

IDENTIFICATION OF POTENTIAL SOLUTIONS

ISSUES AND OPPORTUNITIES

The Existing Conditions report discusses key issues experienced at the subject site and the surrounding area. A list of key road safety issues for road users is summarised below based on community feedback, as well as site observations undertaken by O'Brien Traffic, as well as observations by Council on a typical summer's day. These include:

- Constrained/obstructed traffic lanes by informally parked vehicles
- Insufficient space for parking to accommodate demand (leading to illegal and dangerous parking)
- Informal parking leading to inconsistent parking angles
- Vehicles turning right across double white lines (where sight distance limited due to road alignment and topography)
- High motor vehicle speeds (for conditions) leading to safety concerns for motorists, pedestrians and cyclists
- Pedestrians commonly walking on or close to carriageway (informally parked vehicles leading to pedestrians to utilise carriageway rather than roadside)
- Pedestrians walking on gravel roadside are vulnerable to an errant vehicle
- Cyclist safety concerns include:
 - Insufficient width for vehicles to pass cyclists safely, i.e., without crossing double white lines) and maintain required 1.5m spacing (leading to increased crash risk). This risk may be exacerbated if informally parked vehicles encroach into the traffic lanes.
 - Car-dooring risk for cyclists travelling north-east from vehicles parked informally in an ad hoc manner on the unsealed gravel area.

The existing conditions report also identifies and number of potential trip hazards for pedestrians along the roadside (including rocks and a broken post).

SAFE SYSTEM

A safe road network is critical for all road users. The Safe System approach to road safety management recognises that humans make errors, that crashes will continue to occur and that humans have a limited tolerance to impact forces¹ (Figure 1).

Section 1.2 of the VicRoads *Safe System Assessment* report template outlines Safe System Impact Speeds. The impact speed in a collision is a significant factor that affects the probability of a person being killed or seriously injured in a crash. Safe System impact speeds for common crash types are shown in Figure 2 These are speeds below which the chances of survival are high and the likelihood of serious injury is low. It should be noted that the angle of impact of a collision is also a factor that affects the severity of a crash. As far as is practically possible, infrastructure should be designed and travel speeds

The Safe System approach recognises that people make mistakes, that crashes will continue to occur and that humans have a limited tolerance to impact forces. The approach seeks to eliminate the potential for fatal and serious injury crashes





¹ Safe System principles have been acknowledged in successive national road safety strategies and action plans since 2003 as the guiding principles for road safety programs in Australia.

managed so that the impact speeds when a crash occurs are below the thresholds shown in Figure 2.



SOURCE: STATE OF VICTORIA TOWARDS ZERO 2016-2020; VICTORIA'S ROAD SAFETY STRATEGY AND ACTION PLAN

FIGURE 1: THE SAFE SYSTEM PILLARS

CRASH TYPE	IMPACT SPEED
 Head on with another vehicle	70 km/h
 Side impact	50 km/h
 Side impact with tree	30 km/h
 Pedestrian & cyclists	30 km/h

SOURCE: VICROADS SAFE SYSTEM ASSESSMENT REPORT TEMPLATE (2018) – SECTION 1.2

FIGURE 2: SAFE SYSTEM IMPACT SPEEDS

DESIGN PRINCIPLES

Taking the above into consideration, as well as noting the potential locations identified for new car parking areas identified by Parks Victoria, the design principles for the concept designs for improved traffic management and car parking focus on **safe, convenient and separate access for pedestrians, supporting lower vehicle speeds** (particularly when pedestrian and cyclist volumes are expected to be higher), **discouraging illegal turns across double white lines**, and **separation of parking from the main through route**.

The recommendations taken into consideration Safe System principles, while also being cognisant of the constraints of the site and surrounds.

