the background traffic generation on the surrounding road network. Specific details on the application of the traffic flows generated by the TOD site are outlined within Section 4.1.3 of this report.

As this development includes an additional site access point along Nicholson Road, the location of this access was required to be considered when determining the location of the proposed pedestrian mid-block crossing in order to ensure adequate separation for the safety of both pedestrians and road users.

3.4.2 NICHOLSON ROAD / GARDEN STREET / YALE ROAD ROUNDABOUT POTENTIAL FUTURE UPGRADES

Liaison with Main Roads WA during the initial stages of development revealed that future upgrades to the geometric configuration of the existing Nicholson Road / Garden Street / Yale Road roundabout are currently being considered as part of a separate study that is in the early stages of investigation. Therefore, while the modification of the existing roundabout is not considered as part of this scope of works for the Nicholson Road Station, it is important to highlight that future modifications at this location are currently being studied.

As the Nicholson Road Station is proposed to be delivered within the near future and there is currently no certainty on the likelihood of upgrade funding nor is there an estimated timeline available for the modification to the existing roundabout, it is assumed that the Nicholson Road Station will be complete prior to any adjustments to the roundabout. As such, it would be expected that any changes to the Nicholson Road / Garden Street / Yale Road roundabout would be fully compatible with the Nicholson Road Station and any of the supporting infrastructure, including both the proposed Panama Street signalised intersection and the pedestrian mid-block crossing.

4.0 ANALYSIS OF TRANSPORT NETWORKS

4.1 BACKGROUND AND APPROACH

The traffic assessment of the network surrounding the proposed Nicholson Road Station development is detailed within this section of the report. The goal of this assessment is to demonstrate that the transport infrastructure provided as part of the project is suitable for use and is capable of adequately accommodating the forecast transport demands associated with the future station.

4.1.1 ASSESSMENT YEARS

For the Nicholson Road Station transport infrastructure assessment, the study focuses on the proposed opening year of 2021, and a post-opening year of 2031 to account for the medium term development and background traffic growth within the surrounding area.

As the station is largely expected to accommodate work related trips to / from the Perth CBD and the Nicholson Road light industrial area itself, the assessment will focus primarily on the AM and PM peak periods when the majority of public transport trips are expected to occur. While weekend traffic is anticipated, both the station patronage and background traffic flows during the weekend are expected to be significantly lower than the respective weekday peaks.

The peak period intervals are primarily based on the typical arrival profiles for train stations located on the outer edges of the Perth metropolitan passenger rail network, and demonstrates that the AM peak hour is likely to occur from 07:00 to 08:00 and the PM peak hour from 17:00 to 18:00. For the purposes of undertaking a robust analysis of the performance of the sites to be examined, it is assumed that the peak flows to and from the Station coincide with the peak background traffic flows along the adjacent road network (i.e. Nicholson Road).

4.1.2 INTERSECTIONS TO BE ASSESSED

The modelling developed to assess the future traffic performance along the segment of Nicholson Road used to access the proposed Station includes all existing unsignalised intersections from Tulloch Way through to Canna Drive. While most of these existing intersections are not proposed to be modified from their current arrangement, these side roads were considered in order to reflect the behaviour of both the existing traffic flows along the route and the expected behaviour of the future flows generated by the Nicholson Road Station.

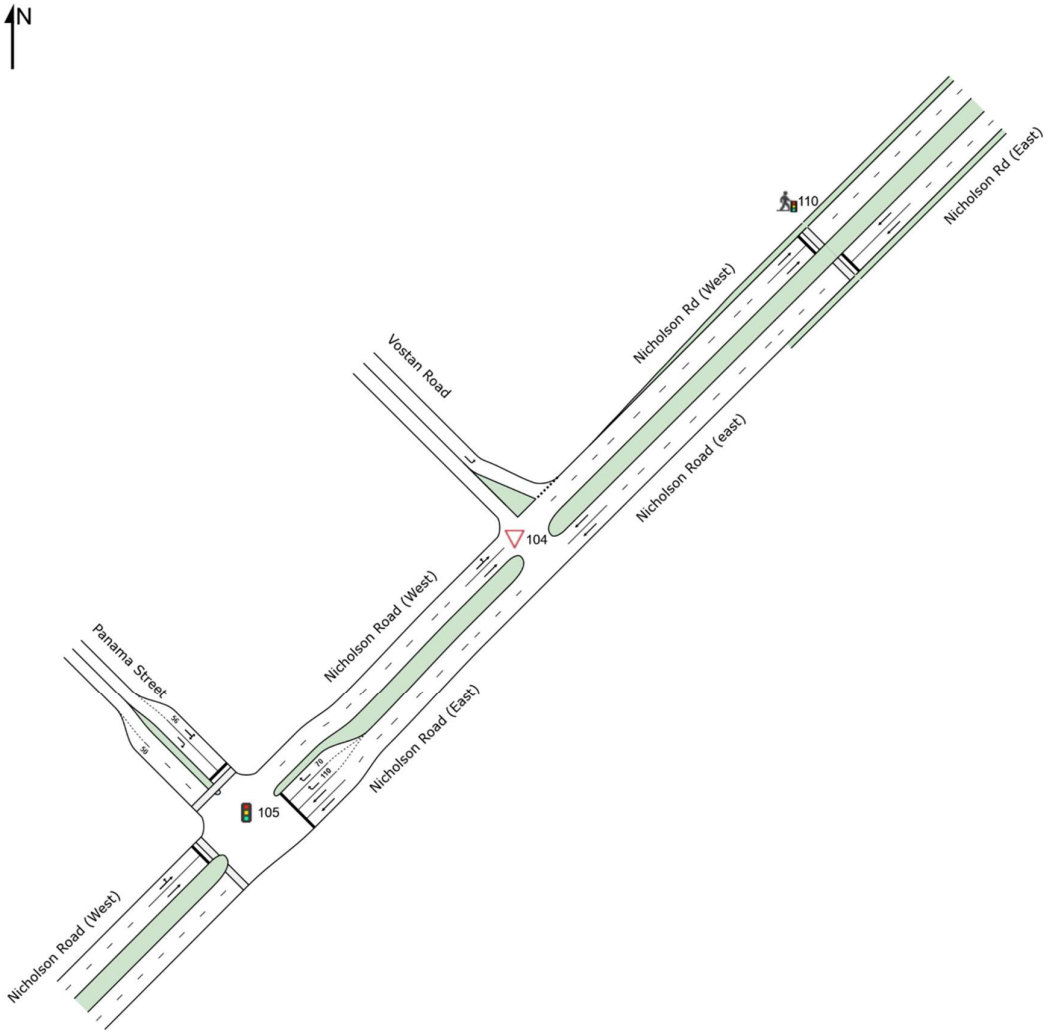
Therefore, the intersections which are most significantly impacted by the Station traffic and are a focus of the proposed modifications as part of the Nicholson Road Station transport strategy include the following sites:

1. Nicholson Road / Panama Street (signalised intersection upgrade from existing priority control).
2. Nicholson Road / Vostan Road (existing priority control).
3. Nicholson Road mid-block pedestrian crossing (new signalised intersection site).

While a majority of inbound Station demand flows when approaching from the west on Nicholson Road are expected to utilise the Tulloch Way connection when accessing the car park, this is a left turn movement on to a minor road and is therefore not expected to result in any significant impact to existing intersection performance at the Nicholson Road / Tulloch Way intersection.

The extents of the SIDRA Intersection network model constructed for the traffic impact analysis is illustrated in Figure 10.

Figure 10. Nicholson Road Station – SIDRA Model Extents



4.1.3 METHODOLOGY AND APPROACH

The overall approach to the transport assessment undertaken in this report is largely in line with the previous Thornlie-Cockburn Link Transport Assessment (May 2019) undertaken by WSP as part of the preliminary works leading up to the current engagement.

The trip generation to and from the site has been calculated based on a combination of several major trip sources including:

1. Background traffic flows (i.e. background growth).
2. Station generated traffic (including Park & Ride, Kiss & Ride).
3. Willow Pond future Transit Oriented Development site (TOD).
4. Forecast bus movements.

Baseline traffic demands have been sourced from the earlier surveyed traffic flows recorded in April 2019 (as referenced in Section 2.2.3). As per the prior assessment, background traffic growth between the source data year of 2019 and the forecast year of 2021 has been assumed at a nominal rate of 0.7% per annum.

Background traffic growth rates between the years 2021 and 2031 have been determined based on the strategic level ROM24 modelled flows supplied to NEWest by Main Roads WA (included in Appendix A). The modelled background flow growth in the ROM24 Network Volume Plots is based on a combination of factors accounted by the Regional Operations Model, including land use forecasts and planned modifications to the surrounding road network. It is noted that these ROM24 forecasts do not include the traffic associated with the proposed Nicholson Road Station, as this is not modelled as a land use within the strategic model. Therefore, any flows generated by the Station itself must be applied over and above the background flow growth captured by the ROM24 modelling.

Peak period traffic flows generated by the station development (including Park & Ride, drop-off parking, as well as the bus interchange) were then added to the future background traffic estimates developed by NEWest, based on the forecast station patronage for that time period and an adopted arrival / departure profile. The methodology used to estimate the traffic generated by the Nicholson Road Station activity is outlined in Section 4.2.

Finally, the traffic generated by the Willow Pond TOD (discussed in Section 3.4.1) must be captured within the assessment, as the additional forecast flows from this development will also contribute to the overall traffic demand along Nicholson Road. Traffic flows estimated for this development have been sourced from the *459 Nicholson Road, Canning Vale Transport Impact Assessment* (WSP, December 2019), and are applied over and above both the background traffic growth and the Station generated traffic in order to arrive at a final vehicle demand profile for this study.

4.1.4 PERFORMANCE METRICS AND LEVEL OF SERVICE TARGETS

- The network results of the analysis summarised in this report are presented in terms of:
- Delay – The average delay experienced per passenger car unit (measured in seconds).
- Level of Service (LoS) – The LoS (ranging from A to F) provides an indicator of the performance of the network or individual movement based on the average delay per passenger car unit (pcu).
- Degree of Saturation (DoS) – The DoS is a ratio of the demand to capacity, with DoS over 90 percent indicating a congested intersection, and DoS of 100 percent indicating an intersection at capacity and DOS over 100 percent indicating oversaturated conditions. The DoS provided represents the maximum DoS at the intersection.
- Queue – The length of the average maximum back of queue (measured in number of passenger car units) on the approach measured over a number of cycles.
- As per the “8803-000-005 Specification - Station Building and Civil Works”, the level of service requirements for intersection performance specified by the Scope of Work and Technical Criteria (SWTC) are as follows:

  3.3 Level of Service for Intersections

  The overall level of service (LOS) for intersections during peak periods (as defined in Transportation Research Board’s Highway Capacity Manual - Special Report 209) shall be Level D or higher, with no individual major movement having a LOS lower than Level D and no individual minor movement having a LOS lower than Level E.

4.2 DEVELOPMENT TRIP GENERATION AND DISTRIBUTION

This section outlines the key methodology and figures / assumptions utilised in order to determine the forecast trip generation and distribution profile associated with the proposed Nicholson Road Station.

4.2.1 TRIP GENERATION

One of the major factors in calculating the trip generation associated with the site is the number of estimated daily station boardings. The agreed daily boardings have been developed through the Department of Transport STEM model and have been sourced from the Project Definition Report to remain consistent with previous assessments.

The forecast daily boardings for the Nicholson Road Station are shown in Table 2.

Table 2. Nicholson Road Station Daily Boardings Forecast

Year	2021	2031
Daily Boardings (passengers / day)	2,250	2,530

The Nicholson Road Station access mode share has been sourced from the Thornlie-Cockburn Line Transport Assessment (WSP, May 2019), which in turn based the adopted mode share assumptions and figures included within the Catchment Analysis Report (Arup, February 2018).

The distribution of the mode share is based on the catchment analysis and has been adjusted based on Murdoch Station surveys undertaken by PTA in 2012, as well as the forecast daily boardings and a Park & Ride occupancy of 1.2 persons per vehicle. The assumed mode share at Nicholson Road Station for the opening year of 2021 is shown in Table 3.

Table 3. Adopted 2021 Nicholson Road Station Mode Share

Access Mode	Mode Share (2021)
Walking	7%
Cycling	5%
Bus	33%
Kiss & Ride	14%
Park & Ride	41%
Total	100%

Based on the above mode share figures, this translates to a maximum parking accumulation of 700 vehicles in the year 2021. The current proposed long term and short term parking provision at the Nicholson Road Station is 950 standard bays plus 20 accessible (disabled) bays and 2 electric car bays. Therefore, this parking accumulation equates to approximately 72% parking occupancy in the opening year scenario.

As the forecast daily boardings increase through to the year 2031 (by approximately 12%), it would be expected that the associated vehicle trip generation would also increase accordingly. However, this results in a parking facility which may still be not utilised to full capacity in the future year of 2031.

Therefore, in order to ensure a robust assessment of the full capacity of the supporting transport infrastructure, it has been assumed that the long term parking (Park & Ride) will be utilised to full capacity by the future year of 2031 (i.e. all available Park & Ride bays occupied by the end of the morning peak period). This represents the maximum expected traffic to be generated by the Park & Ride supply of the station.

Therefore, to account for the assumed increased in Park & Ride demand to account for the full parking utilisation and reach the parking cap of 972 bays, the mode share for the future scenario of 2031 has been adjusted accordingly. It has also been assumed that Kiss & Ride, and both walking and cycling mode shares are largely unchanged from the 2021 scenario, while the bus mode share has been revised down in order to account for the assumed increase in Park & Ride proportion. This approach results in an assessment which accounts for what is expected to be the maximum potential vehicle traffic generated by the site during peak periods.

The final mode assumed share for this assessment at the Nicholson Road Station for 2031 is shown in Table 4.

Table 4. Adopted 2031 Nicholson Road Station Mode Share

Access Mode	Mode Share (2031)
Walking	7%
Cycling	5%
Bus	25%
Kiss & Ride	13%
Park & Ride	50% (cap)
Total	100%

Lastly, the arrival and departure profile of vehicles is a critical element of the station trip generation. As per the methodology adopted in the earlier previous *Thornlie-Cockburn Line Transport Assessment* (WSP, May 2019), the daily profile of boardings at Nicholson Road Station has been assumed to be comparable to the existing Clarkson Station due to the similar journey time to the Perth CBD.

Based on data collected at Clarkson Station, the inbound and outbound trip distribution for both Park & Ride and Kiss & Ride modes assumed for the Nicholson Road Station is summarised in Table 5.

Table 5. Adopted daily passenger Boarding / Alighting trip generation profile

Time (Hour Beginning)	Vehicle Trips (Train Passenger Boardings)		Vehicle Trips (Train Passenger Alightings)	
	Park & Ride	Kiss & Ride	Park & Ride	Kiss & Ride
5:00	10%	6%	0%	0%
6:00	24%	14%	0%	0%
7:00	44%	31%	0%	1%
8:00	7%	11%	0%	1%
9:00	5%	6%	0%	2%
10:00	1%	5%	0%	1%
11:00	1%	3%	1%	2%
12:00	0%	3%	2%	2%
13:00	1%	2%	4%	2%
14:00	1%	2%	6%	5%
15:00	0%	3%	8%	8%
16:00	2%	2%	19%	16%
17:00	1%	5%	31%	13%
18:00	2%	3%	19%	13%
19:00	1%	2%	5%	11%
20:00	0%	1%	2%	11%
21:00	0%	0%	1%	9%
Total	100%	99%	98%	97%

- Note: Some figures do not add up to 100% as the data does not cover a full 24-hour period.
- Note: Kiss & Ride inbound and outbound vehicle trips for each passenger boarding and alighting are accounted for and are equal (i.e. inbound vehicle trips and outbound vehicle trips are equal for a given time period).

4.2.2 DIRECTIONAL DISTRIBUTION OF TRAFFIC FLOWS

The directional distribution of the arriving and departing Park & Ride plus Kiss & Ride traffic has been maintained to be largely consistent with the approach taken in both the earlier WSP traffic assessment and the previous Arup catchment analysis investigation. However, some key adjustments to the assumed arrival profile were adopted for this analysis due to preliminary investigations of the traffic flow along Nicholson Road and the affect that this is expected to have on traffic behaviour.

Due to the anticipated demand at the proposed Panama Street signalised intersection (particularly in the eastbound direction during the AM peak), it was concluded by the NEWest design team that vehicle redistribution along Tulloch Way would be likely to occur for vehicles bound for the Station car parking when approaching from the west (due to anticipated queuing of eastbound vehicles along Nicholson Road). Therefore, the vast majority of left turning vehicles travelling to Nicholson Road Station were assumed to utilise the left turn at Tulloch Way instead of Panama Street during the AM peak period as this would provide those patrons with the minimum possible delay to their journey. A small proportion of vehicles were assumed to utilise the left turn movement at Vostan Road, in order to account for some station related traffic passing eastbound through the Panama Street intersection. Both Park & Ride and Kiss & Ride traffic flows were reassigned to the above routes accordingly.

During the PM peak period, as eastbound traffic was significantly reduced, it was assumed that vehicles approaching the station would utilise the Panama Street route to access the station. This approach was used to maintain a robust assessment in the PM peak scenario.

Similarly, the assumption from the previous analysis that all vehicles departing the station seeking to travel eastbound along Nicholson Road would use the Panama Street signals was revised. As this route would result in additional travel time for vehicles departing the station, it was concluded that these vehicles would be more likely to utilise the existing left turn give-way movement at Vostan Road instead, as this connection is closer to the station car park access and would also likely incur a lower delay when turning eastbound on to Nicholson Road.

The adopted directional distribution proportions for Park & Ride and Kiss & Ride traffic are shown in Figure 11 and Figure 12, respectively.

Figure 11. Adopted 2021 / 2031 Park & Ride Directional Distribution

Figure 12. Adopted 2021 / 2031 Kiss & Ride Directional Distribution

4.2.3 WILLOW POND TOD TRAFFIC FLOWS

In addition to the future Nicholson Road Station, there is currently a proposal to construct a Transit Oriented Development at a site adjacent to the train station (located at 459 Nicholson Road). This development, known as Willow Pond, is proposed to include numerous commercial attractors including a supermarket, gym, childcare centre, service station and drive-through outlets. The area also includes a committed development of a 60 dwelling mid-rise residential building, located at the rear of the lot.

The traffic demand flows for this TOD site were sourced directly from the *459 Nicholson Road, Canning Vale Transport Impact Assessment* report (WSP, December 2019). The summary of the site generated traffic flows is shown in Table 6. Note that TOD traffic demand is assumed to be static between 2021 and 2031 scenarios.

Table 6. Willow Pond TOD (Retail + Residential) Traffic Generation

Time Period	Traffic Generated (Total)	
	Inbound	Outbound
AM Peak	153	157
PM Peak	240	229

The directional distribution to and from the site, as assumed within the transport assessment report, is shown in Figure 13.

Figure 13. Willow Pond TOD Directional Distribution

Source: Lot 459 Nicholson Road, Canning Vale – Transport Impact Assessment (WSP, 19/12/19)

4.2.4 FUTURE BUS MOVEMENTS

Future bus routing and movement frequencies have been sourced from PTA / Transperth, based on the latest bus networking plans. Note that these proposed bus routes and frequencies are preliminary and are subject to change following review and community consultation. The bus routes and number of movements per hour are summarised in Table 7.

Table 7. Forecast Transperth Bus Schedule

Route No.	AM / PM Peak	Inter-Peak
200	4	1
205	6	4
206	6	4
207	4	2
208	4	2
209	4	2
213	4	1
506	4	1
Total	36	17

Liaison with PTA and Transperth confirmed it is preferred that bus routes to and from the station travel along the same route for both the inbound and outbound services. Therefore, the assumed bus routing for this analysis is summarised below:

- Inbound Bus Movements to Nicholson Road Station:
  - Eastbound buses – left turn from Nicholson Road into Panama Street.
  - Westbound buses – right turn from Nicholson Road into Panama Street.
- Outbound Bus Movements from Nicholson Road Station:
  - Eastbound buses – left turn from Panama Street onto Nicholson Road.
  - Westbound buses – right turn from Panama Street onto Nicholson Road.

Note that for this assessment it has also been assumed that the number of bus movements between 2021 and 2031 remains unchanged, as total patronage forecast growth between these years is relatively low and bus movements make up a relatively small proportion of the total traffic demand on the road network.

4.2.5 FINAL DEVELOPMENT TRAFFIC FLOWS

Based on a combination of the individual traffic demand and growth components along the road network adjacent to the Nicholson Road Station outlined above, the final development scenario traffic demands have been calculated.

Final traffic flows are reported on by vehicle classification type (light, medium and heavy vehicles) in order to show the higher than usual proportion of medium / heavy vehicles present along Nicholson Road and to assist with future LinSig analysis as part of the Main Roads WA signal approvals process. Classification data along Nicholson Road was obtained from the Main Roads WA TrafficMap tool.

The final development traffic flows are summarised in Figure 14 and Figure 15 for the forecast year 2021 and 2031 peak periods, respectively.

Figure 14. Nicholson Road Final Development Traffic Flows (2021 AM / PM Peaks)

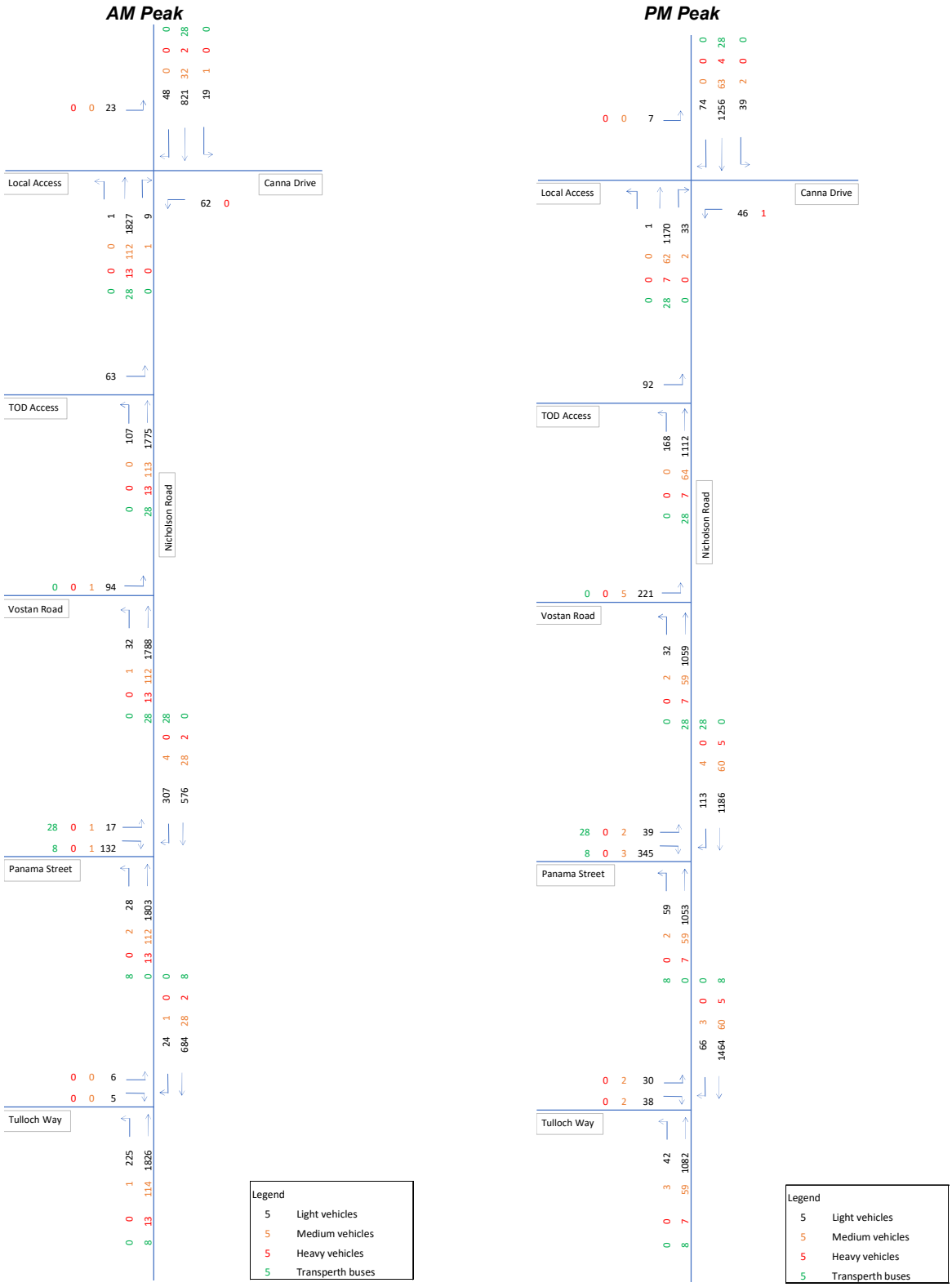


Figure 15. Nicholson Road Final Development Traffic Flows (2031 AM / PM Peaks)

4.3 ROAD NETWORK IMPACT ANALYSIS

4.3.1 NICHOLSON ROAD / PANAMA STREET SIGNALISED INTERSECTION

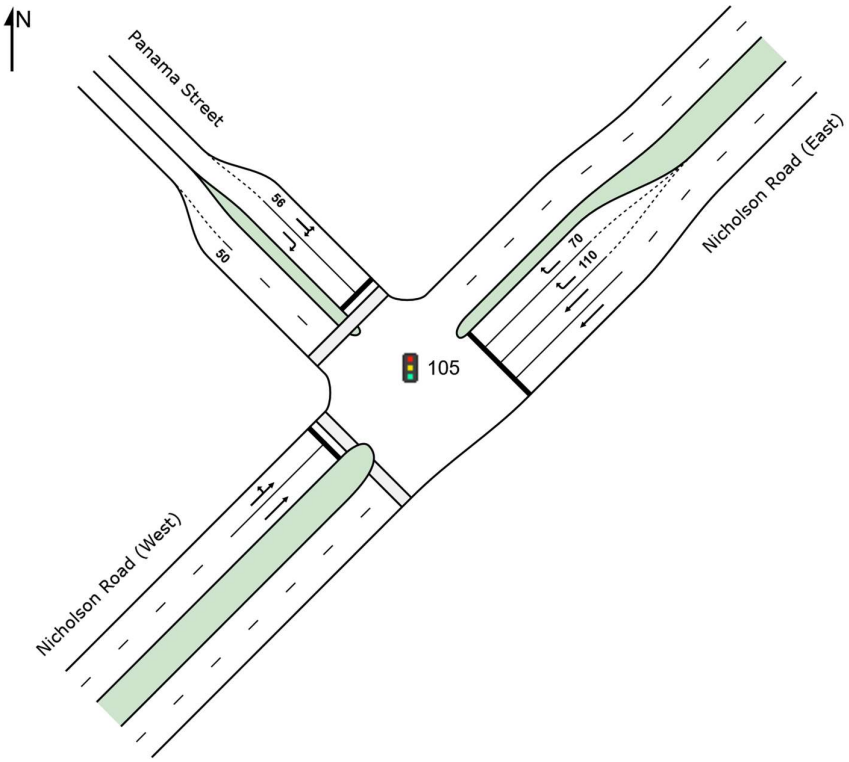
The intersection at Panama Street is expected to become the primary method of access to and from the Nicholson Road Station site for the majority of site related vehicle traffic. In order to support the increased turning flows in and out of Panama Street, including numerous Transperth bus services, it is proposed that the current priority controlled intersection be upgraded to a signalised intersection, allowing full movements.

In determining the proposed layout at the Nicholson / Panama signalised intersection, the available land within the current road reserve width had to be considered against the forecast traffic flow generation and the turns which were likely to become the critical movements. The ability to accommodate pedestrian movements across both Nicholson Road and Panama Street was also a critical element to the proposed treatment.

Ultimately, it was concluded that a minimum of two right turn lanes on the westbound carriageway of Nicholson Road would be required to satisfy the increasing right turn demand for vehicles accessing the Station car parking area. While additional eastbound and westbound through lanes along Nicholson Road were investigated, liaison with internal stakeholders concluded that it was not feasible as part of this project to provide significant widening to the Nicholson Road corridor, due to the road reserve constraints and the significant impacts to homes and businesses along the route that would result from any further widening.

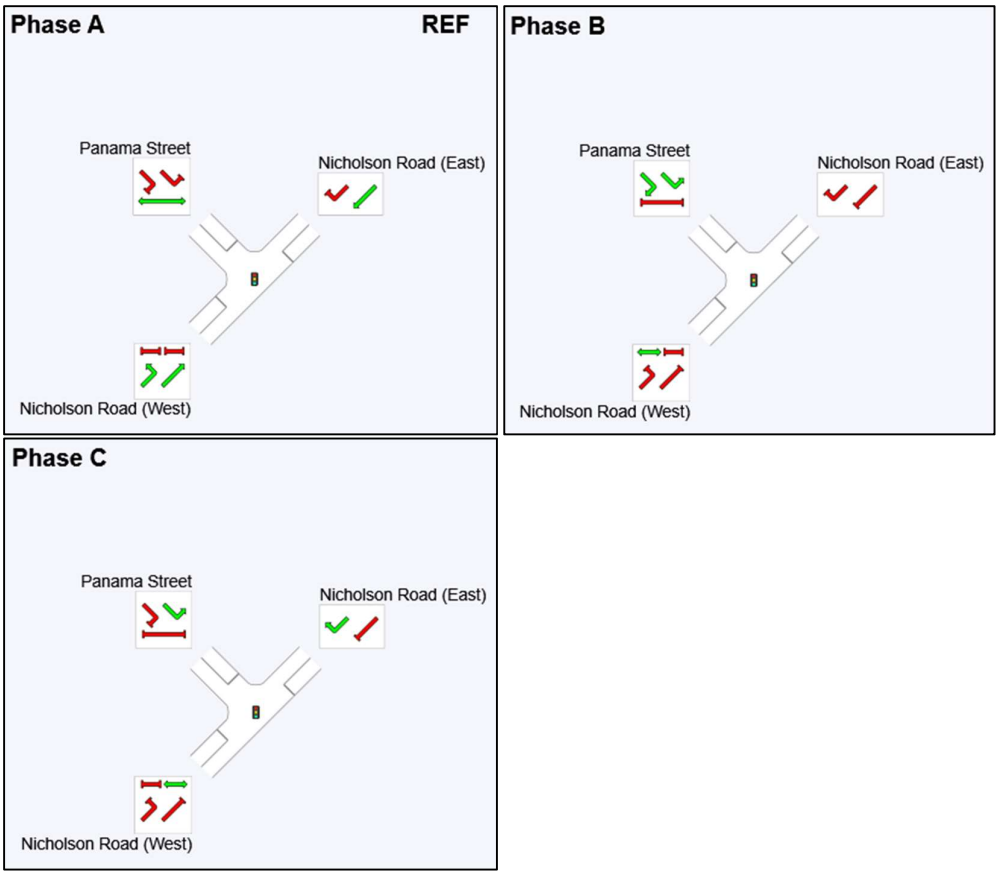
Finally, several pedestrian crossing options were examined through development of the concept design and the traffic modelling, and it was concluded that a staggered pedestrian crossing (i.e. two stage crossing) on the western side of Nicholson Road would provide the optimal performance at the intersection during peak periods when pedestrian demand is likely to be high. The SIDRA layout of the Nicholson Road / Panama Street intersection is shown in Figure 16.

Figure 16. Nicholson Road / Panama Street Proposed Signalised Intersection Layout



To accommodate each of the required traffic movements at the site, illustrated in Figure 17 is the minimum traffic signal phasing sequence adopted for the analysis, which includes pedestrian crossing movements across both Nicholson Road (staged crossing) and Panama Street (full crossing). Note that the below is a preliminary phasing sequence which assumes pedestrian movements are called in every cycle. Additional sub-phases and optimisations may be added through further development of the Main Roads WA signal approvals process via forthcoming LinSig modelling.

Figure 17. Nicholson Road / Panama Street Signalised Intersection – SIDRA Phasing Sequence



Based on the above layout and phasing sequence, a peak hour networked intersection analysis of the three sites covered by this study were undertaken to determine the forecast performance of the Nicholson Road / Panama Street intersection. Based on liaison with Main Roads WA, it was advised that a cycle time of 120 seconds would be the preferred maximum for a signalised intersection in the Perth metropolitan area. Therefore, a peak period cycle time of 120 seconds has been adopted for the following analyses.

The SIDRA Intersection results for the 2021 and 2031 morning and afternoon peaks are detailed below.

