



Technical Note

Date: 2 July 2025

Subject: Road Access Planning for HMAS *Stirling*, Garden Island

1. Background

In December 2024 the Government announced it would deliver a series of studies to inform future infrastructure and transport requirements around HMAS *Stirling* on Garden Island. The intention of these studies was to progress transport planning for local/regional road upgrading that would be required to support the increase in Defence activities at HMAS *Stirling* over the coming decades, driven by Australia's AUKUS pathway. The studies announced included:

- A study of options for roads, infrastructure and local transport
- A detailed environmental study of the Garden Island Highway Proposal
- A detailed heritage study and constraint mapping exercise of the Garden Island Highway Proposal.

To guide study scope, Main Roads has undertaken a high-level comparison of road access options for HMAS *Stirling*. This Technical Note provides a summary of the comparison and a proposed way forward to progress planning for road access.

2. Department of Defence requirements for HMAS *Stirling*

Department of Defence (Defence) recently provided information¹ and data on their requirements for HMAS *Stirling* to assist in the comparison of road access options.

HMAS *Stirling* base and residential population

The base population is shown in Table 1 and is forecast to double by 2050. It is noted this forecast is indicative, subject to change and aligns with the upper limits of workforce on the base.

2025	2030	2040	2050
4,300	6,200	7,200	9,000

¹ Defence requirements to inform Main Roads Western Australia assessment for the upgrade of road infrastructure in the Rockingham Region, Western Australia, Department of Defence, 13 June 2025

The Cape Peron Transport Needs Study², commissioned by the City of Rockingham to assess transport requirements in the Cape Peron area including scenarios with/without Garden Island Highway, assumed a base population of 10,500 by 2040 which is 17% higher than the Defence forecast for 2050.

The base population forecasts exclude construction workers. During the initial construction period at HMAS *Stirling*, the construction workforce is expected to peak at around 900 workers for one year (2026/27). Construction activities will continue through the 2020's and 2030's and Defence is assessing the feasibility of using private bus services to transport the construction workforce from carparks in the region (up to 350 to 450 workers).

A total of 725 Living-In Accommodation Units (i.e. residential dwellings) will be available at HMAS *Stirling* by the end of 2025. Vacancy of these dwellings currently sits around 85%. This workforce would generally not commute on and off the base during peak periods and may be on-duty for lengthened periods of time, for example at sea.

Vehicle types

The majority of vehicles accessing HMAS *Stirling*, particularly during peak periods, are private commuter vehicles. Large heavy vehicles, for example B-Doubles and 100t cranes, also access the base frequently, using the approved access route along Parkin Street and Point Peron Road (Appendix A). Notwithstanding an increase of heavy vehicle movements during construction periods, the number of overall heavy vehicle movements are generally insignificant in the context of the overall traffic volume.

Peak periods

From general observations the weekday morning (AM) peak extends from 5:00 to 8:00 and the weekday afternoon (PM) peak from 14:30 to 17:30. This coincides with the background traffic peaks on the surrounding road network with congestion generated by the morning commute to HMAS *Stirling* and the afternoon commute to home by the workforce. To mitigate this impact Defence currently schedule heavy vehicle movements outside of these peak periods. Staggering of workforce shift start and finish times is noted as another mitigation to reducing the traffic volume during peak periods, however there are challenges associated with this, including managing operational impacts and ensuring appropriate acceptance by the workforce.

Resilience / redundancy of the local road network

Defence provided the following requirements for resilience/redundancy of the local road network: 'Defence does not have any specific policy relating to separate access points to base and nil requirement for new road infrastructure in the Rockingham Region as resiliency or redundancy measures. Existing local roads already provide a diverse network, including Patterson Street – Parkin Street, Safety Bay Road and Memorial Drive - Point Peron Road.'

HMAS *Stirling* Causeway Study

A separate HMAS *Stirling* Causeway Study is currently being progressed by Defence to understand options for the maintenance and sustainment of the low-level and high-level bridges (i.e. the Causeway) to HMAS *Stirling*. This study will also review the vehicle capacity of

² Cape Peron Transport Needs Study, Stantec, 28 June 2024

the existing bridges and overall demand in future years, and provide recommendations as to whether additional lanes are required to be constructed as part of future upgrades in the 2030's. The study is due for completion around December 2025.

3. Traffic volumes

Figure 1 below shows current and forecast weekday traffic volumes on the wider local and regional road networks in Rockingham. The current volumes were sourced mainly from Main Roads' Traffic Map. The forecast volumes were sourced from the Cape Peron Transport Needs Study undertaken by Stantec and modelling undertaken using Main Roads' Regional Operational Model (ROM24).