Short-term priorities and recommendations

The existing conditions report identifies a number of recommendations could be implemented in the short term for the 2021/22 Summer whilst further concept and detailed design and community consultation is undertaken for a longer-term traffic and parking treatment:

- Addressing potential trip hazards, including:
 - removal of the stump from the broken white reflective post;
 - surface improvements for the unsealed gravel area to ensure that large rocks are removed;
- Improving parking arrangements including installation of signs to regulate parking arrangement in unsealed area (i.e. parallel parking, angled parking, or No Stopping);
- Improving conspicuity for drivers in poor light/dark conditions through installation of Raised Reflective Pavement Markers (RRPMs);

- Encouraging lower vehicle speeds, particularly pedestrian and cyclist volumes are expected to be higher through provision of a permanent 60 km/h speed limit for Golden Point Road with a reduction to 40 km/h during warmer weather.
- Improving motorists awareness of potential turning traffic through installation of warning signs (yellow and black diamond) on the approach to the gravel parking area.

Medium- to long-term priorities and recommendations

The following priorities and recommendations are recommended for medium- to long-term:

- Safe, convenient and separate access for pedestrians
- Supporting lower vehicle speeds
- Discouraging unsafe vehicle movements
- Separation of parking from the main through route

Potential options for consideration are outlined in **Table 1** below. Implementation of a combination of these may be considered. In relation to all options, the permanent 60 km/h speed limit (recommended as a short-term priority) provides an incrementally safer speed environment, particularly with cyclists sharing the road space with motor vehicles. In warmer weather, when traffic volumes are expected to be higher (with people travelling to the swimming area, etc) as well as increased cyclists a 40 km/h limit reduces the likelihood as well as the severity outcome for vehicular collisions, while also approaching Safe System speeds for vulnerable road users.

OPTION	DISCUSSION AND RECOMMENDATIONS
Roadside parking on Golden Point Road	<ul style="list-style-type: none"> • In the short term, some roadside parking could be retained (on the reservoir side) while longer term parking options (that provide pedestrian separation are considered). It is noted that at times of highest exposure for pedestrians (summer months), a reduced (40 km/h) speed limit reduces the likelihood as well as the severity outcome for collisions. • In the medium-long term, roadside parking may be prevented through signage and/or installation of physical devices such as bollards, fencing, landscaping, etc.
Existing Parking Area at the Reservoir	<ul style="list-style-type: none"> • Measures to prohibit illegal right turns across double white lines should be considered. From a Safe System perspective, minimising the risk of the potential for high severity right-angle crashes is important, particularly where vehicles speeds exceed the Safe System threshold of 50 km/h for these crash types. In this case, a guard rail could be installed on the outside bend. This would require vehicles wishing to access the Golden Point Road roadside parking area to be travelling in a north-eastbound direction. South-west bound vehicles would be able to turn right and access parking and/or turn around at Llewellyn Road. • The parking in this location should be short term during peak periods (i.e. 5min). This would encourage motorists to drop off / unload and then use the longer term parking off Llewellyn Road (see next option). • The parking layout would maintain access to the launching ramp and also the reservoir wall (using a shared area associated with accessible parking spaces). • Two accessible parking spaces could be provided in this parking area to improve access for mobility impaired visitors.