Figure 18. Nicholson Road / Panama Street – 2021 AM Peak Results

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Aver. Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
NorthEast: Nicholson Road (East)														
25	T1	606	5.0	606	5.0	0.258	10.2	LOS B	4.7	36.1	0.47	0.41	0.47	37.4
26	R2	339	9.4	339	9.4	0.929	85.4	LOS F	7.6	61.3	1.00	1.05	1.64	11.6
Approach		945	6.6	945	6.6	0.929	37.2	LOS D	7.6	61.3	0.66	0.64	0.89	18.4
NorthWest: Panama Street														
27	L2	38	55.3	38	55.3	0.596	62.4	LOS E	2.9	27.7	0.99	0.81	1.04	10.0
29	R2	137	3.6	137	3.6	0.596	63.4	LOS E	3.4	26.3	1.00	0.80	1.03	12.2
Approach		175	14.9	175	14.9	0.596	63.2	LOS E	3.4	27.7	1.00	0.80	1.03	11.7
SouthWest: Nicholson Road (West)														
30	L2	34	17.6	34	17.6	0.950	55.9	LOS E	49.7	393.6	1.00	1.13	1.25	14.2
31	T1	1928	6.5	1928	6.5	0.950	35.4	LOS D	49.7	393.6	0.89	0.94	1.03	8.2
Approach		1962	6.7	1962	6.7	0.950	35.7	LOS D	49.7	393.6	0.90	0.95	1.03	8.4
All Vehicles		3082	7.1	3082	7.1	0.950	37.7	LOS D	49.7	393.6	0.83	0.84	0.99	12.2

Figure 19. Nicholson Road / Panama Street – 2021 PM Peak Results

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Aver. Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
NorthEast: Nicholson Road (East)														
25	T1	1251	5.2	1251	5.2	0.620	19.5	LOS B	15.2	118.4	0.74	0.67	0.74	26.2
26	R2	145	22.1	145	22.1	0.612	67.4	LOS E	2.7	24.4	1.00	0.80	1.07	13.9
Approach		1396	6.9	1396	6.9	0.620	24.5	LOS C	15.2	118.4	0.76	0.68	0.77	23.1
NorthWest: Panama Street														
27	L2	69	43.5	69	43.5	0.662	52.3	LOS D	6.5	56.7	0.97	0.84	0.99	11.5
29	R2	356	3.1	356	3.1	0.662	52.8	LOS D	7.8	59.5	0.97	0.84	0.98	13.9
Approach		425	9.6	425	9.6	0.662	52.7	LOS D	7.8	59.5	0.97	0.84	0.99	13.5
SouthWest: Nicholson Road (West)														
30	L2	69	14.5	69	14.5	0.665	25.2	LOS C	16.4	129.7	0.77	0.71	0.77	24.6
31	T1	1119	5.9	1119	5.9	0.665	19.3	LOS B	16.4	129.7	0.73	0.67	0.73	13.6
Approach		1188	6.4	1188	6.4	0.665	19.7	LOS B	16.4	129.7	0.73	0.67	0.73	14.6
All Vehicles		3009	7.1	3009	7.1	0.665	26.6	LOS C	16.4	129.7	0.78	0.70	0.78	18.2

Figure 20. Nicholson Road / Panama Street – 2031 AM Peak Results

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Aver. Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
NorthEast: Nicholson Road (East)														
25	T1	663	5.0	663	5.0	0.287	10.8	LOS B	5.3	41.3	0.49	0.43	0.49	36.3
26	R2	412	8.0	412	8.0	1.026	156.7	LOS F	13.4	106.9	1.00	1.29	2.29	7.0
Approach		1075	6.1	1075	6.1	1.026	66.8	LOS E	13.4	106.9	0.69	0.76	1.18	11.8
NorthWest: Panama Street														
27	L2	48	60.4	48	60.4	0.672	63.7	LOS E	3.3	33.3	1.00	0.86	1.12	9.9
29	R2	142	6.3	142	6.3	0.672	64.8	LOS E	3.8	29.5	1.00	0.84	1.10	12.0
Approach		190	20.0	190	20.0	0.672	64.5	LOS E	3.8	33.3	1.00	0.84	1.11	11.5
SouthWest: Nicholson Road (West)														
30	L2	42	23.8	42	23.8	1.084	222.1	LOS F	111.1	881.6	1.00	2.09	2.46	4.3
31	T1	2161	6.5	2161	6.5	1.084	129.0	LOS F	111.1	881.6	0.95	1.53	1.77	2.4
Approach		2203	6.8	2203	6.8	1.084	130.7	LOS F	111.1	881.6	0.95	1.54	1.78	2.5
All Vehicles		3468	7.3	3468	7.3	1.084	107.3	LOS F	111.1	881.6	0.87	1.26	1.56	4.9

Figure 21. Nicholson Road / Panama Street – 2031 PM Peak Results

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Aver. Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
NorthEast: Nicholson Road (East)														
25	T1	1371	5.2	1371	5.2	0.714	21.3	LOS C	17.4	135.0	0.79	0.72	0.79	24.7
26	R2	154	20.8	154	20.8	0.639	67.8	LOS E	2.9	25.8	1.00	0.81	1.09	13.9
Approach		1525	6.8	1525	6.8	0.714	26.0	LOS C	17.4	135.0	0.81	0.73	0.82	22.2
NorthWest: Panama Street														
27	L2	74	41.9	74	41.9	0.755	55.4	LOS E	7.7	66.2	0.98	0.89	1.09	11.0
29	R2	406	2.7	406	2.7	0.755	55.2	LOS E	9.2	69.8	0.98	0.88	1.08	13.4
Approach		480	8.8	480	8.8	0.755	55.2	LOS E	9.2	69.8	0.98	0.88	1.08	13.1
SouthWest: Nicholson Road (West)														
30	L2	75	13.3	75	13.3	0.745	27.3	LOS C	19.7	155.1	0.83	0.77	0.83	23.5
31	T1	1238	5.8	1238	5.8	0.745	21.2	LOS C	19.7	155.1	0.78	0.72	0.78	12.6
Approach		1313	6.2	1313	6.2	0.745	21.5	LOS C	19.7	155.1	0.79	0.72	0.79	13.6
All Vehicles		3318	6.8	3318	6.8	0.755	28.5	LOS C	19.7	155.1	0.83	0.75	0.84	17.3

The results of the network analysis indicate that the AM peak is likely to be the critical time period at the proposed signalised intersection, due to the increased right turn demand in to Panama Street for station related traffic, and the strong opposing flow along the eastbound carriageway of Nicholson Road that largely consists of background traffic demand.

In the opening year scenario of 2021, the analysis demonstrates that an overall LoS D is forecast for the Nicholson / Panama signalised intersection. While this result is expected to satisfy the target performance for overall level of service, it is noted that the individual movements level of service for the right turn in to Panama Street is forecast at LoS F.

While this is higher than the target maximum of LoS E (as per the performance guidelines in Section 4.1.4), closer examination of the results indicates that this is likely due to the overall cycle length of the intersection and not due to oversaturation of the movement.

By the future year of 2031, the results suggest that the increased traffic flow through the intersection as a result of strong background traffic growth and increased movements associated with the Nicholson Road Station car park, the performance of the intersection is expected to deteriorate resulting in a forecast LoS F in the AM peak. Again, the results demonstrate that the competing demands between the eastbound through movement on Nicholson Road and the westbound right turn movement in to Panama Street are the origin of much of the reported congestion.

The increasing traffic demands and several movements reporting a degree of saturation in excess of 1.00 indicate that additional capacity at the intersection would ordinarily be required. However, as outlined previously there is currently no scope for land resumption along Nicholson Road due to the significant impacts on properties and costs associated with such works. Therefore, the layout examined for this analysis is effectively the most capacity which is capable of being provided within the current land boundaries.

With the overall cycle time limited to 120 seconds for this analysis, there appears to be limited available green time to satisfy the competing demands. Testing indicated that an increase to the cycle time may yield moderate performance improvements, although several movements were still likely to operate at LoS F. However, modifications to cycle times would require further consultation with Main Roads WA and monitoring of intersection performance as demands increase with time.

While the results of the intersection analysis indicating that the PTA target intersection performance is unlikely to be satisfied in the future year scenario of 2031, Main Roads WA has recently provided ‘Stage 1 – Control Type Selection’ signalised intersection treatment approval for the proposed signals at Nicholson Road / Panama Street. Due to the importance of the access point as the primary way in and out of the Nicholson Road Station for vehicle traffic and the limitations on the layout as a result of the available road reserve, it was concluded that the proposed layout was the optimal potential intersection treatment for this location.

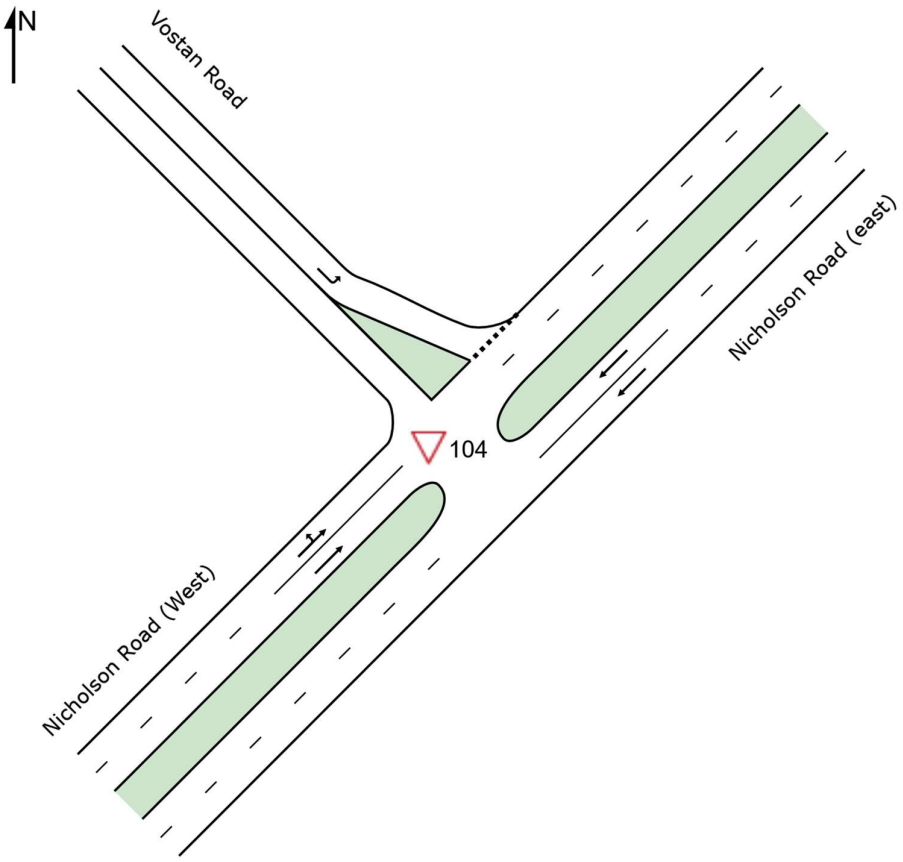
Further analysis to obtain ‘Stage 2 – Concept Design’ approval with Main Roads WA for the proposed signalised intersection is currently underway, with further detailed assessment being undertaken using LinSig software. It is anticipated that additional performance improvements to forecast intersection performance may be achieved through additional phasing sequence and coordination optimisations available to the LinSig software as the ‘Stage 2’ approvals process continues.

4.3.2 NICHOLSON ROAD / VOSTAN ROAD INTERSECTION

The intersection of Nicholson Road and Vostan Road is an existing priority controlled intersection, limited to left in / left out movements only. While the Nicholson Road Station vehicle access strategy does not propose any modifications to the layout or the available movements at this location, the forecast traffic distribution of the Station car park traffic estimates that a significant proportion of eastbound traffic departing the site is likely to utilise this access. Therefore, the forecast performance at this intersection has been assessed to determine if the current left in / left out arrangement can accommodate the peak period flows estimated to depart the Station via Vostan Road.

The SIDRA layout of the current Nicholson Road / Vostan Road priority controlled intersection is shown in Figure 22. At this point, no further modifications to the existing layout are proposed as part of the Nicholson Road Station access works.

Figure 22. Nicholson Road / Vostan Road Existing Priority Control Intersection Layout



Based on the above layout, a peak hour networked intersection analysis of the three sites covered by this study were undertaken to determine the forecast performance of the Nicholson Road / Vostan Road intersection. The SIDRA Intersection results for the 2021 and 2031 morning and afternoon peaks are detailed below.

Figure 23. Nicholson Road / Vostan Road – 2021 AM Peak Results

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
NorthEast: Nicholson Road (east)														
11	T1	945	6.6	945	6.6	0.266	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.9
Approach		945	6.6	945	6.6	0.266	0.0	NA	0.0	0.0	0.00	0.00	0.00	69.9
NorthWest: Vostan Road														
1	L2	95	1.1	95	1.1	0.256	15.5	LOS C	0.4	3.0	0.80	0.93	0.90	25.5
Approach		95	1.1	95	1.1	0.256	15.5	LOS C	0.4	3.0	0.80	0.93	0.90	25.5
SouthWest: Nicholson Road (West)														
4	L2	33	3.0	33	3.0	0.655	6.4	LOS A	0.0	0.0	0.00	0.02	0.00	59.1
5	T1	1941	7.9	1941	7.9	0.655	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	68.7
Approach		1974	7.8	1974	7.8	0.655	0.1	NA	0.0	0.0	0.00	0.01	0.00	68.2
All Vehicles		3014	7.2	3014	7.2	0.655	0.6	NA	0.4	3.0	0.03	0.04	0.03	63.3

Figure 24. Nicholson Road / Vostan Road – 2021 PM Peak Results

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
NorthEast: Nicholson Road (east)														
11	T1	1396	6.9	1396	6.9	0.618	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	69.4
Approach		1396	6.9	1396	6.9	0.618	0.1	NA	0.0	0.0	0.00	0.00	0.00	69.4
NorthWest: Vostan Road														
1	L2	226	2.2	226	2.2	0.318	9.3	LOS A	0.6	4.7	0.62	0.85	0.73	31.7
Approach		226	2.2	226	2.2	0.318	9.3	LOS A	0.6	4.7	0.62	0.85	0.73	31.7
SouthWest: Nicholson Road (West)														
4	L2	34	5.9	34	5.9	0.398	6.4	LOS A	0.0	0.0	0.00	0.03	0.00	57.9
5	T1	1153	8.2	1153	8.2	0.398	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	68.2
Approach		1187	8.1	1187	8.1	0.398	0.2	NA	0.0	0.0	0.00	0.02	0.00	67.4
All Vehicles		2809	7.0	2809	7.0	0.618	0.9	NA	0.6	4.7	0.05	0.08	0.06	59.3

Figure 25. Nicholson Road / Vostan Road – 2031 AM Peak Results

Movement Performance - Vehicles															
Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Aver. Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
NorthEast: Nicholson Road (east)														
11	T1	1075	6.1	1075	6.1	0.350	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.8
Approach		1075	6.1	1075	6.1	0.350	0.0	NA	0.0	0.0	0.00	0.00	0.00	69.8
NorthWest: Vostan Road														
1	L2	99	2.0	99	2.0	0.310	18.5	LOS C	0.5	3.7	0.84	0.97	1.01	23.3
Approach		99	2.0	99	2.0	0.310	18.5	LOS C	0.5	3.7	0.84	0.97	1.01	23.3
SouthWest: Nicholson Road (West)														
4	L2	40	5.0	38	5.0	0.701	6.4	LOS A	0.0	0.0	0.00	0.02	0.00	58.2
5	T1	2169	7.7	2079	7.8	0.701	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	68.5
Approach		2209	7.7	2117[N1]	7.7	0.701	0.2	NA	0.0	0.0	0.00	0.01	0.00	68.0
All Vehicles		3383	7.0	3291[N1]	7.2	0.701	0.7	NA	0.5	3.7	0.03	0.04	0.03	62.6

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Figure 26. Nicholson Road / Vostan Road – 2031 PM Peak Results

Movement Performance - Vehicles															
Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Aver. Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
NorthEast: Nicholson Road (east)														
11	T1	1525	6.8	1525	6.8	0.551	0.0	LOS A	1.5	12.2	0.00	0.00	0.00	69.6
Approach		1525	6.8	1525	6.8	0.551	0.0	NA	1.5	12.2	0.00	0.00	0.00	69.6
NorthWest: Vostan Road														
1	L2	281	2.1	281	2.1	0.430	11.1	LOS B	1.0	7.4	0.68	0.95	0.96	29.6
Approach		281	2.1	281	2.1	0.430	11.1	LOS B	1.0	7.4	0.68	0.95	0.96	29.6
SouthWest: Nicholson Road (West)														
4	L2	38	5.3	38	5.3	0.438	6.4	LOS A	0.0	0.0	0.00	0.03	0.00	58.0
5	T1	1273	8.0	1273	8.0	0.438	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	68.2
Approach		1311	7.9	1311	7.9	0.438	0.2	NA	0.0	0.0	0.00	0.02	0.00	67.4
All Vehicles		3117	6.8	3117	6.8	0.551	1.1	NA	1.5	12.2	0.06	0.09	0.09	57.4

The performance at the Vostan Road give-way with Nicholson Road is forecast to operate satisfactorily in both AM and PM peak periods during both AM and PM peak periods, for the opening year and future year scenarios. Some minor delays are expected for drivers on Vostan Road wishing to turn left on to Nicholson Road as gaps are sought in oncoming traffic flows, however the results demonstrate that these delays are likely to be limited to less than 20 seconds on average – resulting in a forecast LoS C for this left turn movement.

While the 2031 AM peak network analysis indicates that there is expected to be some upstream limitation of eastbound flow due to potential congestion at the Panama Street signals, examination of the isolated site results indicates that there is not expected to be a significant impact to the forecast delay of the left turn movement out of Vostan Road if the upstream congestion is relieved.

Given the proposed signalised intersection at Panama Street, it is expected that downstream gaps at Vostan Road would be relatively consistent due to the signalised phasing sequence. Therefore, no additional modifications to the existing Vostan Road intersection are expected to be required to service the Nicholson Road Station traffic.

4.3.3 NICHOLSON ROAD MID-BLOCK PEDESTRIAN CROSSING

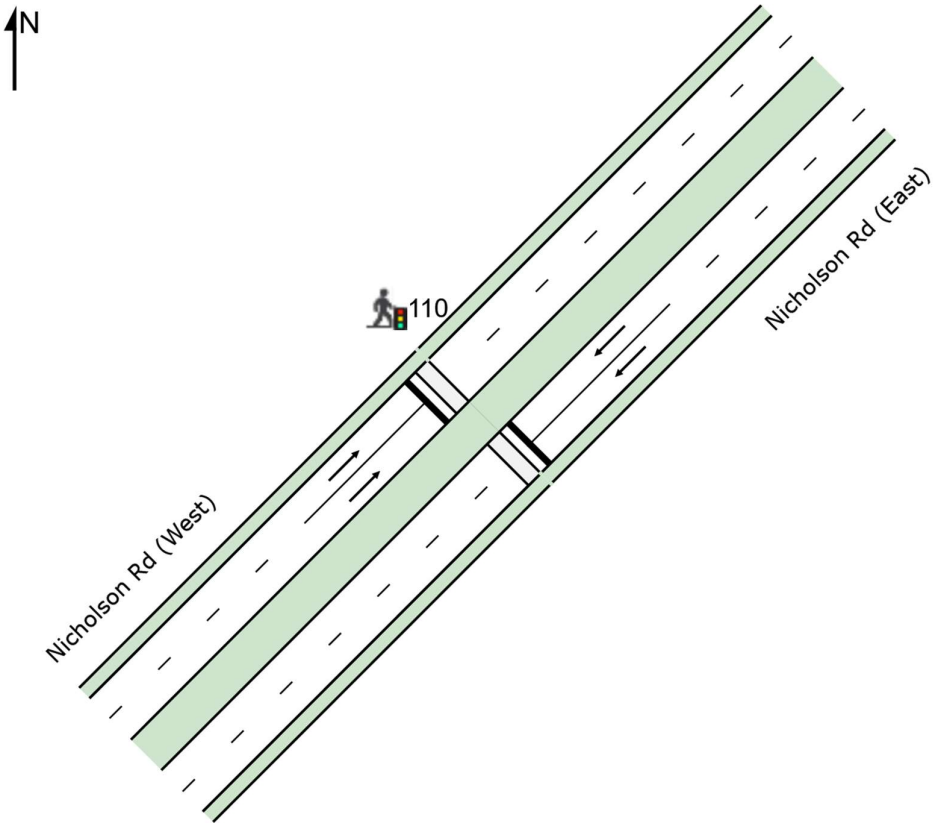
As part of the Nicholson Road Station access strategy for pedestrians, it was concluded that a key element of the local accessibility plan was the provision of a dedicated pedestrian crossing facility on Nicholson Road to allow safe and effective pedestrian access to and from the Station. Due to the strong traffic demand along Nicholson Road during peak periods, this was found to present a barrier to walking and cycling accessibility for a significant segment of the surrounding catchment. Improving the existing pedestrian crossing amenity on Nicholson Road would enhance the catchment connectivity of the Station with the large residential catchment to the south-east and assist in achieving the target mode share for the Station.

While several potential solutions to the pedestrian accessibility were explored, including the possibility of a pedestrian overpass structure, it was ultimately concluded that a signalised pedestrian mid-block crossing facility would provide the most direct access for pedestrians, while also presenting a solution that would be compatible with the existing road reserve and land availability.

Given the multiple constraints along Nicholson Road in the vicinity of the Station as a result of existing site boundaries, plus the future Willow Pond development west of Canna Drive which will include an additional site crossover, the location of the proposed mid-block pedestrian crossing was a key consideration in the concept design development of the treatment. In order to best connect the south-eastern catchment with the Station, while remaining compatible with the Willow Pond development access plans, the crossing point was ultimately located approximately 115 metres east of the Vostan Road intersection. This allows the pedestrian crossing to take advantage of the wide central median along Nicholson Road prior to the right turn pocket in to Canna Drive, while also maintaining a safe distance away from the Willow Pond access point.

The SIDRA layout of the proposed Nicholson Road mid-block pedestrian crossing is illustrated in Figure 27.

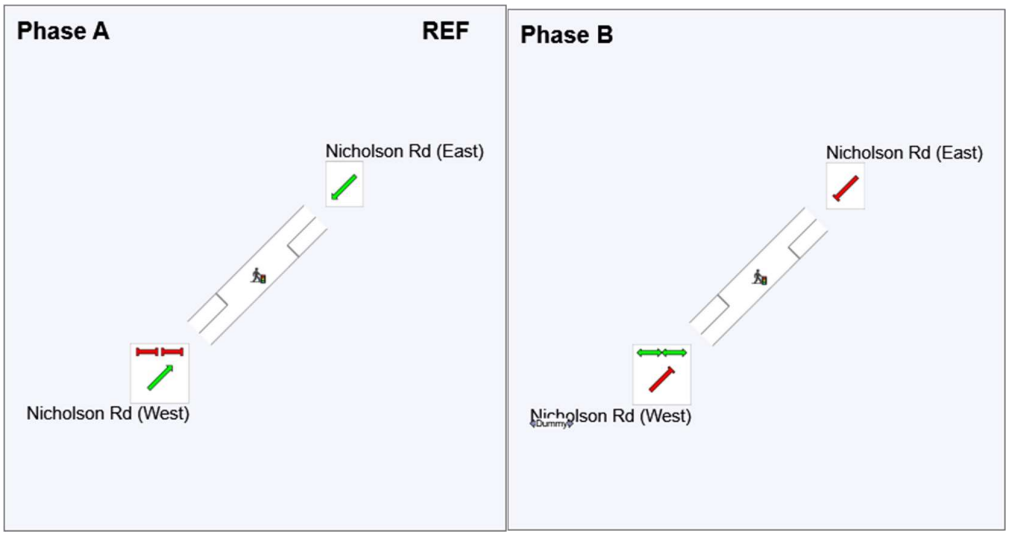
Figure 27. Nicholson Road Mid-Block Pedestrian Crossing Layout



To ensure favourable coordination of traffic movements between the mid-block pedestrian crossing and the Nicholson / Panama signalised intersection, a cycle time of 120 seconds has been adopted for this analysis. The SIDRA phasing sequence for the crossing is also shown in Figure 28, which demonstrates that a simple two-phase sequence is sufficient to accommodate the movements.

Note that consultation with Main Roads WA has indicated that in practice this crossing is expected to operate as a staggered crossing operated by a single signal controller. This approach will be reflected in the forthcoming LinSig analysis as part of the Stage 2 signal approval process.

Figure 28. Nicholson Road Mid-Block Pedestrian Crossing – SIDRA Phasing Sequence



Based on the above layout, a peak hour networked intersection analysis of the three sites covered by this study were undertaken to determine the forecast performance of the Nicholson Road mid-block pedestrian crossing. The SIDRA Intersection results for the 2021 and 2031 morning and afternoon peaks are detailed below.

Figure 29. Nicholson Road Mid-Block Pedestrian Crossing – 2021 AM Peak Results

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Aver. Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
NorthEast: Nicholson Rd (East)														
8	T1	945	6.6	945	6.6	0.314	2.1	LOS A	3.6	28.1	0.23	0.21	0.23	46.0
Approach		945	6.6	945	6.6	0.314	2.1	LOS A	3.6	28.1	0.23	0.21	0.23	46.0
SouthWest: Nicholson Rd (West)														
2	T1	2036	7.6	2036	7.6	0.811	0.7	LOS A	5.0	40.2	0.10	0.09	0.10	65.0
Approach		2036	7.6	2036	7.6	0.811	0.7	LOS A	5.0	40.2	0.10	0.09	0.10	65.0
All Vehicles		2981	7.2	2981	7.2	0.811	1.2	LOS A	5.0	40.2	0.14	0.13	0.14	60.7

Figure 30. Nicholson Road Mid-Block Pedestrian Crossing – 2021 PM Peak Results

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Aver. Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
NorthEast: Nicholson Rd (East)														
8	T1	1396	6.9	1396	6.9	0.462	2.6	LOS A	6.4	50.4	0.28	0.26	0.28	43.0
Approach		1396	6.9	1396	6.9	0.462	2.6	LOS A	6.4	50.4	0.28	0.26	0.28	43.0
SouthWest: Nicholson Rd (West)														
2	T1	1379	7.2	1379	7.2	0.550	0.7	LOS A	2.6	20.2	0.08	0.07	0.08	65.0
Approach		1379	7.2	1379	7.2	0.550	0.7	LOS A	2.6	20.2	0.08	0.07	0.08	65.0
All Vehicles		2775	7.1	2775	7.1	0.550	1.7	LOS A	6.4	50.4	0.18	0.17	0.18	56.1

Figure 31. Nicholson Road Mid-Block Pedestrian Crossing – 2031 AM Peak Results

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Aver. Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
NorthEast: Nicholson Rd (East)														
8	T1	1075	6.1	1075	6.1	0.355	2.3	LOS A	4.3	33.5	0.24	0.22	0.24	45.2
Approach		1075	6.1	1075	6.1	0.355	2.3	LOS A	4.3	33.5	0.24	0.22	0.24	45.2
SouthWest: Nicholson Rd (West)														
2	T1	2268	7.5	2175	7.5	0.864	0.8	LOS A	6.7	53.1	0.12	0.11	0.12	64.7
Approach		2268	7.5	2175[N1]	7.5	0.864	0.8	LOS A	6.7	53.1	0.12	0.11	0.12	64.7
All Vehicles		3343	7.0	3250[N1]	7.2	0.864	1.2	LOS A	6.7	53.1	0.16	0.15	0.16	60.1

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Figure 32. Nicholson Road Mid-Block Pedestrian Crossing – 2031 PM Peak Results

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Aver. Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
NorthEast: Nicholson Rd (East)														
8	T1	1525	6.8	1525	6.8	0.503	2.7	LOS A	7.4	58.2	0.30	0.28	0.30	42.0
Approach		1525	6.8	1525	6.8	0.503	2.7	LOS A	7.4	58.2	0.30	0.28	0.30	42.0
SouthWest: Nicholson Rd (West)														
2	T1	1555	6.9	1555	6.9	0.617	0.8	LOS A	3.7	28.9	0.09	0.09	0.09	64.2
Approach		1555	6.9	1555	6.9	0.617	0.8	LOS A	3.7	28.9	0.09	0.09	0.09	64.2
All Vehicles		3080	6.8	3080	6.8	0.617	1.8	LOS A	7.4	58.2	0.19	0.18	0.19	55.3

The above network results of the proposed signalised pedestrian crossing demonstrate that the forecast performance of the crossing is satisfactory in the 2021 and 2031 scenarios, achieving an overall LoS A during peak periods. With adequate coordination between the mid-block pedestrian crossing controller and the upstream controller at the proposed Panama Street signals, average delays for peak direction flows can be minimised, resulting in favourable level of service.

The results of the 2031 AM peak scenario demonstrate that there is again expected to be some limitation of arrival flow due to potential congestion at the Panama Street signalised intersection. However, study of the isolated intersection results shows that performance is able to be maintained even if the full inbound flow is realised, resulting in a maximum degree of saturation of 0.90.

Given that the phasing sequence at the pedestrian crossing point is a simple two-phase sequence with a short pedestrian crossing stage followed by a lengthy vehicle movement stage, the proportion of the available green time given to vehicle movements is relatively high. Therefore, any vehicles that are able to pass through the Nicholson / Panama intersection will be expected to pass through the proposed mid-block signals with little additional delay.

Overall, the analysis demonstrates that the proposed Nicholson Road signalised mid-block crossing can provide a safe and effective pedestrian crossing solution that is anticipated to add minimal additional delay to major vehicle movements along Nicholson Road. Similar to the proposed Panama Street signalised intersection, Main Roads WA has provided 'Stage 1 – Control Type Selection' signalised intersection treatment approval for the proposed mid-block pedestrian crossing on Nicholson Road. Again, further analysis to obtain 'Stage 2 – Concept Design' approval with Main Roads WA for the proposed signalised intersection is currently underway, with further detailed assessment being undertaken using LinSig software.

4.4 PUBLIC TRANSPORT ROUTES AND SERVICING

With the introduction of the new Thornlie-Cockburn Link extension and the associated bus interchanges at each of the stations along the route, adjustments to existing bus routes and the introduction of new services are expected.

The future Transperth bus network proposed to service the Nicholson Station bus interchange is outlined in Table 8. This information has been supplied by PTA / Transperth and is subject to changes or adjustments pending future planning and community consultation.

Table 8. Nicholson Road Station – Planned Bus Services

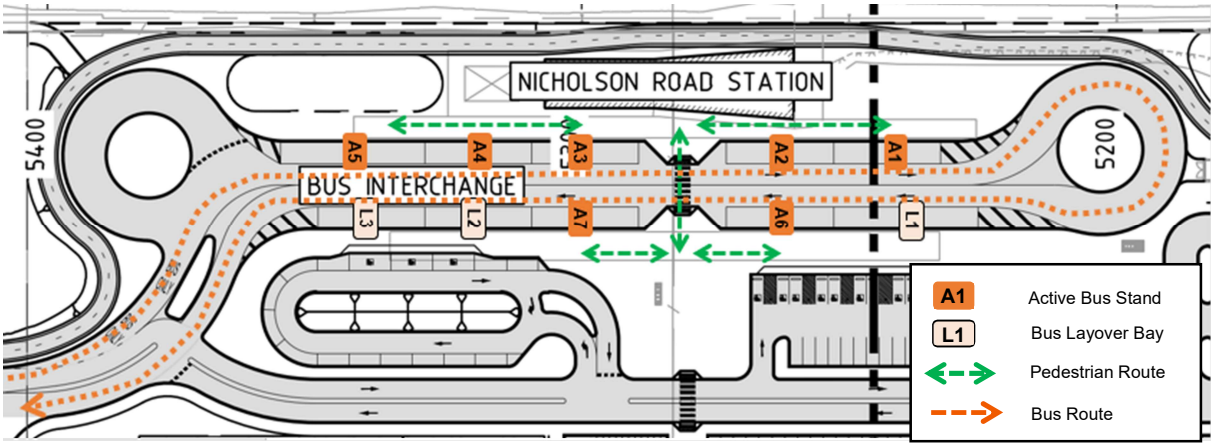
Route	Headway (mins)		Notes
	Peak	Inter-Peak / Off-Peak	
Route 200	15	60	
Route 205	10	15	Bidirectional. In peak periods buses will be operating frequently in both directions, although peak frequency is generally biased to and from Murdoch (so may be 10 in peak flow, 15 min contraflow).
Route 206	10	15	
Route 207	15	30	
Route 208	15	30	
Route 209	15	30	Bidirectional but will likely operate on the same frequency in both directions (due to train connections
Route 213	15	60	
Route 506	15	60	Bidirectional but peak frequency will be biased to and from Bull Creek (due to coordination with Route 507)

4.5 BUS INTERCHANGE

The proposed Nicholson Road Station design provides for an integrated bus interchange which will be located immediately east of the main station building. The layout of the interchange has buses approaching from the south east via Tulloch Way, and will enter the interchange via a bus only segment of the internal road illustrated in Figure 33.

The Nicholson Road Station schedule of accommodation specifies that the bus interchange should at minimum include a total of 7 active bays (including one articulated bus bay) and at least 3 layover bays (also including one articulated bus bay), which the proposed design satisfies. Figure 33 also illustrates how Transperth buses and pedestrians are expected to integrate within the bus interchange and the potential location of the active and layover bays.

Figure 33. Nicholson Road Station – Bus Interchange Layout & Access



4.6 PEDESTRIAN AND CYCLE ACCESS

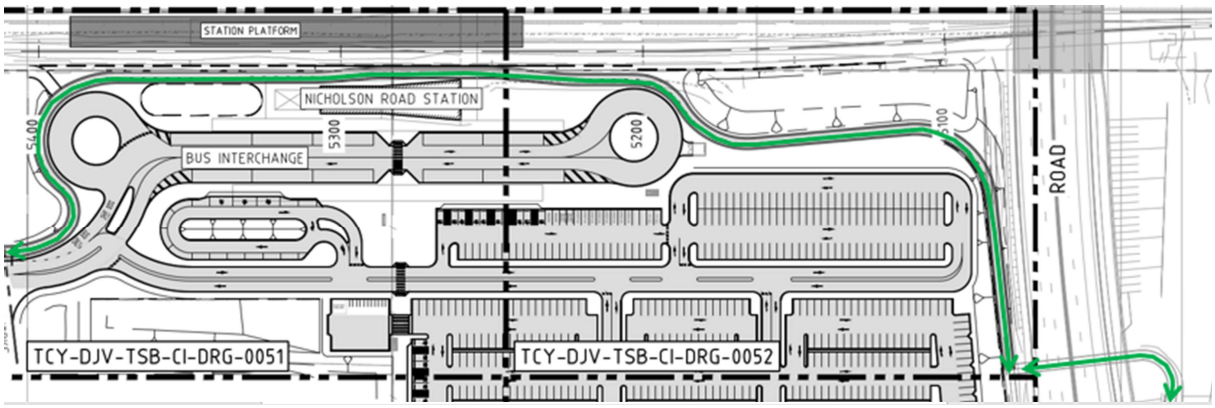
4.6.1 SHARED PATH CONNECTIVITY

A major element of the METRONET TCL project includes the provision of new shared path standard pathways through the new station that integrates with the surrounding path network. The proposed new segments of shared path infrastructure comprise a high-quality shared path connection running the length of the site. The proposed pathway includes a 3.0 metre wide shared path with 0.5 metre shoulders on either side (4.0 metre wide corridor in total). The path itself is proposed to operate along the north-western side of the site, between the station building and the edge of the rail reserve fence line.

The proposed shared path through the Station site will then integrate with the existing underpass connection beneath Nicholson Road (north-east of the station). Additional shared path connectivity is also planned south-west of the Station site via Tulloch Way; however this is still to be confirmed and is expected to form a separate package of works and be delivered by others.

The proposed shared path alignment for Nicholson Road Station is illustrated in Figure 34.

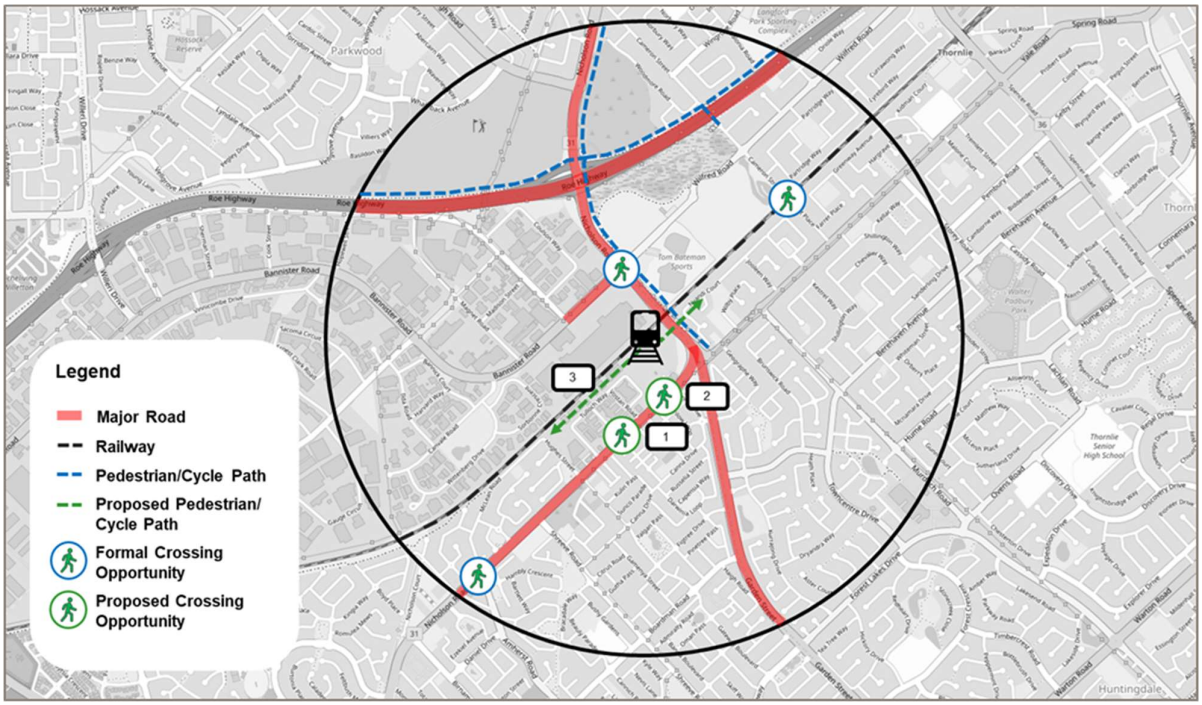
Figure 34. Nicholson Road Station – Shared Path Access



Within the vicinity of the Station, there is an existing PSP which runs along the northern side of Roe Highway, with additional PSP connectivity along the eastern side of Nicholson Road (toward the north from the intersection with Garden Street). There is also existing on-street cycling provision along both sides of Nicholson Road, via 1.5 metre wide sealed shoulders. The extent of this existing pedestrian / cycle path network is illustrated in Figure 35.