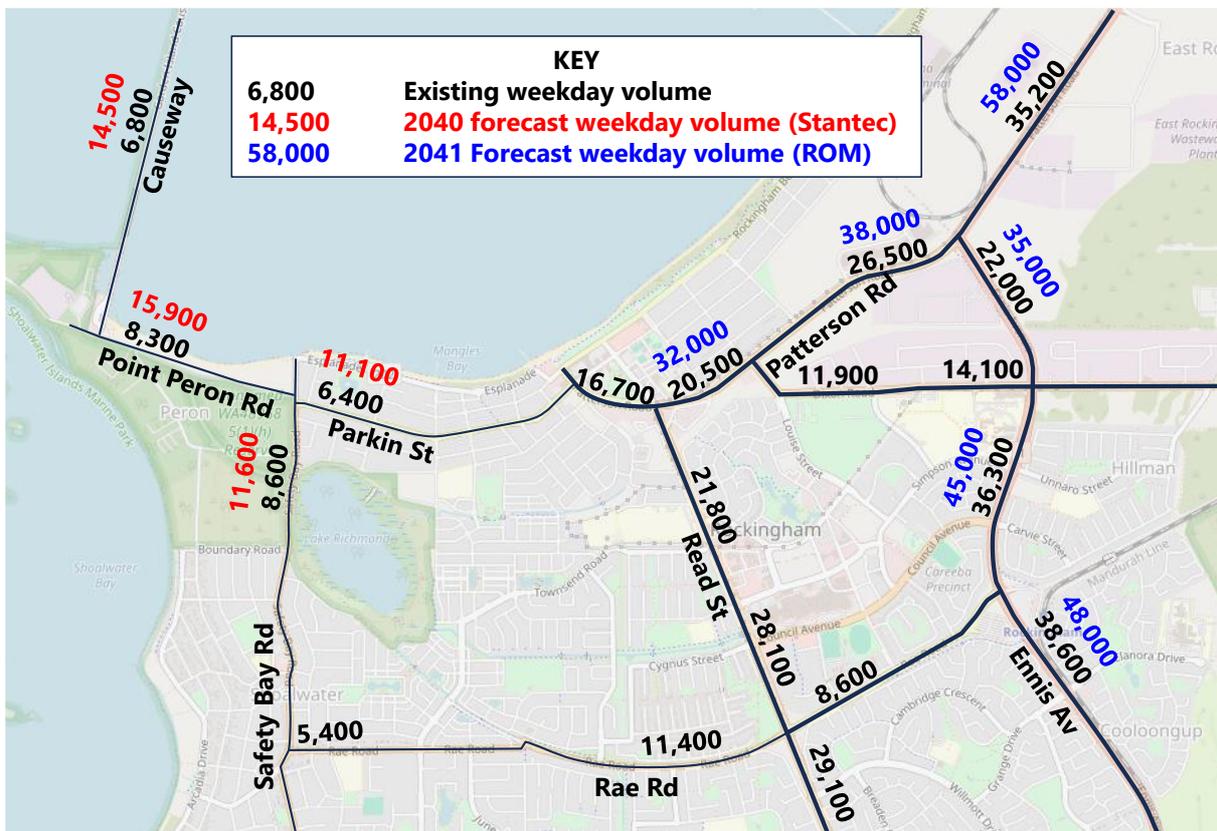


Figure 1: Existing and Forecast Traffic Volumes

Traffic modelling for the Cape Peron Transport Needs Study was undertaken in 2023/24 using the Cape Peron Aimsun micro-simulation model. The forecast 2040 volumes shown in Figure 1 are for the existing road network excluding Garden Island Highway (Scenario 3.0). Forecast 2040 volumes are not excessive, with Point Peron Road forecast to carry 15,900 vehicles per day (vpd), Parkin Street 11,100 vpd and Safety Bay Road 11,600 vpd. As mentioned previously, the forecast volumes are based on a base population of 10,500 by 2040 which is 17% higher than the Defence forecast for 2050 and are therefore conservative.

The modelled trip distribution for HMAS *Stirling* used in the Aimsun model was based on current distribution patterns, with traffic using Parkin Street and Safety Bay Road to access the area.

4. Road access options

Noting that Defence does not have specific requirements or policy relating to access points serving HMAS *Stirling*, including no requirement for new road infrastructure in Rockingham to achieve specific road access resilience or redundancy targets for the base, Main Roads identified three road access options that could be considered. These options are shown in Figure 2 and discussed below.