Parking area at the corner of Golden Point Road and Llewellyn Road	<ul style="list-style-type: none"> This option uses a relative clear area and would provide convenient access for visitors due to its close proximity to the existing (informal) parking location. The car park would accommodate in the order of 47 parking spaces and an area for large / long vehicles. This area along with short term parking at the existing parking area would accommodate the likely peak demand (community feedback indicated 60+ vehicles parked in the area on some days). The car park would be designed to allow larger vehicles to turn around. This would allow a bus to come from the east, turn around and park within the short term parking area or bus parking area (see below). Pedestrians walking to the swimming area could either: <ul style="list-style-type: none"> a) utilise the existing pedestrian path through the bushland which would take visitors to the north of the reservoir (approximately 350 m walk). In relation to Safe System considerations, this option provides good alignment with Safe System objectives, with pedestrian and traffic conflicts avoided. b) utilise a new walking path along Golden Point Road. The path would be gravel and would be delineated by frangible bollards. It is estimated that a width of up to 2.5m could be provided for pedestrians (1.5m for the path and 1m for a buffer from the roadway (incorporating the bollards). The path would be provided in front of the existing guard rail on Golden Point Road and road widening (using the existing shoulder on the eastern side of the road) would be required. The speed reductions would provide safety benefits for pedestrians using this route (particularly the 40km/h limit during peak periods which reduces the likelihood as well as the severity outcome for collisions). Examples of this type of treatment are provided below in "Pedestrian Footpath Examples"
Bus Parking	Bus parking would be provided in close proximity of the existing parking area (utilising on-road parking). The bollarded pedestrian area would be provided behind this bus parking area.
Shuttle bus	Provision of a shuttle bus from a nearby town (e.g. Castlemaine or Chewton) to the swimming area could be considered. This could reduce the demand for parking in the vicinity of area, as swimmers would park their vehicle in a suitable location in town. The feasibility of this option would depend on (1) the feasibility and cost of operating a shuttle service, and (2) whether swimmers are likely to utilise such a service, or whether they will prefer to drive themselves.

TABLE 1: POTENTIAL OPTIONS FOR CONSIDERATION

PEDESTRIAN FOOTPATH EXAMPLES

St Andrews Market, St Andrews

Scott Street (Heidelberg-Kinglake Road) east of Burns Street (in the vicinity of St Andrews Market) is a single carriageway subject to a 60 km/h speed limit and features a single lane in each direction. Historically, vehicles parked informally on the unsealed footpath/roadside with pedestrians walking along the roadway to access the market. In order to provide safe pedestrian access, and separation of pedestrian movements from the vehicular traffic and to discourage the roadside parking, wooden bollards have been installed along both sides of Scott Street.



FIGURE 1: SCOTT STREET, ST ANDREWS

Ocean Beach Road, Sorrento Ocean Beach

Ocean Beach Road on the approach to the Sorrento Ocean Beach (or Sorrento Back Beach) is a single carriageway subject to a 40 km/h speed limit and features a single lane in each direction. Sight distance is limited due to the topography and roadside vegetation and winding alignment. A pedestrian footpath is provided along the north-western side of the carriageway. The path is separated from the vehicular traffic by wooden bollards. The road provides connection to the beach including its associated parking areas, lifesaving club and café. The constrained environment encourages low vehicular speeds which is supported by the provision of a speed hump and wombat (raised pedestrian) crossing near the entrance to the National Park area. Pedestrian access to the beach is provided via the roadside gravel path as well as a number of other tracks. Pedestrian crossing priority is provided via zebra or wombat crossings at each of these crossing points.