Finally, as a part of the overall Station precinct development, a signalised pedestrian crossing on Nicholson Road is planned at the intersection with Panama Street as well as the mid-block crossing point located east of Vostan Road (crossing locations highlighted in Figure 35). These crossing points are expected to enhance the existing accessibility to the area and improve walking / cycling opportunities to and from the large residential catchment to the south-east.

Figure 35. Nicholson Road Station – Current and Proposed Pedestrian Provision



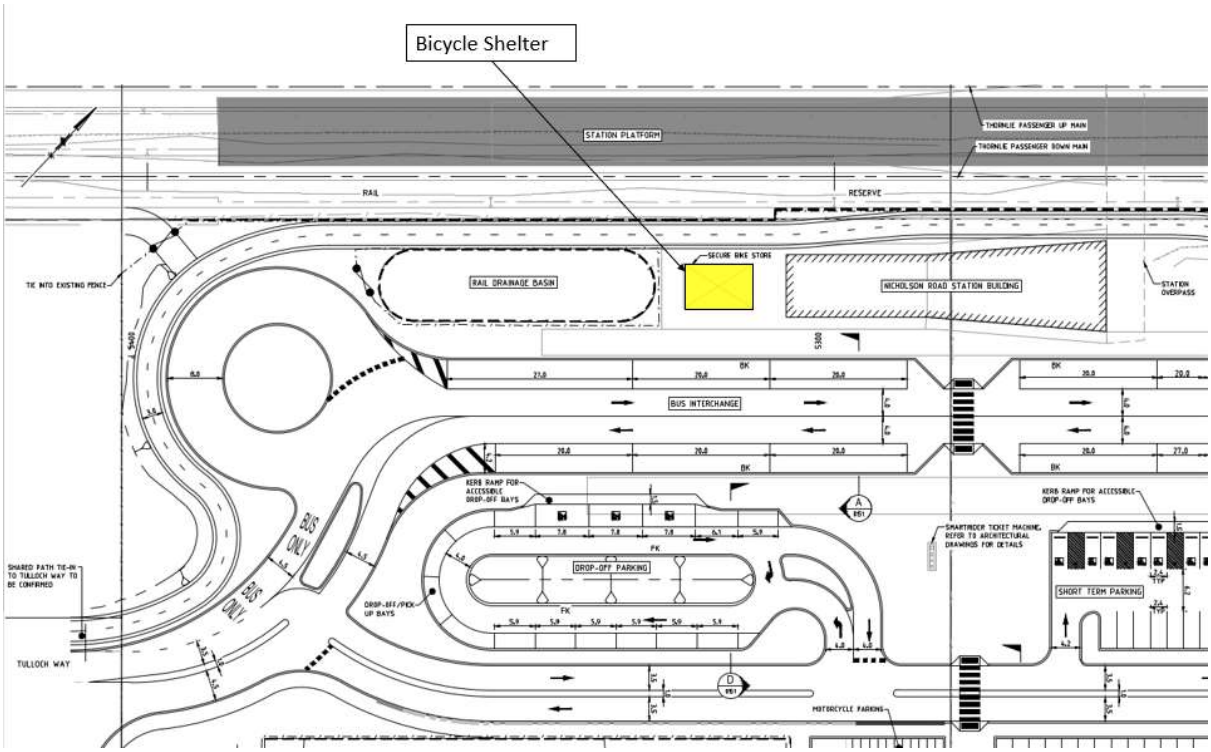
4.6.2 BICYCLE PARKING AND END OF TRIP FACILITIES

As per the Schedule of Accommodation for Nicholson Station referenced in the Yanchep Rail Extension and Thornlie Cockburn Link Scope of Work and Technical Criteria document, the bicycle parking provision within the Nicholson Road Station concept design is summarised below:

- 10 bicycle U-rails.
- 1 x 96 bicycle capacity secure parking shelters (PTA standard 00-A-09-0159-TYPE B Module Arrangement).
- Bicycle storage to accommodate 2.6% of expected patronage (calculated up to 4 years in advance).

Note that no showers or change rooms are required to be provided as part of the Schedule of Accommodation for Nicholson Station. Similarly, secure locker facilities are not required to be provided. The proposed bike shelter location is highlighted in Figure 36.

Figure 36.Nicholson Road Station – Bicycle Shelter Location



4.7 VEHICLE PARKING

As per the Schedule of Accommodation for Nicholson Road Station, referenced in the Yanchep Rail Extension and Thornlie Cockburn Link Scope of Work and Technical Criteria document, the vehicle parking provision within the Nicholson Road Station concept design is summarised in Table 9.

Table 9 Nicholson Road Station – Parking Provision

Type		Provision
Total car parking bays		972
Long Term Parking	Standard parking bays	818
	Accessible bays (ACROD)	8
	Motorcycle bays (over and above car parking bays)	11
Short Term Parking	Drop-off bays (Kiss & Ride)	132
	Accessible bays (ACROD)	12
	Electric car charging bays	2
Drop-Off Parking	Drop-off bays (Kiss & Ride)	13
	Drop off bays (ACROD / Taxi)	3

In addition to the above parking supply, the following service bays are provided for use by PTA staff and other emergency services for the safe and ongoing operation of the station (in accordance with Schedule of Accommodation requirements).

- 2 emergency service bays (ambulance and state transit police).
- 2 PTA Servicing bays.
- 8 PTA Staff parking bays.
- 1 fire response vehicle bay (in accordance with DFES requirements).

4.8 EMERGENCY VEHICLE ACCESS

The Nicholson Road Station concept design will include allowance for one emergency fire response vehicle bay proximate to the main station building area. The location of the bay is also required to be within a suitable distance to the fire booster cabinet, to allow connection to the fire services infrastructure.

The proposed location of the Department of Fire and Emergency Services (DFES) hardstand area is currently being finalised through the development of the Nicholson Road Station Fire Engineering documentation, which will enable NEWest to enter consultation with DFES to confirm the requirements.

4.9 ROAD SAFETY

Vehicle crash history data was obtained from the Main Roads WA Crash Analysis Reporting System (CARS) for the intersection of Nicholson Road and Panama Street. Crash history information for the previous five full years between January 2015 and December 2019 was extracted. Detailed crash history data for the intersection is included within Appendix B.

The crash information indicated that in the five year period of reporting, a total of 5 crashes were recorded at the Nicholson / Panama intersection. Of these, a total of 3 recorded crashes involved turning vehicles either attempting to enter or exit Panama Drive. Another crash involved a driver attempting to perform a U-turn on Nicholson Road.

The additional vehicle traffic generated by the Station is not anticipated to significantly change the existing road traffic safety profile along Nicholson Road, given this segment of the road network is already a heavily utilised distributor connection.

While the additional traffic movements generated by the Nicholson Road Station are expected to add as many as nearly 400 vehicle turning movements at the Nicholson Road / Panama Street intersection during peaks, the inclusion of the proposed signalised intersection upgrade at this location is expected to provide an overall improvement to the safety of turning vehicles through this location.

By providing traffic signal infrastructure at the Nicholson / Panama intersection, it would be expected that the number of potentially conflicting vehicle movements would be reduced as a result of the removal of the current priority control system. Given the posted speed of Nicholson Road of 70 km/h and the number of oncoming traffic lanes which must be navigated to successfully undertake a turn under give-way control, it is anticipated that traffic signals would likely result in an overall improvement to vehicle safety at this point in the network.

Similarly, the provision of traffic signal infrastructure at Panama Street and the mid-block pedestrian crossing is expected to improve the safety and reliability of pedestrian movements across the Nicholson Road corridor during peak periods. As the current infrastructure provides pedestrian cut-throughs only, pedestrians are required to cross the corridor by finding gaps in oncoming traffic. This can be a challenge given the overall level of demand on Nicholson Road and that there are very few signalised intersections within the surrounding area to disperse oncoming flows.

As part of the ongoing design process, a pre-opening Road Safety Audit of the proposed signalised infrastructure will be commissioned to review the proposed concept and highlight the potential safety improvements that may be incorporated in to the overall design that may enhance both the road safety and pedestrian safety elements of the treatments.

5.0 SUMMARY AND CONCLUSION

NEWest has prepared this Transport Impact Assessment in order to document the Station access elements and support the Development Application submission for the proposed Nicholson Road Station development, as part of the wider METRONET Thornlie-Cockburn Link project.

This study examines the function and operation of access to and from the new Nicholson Road Station site, for all modes of transport. As the Nicholson Road Station is expected to become a key transport hub for the surrounding region and nearby employment centre, robust and accessible routes for users to connect to the site are important for the long-term success of the station and the growth of the surrounding region.

The Nicholson Road Station includes a 972 total car parking bay long-term and short-term Park & Ride facility, allowing for both long term and short stay parking for patrons when using the associated public transport facilities, including train station and bus interchange. Multiple special use bays are also provided within the short-term parking area, including electric car charging bays and PTA service and staff parking. Motorcycle / scooter parking, including a scooter shelter structure, is provided in addition to the above bays adjacent to the long-term parking area.

Finally, the Station parking provision also includes a drop-off area (Kiss & Ride), which provides for a total of 16 drop-off bays (including 3 accessible drop-off bays) for station pick-ups and drop-offs. The area has been configured to allow a clockwise circulation of vehicles which permits safe access to vehicles for patrons.

The proposed Station layout also provides for an integrated bus interchange within the station precinct, to be located adjacent to the main Station building. The bus interchange provides for a total of 7 active bus bays (including one articulated bay) and 3 layover bus bays (also including one articulated bay).

Access to and from the site for all vehicle trips, including Transperth buses, shall be via the Tulloch Way main site access point. To access Tulloch Way, it is proposed that the existing intersection of Nicholson Road and Panama Street is upgraded to a signalised intersection treatment in order to accommodate the increased demand for turning vehicles in and out of the Panama Street side road – which then leads to Tulloch Way.

The SIDRA Intersection analysis of the proposed signalised treatment indicates that target performance criteria is satisfied for all but one movement in the AM peak period of the opening year (2021) scenario. By the future year scenario of 2031, the analysis shows that forecast growth in background traffic demand on Nicholson Road, in combination with patronage growth at the Station, is expected to result in an overall LoS F during the AM peak period. While this exceeds the PTA target performance metrics for intersection movements, extensive liaison with Main Roads WA has confirmed that additional intersection capacity could only be yielded from adding extra traffic lanes to Nicholson Road and resumption of nearby land. As the impact of such works would be significant and costly, it was concluded that this was outside of the scope of works for the Nicholson Road Station project. With this in mind, Main Roads WA has provided ‘Stage 1 – Control Type Selection’ signalised intersection treatment approval for the proposed signals at Nicholson Road / Panama Street. The process for obtaining Stage 2 approval for the signalised treatment is ongoing.

Accessibility for cycling and walking modes are also key aspects of the station design. Shared path infrastructure through the station site is provided, which connects to the existing PSP network east of the site via an underpass beneath Nicholson Road. Additional future shared path connection to the west of the station site is also anticipated to form part of a later stage of works to be undertaken by others.

Walking connectivity over the existing Nicholson Road corridor to the south of the site is another critical element to the overall accessibility to the Station. As Nicholson Road is a key distributor road within the local area with strong traffic demand, and a significant part of the walking catchment of the Station is located south of Nicholson Road, the current lack of pedestrian priority crossing over this corridor presents a barrier to access.

To address this identified barrier, the access strategy includes the provision of a proposed new signalised staggered pedestrian mid-block crossing point located east of Vostan Road. This mid-block crossing point is expected to operate in coordination with the signals at Nicholson Road / Panama Street to improve the accessibility and safety of pedestrian movements to and from the Station. Analysis of the signalised pedestrian crossing indicates that the addition of signals at the proposed crossing location is unlikely to add significant delay to vehicle movements along Nicholson Road, due to the upstream coordination with the Panama Street signals. Main Roads WA has also provided 'Stage 1 – Control Type Selection' signalised intersection treatment approval for the proposed pedestrian crossing signals along Nicholson Road, with the Stage 2 approvals process underway.

Overall, the proposed Nicholson Road Station development is found to satisfy the project requirements as set out by the METRONET Thornlie-Cockburn Link strategy. Vehicle (including bus) access to and from the station has been demonstrated to operate satisfactorily in the opening year scenario, however it is acknowledged by NEWest and Main Roads WA that some congestion along Nicholson Road is likely to be observed by the year 2031 as background traffic demands and Station traffic increase. Therefore, local traffic management and monitoring would likely be required along Nicholson Road over the medium term, particularly if future upgrades to the Nicholson Road / Yale Road / Garden Street roundabout are explored by Main Roads WA.

The Nicholson Road Station design supports pedestrian and cycling connectivity via the new shared path connectivity through the site, with additional connections west of the site expected to be added over time by others. Pedestrian and cycling safety and connectivity to the existing residential areas south-west of the station have been enhanced by this connectivity and the proposed inclusion of a pedestrian mid-block signalised crossing along Nicholson Road.

It is expected that the Nicholson Road Station, along with the supporting transport infrastructure, will support the anticipated growth in the local region and provide opportunities for the long-term METRONET development goals within the surrounding precinct.

Appendices

Table 10: Appendix List

Appendix Reference	Appendix Title
Appendix A	Main Roads WA ROM24 Plots (Nicholson Road)
Appendix B	Nicholson Road Crash History Data

Appendix A: Main Roads WA ROM24 Plots (Nicholson Road)

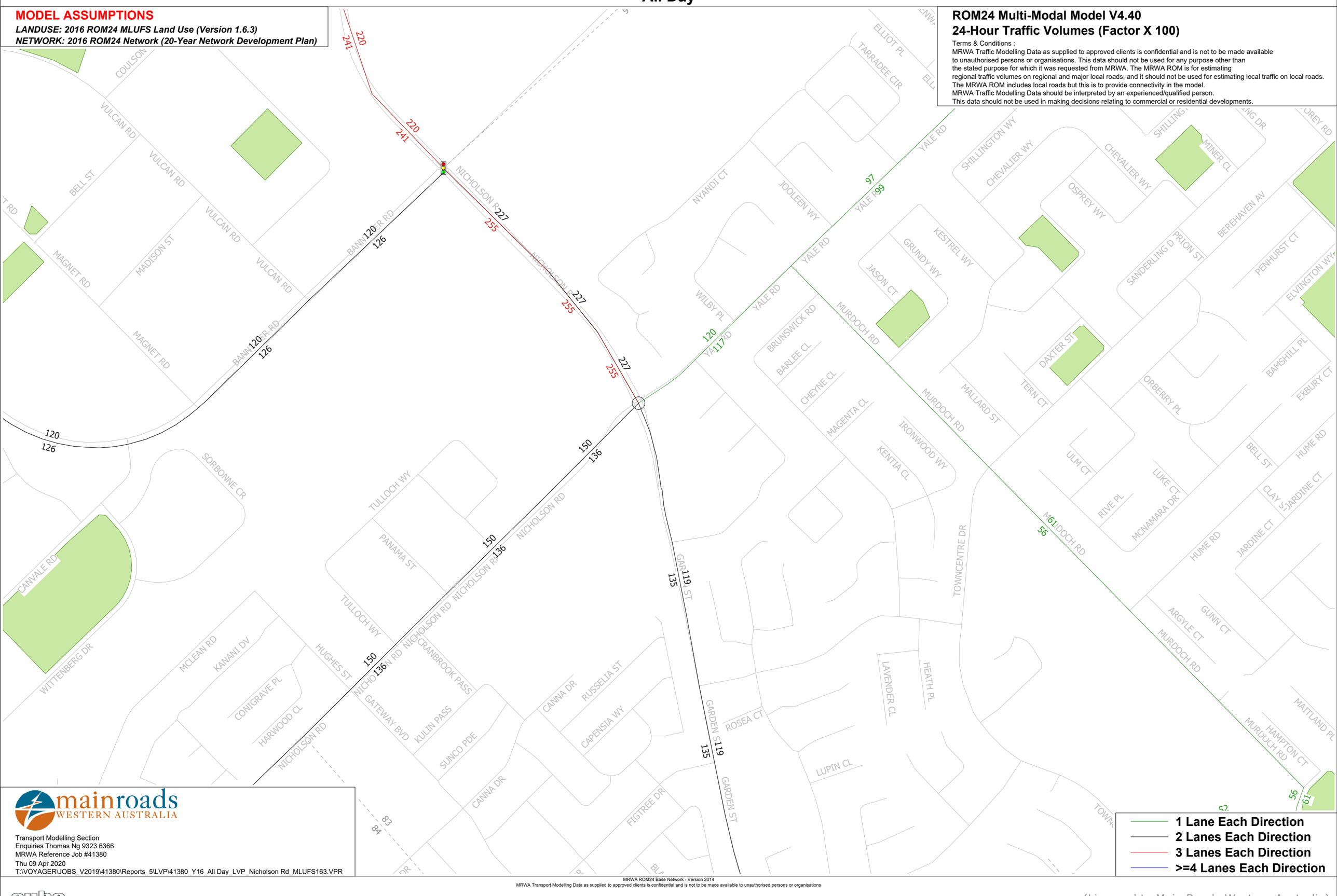
2016 ROM24 MLUFS 1.6.3 Scenario - Link Volume Plot for Nicholson Rd
All Day

MODEL ASSUMPTIONS

LANDUSE: 2016 ROM24 MLUFS Land Use (Version 1.6.3)
NETWORK: 2016 ROM24 Network (20-Year Network Development Plan)

ROM24 Multi-Modal Model V4.40
24-Hour Traffic Volumes (Factor X 100)

Terms & Conditions :
MRWA Traffic Modelling Data as supplied to approved clients is confidential and is not to be made available to unauthorised persons or organisations. This data should not be used for any purpose other than the stated purpose for which it was requested from MRWA. The MRWA ROM is for estimating regional traffic volumes on regional and major local roads, and it should not be used for estimating local traffic on local roads. The MRWA ROM includes local roads but this is to provide connectivity in the model.
MRWA Traffic Modelling Data should be interpreted by an experienced/qualified person.
This data should not be used in making decisions relating to commercial or residential developments.



mainroads WESTERN AUSTRALIA

Transport Modelling Section
Enquiries Thomas Ng 9323 6366
MRWA Reference Job #41380
Thu 09 Apr 2020
T:\VOYAGER\JOBS_V2019\41380\Reports_5\LVP\41380_Y16_All Day_LVP_Nicholson Rd_MLUFS163.VPR

- 1 Lane Each Direction
- 2 Lanes Each Direction
- 3 Lanes Each Direction
- >=4 Lanes Each Direction

MRWA ROM24 Base Network - Version 2014

cube

2021 ROM24 MLUFS 1.6.3 Scenario - Link Volume Plot for Nicholson Rd
All Day

MODEL ASSUMPTIONS

LANDUSE: 2021 ROM24 MLUFS Land Use (Version 1.6.3)
NETWORK: 2021 ROM24 Network (20-Year Network Development Plan)

ROM24 Multi-Modal Model V4.40
24-Hour Traffic Volumes (Factor X 100)

Terms & Conditions :
MRWA Traffic Modelling Data as supplied to approved clients is confidential and is not to be made available to unauthorised persons or organisations. This data should not be used for any purpose other than the stated purpose for which it was requested from MRWA. The MRWA ROM is for estimating regional traffic volumes on regional and major local roads, and it should not be used for estimating local traffic on local roads. The MRWA ROM includes local roads but this is to provide connectivity in the model.
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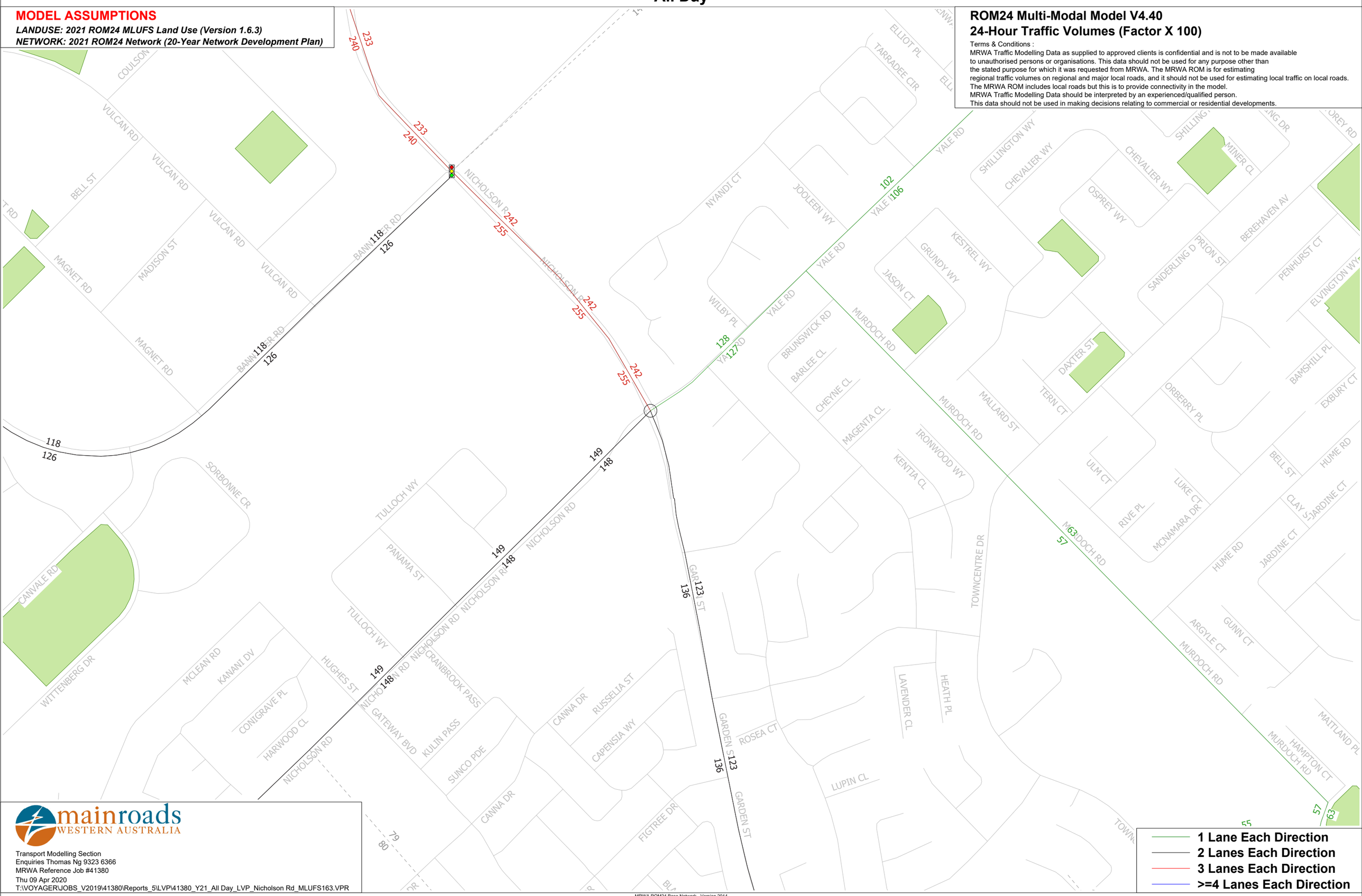

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Enquiries Thomas Ng 9323 6366
MRWA Reference Job #41380
Thu 09 Apr 2020
T:\VOYAGER\JOBS_V2019\41380\Reports_5\LVP\41380_Y21_All Day_LVP_Nicholson Rd_MLUFS163.VPR

- 1 Lane Each Direction
- 2 Lanes Each Direction
- 3 Lanes Each Direction
- >=4 Lanes Each Direction

MRWA ROM24 Base Network - Version 2014

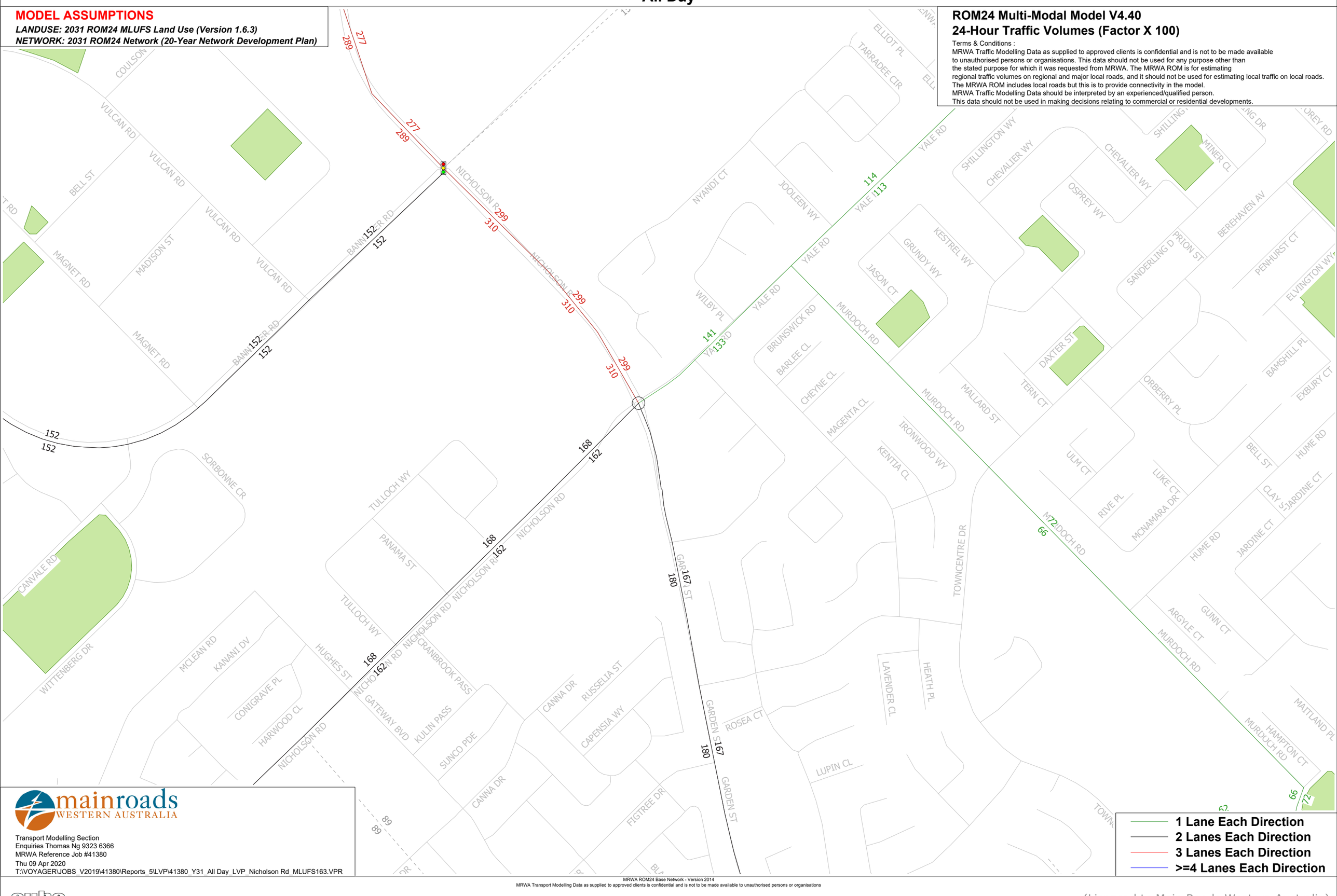
cube

2031 ROM24 MLUFS 1.6.3 Scenario - Link Volume Plot for Nicholson Rd
All Day

MODEL ASSUMPTIONS

LANDUSE: 2031 ROM24 MLUFS Land Use (Version 1.6.3)
NETWORK: 2031 ROM24 Network (20-Year Network Development Plan)

ROM24 Multi-Modal Model V4.40
24-Hour Traffic Volumes (Factor X 100)



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Enquiries Thomas Ng 9323 6366
MRWA Reference Job #41380
Thu 09 Apr 2020
T:\VOYAGER\JOBS_V2019\41380\Reports_5\LVP\41380_Y31_All Day_LVP_Nicholson Rd_MLUFS163.VPR

- 1 Lane Each Direction
- 2 Lanes Each Direction
- 3 Lanes Each Direction
- >=4 Lanes Each Direction

MRWA ROM24 Base Network - Version 2014

cube

Appendix B: Nicholson Road Crash History Data

Summary Crash History

Report Criteria

Parameter	Value	Description
Intersection	081652	NICHOLSON RD & PANAMA ST
From Date	01/01/2015	
To Date	31/12/2019	
Crash Type	All	
Severity	All	

Summary Crash History

Selection Criteria	Value
Intersection	NICHOLSON RD & PANAMA ST (081652)
Date	01/01/2015 to 31/12/2019

Severity	Count	Percentage
Fatal	0	0.0%
Hospital	0	0.0%
Medical	2	40.0%
PDO Major	1	20.0%
PDO Minor	2	40.0%
Other / Unknown	0	0.0%
Total:	**5**	**100.0%**

MR Type	Count	Percentage
Involving Overtaking	0	0.0%
Involving Parking	0	0.0%
Involving Animal	0	0.0%
Involving Pedestrian	0	0.0%
Entering / Leaving Driveway	0	0.0%
Other / Unknown	5	100.0%
Total:	**5**	**100.0%**

Light Conditions	Count	Percentage
Daylight	5	100.0%
Dawn Or Dusk	0	0.0%
Dark - Street Lights On	0	0.0%
Dark - Street Lights Off	0	0.0%
Dark - Street Lights Not Provided	0	0.0%
Other / Unknown	0	0.0%
Total:	**5**	**100.0%**

Object Hit	Count	Percentage
SEC Pole		
Traffic Light Post		
Traffic Sign		
Commercial Sign Post		
Tree		
Other		
Total:		

Road Grade	Count	Percentage
Level	5	100.0%
Crest Of Hill	0	0.0%
Slope	0	0.0%
Other / Unknown	0	0.0%
Total:	**5**	**100.0%**

Road Alignment	Count	Percentage
Curve	0	0.0%
Straight	5	100.0%
Other / Unknown	0	0.0%
Total:	**5**	**100.0%**

Speed a Factor	Count	Percentage
Yes	0	0.0%
No	0	0.0%
Other / Unknown	5	100.0%
Total:	**5**	**100.0%**

Road Condition	Count	Percentage
Wet	3	60.0%
Dry	2	40.0%
Other / Unknown	0	0.0%
Total:	**5**	**100.0%**

MR Nature	Count	Percentage
Rear End	1	20.0%
Head On	0	0.0%
Sideswipe Opposite Dirn	0	0.0%
Sideswipe Same Dirn	0	0.0%
Right Angle	2	40.0%
Right Turn Thru	2	40.0%
Hit Pedestrian	0	0.0%
Hit Animal	0	0.0%
Hit Object	0	0.0%
Non Collision	0	0.0%
Other / Unknown	0	0.0%
Total:	**5**	**100.0%**

Detailed Crash History

Report Criteria

Parameter	Value	Description
Intersection	081652	NICHOLSON RD & PANAMA ST
From Date	01/01/2015	
To Date	31/12/2019	
Crash Type	All	
Severity	All	

Road	Road Name	SLK	CWY	True Dist	Intersection	Date	Day	Time	Severity	Crash No.	Type	Light Cond	Road Cond	Speed Limit	Traffic Control	Road Feature	Road Alignment	Speed Factor	MR Nature	Location	RUM	Unit	Unit Type	From Dir	To Dir	Veh/Ped Move	First Object Hit	Second Object Hit	Third Object Hit	Target Impact Point
1040002	Nicholson Rd	5.19	L	5.19	PANAMA ST (081652)	09/11/2015	Monday	0815	Medical	2015320120	Intersection	Daylight	Dry	70	No Sign Or Control	3-way Intx (T-junction)	Straight		Right Angle	On Cway	14:Intx: Thru - Right	Colliding	Car			Straight Ahead: Not Out Of Control				
1040002	Nicholson Rd	5.19	L	5.19	PANAMA ST (081652)	09/11/2015	Monday	0815	Medical	2015320120	Intersection	Daylight	Dry	70	No Sign Or Control	3-way Intx (T-junction)	Straight		Right Angle	On Cway	14:Intx: Thru - Right	Target	Car			Turning: To Make Right Turn				Side
1040002	Nicholson Rd	5.19	L	5.19	PANAMA ST (081652)	31/08/2016	Wednesday	0740	PDO Minor	2016272160	Intersection	Daylight	Wet	70	No Sign Or Control	3-way Intx (T-junction)	Straight		Rear End	On Cway	31:Same Dirn: Same Lane Rear End	Colliding	Utility	S - NICHOLSON RD	N - NICHOLSON RD	Straight Ahead: Not Out Of Control				
1040002	Nicholson Rd	5.19	L	5.19	PANAMA ST (081652)	31/08/2016	Wednesday	0740	PDO Minor	2016272160	Intersection	Daylight	Wet	70	No Sign Or Control	3-way Intx (T-junction)	Straight		Rear End	On Cway	31:Same Dirn: Same Lane Rear End	Target	Car	S - NICHOLSON RD	N - NICHOLSON RD	Straight Ahead: Not Out Of Control				Rear
1040002	Nicholson Rd	5.19	L	5.19	PANAMA ST (081652)	14/03/2017	Tuesday	0650	PDO Major	2017105852	Intersection	Daylight	Wet	70	No Sign Or Control	Median Opening	Straight		Right Turn Thru	On Cway	27:Opposite Dirn: U - Turn	Colliding	Car			Straight Ahead: Not Out Of Control				
1040002	Nicholson Rd	5.19	L	5.19	PANAMA ST (081652)	14/03/2017	Tuesday	0650	PDO Major	2017105852	Intersection	Daylight	Wet	70	No Sign Or Control	Median Opening	Straight		Right Turn Thru	On Cway	27:Opposite Dirn: U - Turn	Target	Utility			Turning: To Make U Turn				Side
1040002	Nicholson Rd	5.19	L	5.19	PANAMA ST (081652)	03/08/2017	Thursday	0800	Medical	2017246946	Intersection	Daylight	Wet	70	Give Way Sign	3-way Intx (T-junction)	Straight		Right Turn Thru	On Cway	22:Opposite Dirn: Thru - Right	Colliding	Car	S - NICHOLSON RD	N - NICHOLSON RD	Straight Ahead: Not Out Of Control				
1040002	Nicholson Rd	5.19	L	5.19	PANAMA ST (081652)	03/08/2017	Thursday	0800	Medical	2017246946	Intersection	Daylight	Wet	70	Give Way Sign	3-way Intx (T-junction)	Straight		Right Turn Thru	On Cway	22:Opposite Dirn: Thru - Right	Target	Car	N - NICHOLSON RD	W - PANAMA ST	Turning: To Make Right Turn				Side
1040002	Nicholson Rd	5.19	L	5.19	PANAMA ST (081652)	01/02/2018	Thursday	1630	PDO Minor	2018033871	Intersection	Daylight	Dry	70	Give Way Sign	3-way Intx (T-junction)	Straight		Right Angle	On Cway	12:Intx: Right - Thru	Colliding	Car	W - PANAMA ST	S - NICHOLSON RD	Swing Wide: Right Turn At Intx				
1040002	Nicholson Rd	5.19	L	5.19	PANAMA ST (081652)	01/02/2018	Thursday	1630	PDO Minor	2018033871	Intersection	Daylight	Dry	70	Give Way Sign	3-way Intx (T-junction)	Straight		Right Angle	On Cway	12:Intx: Right - Thru	Target	Station Wagon	N - NICHOLSON RD	S - NICHOLSON RD	Straight Ahead: Not Out Of Control				Side

APPENDIX J ACOUSTIC REPORT

NEWest Alliance

NEWest Nicholson Road Station Development Application Report - Acoustics

METRONET: Yanchep Railway Extension and Thornlie-Cockburn Link

Document Approval

Rev	Date	Prepared by	Reviewed By	Approved by
A	24-Aug-2020	Rachel Foster / Laura Keen	Gayle Greer	Chris Deshon
Signature:				
Signature:				
Signature:				

Document Details

PTA Project:	180093 – METRONET Stage 1 Initiatives: Yanchep Railway Extension and Thornlie-Cockburn Link
PTA Document number:	
NEWest Document number:	TCY-DJV-TSB-EN-RPT-0001
Revision date:	24-Aug-2020
Revision:	A

DETAILS OF REVISION AMENDMENTS AND PLAN TERMINOLOGY

Document Control

The Acoustic Engineer is responsible for updating this plan to reflect changes as required.