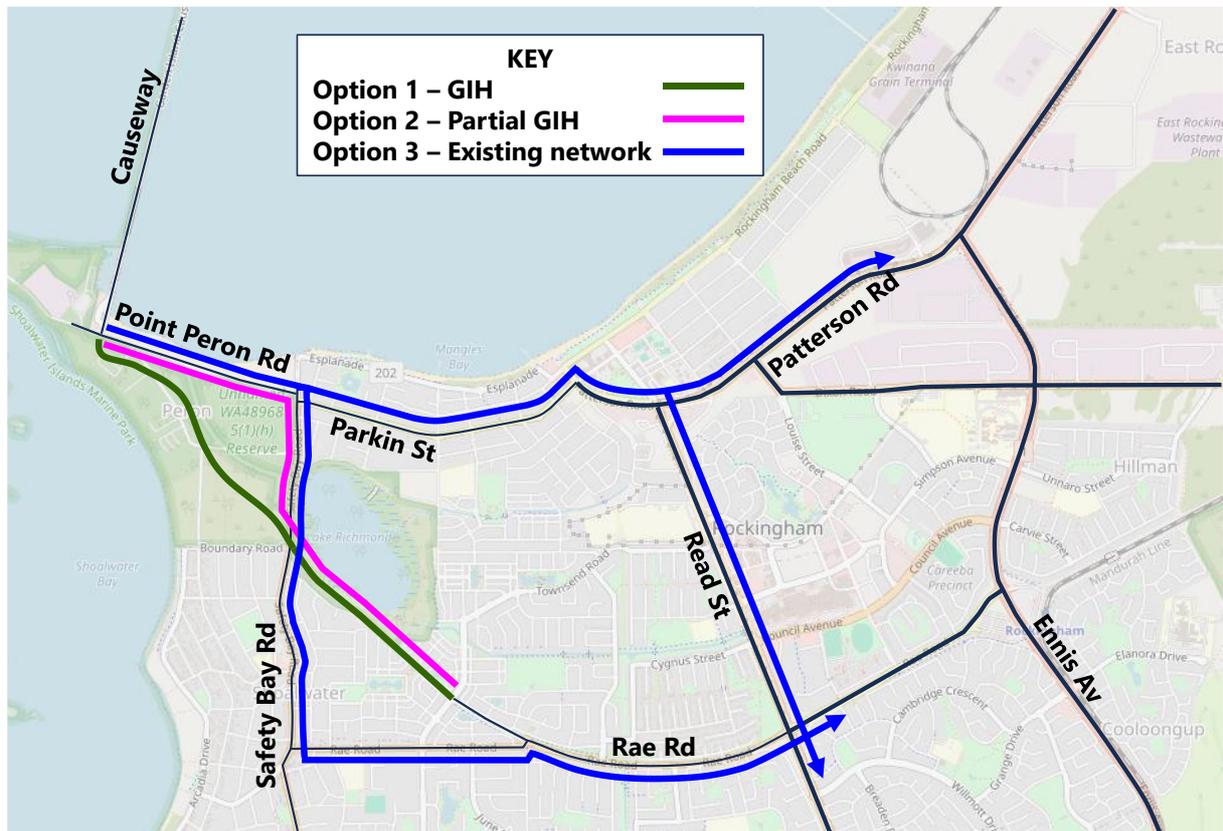


Figure 2: Road Access Options

Option 1: Garden Island Highway as planned

Garden Island Highway west of Ennis Avenue, which is protected as an Other Regional Road (ORR) in the Metropolitan Region Scheme, follows the Rae Road alignment and then a new alignment south of Lake Richmond and through the Rockingham Lakes Regional Park, tying in with the Causeway to Garden Island at Point Peron Road.

The new road section (approximately 3.8km) could be single- or dual-lane, depending on capacity requirements. However, the ORR reservation is only 25m in width and would require widening to accommodate a dual carriageway. Option 1 would most likely include duplicating the single-lane section of Rae Road (approximately 2.2km). It would also include upgrading numerous intersections, most notably: Point Peron Road/Causeway/GIH, GIH/Safety Bay Road, GIH/Hawker Street, GIH/Rae Road and Rae Road/Read Street intersections.