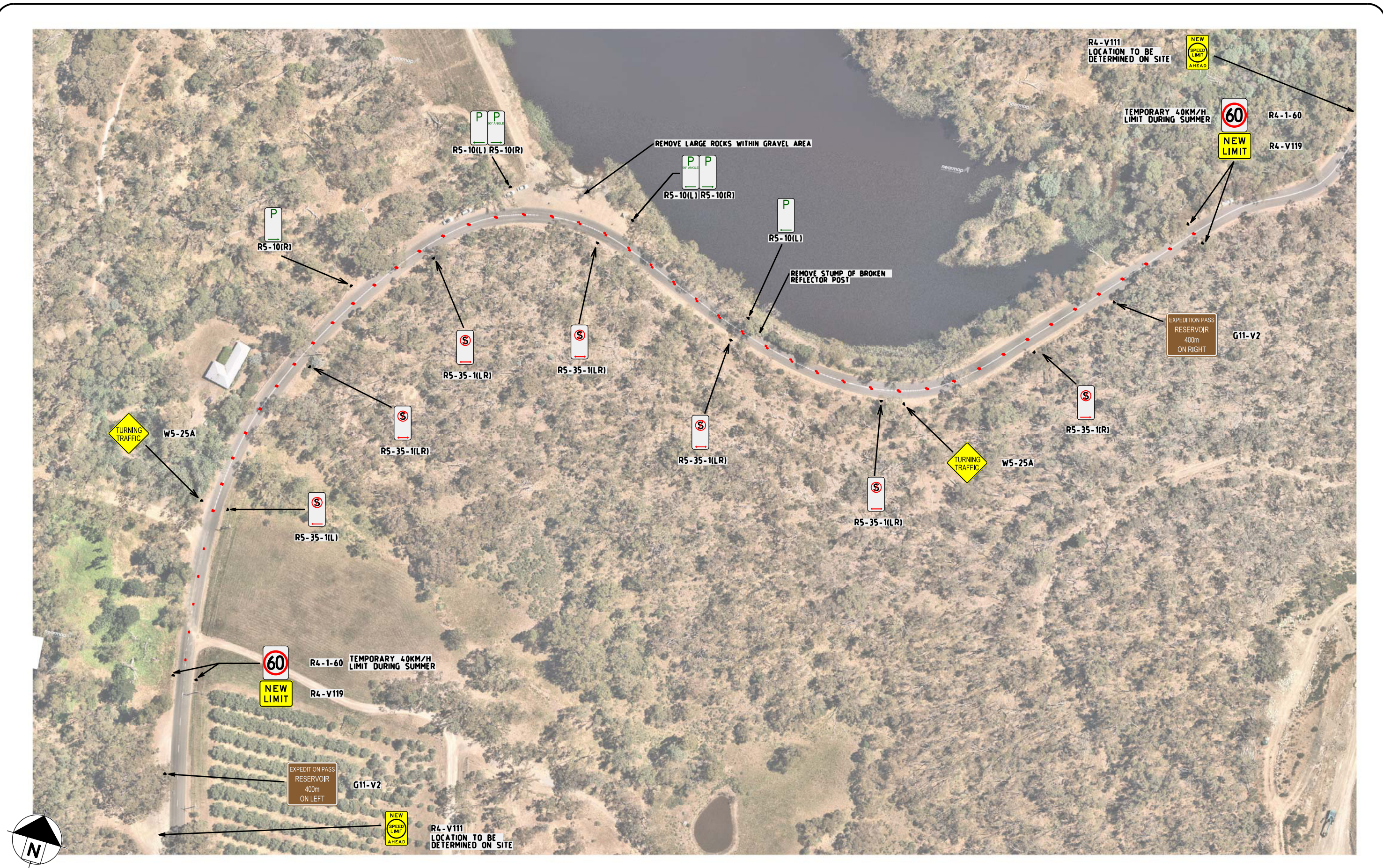
FIGURE 2: OCEAN BEACH ROAD, SORRENTO

Cape Byron Lighthouse, Byron Bay

Lighthouse Road is a narrow single carriageway featuring a single lane in each direction and barrier linemarking (double solid white lines). Sight distance is limited due to the topography and winding alignment. A pedestrian footpath is provided along the eastern side of the carriageway. The path is separated from the vehicular traffic by a barrier kerb while a w-beam is also provided for significant lengths. The road provides connection to the Cape Byron lighthouse including its associated parking areas, café and other amenities. The constrained environment encourages low vehicular speeds which is supported by the provision of speed humps.



FIGURE 3: LIGHTHOUSE ROAD, CAPE BYRON



ISSUE	DATE	AMENDMENTS		BY	

NOT FOR CONSTRUCTION

NOTES:



• Traffic Planning

• Transport Planning

• Traffic Engineering

• Road Safety

SUITE 2.03, 789 TOORAK ROAD

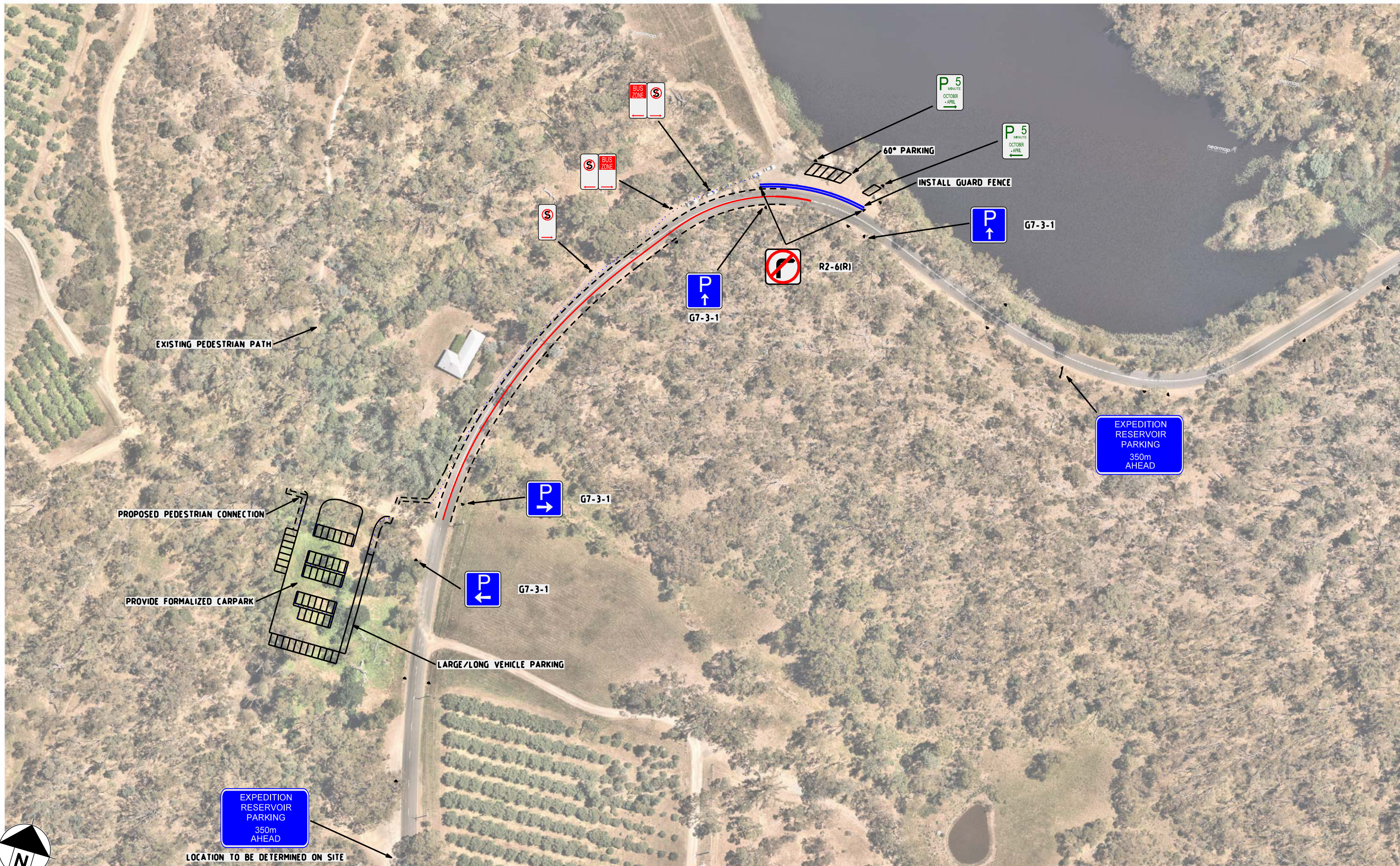
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EXPEDITION PASS RESERVOIR
PROPOSED TRAFFIC IMPROVEMENTS
SHORT TERM OPTION



ISSUE	DATE	AMENDMENTS	BY

NOT FOR CONSTRUCTION

NOTES:



• Traffic Planning • Transport Planning
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EXPEDITION PASS RESERVOIR
PROPOSED TRAFFIC IMPROVEMENTS
LONG TERM OPTION