Amendments

Any revisions or amendments must be approved by the Design Manager before being distributed or implemented.

Revision Details

Revision	Details
A	Issued for Development Application

Terms and Definitions

Term	Meaning
'A' Weighted	Frequency filter applied to measured noise levels to represent how humans hear sounds.
Ambient Sound	The all-encompassing sound at a point being a composite of sounds from near and far.
Background sound	The ambient sound in the absence of the sound under investigation.
dB	The decibel (dB) is a logarithmic unit of measurement that is commonly used to express sound pressure level. An increase of 3 dB corresponds to an approximate doubling of sound power. When applied to sound, an increase of 10 dB corresponds approximately to a perceived doubling of loudness; typically 0 dB is the threshold of hearing and 120 dB is the threshold of pain.
dB(A)	'A' Weighted overall sound pressure level.
D_W	Weighted Level Difference – Single number that represents the noise reduction in sound between two adjoining enclosed spaces. It is a field measurement that relates to the R_w laboratory measurement, but also includes all building elements and flanking paths and acoustic absorption in the receiving room. The result includes the actual noise reduction for the installed partition and ceiling systems. The higher the D_w, the greater the noise isolation between enclosed spaces. D_w has superseded NIC as the Australian Standard for acoustically rating room to room noise isolation. See NIC Below.

$D_{nC,w}$/ CAC	Weighted Ceiling Noise Reduction Index/Ceiling Attenuation Class. This is the ability of a ceiling to prevent the transmission of sound. The $D_{nC,w}$/CAC is a measure of sound reduction between rooms with a common ceiling plenum (or space).
$D_{nT,w}$	Weighted Standardised Field Level Difference: The D_w rating normalised to a standard room volume and room absorption (or reverberation time). The higher the $D_{nT,w}$ rating, the better the insulation performance.
Flanking transmission	The transmission, between two rooms sharing a common partition, of sound generated in the air of one of them via all paths except that through the common partition.
Free field	A sound field in a medium of such extent that the effects of the boundaries are negligible throughout the region of interest.
Frequency (Hz)	The human ear responds to sound in the frequency range of 20 Hertz (Hz) to 20,000 Hz. A combination of sound pressure and frequency determine perceived loudness. The centre frequency of an octave is double the frequency of the lower octave. Sound measurements are usually taken at 16 one-third octave bands between 50 and 5,000 Hz.
Impact sound transmission level	In a given frequency band, between two rooms situated above the other: the average octave band sound pressure level, throughout the lower room, produced by impacts delivered by a standard tapping machine to the floor of the upper room.
Intermittent noise	A noise whose sound pressure level suddenly drops to the background level several times during the period of observation, the time during which the level remains at a constant value different from that of the background level being of the order of 1 s or more.
$L'_{nT,w}$	The single number quantity used to characterise the impact sound insulation of floors over a range of frequencies. See BS EN ISO 140-7:1998
L_{10}	Noise level exceeded for 10% of the measurement period. This represents the upper intrusive noise level and is often used to represent traffic/music noise.
L_{90}	Noise level exceeded for 90% of the measurement period. This represents the background noise level excluding nearby sources. The L_{90} level is commonly referred to as the background noise level.
L_{eq}	Energy averaged noise level over the measurement period. This measure is commonly used when comparing the criterion noise level under the Environmental Noise Regulations and for comparison with relevant standards for air conditioning noise.

Abbreviations and Acronyms

Abbreviation/Acronym	Definition
AS/NZS	Australian/New Zealand Standard
NCC	National Construction Code
PA	Public Address systems
PTA	Public Transit Authority of Western Australia
SPP 5.4	State Planning Policy 5.4 Road and Rail Transport Noise and Freight Considerations in Land Use Planning
SWTC	Scope of work and technical criteria
TCL	Thornlie Cockburn Link
WAEPNR	Western Australia Environmental Protection (Noise) Regulations 1997
YRE	Yanchep Rail Extension

CONTENTS

Tables

Figures

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1. INTRODUCTION

The proposed new Nicholson Road Station is to be located along the Thornlie Cockburn Link, approximately 19 km south-east of Perth, as indicated in Figure 1. The proposed station site is to be located south of the existing Nicholson Road elevated crossing over the current freight rail line. The current Roe Highway/Nicholson Road interchange is located approximately 900 metres north of the station site.

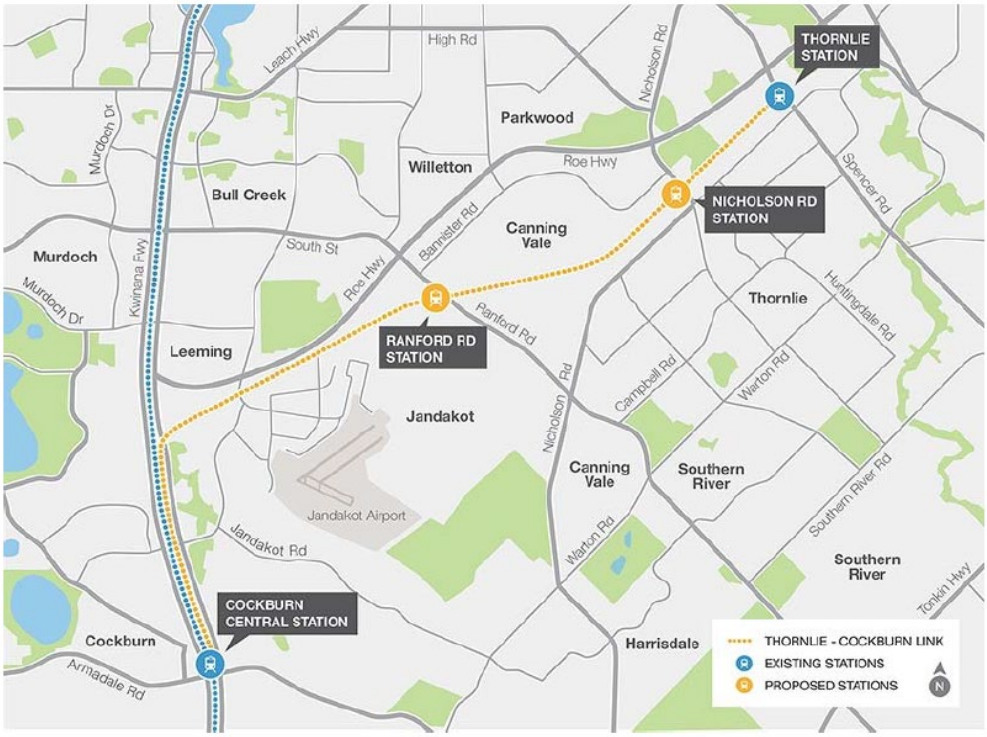


Figure 1: Proposed TCL Line

Nicholson Road Station is to be located adjacent to Nicholson Road in Canning Vale, located between existing residential and industrial areas. The site is currently unoccupied however will be located adjacent to the existing ARC infrastructure/rail line, as indicated in Figure 2.

The station will be a single-platform train station and multi-modal interchange providing facilities for pedestrian and cycle access, local bus service interchanges, kiss-and-ride and park-and-ride passengers. Over 969 parking bays are proposed for the station, which are to be located on the south eastern side of the station.

Vehicle access to the site shall be via the existing road network in the surrounding area. Nicholson Road will serve as the major distributor road which services the site. It is expected that the majority of vehicles will access the site via the intersection of Panama Street with Nicholson Road, before proceeding to Tulloch Way which will lead to the main access point for the site, which is shown in Figure 3.

Figure 2: Proposed Nicholson Road Station location

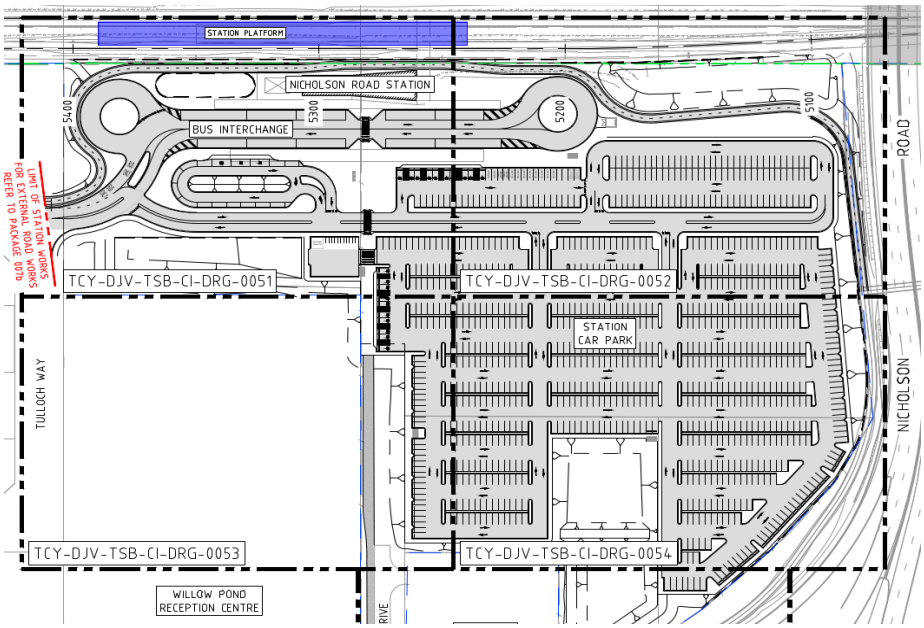


Figure 3: Proposed Nicholson Road Station overall plan

2. ACOUSTIC ENGINEERING SCOPE

The MetroNet Design Joint Venture (DJV) is to include provision of acoustic services for the proposed Nicholson Road Station development. The acoustic design addresses the station, which will be comprised of a passenger platform with a concourse above, and the associated parking, connection into existing roads and bus interchange.

The key acoustic issues associated with the Nicholson Road Station project are:

- The control of noise intrusion into the buildings and the impacts of noise on platform areas from road traffic and mechanical plant.
- The control of building services noise including mechanical plant.
- Reverberation control within spaces.
- Acoustic separation of dissimilar spaces.
- The control of noise emission from mechanical plant to neighbouring sites.
- Assessment and control of the noise from proposed car parking areas to the south east of the station.
- Assessment and control of the noise from the proposed bus movements.

This report sets out acoustic design criteria and the design requirements to achieve the recommended acoustic conditions associated with Development Assessment (DA) application. These are predominantly criteria for environmental noise emission from the station to adjacent noise-sensitive premises.

3. DESIGN CRITERIA

3.1 DESIGN STANDARDS AND CODES

In addition to the Yanchep Rail Extension and Thornlie Cockburn Link Scope of Work and Technical Criteria (SWTC) and the Public Transit Authority of Western Australia (PTA) specific requirements, other codes and standards required to develop the acoustic design for DA include the following:

- State Planning Policy 5.4 *Road and Rail Transport Noise and Freight Considerations in Land Use Planning*
- AS 2436-2010 *Guide to noise and vibration control on construction, maintenance and demolition sites*
- Western Australia *Environmental Protection (Noise) Regulations 1997* (WAEPNR)
- PTA Technical & Operational standards, policies and procedures

The above list is not exhaustive but is provided to note the key guides and standards to which the design shall align.

3.2 NOISE IMPACTS TO SURROUNDING SENSITIVE PREMISES

3.2.1 BUILDING SERVICES, PA SYSTEM AND CAR PARK

The Yanchep Rail Extension and Thornlie Cockburn Link Scope of Work and Technical Criteria states the following:

> *Stations and associated infrastructure (e.g. carparks, plant rooms etc) must be designed to comply with the requirements of the Environmental Protection (Noise) Regulations 1997 (WA)*

Noise criteria for both steady-state and discrete noise emission from the proposed Nicholson Road Station project are nominated in this section. The setting of noise emission criteria is intended to protect the acoustical amenity of nearby sensitive receivers.

Environmental noise impacts resulting from the Nicholson Road Station project are addressed through the Environmental Protection Act 1986 with the prescribed standards detailed in the Western Australian *Environmental Protection (Noise) Regulations 1997* (WAEPNR). The regulations are based on maximum allowable noise levels termed the 'assigned noise level'. The regulations require that:

> *Noise emitted from any premises when received at other premises must not cause, or significantly contribute to, a level of noise which exceeds the assigned level in respect of noise received at premises of that kind*

A noise emission is taken to 'significantly contribute to' a level of noise if the noise emission exceeds a value which is 5 dB below the assigned level at the point of reception.

Table 1: Assigned levels by the Western Australian Environmental Protection (Noise) Regulation 1997

Type of premises receiving noise	Time of Day	Environmental Emission Criterion Level dB(A)		
		$L_{A,10}$	$L_{A,1}$	$L_{A,max}$
Nearest noise sensitive receiver: highly sensitive area	0700 to 1900 hours Monday to Saturday	45 + influencing factor	55 + influencing factor	65 + influencing factor
	0900 to 1900 hours Sunday and public holidays	40 + influencing factor	50 + influencing factor	65 + influencing factor
	1900 to 2200 hours all days	40 + influencing factor	50 + influencing factor	55 + influencing factor
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays	35 + influencing factor	45 + influencing factor	55 + influencing factor
Noise sensitive premises: any area other than highly sensitive area	All hours	60	75	80
Commercial Premises	All hours	60	75	80
Industrial premises	All hours	65	80	90

The regulations also apply penalties on noise levels that contain annoying characteristics such as tonal components. Where these characteristics do exist and cannot be practicably removed, then the measured levels are adjusted according to the penalties as follows:

- Where tonality is present: +5 dB
- Where modulation is present: +5 dB
- Where impulsiveness is present: +10 dB.

The noise adjustments apply up to a maximum cumulative total of 15 dB.

The influencing factor is applied to account for higher noise areas as a result of nearby industrial and commercial areas and major roads. The influencing factor is determined by considering the land use within two circles having a radius of 100 m and 450 m from the noise sensitive premises of concern and proximity to major and minor roads as defined in the WAEPNR. The nearest noise sensitive receivers (NSR) in the vicinity of the Nicholson Road Station project have been identified as shown in Figure 4 and are summarised in Table 2 below.

Figure 4: Nearest noise-sensitive receiver locations

Table 2: Nearest noise-sensitive receiver locations

Location	Noise Sensitive Receiver	Receptor Type
North east	51 Nyandi Court, Thornlie	Residential
South	165 Canna Drive, Canning Vale	Residential
West	35 McLean Road, Canning Vale	Residential

Note: Selection of noise sensitive premises is based on Schedule 1 – Part C of the WAEPNR

Transport factors of 6 dB(A) and 2 dB(A) are applied to noise sensitive receivers if major roads are located within 100 m and 450 m respectively. A transport factor of 2 dB(A) is applied to noise sensitive receivers if a secondary road is located within 100 m of a noise-sensitive receiver.

A major road is defined as having vehicle traffic flows in excess of 15,000 vehicles per day. A secondary road is defined as having traffic flows of 6,000 to 15,000 vehicles per day.

The major roads and secondary roads within 100 m and 450 m of the noise-sensitive receivers are taken from the Main Roads Western Australia website https://trafficmap.mainroads.wa.gov.au/map and are given in Table 3 below.

Table 3: Major / secondary roads adjacent to Nicholson Road Station

Location	Major road within 100 m	Secondary road within 100 m	Major road within 450 m
North east – residential	Nicholson Road	-	Nicholson Road, Bannister Road, Garden Street
South – residential	Nicholson Road	-	Nicholson Road, Garden Street
West – residential	-	-	Nicholson Road, Bannister Road

The area surrounding the Nicholson Road Station is predominantly industrial to the west and residential to the north, east and south. The zoning plans for the City of Gosnells and the City of Canning have been used to identify the zoning around the station. To determine the influencing factor, existing roads and identified land uses have been utilised. The influencing factors at the nearest noise-sensitive receivers are summarised below.

Table 4: Environmental Design Criteria – Influencing Factor

Location	% Industrial Area Use		% Commercial Area Use		Transport Factor	Influencing Factor
	100 m	450 m	100 m	450 m		
North east – residential	27%	29.5%	0%	3%	6 dB(A)	12 dB(A)
South – residential	11.5%	27.5%	9.5%	3%	6 dB(A)	10 dB(A)
West – residential	58.5%	48%	0%	4%	2 dB(A)	13 dB(A)

The assigned levels are adjusted by the calculated influencing factors to result in the overall noise emission criteria for the area.

Table 5: Environmental Design Criteria – Nicholson Road Station Assigned Noise Levels, dB(A)

Type of premises receiving noise	Time of Day	Environmental Emission Criterion Level dB(A)		
		$L_{A,10}$	$L_{A,1}$	$L_{A,max}$
North east - residential	0700 to 1900 hours Monday to Saturday	57	67	77
	0900 to 1900 hours Sunday and public holidays	52	62	77
	1900 to 2200 hours all days	52	62	67
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays	47	57	67
South – residential	0700 to 1900 hours Monday to Saturday	55	65	75
	0900 to 1900 hours Sunday and public holidays	50	60	75
	1900 to 2200 hours all days	50	60	65
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays	45	55	65

West - residential	0700 to 1900 hours Monday to Saturday	58	68	78
	0900 to 1900 hours Sunday and public holidays	53	63	78
	1900 to 2200 hours all days	53	63	68
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays	48	58	68
Noise sensitive premises: any area other than highly sensitive area	All hours	60	75	80
Commercial Premises	All hours	60	75	80
Industrial premises	All hours	65	80	90

Notes:

1. A noise emission from a premises is considered to not significantly contribute to the noise at a receiver if the noise emission is 5 dB below the overall noise emission criteria for the area.

It is noted that the WAEPNR does not specifically identify that the above environmental noise criteria are applicable to noise from rail passengers and patrons of the Nicholson Road Station; however, an assessment is made here to quantify the likely impacts of these to adjacent noise-sensitive receivers.

3.2.2 STATION ENTRY ROADS AND BUS MOVEMENTS

The Yanchep Rail Extension and Thornlie Cockburn Link Scope of Work and Technical Criteria states the following:

> *The Alliance must design roads works and any associated noise mitigation controls to meet the requirements of Western Australia State Planning Policy 5.4 Road and Rail Transport Noise and Freight Considerations in Land Use Planning.*

Table 6: Environmental Design Criteria – New and Upgraded Public Roads and Bus Lanes

Type of premises receiving noise	Time of Day	New Road	Upgraded Road
Noise-sensitive land use (existing and planned development)	Day (6 am–10 pm)	L_{Aeq} (Day) = 55 dB(A)	L_{Aeq} (Day) = 60 dB(A)
	Night (10 pm–6 am)	L_{Aeq} (Night) = 50 dB(A)	L_{Aeq} (Night) = 55 dB(A)

It is noted that the assessment of rail noise to adjacent noise-sensitive receivers is being addressed separately for the MetroNet project, and does not form part of this scope.

3.3 CONSTRUCTION NOISE AND VIBRATION

The WAEPNR clarifies that the environmental noise criteria outlined in Table 5 are not applicable to noise emitted from a construction site where works are carried out between 0700 hours and 1900 hours on any day which is not a Sunday or public holiday if it shown that the construction works are generally carried out in accordance with the control of Section 4 of AS 2436-2010 *Guide to noise and vibration control on construction, maintenance and demolition sites* and if construction work is carried out in accordance with an approved management plan.

It is noted that a specific construction noise and vibration management plan is being addressed separately for the MetroNet project, which will include relevant site clearing and construction works associated with the Nicholson Road Station, and does not form part of this scope.

4. ACOUSTIC DESIGN ELEMENTS

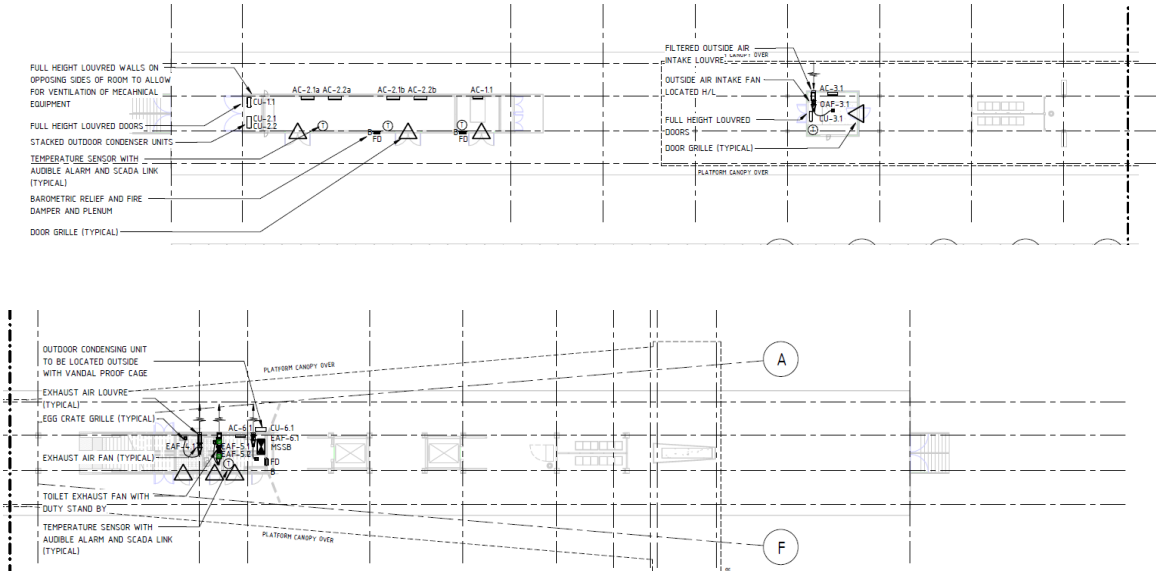
4.1 STATION IMPACTS TO SURROUNDING SENSITIVE PREMISES

4.1.1 BUILDING SERVICES

Mechanical services plant selections for the Nicholson Road Station have not been determined at this stage, however, will likely comprise:

- Small exhaust fans to ablution facilities and electrical plant spaces
- Critical cooling to comms spaces
- Air conditioning to occupied spaces (offices, crib room) incorporating split systems with wall-mounted indoor units
- Two transformers as follows:
  - 1x 630 kVA precinct mains supply transformer – 66 dB(A) Sound Power Level
  - 1x 500 kVA station isolation transformer – 62 dB(A) Sound Power Level.

The anticipated equipment and locations are as shown in Figure 5.



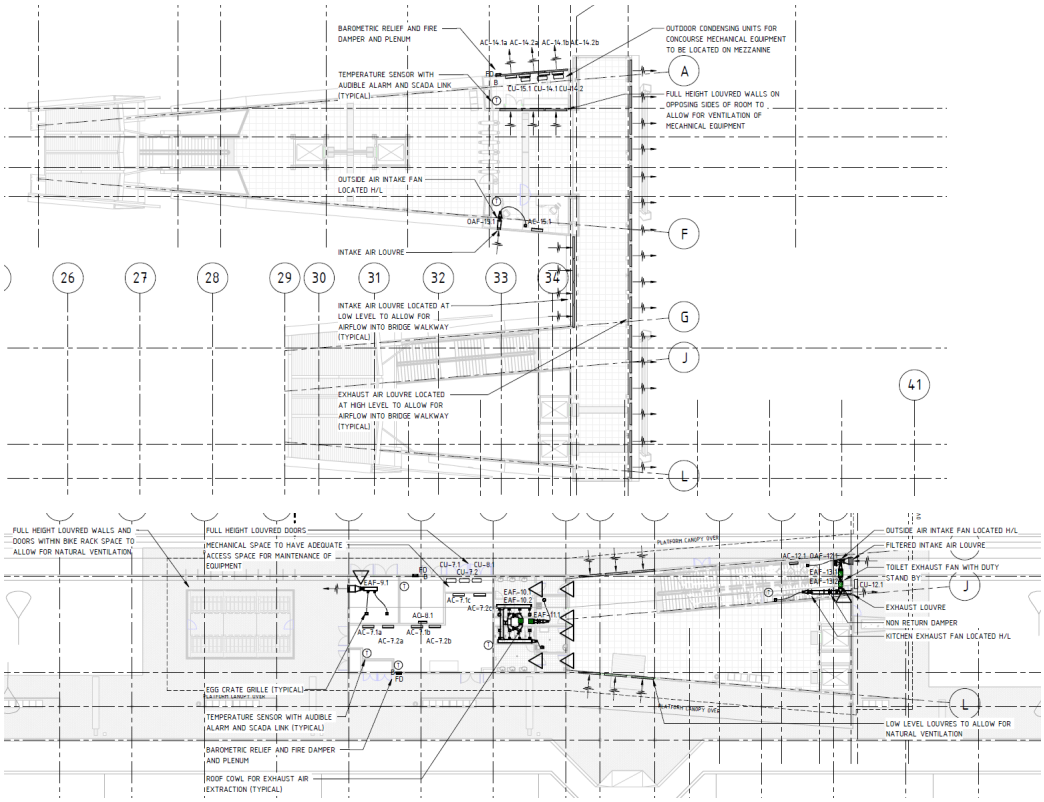


Figure 5: Proposed Nicholson Road Station building services

It is expected that standard noise control measures will be sufficient to control mechanical services plant noise in order to meet the required environmental noise levels at adjacent noise-sensitive areas. Such measures include:

- Selection of quietest possible equipment
- Internal duct lining (where appropriate)
- Appropriate location of equipment away from adjoining noise-sensitive receivers (including taking advantage of shielding afforded by the station itself)
- Enclosure of transformers.

4.1.2 PUBLIC ADDRESS SYSTEM

The design of the public address system design will be developed during the next stage of the design development to meet the environmental noise criteria outlined in Table 5.

Preliminary calculations suggest that a maximum combined sound power level of all PA speakers of approximately 97 dB(A) would achieve the environmental noise criteria at all noise-sensitive receivers.

4.1.3 CAR PARK

The car parking associated with the Nicholson Road Station is proposed to have a maximum capacity of over 969 bays. Assuming the car park is full during peak hours (morning and afternoon), Car Park 1 is expected to receive 260 trips and Car Park 2 is expected to receive 212 trips. The predicted noise levels from the car park alone at the nearest noise-sensitive receptors are as follows:

- North east – residential 39 dB(A)
- South – residential 40 dB(A)
- West – residential 23 dB(A)

It is noted that these estimated car park noise levels do not take into account any acoustic barriers which the project may be required to construct to meet rail noise criteria as defined in the SWTC.

Nevertheless, the environmental noise criteria identified in Table 5 are predicted to be achieved without any potential influence from any such barriers, and therefore noise from the Nicholson Road Station car park is not expected to cause disturbance to the nearby noise-sensitive receivers.

4.1.4 PASSENGER NOISE

The station is anticipated to have around 2,530 passengers per day by 2031. The passenger volumes expected during the morning and afternoon peak hours are very similar (1,609 passengers in the morning peak; 1,621 passengers in the afternoon peak). The afternoon peak hour period is predicted to have 23 boardings and 1,598 alightings. For TCL, the peak 15-minute period has 27% of the peak one-hour demand i.e. 6 boardings and 431 alightings. This equates to around 437 passengers on the station platform for a 15-minute period.

On the basis that the gender split is 50%/50%, and that half the passengers would be speaking in normal voices at any one point in time, the predicted noise levels from passengers at the nearest noise-sensitive receptors are as follows:

- North east – residential 40 dB(A)
- South – residential 32 dB(A)
- West – residential 27 dB(A)

These predicted noise levels are well below the daytime environmental noise criteria, and therefore noise from passengers on the Nicholson Road Station platform is not expected to cause disturbance to the nearby noise-sensitive receivers.

4.2 ROAD AND BUS MOVEMENT IMPACTS TO SURROUNDING SENSITIVE PREMISES

The connection road between the proposed new car park and Tulloch Way, the associated car park vehicles using Tulloch Way, Vostan Road, Panama Street and Nicholson Road as well as the bus movements along the internal station area, are required to be assessed against the road traffic requirements of the SPP 5.4.

The inputs to the road and bus noise assessment have been taken from the transport planning report *NEWest Nicholson Road Station Transport Assessment 15-07-20*, presented in Figure 6.

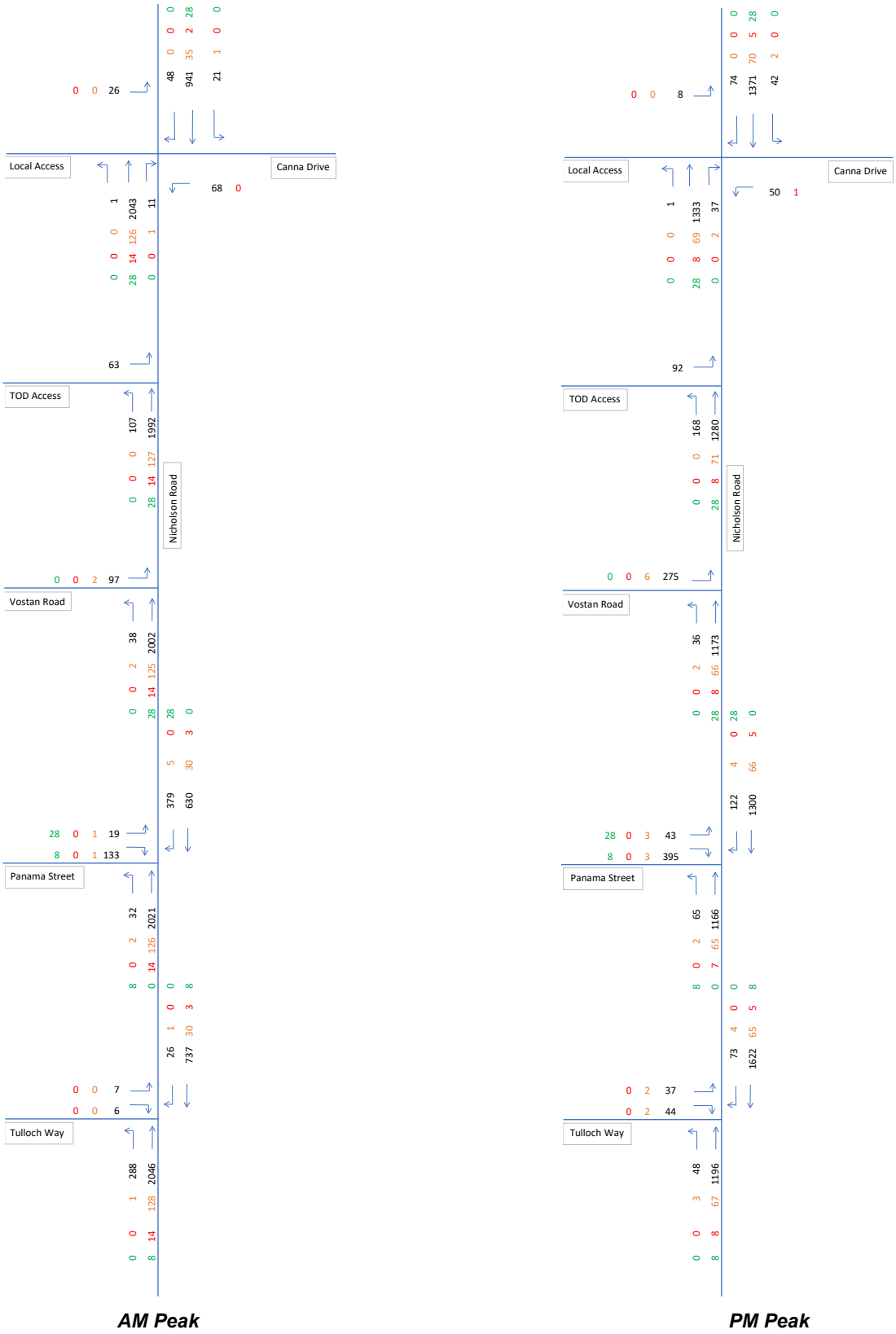


Figure 6. Nicholson Road Final Development Traffic Flows (2031 AM/PM Peaks)

It is noted that approximately 96% of vehicle movements occurring during the daytime period. On the basis of these movements, the predicted vehicle movement noise levels associated with the station precinct are as follows:

- North east – residential $L_{Aeq\ (Day)}$ 52 dB(A), $L_{Aeq\ (Night)}$ 44 dB(A)
- South – residential $L_{Aeq\ (Day)}$ 65 dB(A), $L_{Aeq\ (Night)}$ 60 dB(A)
- West – residential $L_{Aeq\ (Day)}$ 49 dB(A), $L_{Aeq\ (Night)}$ 43 dB(A)

Therefore the road traffic noise criteria of $L_{Aeq\ (Day)}$ 55 dB(A) and $L_{Aeq\ (Night)}$ = 50 dB(A) are expected to be achieved at the nearest noise-sensitive receivers to the north east and to the west, but both day and night road traffic noise criteria are predicted to be exceeded at the nearest residential area to the south (on Canna Drive).

However, for this selected worst-case receiver location (refer Figure 4), it is noted that these traffic noise levels are also to be considered in the context of the existing traffic noise levels. With traffic volumes of approximately 32,000 vpd on Nicholson Road, 23,000 vpd on Garden Street and 16,000 vpd on Yale Road, traffic noise levels from the station vehicle movements is expected to increase overall road traffic noise levels by around 1 dB at residential receivers to the south which is considered to be imperceptible. Therefore, no further consideration of noise control measures is required.