Option 2: partial Garden Island Highway

This option follows Point Peron Road from the Causeway to Safety Bay Road, continues along Safety Bay Road to around Boundary Road and then the new Garden Island Highway alignment south of Lake Richmond to Rae Road. As for Option 1, the new road section

(approximately 1.4km) could be single- or dual-lane, and the single-lane section of Rae Road would most likely be duplicated. Option 2 may include the duplication of Point Peron Road between the Causeway and Hymus Street / Safety Bay Road, however this requires further investigation. Option 2 would include upgrading numerous intersections, most notably: Point Peron Road/Causeway, Point Peron Road/Hymus Street/Safety Bay Road/Parkin Street, GIH/Safety Bay Road, GIH/Hawker Street, GIH/Rae Road and Rae Road/Read Street intersections.

Option 3: existing road network

This option utilises the existing road network, with all traffic using Point Peron Road from the Causeway and then distributing between Parkin Street and Safety Bay Road to Patterson Road, Read Street and Rae Road. The need to duplicate Point Peron Road between the Causeway and Hymus Street / Safety Bay Road requires further investigation. The intersections of Point Peron Road/Causeway and Point Peron Road/Hymus Street/Safety Bay Road/Parkin Street would require upgrading.

5. Comparison of road access options

A high-level comparison of road access options was undertaken to guide the scope of studies to progress planning for access to HMAS *Stirling*.

Option 1: Garden Island Highway as planned

The Other Regional Road (ORR) reservation that is currently protected for the Garden Island Highway is shown in blue in Figure 3. Preliminary desktop assessment shows that this option will have significant environmental impacts as it passes through Rockingham Lakes Regional Park and very close to Lake Richmond. The impacts will require State and Commonwealth approvals as well as significant environmental offsets. Between the Causeway/Point Peron Road intersection and Vitesse Approach the alignment crosses a Bush Forever site, shown hatched in Figure 3 below. The length of direct impact is 2.7 km, with an impacted area of approximately 7.1 Ha.



Figure 3: Environmental and Heritage Impacts

There is a high likelihood that the alignment will impact Threatened Ecological Communities and Conservation Category Wetlands. The alignment also intersects areas around Lake Richmond requiring investigation as Carnaby's Cockatoo feeding habitat.

Aboriginal heritage sites are shaded pink in Figure 3. The alignment passes over three sites listed on the Aboriginal Cultural Heritage Register, Lake Richmond (camp, ritual/ceremonial), Mooribirdup Ceremonial Grounds (camp, ritual/ceremonial, plant resource) and Sister Kate's Children's Home (camp, historical, mission). It is likely that there will be direct impacts to Aboriginal values on these sites.

The alignment will have significant amenity impacts to more than 30 existing residences fronting Lake Richmond. This includes noise, visual and safety impacts, reduction in access to Lake Richmond for recreational purposes, as well as potential reduction in property value.

A 500m section of the ORR reservation between Zaraffa Avenue and Hawker Street immediately to the east of Lake Richmond is currently treed with a shared path and is used as public open space for recreational purposes. The alignment will remove this public open space and reduce community connectivity.

It is expected that this option would entail duplicating a 2.2 km section of Rae Road, with associated impacts including increased traffic and noise, reduction in safety and potential reduction in property value.

Traffic modelling for the Cape Peron Transport Needs Study shows that the single-lane Garden Island Highway option will carry between 5,000 vpd and 6,400 vpd by 2030. Forecast volumes increase to between 6,400 vpd and 8,200 vpd by 2040 for the dual-lane option. The forecast volumes would typically not justify constructing a new highway through environmentally sensitive areas if acceptable alternative routes are available, unless there is a specific requirement to service strategic development such as defence facilities.

Option 2: partial Garden Island Highway

This option avoids environmental impact on the Rockingham Lakes Regional Park between the Causeway/Point Peron Road and Safety Bay Road/Boundary Road intersections. Nevertheless, it will still have significant environmental impacts as it passes very close to Lake Richmond, more than likely requiring State and Commonwealth approvals as well as environmental offsets. The Bush Forever impact is reduced, with an impacted area of approximately 2.3 Ha over 0.9km. There is still a high likelihood that the alignment will impact Threatened Ecological Communities and Conservation Category Wetlands, including intersecting areas around Lake Richmond requiring investigation as Carnaby's Cockatoo feeding habitat.

The alignment passes over the Lake Richmond (camp, ritual/ceremonial) site listed on the Aboriginal Cultural Heritage Register and it is likely that there will be direct impacts to Aboriginal values on this site.