APPENDIX K SUMMARY OF ENVIRONMENTAL APPROVALS

NEWest Alliance

TCL Environmental Strategies Summary Statement for DA Planning Reports

DRAFT 1.0, 22 Sep 20

METRONET's Thornlie-Cockburn Link (TCL) duplicates three kilometres of track between Beckenham Station and Thornlie Station, relocates 11 kilometres of freight track, builds 14.5 kilometres of new passenger rail between Thornlie and Cockburn stations and two new stations at Nicholson Road and Ranford Road. The project is the catalyst for the medium to long-term redevelopment in the area. As the project is located within a well populated urban corridor, there is a focus on minimising environmental and community impacts during its construction and subsequent operation. While a new railway is itself a sustainability initiative, construction of such major public transport infrastructure is overseen by a raft of both environmental and public health requirements - governing hours of work, the management of noise, vibration and dust, and the need to working together with communities in developing measures that will minimise impacts.

Flora and Fauna

The existing rail freight corridor has been largely cleared of native vegetation. However, some clearing is required and environmental approvals for this work have been obtained under the *Environmental Protection Act 1986*. The design has been optimised to limit any new clearing to only that required to safely construct the permanent footprint.

The project footprint has also been adjusted where possible to avoid significant ecological communities. Where this could not be achieved, areas of offset vegetation have been obtained elsewhere and funds have been allocated to manage those environmental offsets in perpetuity.

Prior to clearing, a trapping and relocation program will be undertaken by a qualified ecologist. Native animals will be relocated to nearby suitable habitat, as approved by the Department of Biodiversity, Conservation and Attractions.

Aboriginal Heritage

Duplicating the rail bridge over the Canning River, known as the Dyarlgarro by Noongar people, will occur within an identified Aboriginal heritage site. While the impact is expected to be minimal, recognising the importance of this site to the Whadjuk people, relevant approvals have been sought.

Specialist Aboriginal monitoring personnel will also be engaged during the initial ground work at this location to further ensure that any culturally significant material, if uncovered, is managed appropriately.

Environmental Controls

There are numerous controls in place for the different stages of the project to mitigate potential environmental impacts. A combination of legislative, planning and construction controls, and monitoring govern the project with the aim of protecting the environment during construction and delivery. These controls include:

- limiting noisy works outside of normal working hours, where practicable and using construction techniques and work practices that generate lower noise levels.
- monitoring of dust, noise and vibration during construction.
- using water trucks and water sprays to suppress dust.
- reducing the number of vehicle movements and maintaining low speed limits for construction

vehicles, machinery and equipment.

- doing property pre-condition surveys to record the condition of buildings and structures within 50 metres of the project site.
- placing vibration monitoring equipment to monitor vibration levels against compliance limits.
- marking all clearing boundaries by surveyors prior to commencing clearing.
- fauna trapping and relocation prior to clearing, and the presence of fauna spotters during clearing.
- barricading and signage to clearly outline 'no-go' areas.
- adhering to required regulatory legislative approvals and associated conditions.
- environmental monitoring, inspections and audits to confirm compliance with approvals and legislation.
- Environmental training and awareness incorporated into induction for all personnel, subcontractors and visitors to site.
- Notifying and keeping local residents, businesses and road users informed of upcoming construction activities through a number of media and communication channels.

Controls will be inspected regularly throughout the project duration to ensure their ongoing suitability and effectiveness.

Managing Noise, Vibration and Light During Construction and Operation

Potential construction impacts, including noise, vibration and light related impacts, will be minimised as much as possible. All works will be planned with the community in mind and will follow the project's approved management processes.

Every effort is made to minimise noise and vibration during out-of-hours works and local residents will be informed about upcoming activities. Where out of hours works are required, they will be undertaken in accordance with a Noise and Vibration Management Plan approved by the relevant Local Government Authority. This plan will outline additional controls and community notification requirements.

Work is also underway to minimise the operational noise and vibration levels from the new electric passenger lines for the surrounding community. Based on early designs, an initial operational noise and vibration assessment recommends noise barriers in certain locations and anti-vibration ballast matting. Ballast matting (matting that sits in the rail formation) will be installed under the rail where it is located next to existing and future residential developments. This matting absorbs vibrations made by the train and will be used under both the freight and passenger tracks. This approach will continue to be reviewed and updated as the detailed design progresses.

Noise walls will also be used in existing residential developments to assist with noise mitigation for residents living near to the trainline. The project team is currently confirming the height, materials and location of the noise walls along the alignment.

Lighting of the station areas will be directed away from residential properties as much as possible and will be assessed during the final design stages.

Revegetation and Landscaping

All areas disturbed by the construction process that are not part of the permanent infrastructure will be revegetated as part of a landscape design produced by a landscape architect. The landscape

design will provide quality landscape and urban design solutions which integrate the rail development and station precincts with the surrounding natural areas.

Revegetation and landscaping measures will include some or all of the following measures:

- reuse of topsoil from clearing during revegetation and landscaping.
- maintenance of the required groundwater hydrology where needed to support existing vegetation and habitats in sensitive areas.
- application of mulch to revegetated and landscaped areas to improve vegetation success.
- retention of vegetation where not impacted by earthworks and not posing a safety risk.

APPENDIX L TCL CONSTRUCTION SUMMARY STATEMENT

NEWest Alliance

TCL Construction Program Summary Statement for DA Planning Reports

DRAFT 2.0, 12 Aug 20

Construction Program and Management

Overview of Thornlie-Cockburn Link

The Thornlie-Cockburn Link (TCL) is the extension of Public Transport Authority (PTA's) passenger rail network. In conjunction with the state government's METRONET initiative, the 17.5 Kilometre distance spans from the entrance at Kenwick tunnel, through Thornlie station along the existing Arc freight rail corridor which accesses Kwinana Freeway via an existing portal and ending at Cockburn Central station. The existing Thornlie station will be significantly modified, and in addition, new stations will be constructed at Nicholson and Ranford Road whilst the existing platforms at Cockburn and Stadium Stations will undergo an extension.

TCL Stations are typically brownfield construction with challenges including:

- Ranford Road – contaminated waste to be removed below area of station entry building;
- Stadium and Ranford Road both contaminated landfill sites NWA will comply with requirements set out in the Site Management Plans to be prepared by PTA.
- Ranford Road, Nicholson Road and Thornlie Stations all have challenges with existing inground services and being adjacent to the existing Arc rail infrastructure;
- Thornlie Station is an existing live operational Station; and
- Stadium and Cockburn Stations are existing operational Stations with live rail lines flanking the works and situated adjacent to major road infrastructure.

Construction Management Planning

Each Station development site will be required to have a Construction Management Plan (CMP) endorsed prior to site mobilisation. The CMP will be supported by a range of other management plans (e.g. Traffic Management Plan), which will be prepared in consultation with the local government and other relevant agencies, based on the range of risks needing to be managed at each development site. Each CMP will provide the overarching framework and direction for all construction related works and activities on site during the station's construction phase. The CMP set outs the NEWest Alliance's construction methodology for this multi-disciplinary project and:

- complies with the PTA's Scope of Works and Technical Criteria (SWTC) and associated Project Specific Requirements (PSRs) and objectives;
- provides appropriate consideration to working in a constrained urban and existing rail environment;
- identifies, mitigates or effectively manages all interfaces and associated risks;
- ensures a respectful and considered approach to construction that minimises disruption to the existing PTA network, community and other stakeholders (e.g. road closures, working after hours, etc.);
- ensures delivery phase activities are undertaken in a clear, structured, methodical manner with 'no surprises';
- achieves desired functionality, safety, quality and program requirements in an environmentally and community sensitive manner; and

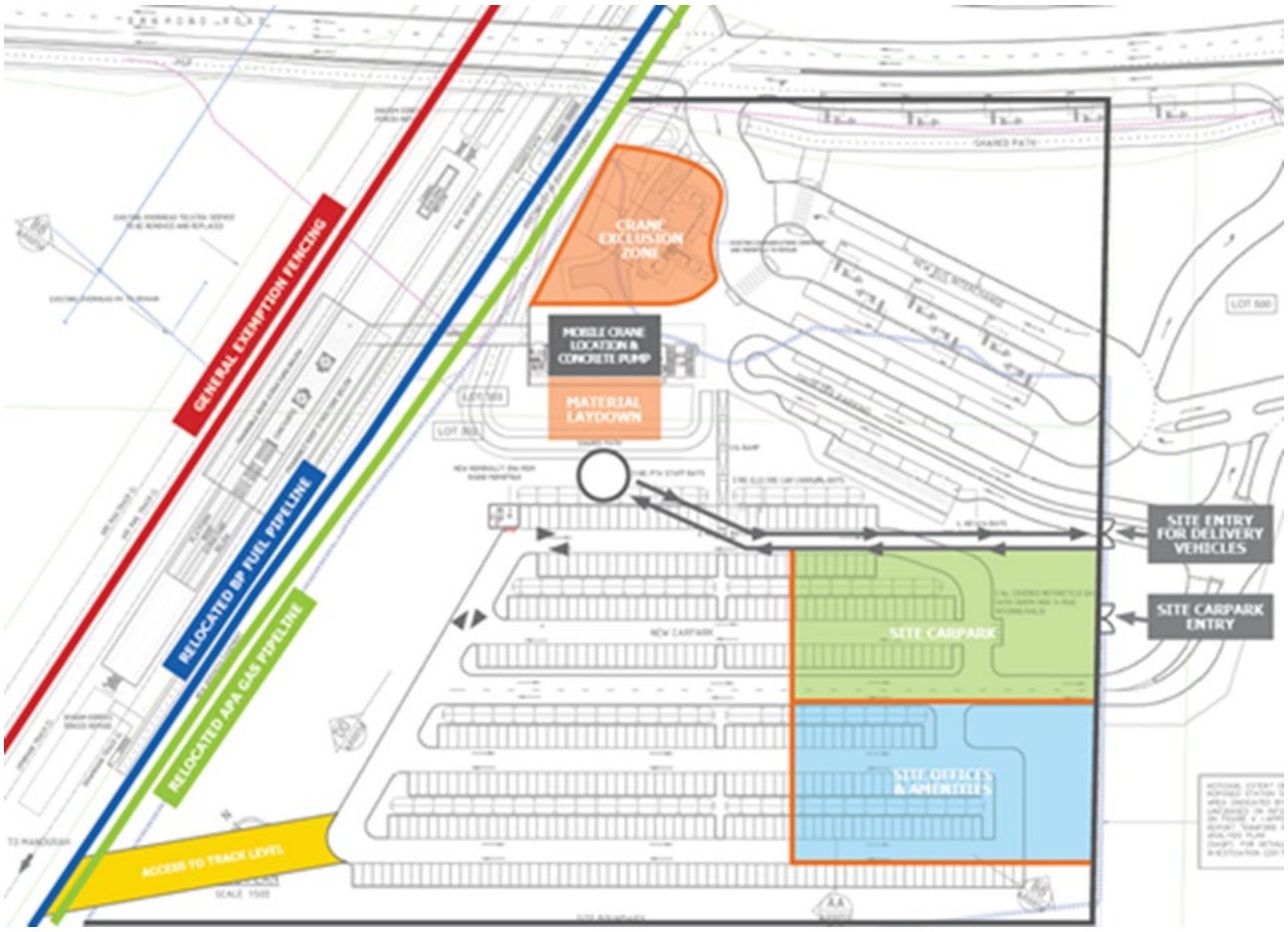
- details the management strategies and practices for construction at each site, excluding construction relating to rail and rail systems.

The preparation of each station development site CMP will be informed by the endorsed Construction Plan TCL document. This provides the overarching framework and direction for all construction-related activities and works during the delivery phase of the METRONET Stage 1 Initiatives: Thornlie-Cockburn Link.

Station Construction Site Layout

The sketch shown in Figure ? demonstrates the planned approach for site set up at new stations and notes locations for the set-up of mobile cranes and concrete pumps.

Figure ?: Typical construction site layout for a TCL station development project.



Timeframes for Construction and Day One Operations

The NEWest Alliance has taken a risk based approach on design to ensure accurate and efficient project delivery deadlines. The key construction milestones are as follows:

Table ?: TCL wide key construction milestones.

Milestone	Target Completion Date
Design Complete	5 August 2021

Milestone	Target Completion Date
Civil Works Complete	10 January 2023
Bridges Complete	17 August 2022
Stations Complete	30 November 2022
Final Commissioning and EIS	27 February 2023
Project Complete	26 May 2023
Operational Readiness and Drivers Training	26 May 2023

The TCL project has established three construction zones as shown in Figure ? below for effective and efficient management in terms of program, traffic staging and cost whilst minimising disruptions to stakeholders including train operations and the public.

Figure ?: Project Zone Layout between Beckenham and Cockburn Station.

The program of dates for commencing construction of each TCL station and their anticipated date for commencing the operation of a passenger train services is summarised in the table below.

Station Project	Date for Construction	Day One Operation Date
Perth Stadium	2 March 2021	Late 2022
Nicholson Road	29 November 2021	
Thornlie	8 December 2020	
Ranford Road	29 November 2021	
Cockburn Central	30 July 2021	

APPENDIX M NICHOLSON ROAD STATION CATCHMENT & MODE SHARE REVIEW

NEWest Alliance

Memorandum

Date	16/11/2020
To	Anastasia Katsimbardis, Marco Bense
From	Hugo Nilsson Teresa Matassa
CC	Thor Farnworth, Chris Deshon, Brad Sherlock, Dusko Petrovich, Rebecca Travaglione, Peral Rasmussen
Subject	**NICHOLSON ROAD STATION CATCHMENT AND MODE SHARE REVIEW**
Doc No.	**TCY-DJV-TSB-TM-MMO-0001**
Revision	**B**

1.0 Introduction

NEWest Alliance has been commissioned by METRONET to undertake a review of the catchment analysis for the Thornlie Cockburn Link (TCL), based on the most recent land use, infrastructure and station design assumptions. This note summarises the data used, the methodology adopted and the findings of the analysis: mode specific patronage and associated parking requirements.

This note first considers the existing and forecast land use data and transport network to assess the potential catchments and associated patronage for each mode (car, bus, cycle and walk). This is followed by a review of the likely mode split, which, along with the forecast patronage volumes, will inform parking requirements.

The analysis in this note builds on previous catchment analysis and transport assessment work for the METRONET TCL project, included in the following documents, and referenced throughout this note:

- *Thornlie Rail Line Extension Strategic Access Planning* (Arup, 2018)
- *Thornlie – Cockburn Link Transport Assessment* (WSP, 2019)

The assumed future infrastructure network and land uses informing the catchment analysis have been sourced from online mapping as well as from the following the following documents:

- *City of Canning Town Planning Scheme No. 42*
- *City of Gosnells Draft Local Planning Scheme 24*

Overviews of the planning sources are provided in Figure 1 and Figure 2.

Figure 1: City of Canning Town Planning Scheme No. 42

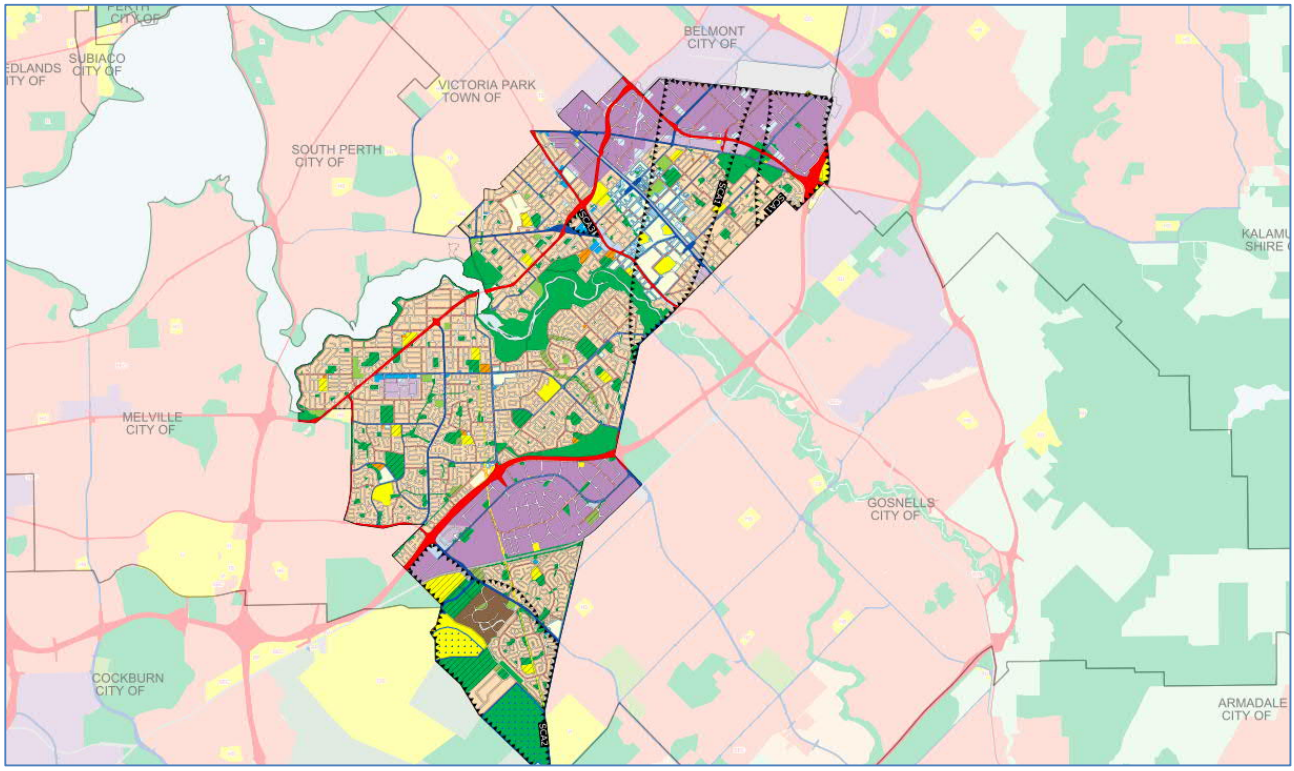
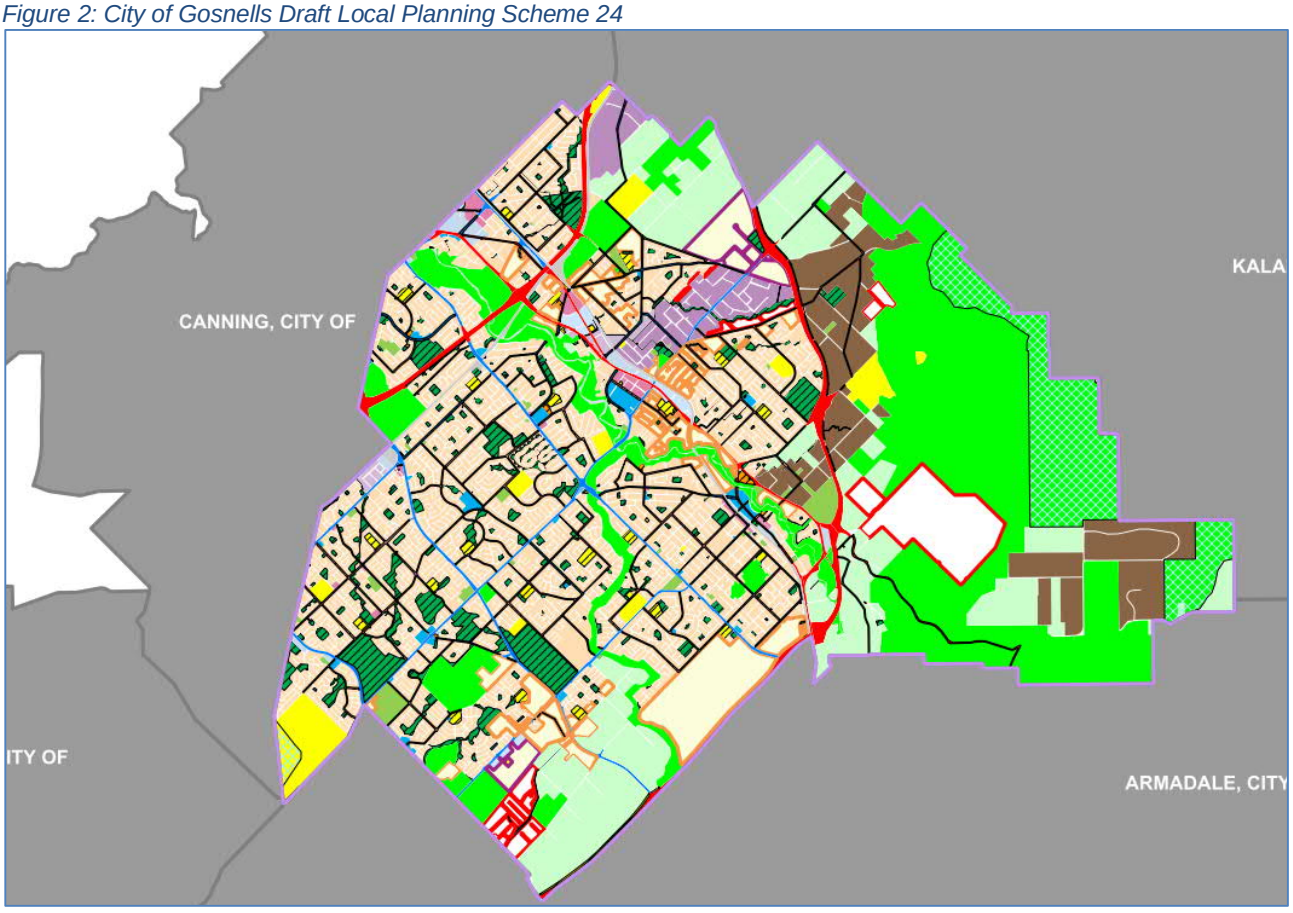


Figure 2: City of Gosnells Draft Local Planning Scheme 24



2.0 Geographical Catchment

This section describes the methodology of determining the geographical catchments for each mode. The extent of the geographical catchments will subsequently inform the potential patronage capture in Section 4.0.

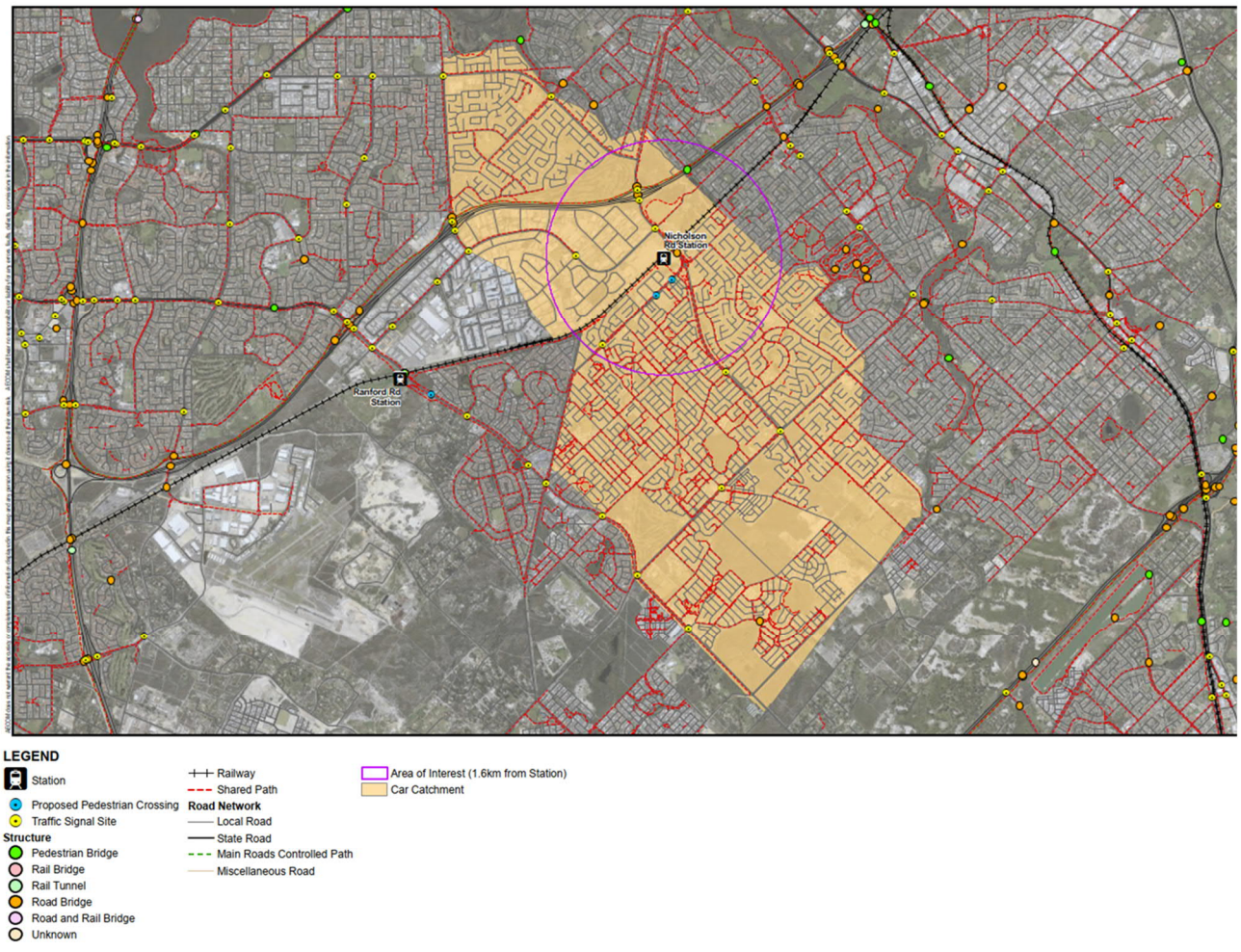
2.1 General Car Catchment

Land use data from the Metropolitan Land Use Forecasting System (MLUFS) (version 1.6) has been used to estimate the potential population within the future Nicholson Road Station catchment.

The general (car) catchment for all new stations along the TCL was completed using the same analysis and assumptions adopted in the *TCL Strategic Access Planning* (Arup, 2018). This assumes a tendency that drivers will avoid 'back-tracking' and are likely to prefer driving to a station that is toward their destination or "downstream" on the railway line (in this instance, towards Perth CBD) rather than away from their destination or "upstream" (in this instance, away from Perth CBD).

The Nicholson Road catchment identified in the previous Arup study has been adjusted by extending it southwards to include the Southern River precinct as this area can be reached within 10-12 minutes by car during peak hour. Therefore, it is assumed that this precinct will form part of the potential catchment by car. The resulting assumed general catchment for Nicholson Road Station including this adjustment is presented in Figure 3.

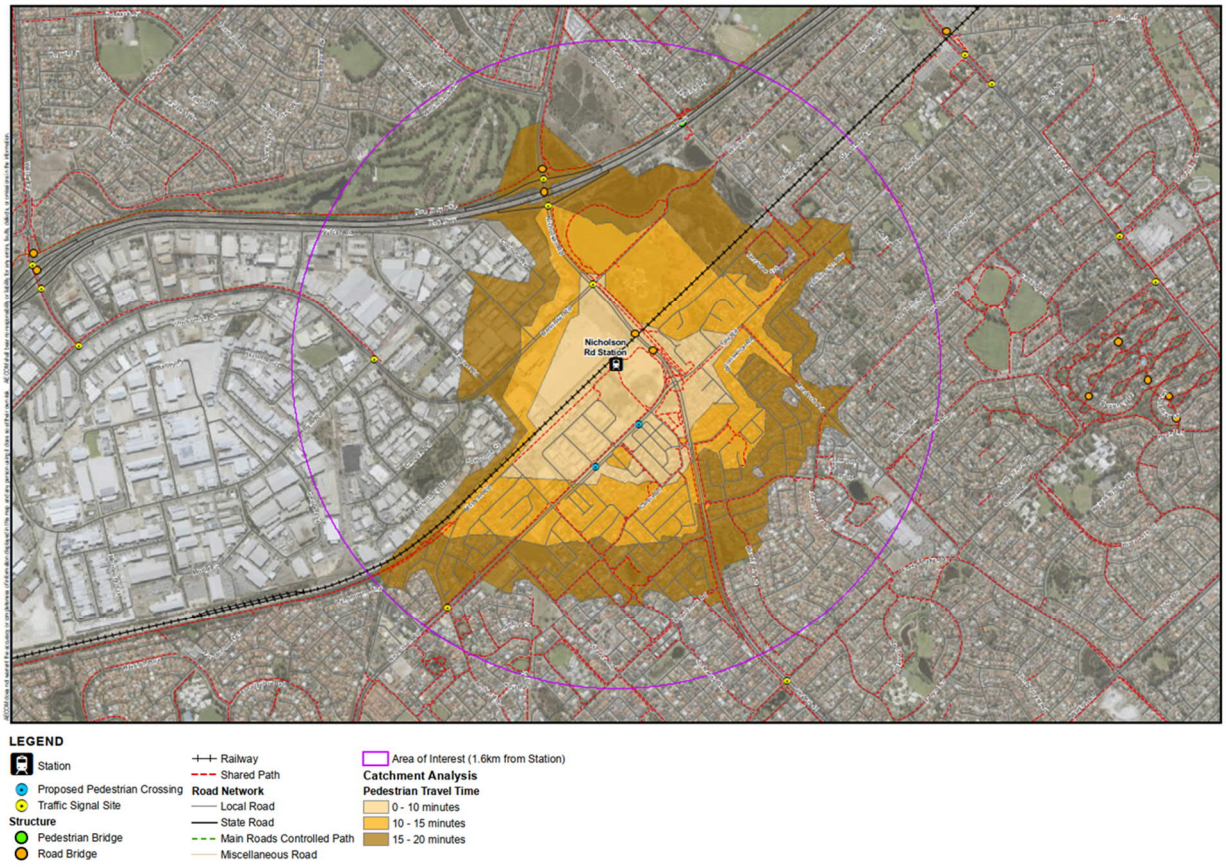
Figure 3: General Car Catchment



2.2 Future (2031) Walkable Catchment

Figure 4 presents the future (2031) walkable catchment around Nicholson Road Station, segmented into 800m, 1200m and 1600m network distances. This is equivalent to a 10-, 15- and 20-minute walk at 4.8km/h, respectively. The potential walking catchment is set to fall within the 20-minute zone.

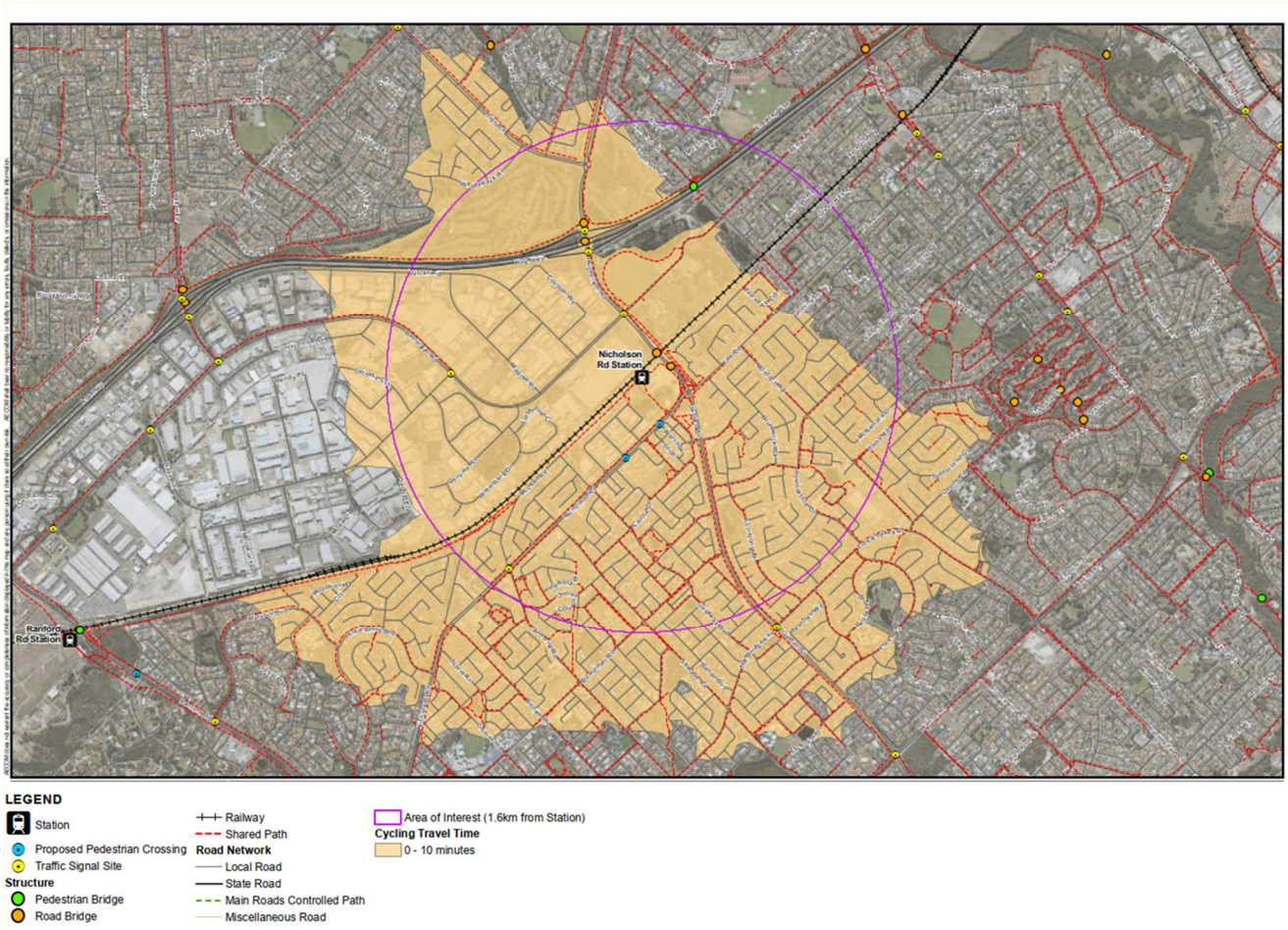
Figure 4: Future (2031) 10 /15/ 20 minute Walkable Catchment



2.3 Future (2031) Cyclable Catchment

Figure 5 presents the future cyclable catchment around Nicholson Road Station, within an 3km network distance. This is equivalent to a 10-minute cycle[1] and is the assumed potential cycling catchment. It further considers the assumed extent of the future cycling catchments of the neighbouring Ranford Road and Thornlie stations, using the same principle to avoid 'back-tracking' used to define the general catchment for each individual station.

Figure 5: Future (2031) 10-minute Cyclable Catchment

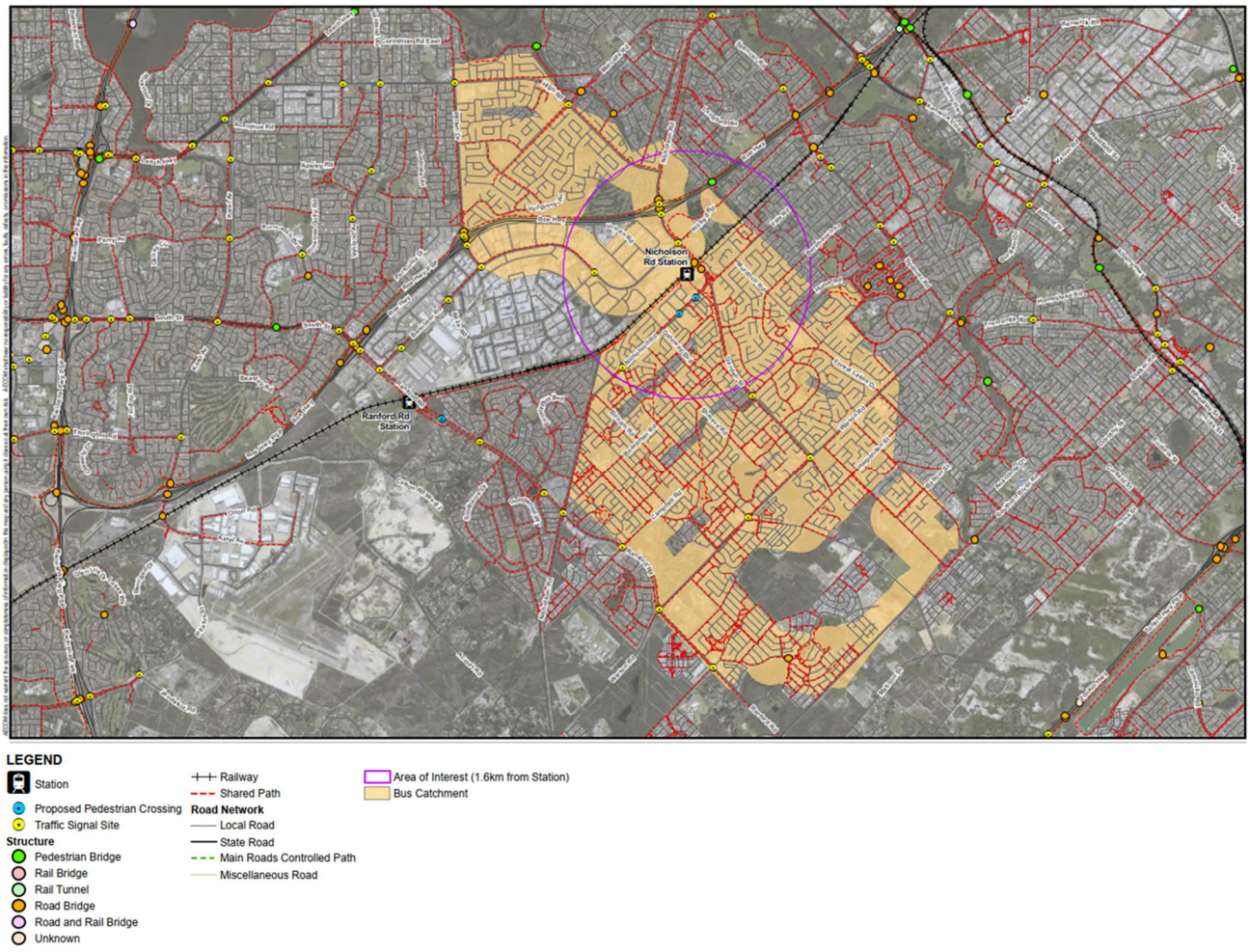


[1] Based on an average of 18/km cycle speed

2.4 Future (2031) Bus Catchment

A preferred future bus network option has been supplied to the NEWest team by PTA. Figure 6 highlights the resulting associated bus catchment. As route alignment and bus stop locations are yet to be confirmed the catchments are indicative only and formed by a 400m bus route buffer. It further considers the assumed extent of the bus catchments of the neighbouring Ranford Road and Thornlie stations, using the same principle to avoid 'back-tracking' used to define the general catchments.

Figure 6: Bus Catchment



3.0 STATION TYPOLOGIES AND PATRONAGE

3.1 Nicholson Road Station Typology

The future Nicholson Road Station Access Typology and Precinct Typology are identified below in Table 1. The Station Access Typology reflects the anticipated catchment conditions and priority access modes, noting that a Bus n Ride Station suggests a large (typically more than 30 percent) mode share for bus transfers at the station but also allows for similar Park n Ride and walking/cycling mode shares depending on the Precinct Typology and surrounding land uses. It is noted that Nicholson Road Station is likely to also have a large share of Park n Ride patronage and therefore some overlap with this typology classification is expected.

Nicholson Road Station is identified as an SP4 'Neighbourhood Centre' Precinct Typology, which mainly supports residential land use in various densities along with some retail activity within the core station precinct. Stations with Neighbourhood Centre typology are also expected to have a limited catchment extent with a role of mostly serving the surrounding community rather than serving a strategic role within the regional area and is subsequently expected to generate moderate overall patronage levels.

Table 1: Station Typologies

Access Typology	Precinct Typology	Comparable Stations based on defined typologies and mode share analysis included in Station Access Strategies
Bus n Ride/Park n Ride	SP4 Neighbourhood Centre	• Thornlie Station (Bus n Ride, next closest existing station) • Oats Street (although Nicholson Station catchment characteristics will likely result in a lower active mode share) • Wellard (although Nicholson Station catchment characteristics will likely result in a lower active mode share) • Warnbro (Precinct typology not yet defined, but likely to be SP4 or SP6, and is a Bus n Ride / Park n Ride station)

3.2 Forecast Patronage

The NEWest adopted patronage forecasts for Nicholson Road Station are derived from the METRONET TCL Scope of Work and Technical Criteria (SWTC):

- 2,250 daily boardings in 2021
- 2,540 daily boardings in 2031

These patronage estimates are consistent with the previous METRONET studies by Arup (2018) and WSP (2019).

4.0 Potential Patronage Capture

MLUFS land use data has been used to estimate potential patronage that can access Nicholson Road Station by each mode. The analysis for each mode has been carried out to determine the percentage of land area of the MLUFS zones that are within the mode-specific geographical catchment. Detailed information on future land use development gathered from structure plans has been used to further adjust the percentage of the MLUFS zone within a catchment, to more realistically reflect the potential patronage. This adjusts for land uses areas which are likely to have low residential, employment or education activities such as conservation areas or large sections of public open space.

The outcome of this analysis is to indicate the size of the potential patronage, i.e. the comparable scale of potential rail passengers originating from each mode specific catchment. For this anlaysis, the patronage is assumed to be directly proportional to the size of the residential population, along with consideration of the number of employment opportunities in the station catchment. It is expected that there will be greater patronage opportunity arising from the residential population, as it is assumed incoming workers to the industrial area are much less likely to use public transport than local residents, as staff parking is generally readily available at industrial sites and shift times often commence before the peak travel period. In addition, it was assumed that station access trips generated by workers travelling to their local employment activities will mostly generate bus and walking trips, with some opportunity for cycle trips from the station for workers travelling outside of peak hour (or against the peak flow).

The outcome of this potential patronage analysis is a review of the Nicholson Road Station estimated access mode share split for 2021 (station opening) and in 2031 (approximately 10 years after opening), as detailed in Section 5.0. Based on the revised station access mode share split, the potential demand for the station Park n Ride supply is also assessed. Recommendations are also included on other initiatives which should be considered by a range of government agencies to ensure the Station can achieve or exceed the forecast daily boardings and the identified bus and active transport mode shares.

4.1 MLUFS Data

MLUFS data describes forecasted population and employment figures for the Perth metropolitan region and forms the basis for the catchment analysis. The zones falling within the various station catchments are highlighted in Figure 7.

Figure 7: MLUFS Zones

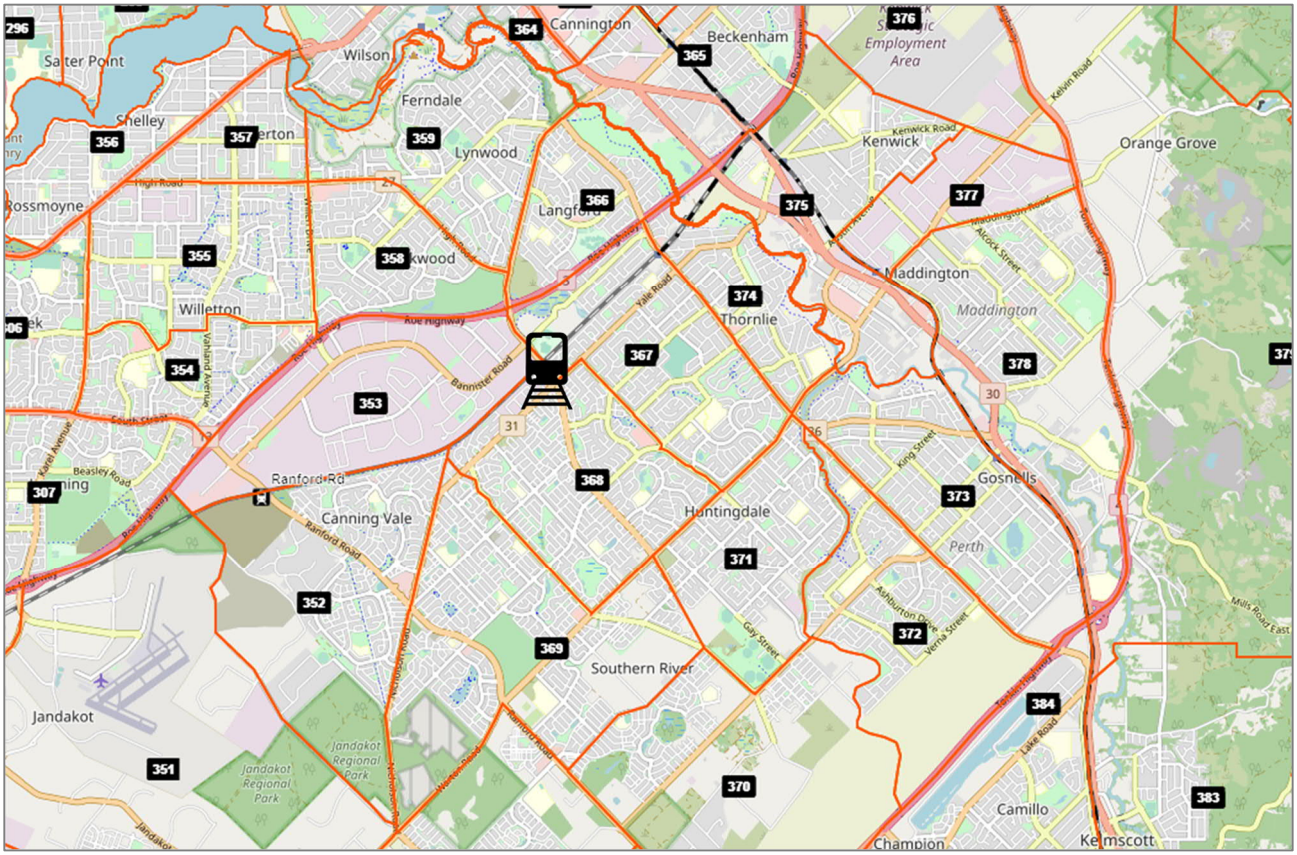


Table 2 provides a break-down of the residential and employment data for each zone for the year 2021 and 2031, along with the resulting growth between the two years. The zones with the higher proportion of existing or future population are highlighted in shades of green, illustrating the zones which have the potential to generate the most growth in trips for Nicholson Road Station between 2021 and 2031. These zones should therefore be a key focus for delivery of the interim (2021) and future transport routes to the station.

Table 2: MLUFS Land Use Data

	2021			2031		2021 to 2031	
MLUFS Zone	Residents	Employment	Combined	Residents	Employment	Combined	Combined growth
352	9,858	1,713	11,571	10,846	1,954	12,800	11%
353	0	15,198	15,198	0	19,436	19,436	28%
354	6,419	1,745	8,164	6,587	2,063	8,650	6%
355	11,441	2,341	13,782	11,739	2,838	14,577	6%
357	5,849	1,274	7,123	6,392	1,467	7,859	10%
358	5,782	644	6,426	5,419	995	6,414	0%
359	8,533	983	9,516	8,146	1,177	9,323	-2%
366	5,536	510	6,046	5,869	559	6,428	6%
367	11,137	1,280	12,417	10,589	1,377	11,966	-4%
368	17,460	2,464	19,924	20,015	2,818	22,833	15%
369	19,511	4,049	23,560	23,702	4,531	28,233	20%
370	6,171	787	6,958	8,274	1,181	9,455	36%
371	9,926	953	10,879	12,773	1,170	13,943	28%
393	23,850	4,215	28,065	25,461	4,120	29,581	5%

4.2 Overall Catchment Potential

Figure 8 provides an overview of the area overlap between the general catchment and the MLUFS zones, along with detailed land use data. The overlap serves as an indication of the proportion of population and employment within each MLUFS zone that will form part of the potential car patronage for Nicholson Road Station.

Figure 8: Future (2031) Overall Catchment, Land Use and MLUFS Zone Overlap

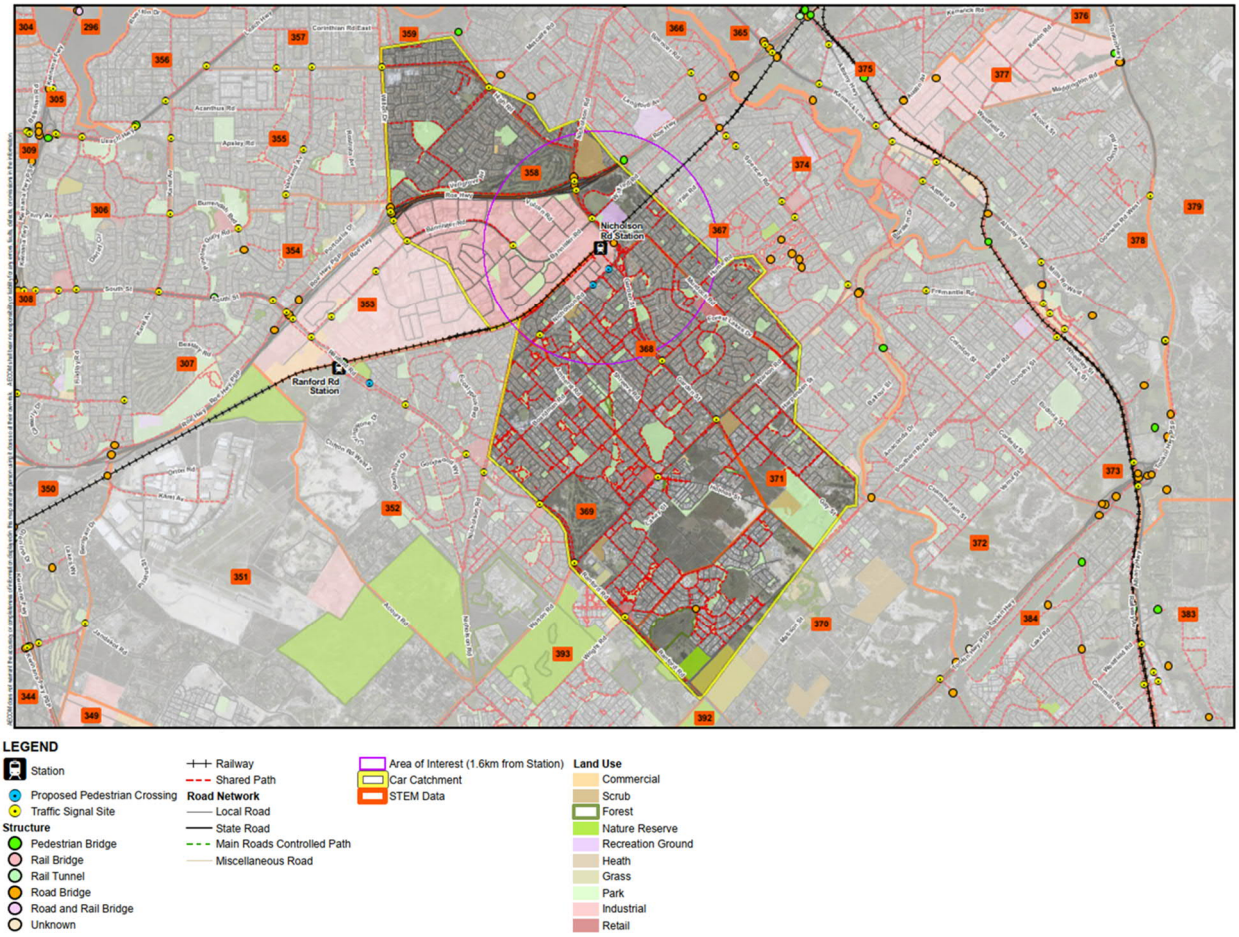


Table 3 details the proportion of each MLUFS zone captured within the overall station catchment, along with an assumed proportion of population and employment within overlap following consideration of the existing and planned detailed land use data sourced from structure plans.

Table 3: Future (2031) Overall Catchment and MLUFS Zone Adjusted Overlap

MLUFS Zone	Overlap with catchment	Adjusted proportion of population and employment within overlap	Reason for adjustment
353	48%	48%	
358	100%	100%	
359	12%	12%	
366	9%	5%	Catchment overlap includes large proportion of non-developed land
367	35%	30%	Catchment overlap includes large proportion of non-developed land
368	100%	100%	
369	71%	71%	
370	25%	75%	Catchment overlap includes a significant of majority trip-generating land
371	50%	40%	Catchment overlap includes large proportion of non-developed land

4.3 Future (2031) Bus Catchment Potential

Figure 9 provides an overview of the area overlap between the bus catchment and the MLUFS zones, along with detailed land use data. The overlap serves as an indication of the proportion of population and employment within each MLUFS zone that will form part of the potential bus patronage for the station.

Figure 9: Future (2031) Bus Catchment, Land Use and MLUFS Zone Overlap

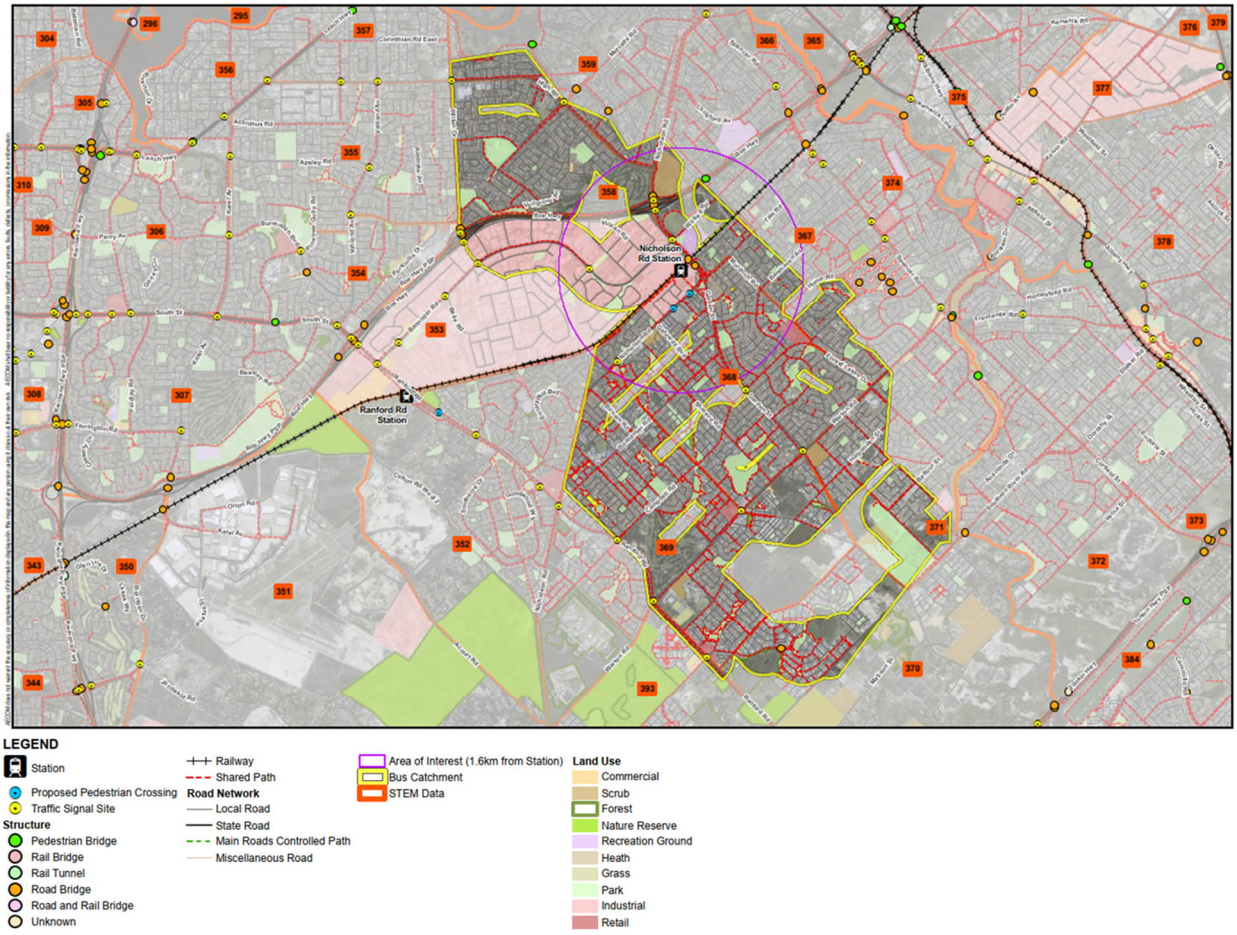


Table 4 highlights the area-based overlaps between the bus catchment and the MLUFS zones, along with an assumed proportion of population and employment within overlap following consideration of the existing and planned detailed land use data sourced from structure plans

Table 4: Future (2031) Bus Catchment and MLUFS Zone Adjusted Overlap

MLUFS Zone	Overlap with catchment	Adjusted proportion of population and employment within overlap	Reason for adjustment
353	35%	35%	
358	91%	91%	
359	12%	12%	
366	8%	0%	No trip-generating land use included in catchment overlap
367	30%	30%	
368	93%	93%	
369	57%	71%	Large proportion of non-developed land falls outside catchment overlap
370	13%	40%	Catchment overlap includes large proportion of trip-generating land
371	41%	20%	Catchment overlap includes large proportion of non-developed land

4.4 Future (2031) Cycling Catchment Potential

Figure 10 provides an overview of the area overlap between the cyclable catchment and the MLUFS zones, along with detailed land use data. The overlap serves as an indication of the proportion of population and employment within each MLUFS zone that will form part of the potential cycle patronage for Nicholson Road Station.

Figure 10: Future (2031) Cyclable Catchment, Land Use and MLUFS Zone Overlap

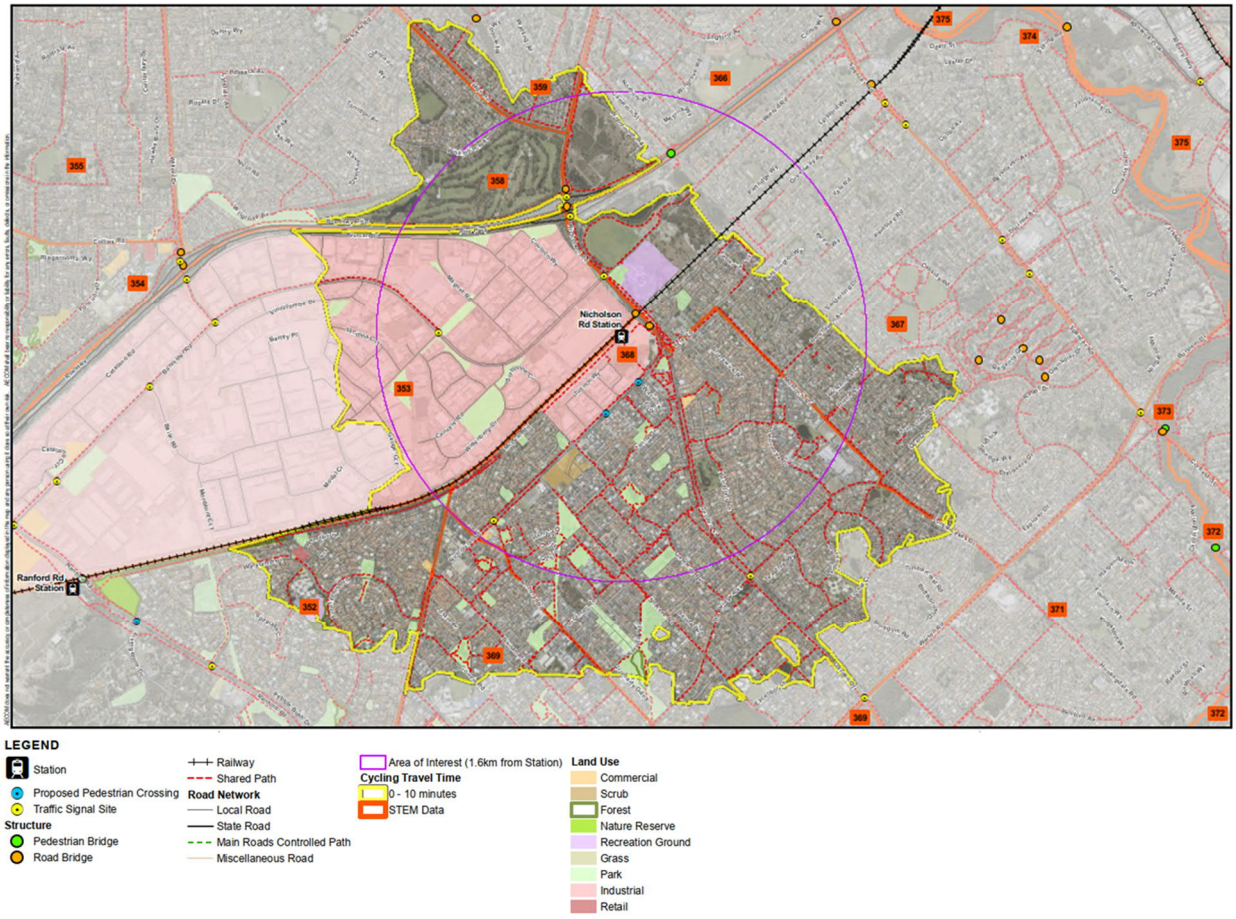


Table 5 highlights the area-based overlaps between the cyclable catchment and the MLUFS zones, along with an assumed proportion of population and employment within overlap following consideration of the existing and planned detailed land use data sourced from structure plans

Table 5: Future (2031) Cyclable Catchment and MLUFS Zone Adjusted Overlap

MLUFS Zone	Overlap with catchment	Adjusted proportion of population and employment within overlap	Reason for adjustment
352	9%	9%	
353	36%	36%	
358	24%	0%	No trip-generating land use included in catchment overlap
359	4%	4%	
366	9%	0%	No trip-generating land use included in catchment overlap
367	27%	23%	Catchment overlap includes large proportion of non-developed land
368	76%	76%	
369	8%	15%	Large proportion of non-developed land falls outside catchment overlap

4.5 Future (2031) Walking Catchment Potential

Figure 11 provides an overview of the area overlap between the walkable catchment and the MLUFS zones, along with detailed land use data. The overlap serves as an indication of the proportion of population and employment within each MLUFS zone that will form part of the potential pedestrian patronage for Nicholson Road Station.

Figure 11: Future (2031) Walkable Catchment, Land Use and MLUFS Zone Overlap

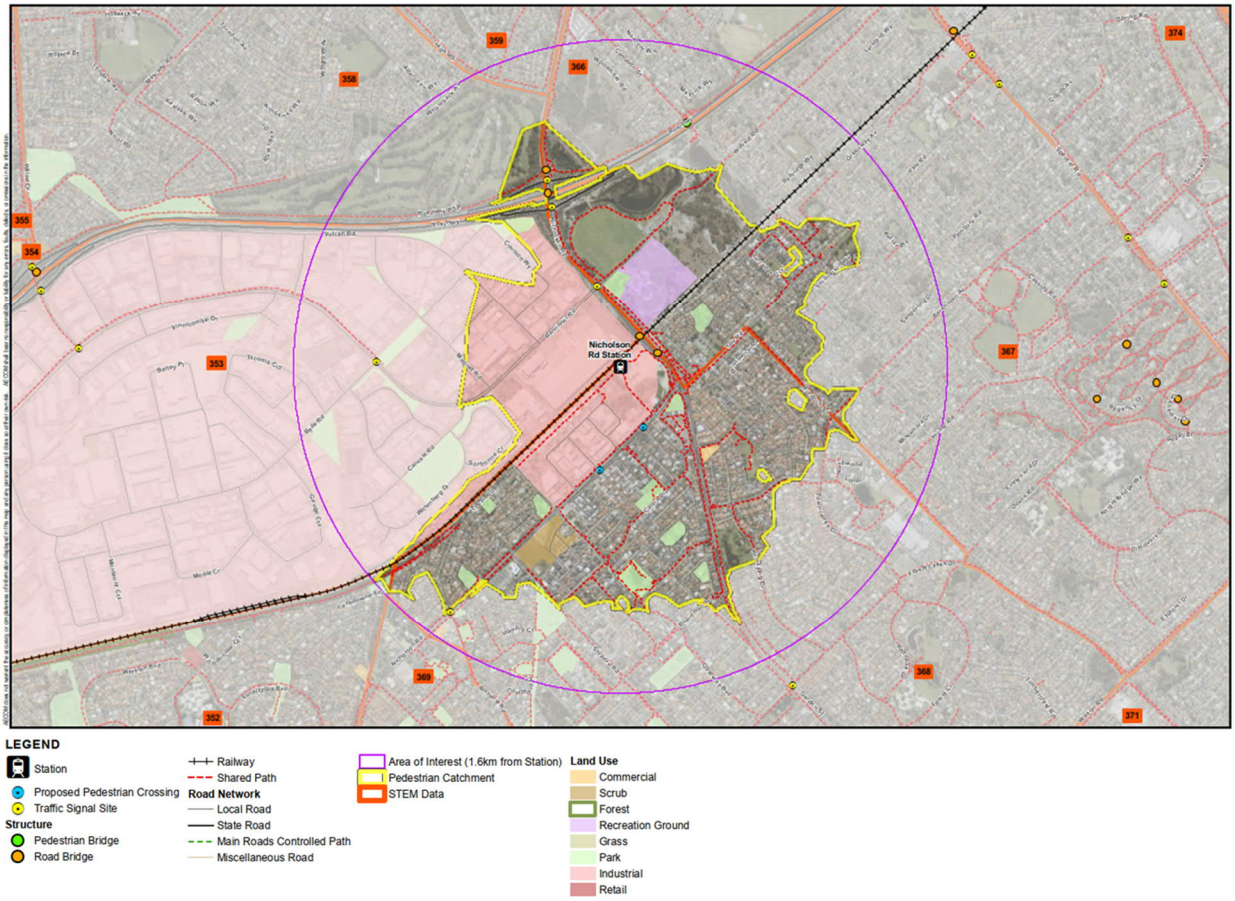


Table 6 highlights the area-based overlaps between the future walkable catchment and the MLUFS zones, along with an assumed proportion of population and employment within overlap following consideration of the existing and planned detailed land use data sourced from structure plans.

Table 6: Future (2031) Walkable Catchment and MLUFS Zone Adjusted Overlap

MLUFS Zone	Overlap with catchment	Adjusted proportion of population and employment within overlap	Reason for adjustment
353	9%	9%	
358	1%	0%	No trip-generating land use included in catchment overlap
366	2%	0%	No trip-generating land use included in catchment overlap
367	16%	10%	Catchment overlap includes large proportion of non-developed land
368	27%	35%	Catchment overlap includes areas of zone (the surrounding station precinct with future TOD development) expected to generate most pedestrian demand

4.6 Mode Share Potential

Table 7 summarises the adjusted overlaps between the mode-specific catchments and the MLUFS zones, along with the resulting potential patronage volumes using the patronage volumes presented in Section 3.0. The potential patronage is assumed to be directly proportional to the residential population and number of employment opportunities combined (except for the car catchment which only relies in the residential population as a result of the assumption that workers travelling to the station will not use car for onward travel). It is important to note that these potential patronage volumes only denote the theoretical maximum patronage volumes for each mode. Hence, these should be viewed as the potential market size rather than the actual patronage.

Table 7: Potential Patronage by Mode

	Adjusted overlap - 2031				Potential patronage - 2031			
MLUFS Zone	**Car**	**Bus**	**Cycling**	**Walking**	**Car**	**Bus**	**Cycling**	**Walking**
352	0%	0%	9%	0%	0	0	1,152	0
353	48%	35%	36%	9%	0	6,803	6,997	1,749
358	100%	91%	0%	0%	5,419	5,837	0	0
359	12%	12%	4%	0%	978	1,119	373	0
366	5%	0%	0%	0%	293	0	0	0
367	30%	30%	23%	10%	3,177	3,590	2,752	1,197
368	100%	93%	76%	35%	20,015	21,235	17,353	7,992
369	71%	71%	15%	0%	16,828	20,045	4,235	0
370	75%	40%	0%	0%	6,206	3,782	0	0
371	40%	20%	0%	0%	5,109	2,789	0	0

The combined potential patronage volumes for all MLUFS zones and each mode serve as an indication of their market size (i.e. the potential number of rail passengers either living or working within each catchment). The relative size of their market share (defined as potential mode share) is the used as one of the indicators for deriving the effective ("actual") mode share. For example, if the potential patronage with the cyclable and walkable catchments is relatively large compared to the overall catchment, then this would suggest that a high effective mode share for active modes.

The potential mode share is determined by calculating the proportion of potential patronage for each mode relative to the potential car patronage, as summarized in Table 8. The methodology assumes that only residents in the station catchment will use a car to access the station and that employees arriving from elsewhere at this station will travel onwards by other modes. Therefore, the non-car modes may have a potential mode larger than 100% share relative to the potential car mode share, as is the case for bus in the estimation here.

Table 8: Potential Mode Shares

2031	Car	Bus	Cycling	Walking
Potential patronage	58,025	65,668	32,862	10,937
Potential mode share	100%	112%	57%	19%
Potential mode share (Arup, 2018)	100%		69%	8%

The analysis highlights that relative to the car catchment, the potential for a large effective bus mode share as the potential patronage for bus exceeds the potential car patronage. The potential cycling patronage is roughly half that of the car catchment. Although this is less than found in previous Arup analysis, it still suggests an ambitious effective mode share for cycle should be targeted. The potential walk patronage is relatively minor compared to other modes (although larger than previous Arup analysis), and therefore a more ambitious effective pedestrian mode share is likely unrealistic.

5.0 Access Mode Share

The effective mode shares for 2031, presented in Table 9, have been derived using bench-marking analysis against similar stations (considering the Station typologies and catchment conditions) and consideration of the potential mode shares derived in Section 4.0. These have subsequentially been compared to the mode shares suggested by previous TCL 2018[2] analysis (Arup) and TCL 2019[3] analysis (WSP). The car access modes, 'Kiss and Ride' (KnR) and 'Park and Ride' (PnR) has been estimated separately, in order to be able to assess the required parking supply in Section 0.

The WSP analysis, which builds on the Arup analysis, is based on 2021 mode shares with the adjustment that the PnR mode share is constrained to the assumed parking capacity and shifting the overflow PnR to bus. Therefore, the WSP mode shares could potentially overestimate the bus target mode share for the 2031 scenario.