The amenity and safety impacts east of Safety Bay Road are as for Option 1. Due to reduced connectivity, it is expected that Option 2 would carry lower volumes than Option 1.

If Point Peron Road between the Causeway and Hymus Street / Safety Bay Road requires

duplication, impacts will depend on which side the road is widened, with Bush Forever to the south and land predominantly under Government control to the north. Upgrading the Point Peron Road/Hymus Street/Safety Bay Road/Parkin Street intersection to either a dual staggered roundabout or a single 4-way roundabout will impact the Bush Forever site to the south-west, avoiding impact to residential property.

Option 3: existing road network

Traffic modelling for the Cape Peron Transport Needs Study, which assumed current trip distribution patterns for HMAS *Stirling*, forecast the following 2040 weekday volumes for the main local access roads: Point Peron Road at 15,900 vehicles per day (vpd), Parkin Street 11,100 vpd and Safety Bay Road 11,600 vpd. While the daily volume on Point Peron Road (Causeway to Memorial Drive) is significant, similar volumes are carried on comparable single lane roads across Perth, for example: Aberdare Road (Shenton Park) carrying between 13,900 vpd and 17,900 vpd, The Boulevard (City Beach) at 14,500 vpd and Cockman Road (Greenwood) at 13,400 vpd. Single lane roads generally have a capacity of around 16,000 vpd but this is dependent on standard (cross-section including provision for on-street parking), spacing and control of intersections, the frequency of property access, traffic mix and peaking characteristics.

The Aimsun micro-simulation model shows slow travel speeds during the 2040 AM and PM peak hours on the 'Do Nothing' road network (Scenario 3.0) along the Causeway, Point Peron Road (Causeway to Memorial Drive), Safety Bay Road (Parkin Street to Vaux Street) and Parkin Street. The slow travel speeds are caused by congestion at the following intersections which operate at Level of Service F: Point Peron Road/Causeway, Parkin Street/Safety Bay Road and Point Peron Road/Memorial Drive (delays on Memorial Drive). The remaining intersections on the local access road network operate at acceptable levels of service (Level of Service A to C). Intersection performance was assessed using the SIDRA intersection package.

Stantec developed 'Do-Nothing with Mitigation' scenarios (Scenarios 3.3a and 3.3b) to address the congestion at intersections. The network improvements included:

- Duplicating Point Peron Road between the Causeway and Hymus Street / Safety Bay Road
- Upgrading the Point Peron Road/Causeway intersection to a roundabout with two circulating lanes and additional approach lanes
- Upgrading the Point Peron Road/Hymus Street/Safety Bay Road/Parkin Street intersection to (i) a dual staggered roundabout with additional approach lanes (Scenario 3.3a) or (ii) a single 4-way roundabout with additional approach and circulating lanes.

It is noted that Defence is progressing a Traffic Signals Approval Policy Stage 1 (TSAP1) application to obtain Main Roads' approval to upgrade and signalise the Point Peron Road/Causeway intersection. This work is currently ongoing.

The Aimsun micro-simulation model shows reasonable travel speeds during the 2040 AM and PM peak hours for the 'Do Nothing with Mitigation' road networks (Scenarios 3.3a and 3.3b) – see Figure 4 below.