[2] TCL 2018 - Thornlie Rail Line Extension Strategic Access Planning (Arup, 2018)
[3] TCL 2019 - Thornlie – Cockburn Link Transport Assessment (WSP, 2019)

Table 9: Effective Mode Shares 2031

Mode shares	TCL 2018[4]	TCL 2019[5]	STEM	TCL 2020 Catchment Analysis	Comments
Walking	6%	7%		8%	Based on increased potential pedestrian patronage compared to Arup analysis (although overall still small) and benchmarking against Warnbro (4%) and Thornlie (13%) Station Access Strategy 2031 targets, noting that Thornlie Station is likely to have more opportunity for TOD / more intensive land uses within the pedestrian catchment
Cycling	10%	5%		4%	Based on decreased potential cycling patronage compared to the Arup analysis, and benchmarking against Warnbro (4%), Wellard (5%), Oats Street (2%) and Thornlie (1%) Station Access Strategy 2031 targets and reflecting the direct and quality PSP connections to be delivered as part of the Nicholson Road Station.
Walking + Cycling	16%	12%	8%	12%	A low combined active mode share is a conservative estimate for the SP4 Neighbourhood Precinct Typology.
Bus	40%	33%	9%	45%	A high mode share is suggested to reflect relatively large potential bus catchment, benchmarking against Warnbro (45%), Oats Street (38%) and Thornlie (33%) Station Access Strategy 2031 targets and to reflect its Bus n Ride access typology classification.
KnR	11%	14%	11%	15%	A network-standard mode share is suggested.
PnR	32%	41%	71%	28%	Remaining mode share, and reflective of the Station Access (Bus n Ride / Park n Ride) and SP4 Station Precinct Typology.

[4] TCL 2018 - *Thornlie Rail Line Extension Strategic Access Planning* (Arup, 2018)
[5] TCL 2019 - *Thornlie – Cockburn Link Transport Assessment* (WSP, 2019)

Nicholson Station is located within a 'brownfield' development area without significant land use changes planned between 2021 and 2031. The forecast patronage growth is likely to be captured across all station access modes:

- There is a planned Transit Oriented Development within the immediate station area which will increase the number of walking trips to this station, but this is unlikely to be fully delivered within 10 years and therefore unlikely to significantly increase the overall walking mode share by 2031.
- The MLUFS data indicates residential growth for the Southern River area (STEM Zones 370, 371) which would generate an increase in PnR and bus trips to the station.
- The MLUFS forecast growth in employment within the industrial area to the west of the station (STEM Zone 353), would account for some increase in walking and bus trips to/from the station, and a minor increase in cycling trips.

The station access mode splits are therefore not expected to change between 2021 and 2031, and the growth in patronage from the intensification noted above is assumed to be captured in the adopted 2031 daily boardings forecast for Nicholson Station. Table 10 presents the resulting daily boardings by mode for the years 2021 and 2031, based on the assumed mode share in Table 10 and adopted 2021 and 2031 patronage for Nicholson Station.

Table 10: Patronage by Mode

Patronage by mode	2021	2031
Walking	180	202
Cycling	90	101
Bus	1,013	1,139
KnR	338	380
PnR	630	708

6.0 Station Requirements

Based on the PnR patronage volumes estimated in Section 5.0, long-term parking supply requirements for Nicholson Road Station have been assessed, using an assumed 1.1 parking space turnover rate and 1.2 vehicle occupancy rate (consistent with the previous Arup and WSP analysis). The resulting necessary parking supply is presented in Table 11, along with a comparison against previous Arup and WSP analysis, STEM modelling assumptions and current design provision. The analysis suggests that the current design provides an oversupply of parking for both the anticipated 2021 and 2031 demand, based on the patronage forecasts adopted for the TCL project. This could lead to a detrimental effect for the active and public mode shares and overstimulate Park n Ride usage. However, concurrent analysis has concluded that the current proposed provision for the two neighbouring stations, Ranford Road and Thornlie stations, will likely be insufficient to meet demand. Therefore, in addition to revisiting and potentially reducing the parking supply at Nicholson Road Station, its role as a reliever station for Park n Ride passengers for neighbouring station catchments should be considered. This would help ensure no potential loss in overall rail patronage from the wider area resulting from parking capacity constraints.

Table 11: Future (2031) Parking Requirements

Parking	TCL 2018[5]	TCL 2019[6]	STEM	Current 15% Design	TCL 2020 Catchment Analysis
2021	666	963		963	477
2031	589	963	1,000	963	537

7.0 Conclusions

This note has reviewed the proposed station access mode shares for Nicholson Road Station and the associated patronage for each access mode. It is estimated that the suggested parking provision will result in an oversupply relative to the demand for both the opening and forecast year, based on the forecast patronage adopted for the TCL project. However, the station is also likely able to act as a complimentary source of parking for surrounding stations where demand is forecast to surpass proposed capacity. Therefore, keeping the suggested parking provision could help prevent any loss of potential Park n Ride demand resulting from capacity constraints.

APPENDIX N INDIGENOUS HERITAGE SURVEY

ABORIGINAL HERITAGE SURVEY:

THORNLIE-COCKBURN LINK PROJECT

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For
Public Transport Authority,
Public Transport Centre,
West Parade,
Perth
WA 6000.

September 2017

TCYAD-R&E-AH-RPT-00001

Coordinates listed in this report are MGA Zone 50.

Aboriginal readers should note that this report contains references to and the names of deceased Aboriginal persons.

ABSTRACT

The Public Transport Authority proposes to construct a 17.5 kilometre railway extension from Thornlie to Cockburn Central, which will serve the current and future growth occurring between the Mandurah and Armadale Railway lines. In September 2017, PTA commissioned R & E.O'Connor Pty Ltd to carry out an Aboriginal consultation and a heritage survey of the Thornlie-Cockburn Link Project and produce a report suitable to inform a Notice pursuant to Section 18 of the *Aboriginal Heritage Act 1972* to be submitted to the ACMC in respect of the proposed works, should such submission be required. This document details the methodology, execution and results of that consultative process and Aboriginal heritage survey.

Searches of the Register of Aboriginal Sites at the Department of Planning, Lands and Heritage for the Rail Extension corridor and surrounding land were carried out as a component part of the survey. Register extracts are included in this report as Appendix Four. One registered Aboriginal Site, as follows, is listed in the Register as relevant to the Rail Extension.

- Canning River – Site Number 3538, a mythological and water source site.

This site, which is listed on the Permanent Register has been the subject of a number of previous reports and Section 18 Applications. Because of its status and history, it is the author's opinion that any additional bridgeworks in its vicinity associated with the Project should be preceded by an application pursuant to Section 18 of the *Aboriginal Heritage Act 1972*. The Project involves construction of a new bridge structure across this Aboriginal site.

An initial inspection of the Rail Extension was carried out by the author on 15 September 2017. The morning of Monday, 19 September 2017 was chosen for the meeting and the representatives chosen by SWALSC were notified in the course of the intervening weekend. The proposed works areas were inspected by Ms. M.Yarran, Mr N.Morich, Mr H.Nannup, Ms. T.Walley, Ms. D.Getta, Mr S.Champion, Ms. D.Wynne and Mr T.Walley. PTA was represented on site by Ms. C.Harwood, Senior Environmental Planner for Metronets and Ms. L.Zimmermann, Environmental Officer Infrastructure, Planning and Land Services. R & E.O'Connor Pty Ltd was represented by R.O'Connor and Mr Ted Hart.

In addition to the Canning River Aboriginal Site discussed above, the Aboriginal heritage survey herein documented nominated a wetland area in the proposed Nicholson Road station site as an Aboriginal site. Following the winter rains the wetland area contains surface water and associated reeds indicate that it is a permanent feature. It is located at (MGA Zone 50) 399641E 6452183N. It is a roughly circular shape, with a radius of thirty metres (30m).

As a result of the field survey and database research, the following recommendations are made.

Recommendation One: Public Transport Authority should submit a Notice pursuant to Section 18 of the *Aboriginal Heritage Act 1972* to the Aboriginal Cultural Material Committee in respect of proposed works associated with the Project at Canning River crossing and Nicholson Road Station.

Recommendation Two: A Heritage Information Submission form should be submitted to the Department of Planning, Lands and Heritage in respect of the wetland area at Nicholson Road station site nominated as an Aboriginal site by the Whadjuk survey participants.

Recommendation Three: In view of the possibility of encountering Aboriginal cultural material, Aboriginal monitors should be engaged by Public Transport Authority to attend on site when initial ground disturbance associated with the Project is taking place.

Recommendation Four: Public Transport Authority should arrange for access to the Nicholson Road station site and convene a further meeting of the Whadjuk representatives there before Project construction commences. The northern bank of Canning River where the bridgeworks will take place can be visited at that time also.

Recommendation Five: The Aboriginal Cultural Material Committee should recommend to the Minister that formal consent for the Project should be granted, on the grounds that the Whadjuk representatives have given their conditional approval, that disturbance to Aboriginal heritage sites will be minimal and that the proposed railway extension will be of benefit to the general community.

Recommendation Six: Public Transport Authority should give favourable consideration to the non-heritage matters raised by the Whadjuk representatives and listed in Section 3.5 of this report.

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1.0 BACKGROUND

1.1 Introduction

Metronet is the long-term blueprint for connecting Perth's suburbs, reducing road congestion and meeting the Metropolitan Area's future planning needs. It will ensure that consideration of land-use outcomes is embedded in the design of new infrastructure. As part of that programme, the 17.5 kilometre railway extension from Thornlie to Cockburn Central (the Thornlie-Cockburn Link Project – "the Project") will serve the current and future growth occurring between the Mandurah and Armadale Railway lines. The Project will provide local residents and employees with better connections and more public transport. It will also allow the introduction of a Mandurah special service for events at Perth Stadium. It addresses the following three local issues:

- Current transport connections are insufficient to cope with expected population growth;
- The radial design of the current passenger rail network creates service gaps and reduces system resilience, limiting passenger mobility; and
- Economic and population growth pressures are leading to increased congestion and crowding across the transport system, adversely impacting the productivity of the system.

In September 2017, Public Transport Authority (PTA) commissioned R & E.O'Connor Pty Ltd to carry out an Aboriginal consultation and a heritage survey of the Thornlie-Cockburn Link Project and produce a report suitable to inform a Notice pursuant to Section 18 of the *Aboriginal Heritage Act 1972* (AHA) to be submitted to the Aboriginal Cultural Material Committee

(ACMC) in respect of the proposed works, should such submission be required. This document details the methodology, execution and results of that consultative process and Aboriginal heritage survey.

1.2 Research Brief

The Project area, as detailed in the Activity Notice submitted to South West Aboriginal Land and Sea Council in accordance with the requirements of the Whadjuk Noongar Standard Heritage Agreement, is shown in Figure One; Figure Two details the proposed bridgeworks at Canning River; Figure Three details the design of the proposed Nicholson Road Station and associated car parking facilities; Figure Four shows design of and associated facilities at the proposed Ranford Road Station. In respect of the Project, as thus described, the research brief required R & E O'Connor Pty Ltd to carry out the following duties.

- Assist PTA with the implementation of the Noongar Standard Heritage Agreement (NSHA) as it applies to proposed formal consultations to support a Section 18 application in respect of the above works, should such an application be required.
- Liaison with South West Aboriginal Land and Sea Council (SWALSC) as required.
- Arrange for on-site consultations with the relevant knowledge holders as advised by SWALSC.
- Liaise with attendees to advise meeting times and locations.
- Facilitate and minute consultation sessions.
- Pay all required consultation fees to attendees.

- At the completion of the briefings provide a report which
    1. Provides the context for the consultations;
    2. Contains detailed minutes of the consultations;
    3. Provides a concise summary of key items raised during the consultations;
    4. Provides recommendations for PTA regarding significant matters raised during the consultations;
    5. Provides payment records for any consultation fees paid to attendees; and
    6. Is suitable to support a Section 18 Application under the AHA, should such an application be required.
- Assist with the drafting of a Section 18 Notice, as required.

It is noted that, for a report to be suitable to inform a Notice pursuant to Section 18 of the AHA as required above, it, and the consultative process and surveys which it details, should be in such a format that it assists the ACMC to:

- Form an opinion as to whether there is any Aboriginal site on the land in question; and
- Evaluate the importance and significance of any such site.

1.3 Potential Impacts of Proposed Works

The environmental impact of the proposed works will be minimal, as the major part will take place within or alongside an existing rail corridor, the Forrestfield to Kwinana Freight Line. Areas not included within that corridor are shown on Figure One and detailed in Figures Two to Four. A new proposed bridge crossing of the Canning River will also involve minimal disturbance to the riparian environment, as bridge footings and pylons will not be positioned within the waterway.

2.0 SOCIAL AND HISTORICAL BACKGROUND.

2.1 Anthropological Considerations

The Aboriginal political geography of Southwestern Australia has been described in O'Connor (1984), O'Connor, *et al.*, (1985) and O'Connor and Quartermaine (1986 and 1987). The following summarised points are relevant to the present exercise.

2.1.1 Southwestern Aborigines were a distinct sociocultural group in pre-contact times, although dialectal variation occurred within a single southwestern language family.

2.1.2 A regional system of land tenure, based on either kinship or dialectal units existed.

2.1.3 Territorial separateness disappeared soon after European settlement, due to population movements, deaths and the development of fringe camps (and later settlements and "missions").

2.1.4 The development of a widely-scattered population of people of mixed-ethnic background, who live in the southwest of this State, see themselves as sharing a common identity and refer to themselves as "Nyungars", occurred during the nineteenth century. Contradicting that tendency, families were still seen by other Nyungars as "belonging" to specific areas on the basis of connections with the traditional past.

2.1.5 Continuity with that traditional past, knowledge of regional mythology and knowledge of areas of religious significance were passed to the present senior adult generation of Nyungars by a pivotal generation of culture transmitters. Among these, in the Metropolitan Region, were Maitland Sandy, Chitty Hedland, Daglish Granny, Sam Broomhall, Herbert Dyson, Bulyil, Wandi, Lottie Harris and Ollie Worrell and George Winjan and Kitty in the Peel Region.

2.1.6 There is now a determination among the present senior adult generation to protect remaining areas of significance from development.

2.2 Significance

Significance is attributed by Aboriginal people to areas in the South West region on the basis of former or current domestic usage, or on the basis of relevance to traditional ritual or mythology. Broadly speaking, this distinction can be viewed as a series of dichotomies between historical and mythological, human and supernatural, or mundane and sacred areas. Thus, one area may be viewed as significant from a historical/human/mundane viewpoint, and another from a mythological/sacred viewpoint.

In addition to the above, a substantial number of Aboriginal sites are mentioned in Hammond (1933), Moore (1885), Bates (numerous dates) and other historical sources. Any sites not known to contemporary Aborigines cannot reasonably be classified as "sites of significance to living Aborigines". However, rediscovery or realisation of the existence of such sites could lead to an attribution of significance. Thus, the neat compartmentalisation resulting from European academic disciplines may not fit absolutely the Aboriginal models; any archaeological or historical site in the survey region could also be potentially significant to Aboriginal people.

In the course of a previous survey in the Mandurah area, however, a further aspect of significance, which the present author terms "generalised significance" was encountered. This has been touched upon in O'Connor and Quartermaine (1989), but not considered there in detail. The Aboriginal elders from the Mandurah area referred to the undeniable fact that the region's wetlands and rivers were Aboriginal food and water resources, access tracks and campsites. They also pointed out that those areas were spiritual repositories, not in the sense of the ubiquitous Waugal myth, which has been previously recorded in relation to the Murray and Serpentine Rivers, but in a more general sense which draws on the fundamentals of Aboriginal

philosophico-religious belief. In this belief system all living creatures, including humans, share a common spiritual essence and therefore, by extension, every living being represents a part of the wider spiritual universe. The region's wetlands, as breeding grounds for numerous living creatures, are therefore repositories of this spiritual essence realised generationally by individuals.

The above concept is clearly a development from the commonly held notion that significance is only attributable specifically. However, if Section Five of the *Aboriginal Heritage Act* is carefully considered, it is clear that it would be difficult to argue that areas to which this generalised significance is attributed are not Aboriginal sites within the meaning of the Act, as they are clearly being described by the Aboriginal people concerned as "sacred" places "of importance and special significance to persons of Aboriginal descent". Nonetheless, the author has been notified by the (then) Department of Indigenous Affairs that the Aboriginal Cultural Material Committee has received legal advice that an attribution of generalised significance by Aboriginal people is insufficient to meet the requirements of Section 5 (b) of the Act. There is therefore a potential dissonance between "Aboriginal sites", as defined by Aboriginal people, and "Aboriginal sites", as defined by the Act.

2.3 Native Title Matters

On 8 June 2015 the Government of Western Australia signed six individual Indigenous Land Use Agreements (ILUA) with the six native title groups whose Applications for

Determination of Native Title covered the South West Region of the State. These groups are the Yued, Gnaala Karla Booja, South West Boojarah, Wagyl Kaip, Ballardong and Whadjuk. The areas of proposed works considered in this report lie wholly within the area covered by the Whadjuk ILUA. Most components of the above settlement of the Applications will not commence until the ILUAs are successfully registered, an outcome currently being delayed by ongoing legal action. For the avoidance of doubt, this report notes that, regardless of the ultimate outcomes of that legal action, the AHA still applies and will continue to apply at all times.

Under the ILUA, the NSHA created a new uniform approach to Aboriginal heritage surveys, providing all involved parties with a clear and timetabled framework about their obligations in respect of Aboriginal heritage matters and how to deal with those obligations. The implementation of the NSHA came into effect from the settlement date of the ILUAs, namely 8 June 2015. All WA Government land users are required to enter into and follow the NSHA if there is a risk that a proposed activity will unlawfully impact upon an Aboriginal site. Accordingly PTA, as a Government Agency, entered into a NSHA with SWALSC, as representative of the Whadjuk People, and an Activity Notice was duly issued to that Council in respect of the Rail Extension.

3.0 THE SURVEY

3.1 Methodology

The survey included five separate stages, as follows:

(i) examination of existing ethnographic database;

(ii) On-site inspection of areas of proposed works by the anthropologist to decide upon a suitable venue for the initial survey meeting;

(iii) consultation with Whadjuk representatives nominated by SWALSC after consideration of the Activity Notice;

(iv) inspection of areas of proposed works by nominated Whadjuk representatives in the company of the author and PTA Officers;

(v) report preparation.

SWALSC replied to the PTA Activity Notice mentioned in 2.3 above, advising the need for an Aboriginal heritage survey of the Project Area, nominating a Site Identification Survey methodology. That field methodology is described in the *Aboriginal Heritage Procedures Manual (2002)* as follows.

Ethnographic research involves the identification and recording of Aboriginal sites, as defined under the Aboriginal Heritage Act, through interviews and field inspections with Aboriginal Consultants. This process has been termed a "site identification survey"
During the ethnographic research process, the Aboriginal Consultants are asked about their associations with the area under consideration and whether they know of the existence of any places that might be considered Aboriginal sites.
If such places are identified, the Aboriginal Consultants are asked to provide details of their nature and extent. Although the ethnographer may record detailed cultural information about the place(s), this will not necessarily be communicated to the proponent, as it may be deemed highly culturally sensitive by the Aboriginal Consultants.

3.2 Existing Aboriginal Heritage Database

Searches of the Register of Aboriginal Sites for the Rail Extension corridor and surrounding land were carried out as a component part of the survey. Register extracts are included below as Appendix Three. One registered Aboriginal Site, as follows, is listed in the Register as relevant to the Project.

- Canning River – Site Number 3538. This site, which is listed on the Permanent Register has been the subject of a number of previous reports and Section 18 Applications, the first of which is detailed below. Because of its status and history, it is the author's opinion that any additional bridgeworks in its vicinity associated with the Project should be preceded by an application pursuant to Section 18 of the *Aboriginal Heritage Act 1972*. It is also suggested that any bridge widening should be designed in such a way that no additional piling in the bed or banks of the river is required.

In 1989, on behalf of (then) Main Roads Department, R.O'Connor and G.Quartermaine produced the *Report on a Survey for Aboriginal Sites on the Roe Highway, Welshpool Road to South Street Section.* No archaeological sites were recorded within, or in close proximity to the current Project area in the course of that survey. Aboriginal participants were Mr C.Bodney, Mr P.Bennell, Mr K.Miller, Mr J.Woods, Mr A.Mippy and Mrs V.Mippy. The report includes the following comments on Canning River. *Aboriginal interests in the Canning River have been previously noted in a number of documents prepared for the Water Authority of WA and other agencies by O'Connor and Bodney. Its association with a Waugal myth would appear to be sufficient grounds for its registration as an Aboriginal site within the meaning of the AHA. The accurate definition of a riverine site has become a contentious issue in the years following the protracted dispute between SECWA and the Fringedwellers of the Swan Valley Inc. over the*

crossing of Bennett Brook by the High Pressure Gas Pipeline. It is clear that in all cases the Aboriginal concept of a site of this nature includes, minimally, the actual ground depression through which the main stream flows and the sub-surface soils to an indeterminate depth. However, the banks and surrounding floodplain may also be seen by Aboriginal people either as a buffer zone or as an integral part of the site. In the case of the Canning River, it is the author's opinion that the Aboriginal site should be seen as the area within the one hundred year flood level. The Canning River was registered as an Aboriginal site within the meaning of Section 5 of the AHA as a result of this report. However, no mention was made therein of the River's tributaries and therefore these were not at that time included in the registration.

3.3 Field Inspection and Consultative Meetings

An initial inspection of the Rail Extension was carried out by the author on 15 September 2017. A suitable meeting point from which the proposed crossing of the Canning River could be viewed was selected. Whadjuk representatives nominated by SWALSC to participate in the field survey were as follows: Mr Stanley Headland, Ms. Myrtle Yarran, Ms. Theresa Walley, Mr Noel Morich, Mr Harry Nannup, Ms. Doris Getta, Mr Simon Champion, Ms. Dianne Wynne and Mr Trevor Walley as reserve, should one of the previous eight not be available. The morning of Monday, 18 September 2017 was chosen for the meeting and the representatives chosen by SWALSC were notified in the course of the intervening weekend. Mr Headland could not be contacted and Mr Walley, nominated as reserve by SWALSC, duly took his place. The meeting took place at the selected point, adjacent to O'Dell Street in Thornlie, beside the Canning River.

PTA was represented on site by Ms. C.Harwood, Senior Environmental Planner for Metronet and Ms. L.Zimmermann, Environmental Officer Infrastructure Planning and Land Services. R & E.O'Connor Pty Ltd was represented by R.O'Connor and Mr Ted Hart.

3.4 Meeting Discussions

R.O'Connor (ROC) declared the meeting open at 10:10 at the selected point, within clear view of the Canning River crossing, welcomed all to the meeting and explained its purpose. The PTA representatives then gave a detailed explanation of the Project.

C.Harwood (CH): Although we will follow the existing freight line and the existing passenger line as far as Thornlie, there will be a second passenger line constructed alongside the existing one, so we will require a second bridge to carry the line across the Canning River. From Thornlie there will be two new lines all the way to the joining with the Mandurah line. There will be two new stations: one at Ranford Road and another at Nicholson Road. The Ranford road site is at the current waste recycle and disposal facility; the Nicholson Road site is currently within a construction site where MRWA contractors are building a bridge to carry that roadway across the freight line. Here at Canning River we will not be disturbing the waterway itself as there will be no piles in the river. The bridge will duplicate the existing one, with structures on both banks and a span across the river.

Noel Morich (NM): When will construction start?

CH: Construction will start in 2018 or 2019 to open the railway in 2021.

R.O'Connor (ROC): Spoke of the original Aboriginal heritage survey carried out for the existing rail link to Thornlie. Recalled that the late Mr Patrick Sullivan Hume had participated.

CH: The original plan for the Mandurah Railway route had a number of options for consideration – one was to build the railway through Thornlie and use the alignment we are now going to use. The tunnel under the Freeway is already in place for us to use.

NM: What is the budget for this work?

CH: Approximately five hundred million dollars.

NM: Will there be opportunities for local Aboriginal content in the tendering process – tendering for contracts.

CH: PTA is looking at a possible Aboriginal Engagement Strategy.

ROC: As Noel will tell you, we have been trying with the Forrestfield-Airport Link, but are having difficulty filling our quotas for Aboriginal employment and contracting.

CH: We hope to learn from that experience.

The group then walked to a position under the existing rail bridge.

CH: You can see here that there is provision for the additional bridge, but also that we are very constrained by the other infrastructure here.

Dianne Wynne (DW): Can the pylons be brought back a bit further from the water?

CH: The problem is that the bicycle path has to stay here, so the constraints do not allow a shift of much more than a half-metre on this bank.

Ted Hart (TH): Just to note that in all earlier consultations, people preferred pylons to be further back from the hundred-year flood level.

CH: Yes, but that is just not possible here because of existing constraints.

DW: It looks like it should be possible on the other side.

CH: Yes, there are less constraints on the other side.

ROC: Will you apply for a Section 18 Ministerial Consent for this work?

CH: Yes.

TH: Will you need another bed and bank permit?

CH: We are investigating that; it depends on where the pylons are going.

NM: You may disturb cultural material on the banks. Will you have our people monitoring works here?

CH: That could be a recommendation of the report.

ROC: Do you wish for that recommendation to be included in my report?

General discussion on the recommendation that monitors should be present during works. A motion was passed unanimously to that effect.

NM: They should be there for the entire Project works.

ROC: Much of those works are along the existing line.

NM: There was never a survey of that line. If you expand out, even in the rail corridor, you may disturb new ground.

NM: Are we going to stop at the other places outside the existing corridor?

CH: That is easy at Ranford Road, but the problem with Nicholson Road is that there is a lot of traffic there. We can probably stop at Willow Ponds Reception Centre and walk from there. But the area is fenced off at present by the MRWA contractors building the bridge across the railway line.

Again, a general discussion took place and a decision was taken to try to get access to the Nicholson Station site. A request was also made by those attending that the maps which are

included in this report as Figures One to Four should be sent to the Whadjuk representatives in attendance by PTA.

ROC: I can supply the addresses to PTA so they can be posted out.

Meeting then reconvened at Willow Ponds Reception Centre car park at 10:55 and the party walked to the MRWA work site, staying outside the works fence.

NM: In all how many bridges will there be?

CH: Apart from the river crossing there will be three: one at Nicholson Road, one at Ranford Road and one at Karel Avenue.

CH: As you can see, currently MRWA is building a bridge to carry Nicholson Road over the freight line and the future passenger line. This does away with railway crossings and the associated dangers and delays. The car park and railway station will be here (showing map included as Figure Three below).

Theresa Walley (TW): There is a nice little pool there, right where the car park will be.

CH: It has surface water in winter.

Unrecorded speaker: There are reeds there.

ROC: In that case it isn't a result of the earthworks going on.

TW: I would like to make a recommendation that the pool should be retained in the landscaping that is going to happen here. Rather than covering it in concrete.

Trevor Walley (TRW): it should be retained. Water is a sacred thing to us.

TW: The Rainbow Serpent is the spirit of the water under the ground. Just as a serpent travels by raising part of the body and then lowering it, the Rainbow Serpent we call the Waugal travels

under the ground and then comes up for a while and then goes down again. These places where he comes up are wetlands and are his sites.

General discussion about this topic and ROC was instructed to include a recommendation from the Whadjuk representatives that the wetland should be preserved through incorporation into a landscaped area within or bordering the proposed car park. The central point of the wetland in question is located at (MGA Zone 50) 399641E 6452183N. It is a roughly circular shape, with a radius of thirty metres (30m).

NM: We really need to walk around this area.

CH: Unfortunately, the MRWA contractor has it fenced off and we are not permitted inside the fence.

General discussion about this mater and a request was made that the representatives should be allowed to return to walk over the area and inspect it. A security person from the contractors approached the party at that stage to ask why we were on site. CH and ROC spoke to him and he suggested that we should contact his office to arrange access. In reply to a question as to whether an Aboriginal heritage survey had been carried out for the current works, he stated that he did not know.

ROC (having returned to the meeting): Did anyone to your knowledge carry out a survey here for these works?

General reply: No.

Myrtle Yarran (MY): Where water is, there you will find old Nyungar camps and sacred sites. That is where you will find all our old relics [Author's note: Ms. Yarran was referring to items of Aboriginal cultural material, such as artefacts].

NM: If we are going to come back to inspect this place, can we also at the time walk to the other bank of the Canning River to have a look at it.

CS: There is private property on the other bank of the river, but I will look into that.

TH: There is a little park on the other side you can walk across.

Meeting then reconvened at Canning Vale Waste Recycling and Disposal Facility at 11:45.

CS and LZ referred to the map included below as Figure Four to explain the proposed station and car park lay-out.

NM: There is some bush that will be disturbed between here and the road.

CH: Yes (showed the area on the map).

TRW: There are a lot of rare orchids here. They need fire to generate and then the winter rains raise them. [Author's note: Mr Walley is a retired CALM Officer].

CH: We have had surveys for rare orchids done, but we are awaiting the results.

MY: We need to also consider protecting the native trees. They are our medicines and our foods.

A general discussion about orchids followed, with references to the Spider Orchid of the *Caladenia* genus.

LZ: There has been a survey for them and we will protect them. The survey is for orchid habitats as well as just for the orchids.

CH: Pointed out on the map the nearby conservation area in Caladenia Grove Reserve – a Nature Reserve.

TRW: Orchids are important to us, the Caladenia is our totem.

NM: We need to have monitors on site for rare orchids when digging for the station here.

CH: Our survey will show potential habitats for them.

TRW: Could you consider using the name of the rare orchids here for the railway station? Can we have that as a recommendation?

ROC: Do we all agree?

General agreement. No objections. Caladenia should be the name of the station.

TRW: Can I also recommend that we get a Nyungar artist to do artwork for this station.

NM: We should have more real input in terms of contracts. There should be a concrete agreement for Nyungar contractors, labour and employment. We need an Aboriginal Company to liaise with the lead contractor.

TH: There could be a Joint Venture with the principal contractor.

NM: There is an example of that in Victoria. BARPA acts as joint venture with lead contractors to encourage Aboriginal participation in the workforce.

At this point, a person from the Waste Disposal Facility approached the group to enquire into our reason for gathering in the car park. LZ and ROC spoke to him and explained our purpose.

TRW: There is something else I want to bring up. We have had three meetings today and covered a lot of ground. But we only get one payment. This probably isn't too bad, but Main Roads meetings are running us all over the country and expecting us to give approval for a lot of different projects in one meeting. It is not right because we don't get a chance to walk around and look at places properly.

ROC: The way the Activity Notices are set out, we tend to look at Projects at one time, rather than specific work areas.

TH: The Agreement says that the payments are for a day or a part of a day.

ROC: I understand the issue. Perhaps that is something you should discuss with SWALSC, as we are only able to work within the rules set by the Agreement and the directions given by

SWALSC, which include the numbers to be involved, the payments to be made and the persons who are appointed to carry out the surveys of the various projects.

A general discussion followed after drinks were distributed by the PTA representatives. The meeting closed at 12:45 after representatives had signed a conditional approval for the Project and receipts for consultancy fees paid. Those documents are included below as Appendix Three.

3.5 Meeting Outcomes

The Whadjuk representatives are generally supportive of both the Project herein considered and also the general principle of light rail development in the Perth Metropolitan area. The following heritage-related issues were raised in the course of the survey.

- In view of the possibility of encountering Aboriginal cultural material in previously-undisturbed parts of the Project area, or in parts where fill has been laid on the original ground surface, Aboriginal monitors should be on-site for all initial ground disturbance.
- The Whadjuk representatives wish to return to inspect the Nicholson Road station site on foot when access can be arranged. Whilst thus engaged, they can also visit the northern bank of the Canning River where the proposed pylon will be located.
- The wetland at the proposed Nicholson Road station site is an Aboriginal site because it is a manifestation of the Waugal. It should therefore be protected by incorporation into a landscaped area.

Recommendations in respect of the above three matters are included below. Other non-heritage related issues raised were as follows:

- Whadjuk people want opportunities for direct employment on the Project;
- Whadjuk people also want opportunities for Whadjuk businesses to tender for contracts on the Project;
- The Ranford Road station should be named after the Caladenia orchid;
- There should be Whadjuk monitors skilled in identifying Caladenia orchid habitats on site when previously-undisturbed bushland is being cleared for the Ranford Road station site.
- Whadjuk people want involvement in the public art planning for the two proposed stations – the Ranford Road station should include artwork incorporating the Caladenia orchid and should be carried out by a Whadjuk artist.

4.0 CONCLUSIONS AND RECOMMENDATIONS

The Public Transport Authority proposes to construct a 17.5 kilometre railway extension from Thornlie to Cockburn Central, which will serve the current and future growth occurring between the Mandurah and Armadale Railway lines. In September 2017, PTA commissioned R & E.O'Connor Pty Ltd to carry out an Aboriginal consultation and a heritage survey of the Thornlie-Cockburn Link Project and produce a report suitable to inform a Notice pursuant to Section 18 of the *Aboriginal Heritage Act 1972* to be submitted to the ACMC in respect of the proposed works, should such submission be required. This document details the methodology, execution and results of that consultative process and Aboriginal heritage survey.

Searches of the Register of Aboriginal Sites at the Department of Planning, Lands and Heritage for the Rail Extension corridor and surrounding land were carried out as a component part of the survey. Register extracts are included in this report as Appendix Four. One registered Aboriginal Site, as follows, is listed in the Register as relevant to the Rail Extension.

- Canning River – Site Number 3538, a mythological and water source site.

This site, which is listed on the Permanent Register has been the subject of a number of previous reports and Section 18 Applications. Because of its status and history, it is the author's opinion that any additional bridgeworks in its vicinity associated with the Project should be preceded by an application pursuant to Section 18 of the *Aboriginal Heritage Act 1972*. The Project involves construction of a new bridge structure across this Aboriginal site.

An initial inspection of the Rail Extension was carried out by the author on 15 September 2017. The morning of Monday, 19 September 2017 was chosen for the meeting and the representatives chosen by SWALSC were notified in the course of the intervening weekend. The proposed works areas were inspected by Ms. M.Yarran, Mr N.Morich, Mr H.Nannup, Ms. T.Walley, Ms. D.Getta, Mr S.Champion, Ms. D.Wynne and Mr T.Walley. PTA was represented on site by Ms. C.Harwood, Senior Environmental Planner Metronet and Ms. L.Zimmermann, Environmental Officer Infrastructure, Planning and Land Services. R & E.O'Connor Pty Ltd was represented by R.O'Connor and Mr Ted Hart.

In addition to the Canning River Aboriginal Site discussed above, the Aboriginal heritage survey herein documented nominated a wetland area in the proposed Nicholson Road station site as an Aboriginal site. Following the winter rains the wetland area contains surface water and associated reeds indicate that it is a permanent feature. It is located at (MGA Zone 50) 399641E 6452183N. It is a roughly circular shape, with a radius of thirty metres (30m).

As a result of the field survey and database research, the following recommendations are made.

Recommendation One: Public Transport Authority should submit a Notice pursuant to Section 18 of the *Aboriginal Heritage Act 1972* to the Aboriginal Cultural Material Committee in respect of proposed works associated with the Project at Canning River crossing and Nicholson Road Station.

Recommendation Two: A Heritage Information Submission form should be submitted to the Department of Planning, Lands and Heritage in respect of the wetland area at Nicholson Road station site nominated as an Aboriginal site by the Whadjuk survey participants.

Recommendation Three: In view of the possibility of encountering Aboriginal cultural material, Aboriginal monitors should be engaged by Public Transport Authority to attend on site when initial ground disturbance associated with the Project is taking place.

Recommendation Four: Public Transport Authority should arrange for access to the Nicholson Road station site and convene a further meeting of the Whadjuk representatives there before Project construction commences. The northern bank of Canning River where the bridgeworks will take place can be visited at that time also.

Recommendation Five: The Aboriginal Cultural Material Committee should recommend to the Minister that formal consent for the Project should be granted, on the grounds that the Whadjuk representatives have given their conditional approval, that disturbance to Aboriginal heritage sites will be minimal and that the proposed railway extension will be of benefit to the general community.

Recommendation Six: Public Transport Authority should give favourable consideration to the non-heritage matters raised by the Whadjuk representatives and listed in Section 3.5 of this report.

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BULL CREEK
12.1km

MURDOCH
14.3km

RANFORD RD
9.3km

NICHOLSON RD
5.2km

THORNLIE
3.0km

KENWICK
14km

BECKENHAM JUNCTION

MADDINGTON
16km

GOSNELLS
19.4km

HIGHWAY
LEACH HIGHWAY
HIGH AVENUE
ROAD
NICHOLSON ROAD
SPENCER ROAD
KENWICK HIGHWAY
PARADE STREET
LINK
FREEWAY
KWINANA FREEWAY
AVENUE
VAHLAND AVENUE
HIGHWAY (FUTURE)
ROE
SPENCER ROAD
STREET
SOUTH STREET
KAREL
ROAD
GARDEN ROAD
ROAD
WARTON STREET
WARTON ROAD
HOLMES ROAD
RANFORD ROAD
WOODBRIDGE-KWINANA FREIGHT LINE
HOPE ROAD
DRIVE
BERRIGAN DRIVE
KWINANA FREEWAY
JANDAKOT ROAD

SKETCH ONLY
FOR DISCUSSION PURPOSES

LEGEND

- EXISTING PTA TRACK ALIGNMENT
- EXISTING STATION
- PROPOSED STATION
- PTA RAIL RESERVE
- CONSTRUCTION ZONES OUTSIDE THE RAIL RESERVE
- TOTAL AREA INVESTIGATION SITE = 95 Ha

REV	DATE	AMENDMENT	DSN	DRN	CHKD	APP
A	19.09.17	FIRST ISSUE		MST		

ORIG SIZE A1

CONCEPT DESIGN SUBJECT TO THE FOLLOWING

- PTA MAINTENANCE REQUIREMENTS
- PTA SAFEWORKING REQUIREMENTS
- MRWA CONCRETE BARRIER DESIGN AND REQUIREMENTS
- UTILITIES REQUIREMENTS
- RELOCATION OF EXISTING SIGNALLING AND COMMUNICATIONS INFRASTRUCTURE
- GEOTECHNICAL CONDITIONS
- EXTENT OF RETAINING AND STRUCTURE TYPES
- DRAINAGE DESIGN

REFERENCE DRGS
PCG94 Perth to Glen Iris Road Base
XR PCG Metro Sheet 4 Faded 2016

SCALE BARS
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1:20

SCALE : (@ A1)
DATUM :
HORIZONTAL: PCG94
VERTICAL: AHD71
DOC REVIEW NOTE No.

DESIGNED
DRAWN MST
CHECKED
APPROVED FOR ISSUE
EXECUTIVE DIRECTOR
PTA Division / External Company
DATE

Government of Western Australia
Public Transport Authority

THORNLIE LINE EXTENSION

THORNLIE LINE EXTENSION
ENVIRONMENTAL ASSESSMENT AREAS
OVERALL PLAN

PTA Drawing No: 05-C-03-0006 REV : A

CAD DRAWING PATHNAME G:\IPLS\01_Projects\05_BKH_GLE\05_1701_TLE_PDP\03_DFT\01_Drg\03 - Environmental Plans\05-C-03-0006_A.dwg

REV	DATE	AMENDMENT	DSN	DRN	CHKD	APP
A	14.09.17	ISSUED FOR DISCUSSION		GL		

ORIG SIZE A1

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REFERENCE DRGS

SCALE : (@ A1)

DATUM : HORIZONTAL: VERTICAL:

DRAWING STATUS *PRELIMANARY*

DOC REVIEW NOTE No.

DESIGNED

DRAWN *GL*

CHECKED

APPROVED *DIRECTOR*

DATE

Government of Western Australia Public Transport Authority

THORNLIE-COCKBURN LINK

ABORIGINAL HERITAGE SITE ASSESSMENT

CANNING RIVER BRIDGE DUPLICATION

CONCEPT DESIGN PLAN

PTA Drawing No: 05-C-03-0002 REV : A

CAD DRAWING PATHNAME G:\IPLS\01_Projects\05_BKH_GLE\05_1701_TLE_PDP\03_DFT\01_Drg\03 - Environmental Plans\05-C-03-0002_A.dwg

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A	14.09.17	ISSUED FOR DISCUSSION		GL		

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REFERENCE DRGS

SCALE : (@ A1)

DATUM :
HORIZONTAL:
VERTICAL:

DRAWING STATUS
PRELIMANARY

DOC REVIEW NOTE No.

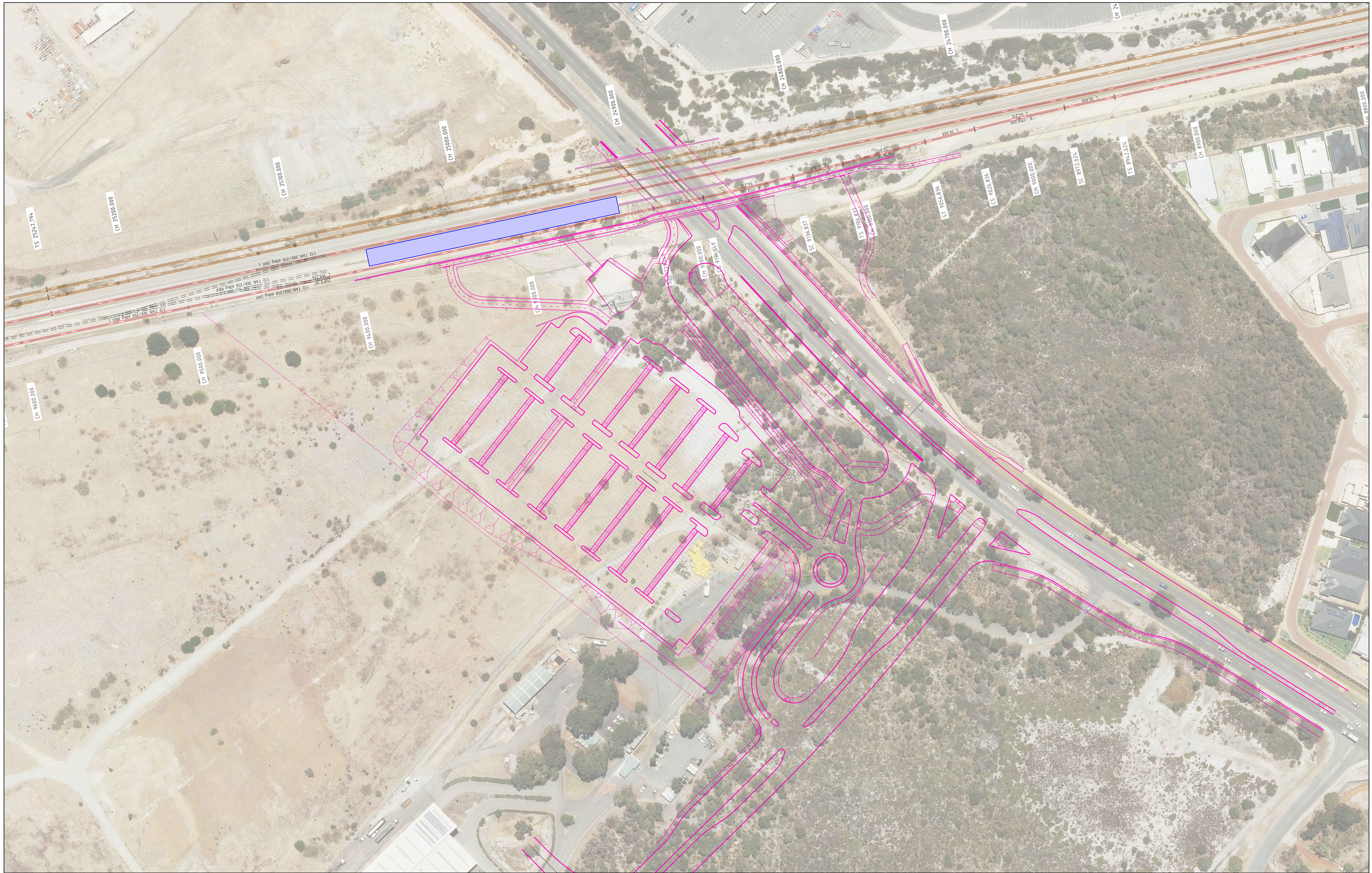
DESIGNED
DRAWN *GL*
CHECKED
APPROVED
DIRECTOR
DATE

Government of **Western Australia**
Public Transport Authority

THORNLIE-COCKBURN LINK

ABORIGINAL HERITAGE SITE ASSESSMENT
NICHOLSON ROAD STATION
CONCEPT DESIGN PLAN

PTA Drawing No: 05-C-03-0004 REV : A



REV	DATE	AMENDMENT	DSN	DRN	CHKD	APP
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ORIG SIZE A1

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REFERENCE DRGS

SCALE : (@ A1)

DATUM : HORIZONTAL: VERTICAL:

DRAWING STATUS *PRELIMANARY*

DOC REVIEW NOTE No.

DESIGNED

DRAWN *GL*

CHECKED

APPROVED *DIRECTOR*

DATE

Government of Western Australia Public Transport Authority

THORNLIE-COCKBURN LINK

ABORIGINAL HERITAGE SITE ASSESSMENT

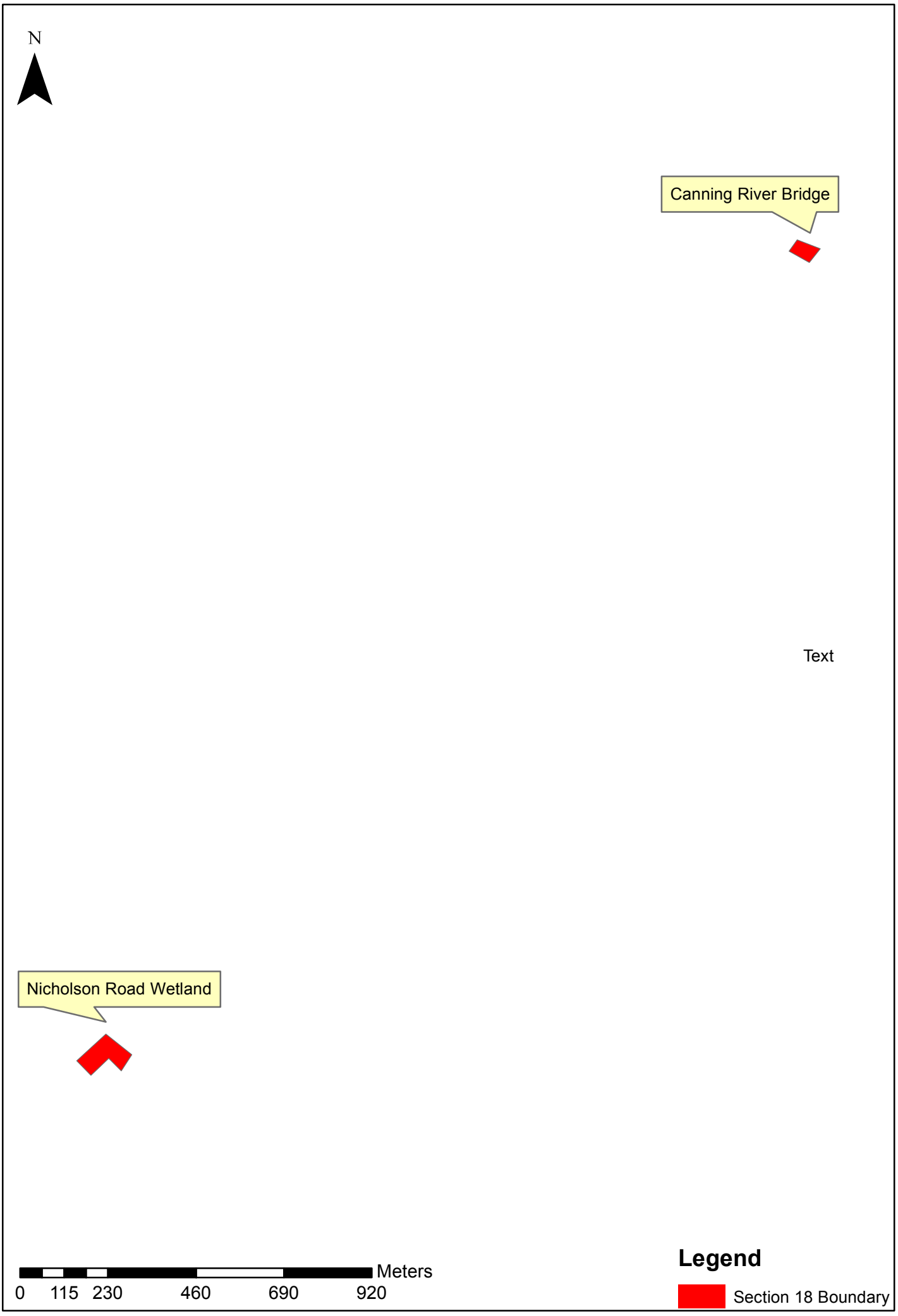
RANFORD ROAD STATION

CONCEPT DESIGN PLAN

PTA Drawing No: 05-C-03-0005 REV : A

CAD DRAWING PATHNAME G:\IPLS\01_Projects\05_BKH_GLE\05_1701_TLE_PDP\03_DFT\01_Drg\03 - Environmental Plans\05-C-03-0005_A.dwg

Section 18 Boundary for Thornlie-Cockburn Link Map



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Public Transport Authority September 2017

Imagery Courtesy of Nearmap

Appendix One:

Notes on the *Aboriginal Heritage Act, 1972*

OBLIGATIONS RELATING TO SITES UNDER THE ABORIGINAL HERITAGE ACT, 1972

Report of Findings

"15. Any person who has knowledge of the existence of anything in the nature of Aboriginal burial grounds, symbols or objects of sacred, ritual of ceremonial significance, cave or rock paintings or engravings, stone structures or arranged stones, carved trees, or of any other place or thing to which this Act applies or to which this Act might reasonably be suspected to apply shall report its existence to the Registrar, or to a police officer, unless he has reasonable cause to believe the existence of the thing or place in question to be already known to the Registrar."

Excavation of Aboriginal Sites

"16. (1) Subject to Section 18, the right to excavate or to remove any thing from an Aboriginal site is reserved to the Registrar.

(2) The Registrar, on the advice of the Committee, may authorise the entry upon and excavating of an Aboriginal site and the examination or removal of any thing on or under the site in such manner and subject to such conditions as the Committee may advise."

Offences Relating to Aboriginal Sites

"17. A person who-

(a) Excavates, destroys, damages, conceals or in any way alters any Aboriginal site; or

(b) In any way alters, damages, removes, destroys, conceals, or who deals with in a manner not sanctioned by relevant custom, or assumes the possession, custody or control of, any object on or under an Aboriginal site,

commits an offence unless he is acting with the authorisation of the Registrar under Section 16 or the consent of the Minister under Section 18."

Consent to Certain Uses

"18. (1) For the purposes of this section, the expression "the owner of any land" includes a lessee from the Crown, and the holder of any mining tenement or mining privilege, or of any right or privilege under the Petroleum Act, 1967, in relation to the land.

(2) Where the owner of any land gives to the Trustees notice in writing that he requires to use the land for a purpose which, unless the Minister gives his consent in this Section, would be likely to result in a breach of Section 17 in respect of any Aboriginal site that might be on the land, the Committee shall, as soon as they are reasonably able, form an opinion as to whether there is any Aboriginal site on the land, evaluate the importance and significance of any such site, and submit the notice to the Minister together with their recommendations in writing as to whether or not the Minister should consent to the use of the land for that purpose, and, where applicable, the extent to which and the conditions upon which his consent should be given.

(3) When the Committee submit a notice to the Minister under subsection (2) of this section he shall consider their recommendation and having regard to the general interest of the community shall either -

(a) Consent to the use of the land the subject of the notice, or a specified part of the land, for the purpose required, subject to such conditions, if any, as he may specify; or

(b) Wholly decline to consent to the use of the land the subject of the notice for the purpose required,

and shall forthwith inform the owner in writing of his decision.

(4) Where the owner of any land has given to the Committee notice pursuant to the subsection (2) of this section and the Committee have not submitted it with their recommendation to the Minister in accordance with that subsection the Minister may require the Committee to do so within a specified time, or may require the Trustees to take such other action as the Minister considers necessary in order to expedite the matter, and the Committee shall comply with any such requirement.

(5) Where the owner of any land is aggrieved by a decision of the Minister made under subsection (3) of this section he may, within the time and in the manner prescribed by the rules of court, appeal from the decision of the Minister to the Supreme Court which may hear and determine an appeal.

(6) In determining an appeal under subsection (5) of this section the Judge hearing the appeal may confirm or vary the decision of the Minister against which the appeal has been made or quash the decision of the Minister, and may make such order as to the costs of the appeal as he sees fit.

(7) Where the owner of the any land gives notice to the Committee under subsection (2) of this section, the Committee may if they are satisfied that it is practicable to do so, direct the removal of any object to which this Act applies from the land to a place of safe custody.

(8) Where consent has been given under this section to a person to use any land for a particular purpose nothing done by or on behalf of that person pursuant to, and in accordance with any conditions attached to, the consent constitute an offence against the Act."

Appendix Two:

Notes on the Recognition of Aboriginal Sites

There are various types of Aboriginal Sites, and these notes have been prepared as a guide to the recognition of those types likely to be located in the survey area.

An Aboriginal Site is defined in the Aboriginal Heritage Act, 1972, in Section 5 as:

"(a) Any place of importance and significance where persons of Aboriginal descent have, or appear to have, left any object, natural or artificial, used for, or made for or adapted for use for, any purpose connected with the traditional cultural life of the Aboriginal people, past or present;

(b) Any sacred, ritual or ceremonial site, which is of importance and special significance to persons of Aboriginal descent;

(c) Any place which, in the opinion of the Committee is or was associated with the Aboriginal people and which is of historical, anthropological, archaeological or ethnographical interest and should be preserved because of its importance and significance to the cultural heritage of the state;

(d) Any place where objects to this Act applies are traditionally stored, or to which, under the provisions of this Act, such objects have been taken or removed."

Habitation Sites

These are commonly found throughout Western Australia and usually contain evidence of tool-making, seed grinding and other food processing, cooking, painting, engraving or numerous other activities. The archaeological evidence for some of these activities is discussed in details under the appropriate heading below.

Habitation sites are usually found near an existing or former water source such as a gnamma hole, rock pool, spring or soak. They are generally in the open, but they sometimes occur in shallow rock shelters or caves. It is particularly important that none of these sites be disturbed as the stratified deposits which may be found at such sites can yield valuable information about the inhabitants when excavated by archaeologists.

Seed Grinding

Polished or smoothed areas are sometimes noticed on/near horizontal rock surfaces. The smooth areas are usually 25cm wide and 40 or 50cm long. They are the result of seed grinding by the Aboriginal women and indicate aspects of past economy.

Habitation Structures

Aboriginal people sheltered in simple ephemeral structures, generally made of branches and sometimes of grass. These sites are rarely preserved for more than one occupation period. Occasionally rocks were pushed aside or used to stabilise other building materials. When these rocks patterns are located they provide evidence for former habitation sites.

Middens

When a localised source of shellfish and other foods has been exploited from a favoured camping place, the accumulated ashes, hearth stones, shells, bones and other refuse can form mounds at times several metres high and many metres in diameter. Occasionally these refuse mounds or middens contain stone, shell or bone tools. These are most common near the coast, but examples on inland lake and river banks are not unknown.

Stone Artefact Factory Sites

Pieces of rock from which artefacts could be made were often carried to camp sites or other places for final production. Such sites are usually easily recognisable because the manufacturing process produces quantities of flakes and waste material which are clearly out of context when compared with the surrounding rocks. All rocks found on the sandy coastal plain , for example, must have been transported by human agencies. These sites are widely distributed throughout the State.

Quarries

When outcrops of rock suitable for the manufacture of stone tools were quarried by the Aborigines, evidence of the flaking and chipping of the source material can usually be seen in situ and nearby. Ochre and other mineral pigments used in painting rock surfaces, artefacts and in body decoration are mined from naturally occurring seams, bands and other deposits. This activity can sometimes be recognised by the presence of wooden digging sticks or the marks made by these implements.

Marked Trees

Occasionally trees are located that have designs in the bark which have been incised by Aborigines. Toeholds, to assist the climber, were sometimes cut into the bark and sapwood of trees in the hollow limbs of which possums and other arboreal animals sheltered. Some tree trunks bear scars where section of bark or wood have been removed and which would have been used to make dishes, shield, spearthrowers and other wooden artefacts. In some parts of the state

wooden platforms were built in trees to accommodate a corpse during complex rituals following death.

Burials

In the north of the state, it was formerly the custom to place the bones of the dead on a ledge in a cave after certain rituals were completed. The bones were wrapped in sheets of bark and the skull placed beside this. In other parts of Western Australia the dead were buried, the burial position varying according to the customs of the particular area and time. Natural erosion, or mechanical earthmoving equipment occasionally exposes these burial sites.

Stone Structures

If one or more stone are found partly buried or wedged into a position which is not likely to be the result of natural forces, then it is probable that the place is an Aboriginal site and that possibly there are other important sites nearby. There are several different types of stone arrangements ranging simple cairns or piles of stones to more elaborate designs.

Low weirs which detain fish when tides fall are found in coastal areas. Some rivers contain similar structures that trap fish against the current. It seems likely that low stone slab structures in the south west jarrah forests were built to provide suitable environments in which to trap some small animals. Low walls or pits were sometimes made to provide a hide or shelter for a hunter.

Elongated rock fragments are occasionally erected as a sign or warning that a special area is being approached. Heaps or alignments of stones may be naturalistic or symbolic representations of animals, people or mythological figures.

Paintings

These usually occur in rock shelters, caves or other sheltered situations which offer a certain degree of protection from the weather. The best known examples in Western Australia occur in the Kimberley region but paintings are also found through most of the states. One of several coloured ochres as well as other coloured pigments may have been used at a site. Stencilling was a common painting technique used throughout the state. The negative image of an object was created by spraying pigment over the object which was held against the wall.

Engravings

This term described designs which have been carved, pecked or pounded into a rock surface. They form the predominant art form of the Pilbara region but are known to occur in the

Kimberleys in the north to about Toodyay in the south. Most engravings occur in the open, but some are situated in rock shelters.

Caches

It was the custom to hide ceremonial objects in niches and other secluded places. The removal of objects from these places, or photography of the places or objects or any other interference with these places is not permitted.

Ceremonial Grounds

At some sites the ground has been modified in some way by the removal of surface pebbles, or the modelling of the soil, or the digging of pits and trenches. In other places there is not noticeable alteration of the ground surface and Aborigines familiar with the site must be consulted concerning its location.

Mythological Sites

Most sites already described have a place in Aboriginal mythology. In addition there are many Aboriginal sites with no man-made features which enable them to be recognised. They are often natural features in the landscape linked to the Aboriginal Account of the formation of the world during the creative "Dreaming" period in the distant past. Many such sites are located at focal points in the creative journeys of mythological spirit beings of the Dreaming. Such sites can only be identified by the Aboriginal people who are familiar with the associated traditions.

Appendix Three:

Signed Statements

Date 18-9-17

The proposed THARLIE-COCKBURN LINK PROJECT

has been inspected by the following elders of the NHARNJUK

Group

and has been:

~~Approved~~

Approved subject to the following conditions

~~Not approved for the following reasons~~

- Monitors.
- Orchid monitors.
- Return to Cunningham's Nicholson Rd Site.
- Protect pool/wetland here - in Landscaping.
- Opportunities for Aboriginal contracting employment - through WWP
- Station name after orchids or artwork representing them.

NAME	SIGNATURE
DORIS GETTA	Doris Getta
TREVOR WALLEY	
Diane Wynne	
NOEL MARCH	
SIMON CHAMPION	
HARRY WARNER	
MURTLE HARRAN	

Date 18-9-17

The following members of the WHADJUK

Group have received the sum of $510 per person per day as reimbursement of expenses incurred attending an Aboriginal heritage survey of the proposed THORNLIE - CockBURN LINK project.

Name	Signature
DORIS GETTA	Doris Getta
[illegible]	[illegible]
[illegible]	[illegible]
Dianne Wynne	
NOEL MORICH	
SIMON CHAMPION	
HARRY NARWIN	
MYRTLE YARRAN.	Myrtle Yarran

Appendix Four:

Register of Aboriginal Sites Extract

Search Criteria

Registered Aboriginal Site ID 3538

Disclaimer

The *Aboriginal Heritage Act 1972* preserves all Aboriginal sites in Western Australia whether or not they are registered. Aboriginal sites exist that are not recorded on the Register of Aboriginal Sites, and some registered sites may no longer exist.

The information provided is made available in good faith and is predominately based on the information provided to the Department of Planning, Lands and Heritage by third parties. The information is provided solely on the basis that readers will be responsible for making their own assessment as to the accuracy of the information. If you find any errors or omissions in our records, including our maps, it would be appreciated if you email the details to the Department at heritageenquiries@daa.wa.gov.au and we will make every effort to rectify it as soon as possible.

South West Settlement ILUA Disclaimer

Your heritage enquiry is on land within or adjacent to the following Indigenous Land Use Agreement(s): Gnaala Karla Booja People ILUA, Whadjuk People ILUA.

On 8 June 2015, six identical Indigenous Land Use Agreements (ILUAs) were executed across the South West by the Western Australian Government and, respectively, the Yued, Whadjuk People, Gnaala Karla Booja, Ballardong People, South West Boojarah #2 and Wagyl Kaip & Southern Noongar groups, and the South West Aboriginal Land and Sea Council (SWALSC).

The ILUAs bind the parties (including 'the State', which encompasses all State Government Departments and certain State Government agencies) to enter into a Noongar Standard Heritage Agreement (NSHA) when conducting Aboriginal Heritage Surveys in the ILUA areas, unless they have an existing heritage agreement. It is also intended that other State agencies and instrumentalities enter into the NSHA when conducting Aboriginal Heritage Surveys in the ILUA areas. It is recommended a NSHA is entered into, and an 'Activity Notice' issued under the NSHA, if there is a risk that an activity will 'impact' (i.e. by excavating, damaging, destroying or altering in any way) an Aboriginal heritage site. The Aboriginal Heritage Due Diligence Guidelines, which are referenced by the NSHA, provide guidance on how to assess the potential risk to Aboriginal heritage.

Likewise, from 8 June 2015 the Department of Mines, Industry Regulation and Safety (DMIRS) in granting Mineral, Petroleum and related Access Authority tenures within the South West Settlement ILUA areas, will place a condition on these tenures requiring a heritage agreement or a NSHA before any rights can be exercised.

If you are a State Government Department, Agency or Instrumentality, or have a heritage condition placed on your mineral or petroleum title by DMIRS, you should seek advice as to the requirement to use the NSHA for your proposed activity. The full ILUA documents, maps of the ILUA areas and the NSHA template can be found at https://www.dpc.wa.gov.au/lantu/Claims/Pages/SouthWestSettlement.aspx.

Further advice can also be sought from the Department of Planning, Lands and Heritage at heritageenquiries@daa.wa.gov.au.

Copyright

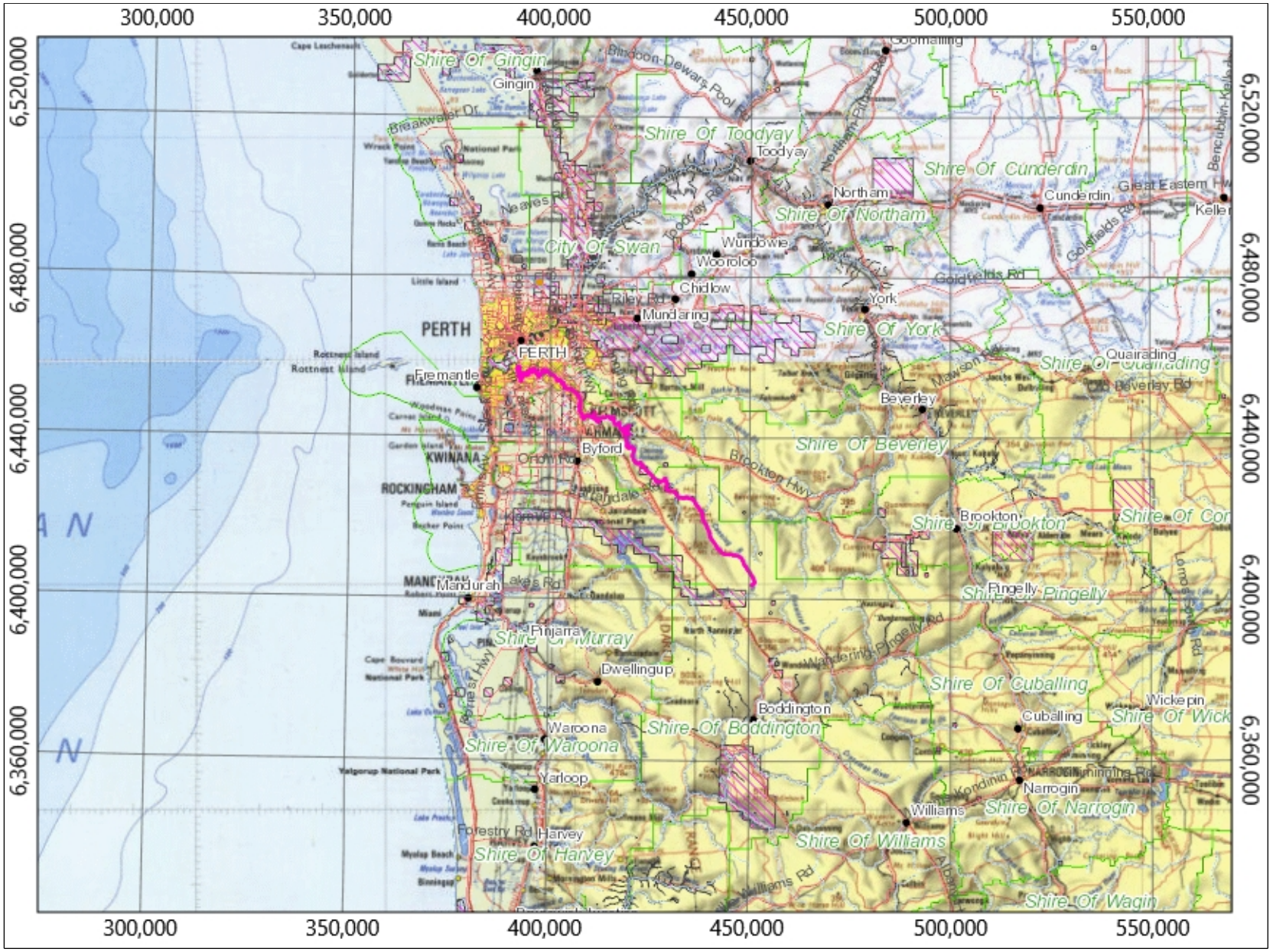
Coordinates

Map coordinates (MGA Zone 50 Easting/Northing metres) are based on the GDA 94 Datum.

Basemap Copyright

Aboriginal Heritage Inquiry System

Map of Registered Aboriginal Sites



Legend

- Registered Aboriginal Site
- Town
- Road
- River
- Local Government Authority

56.21 kilometres

Map Scale 1 : 1,700,000

MGA Zone 50 (GDA94)

Search Criteria

Registered Aboriginal Site ID 3538

Disclaimer

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The ILUAs bind the parties (including 'the State', which encompasses all State Government Departments and certain State Government agencies) to enter into a Noongar Standard Heritage Agreement (NSHA) when conducting Aboriginal Heritage Surveys in the ILUA areas, unless they have an existing heritage agreement. It is also intended that other State agencies and instrumentalities enter into the NSHA when conducting Aboriginal Heritage Surveys in the ILUA areas. It is recommended a NSHA is entered into, and an 'Activity Notice' issued under the NSHA, if there is a risk that an activity will 'impact' (i.e. by excavating, damaging, destroying or altering in any way) an Aboriginal heritage site. The Aboriginal Heritage Due Diligence Guidelines, which are referenced by the NSHA, provide guidance on how to assess the potential risk to Aboriginal heritage.

Likewise, from 8 June 2015 the Department of Mines, Industry Regulation and Safety (DMIRS) in granting Mineral, Petroleum and related Access Authority tenures within the South West Settlement ILUA areas, will place a condition on these tenures requiring a heritage agreement or a NSHA before any rights can be exercised.

If you are a State Government Department, Agency or Instrumentality, or have a heritage condition placed on your mineral or petroleum title by DMIRS, you should seek advice as to the requirement to use the NSHA for your proposed activity. The full ILUA documents, maps of the ILUA areas and the NSHA template can be found at https://www.dpc.wa.gov.au/lantu/Claims/Pages/SouthWestSettlement.aspx.

Further advice can also be sought from the Department of Planning, Lands and Heritage at heritageenquiries@daa.wa.gov.au.

Copyright

Coordinate Accuracy

Coordinates (Easting/Northing metres) are based on the GDA 94 Datum. Accuracy is shown as a code in brackets following the coordinates.

Terminology (NB that some terminology has varied over the life of the legislation)

Place ID/Site ID: This a unique ID assigned by the Department of Planning, Lands and Heritage to the place.

Status:

- Registered Site: The place has been assessed as meeting Section 5 of the Aboriginal Heritage Act 1972.
- Other Heritage Place which includes:
  - Stored Data / Not a Site: The place has been assessed as not meeting Section 5 of the Aboriginal Heritage Act 1972.
  - Lodged: Information has been received in relation to the place, but an assessment has not been completed at this stage to determine if it meets Section 5 of the Aboriginal Heritage Act 1972.

Access and Restrictions:

- File Restricted = No: Availability of information that the Department of Planning, Lands and Heritage holds in relation to the place is not restricted in any way.
- File Restricted = Yes: Some of the information that the Department of Planning, Lands and Heritage holds in relation to the place is restricted if it is considered culturally sensitive. This information will only be made available if the Department of Planning, Lands and Heritage receives written approval from the informants who provided the information. To request access please contact heritageenquiries@daa.wa.gov.au.
- Boundary Restricted = No: Place location is shown as accurately as the information lodged with the Registrar allows.
- Boundary Restricted = Yes: To preserve confidentiality the exact location and extent of the place is not displayed on the map. However, the shaded region (generally with an area of at least 4km²) provides a general indication of where the place is located. If you are a landowner and wish to find out more about the exact location of the place, please contact the Department of Planning, Lands and Heritage.
- Restrictions:
  - No Restrictions: Anyone can view the information.
  - Male Access Only: Only males can view restricted information.
  - Female Access Only: Only females can view restricted information.

Legacy ID: This is the former unique number that the former Department of Aboriginal Sites assigned to the place. This has been replaced by the Place ID / Site ID.

Aboriginal Heritage Inquiry System

List of Registered Aboriginal Sites

ID	Name	File Restricted	Boundary Restricted	Restrictions	Status	Type	Knowledge Holders	Coordinate	Legacy ID
3538	CANNING RIVER.	No	No	No Gender Restrictions	Registered Site	Mythological, Named Place, Ochre, Water Source	*Registered Knowledge Holder names available from DAA	412123mE 6442557mN Zone 50 [Reliable]	S02550

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