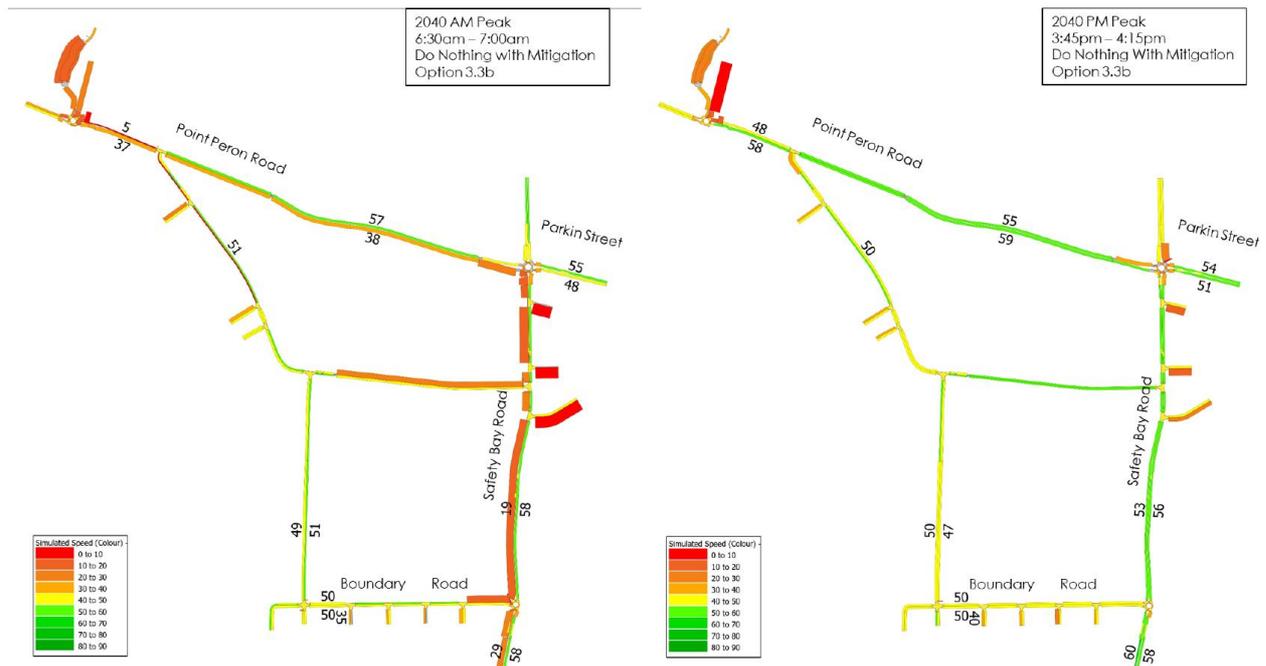


Figure 4: Travel speeds 2040 Do-Nothing with Mitigation network

The Point Peron Road/Causeway intersection still operates at Level of Service F during the PM peak as vehicles exiting HMAS *Stirling* experience delays. This may be resolved by implementing traffic signals (TSAP1 application in process) and further investigation is required to confirm the required layout. The Point Peron Road/Memorial Drive intersection still operates at Level of Service F during the AM peak. However, delay is not experienced on Point Peron Road and vehicles can use alternative routes (Safety Bay Road). The remaining intersections on the local access road network operate at acceptable levels of service (Level of Service A to C).

Further investigation needs to be undertaken to determine whether it is necessary to duplicate Point Peron Road between the Causeway and Hymus Street / Safety Bay Road. There are limited access points on this section of road and a single lane road with widening at intersection approaches may provide adequate capacity. If duplication is required, consideration should be given to widening to the north to avoid impacting the Bush Forever site to the south. Land to the north is predominantly in Government control.

Upgrading the Point Peron Road/Hymus Street/Safety Bay Road/Parkin Street intersection to either a dual staggered roundabout or a single 4-way roundabout will impact the Bush Forever site to the south-west, avoiding impact to residential property. However, this impact would be negligible compared to that of the Garden Island Highway full or partial options. It is suggested that the single 4-way roundabout would be preferred, but this requires further investigation.

6. Conclusion and recommendation

The following main conclusions may be drawn from this high-level comparison of road access options:

- Defence does not have specific requirements or policy relating to access points serving HMAS *Stirling*, including no requirement for new road infrastructure in Rockingham to achieve specific road access resilience or redundancy targets for the base
- The forecast traffic volumes for the full and partial Garden Island Highway road access options (Options 1 and 2) would typically not justify constructing a new highway through environmentally sensitive areas if acceptable alternative routes are available, unless there is a specific requirement to service strategic development such as defence facilities
- Options 1 and 2 would have significant environmental impacts, requiring State and Commonwealth approvals as well as environmental offsets. These options pass over Aboriginal heritage sites with likely direct impacts on Aboriginal heritage values. These options also have significant impacts on amenity and safety along the corridor
- Traffic assessment shows that utilising the existing road network (Option 3), with targeted intersection upgrades and possible duplication of a section of Point Peron Road (to be confirmed), would achieve acceptable traffic outcomes during the weekday AM and PM peak periods. While there would be impacts, these would be negligible compared with Options 1 and 2.

The following recommendations are made:

1. Prepare a Briefing Note for the Minister for Transport (Deputy Premier) presenting the high-level comparison of road access options and recommending that a 'Do Nothing with Mitigation' option be investigated further. This option would typically be delivered by the asset owner (i.e. the City of Rockingham) and if that is the case, State and Federal Government need to decide which agencies undertake the various planning and other roles
2. Prepare a letter from the Deputy Premier to the Premier / Deputy Prime Minister seeking endorsement for this approach
3. Share this Technical Memorandum, Briefing Note and letter with Defence.

Road Planning Branch, Planning and Technical Services

