



# Final Report

## Inverloch Parking Study

12 OCTOBER 2011

Prepared for  
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## Introduction

URS Australia Pty Ltd (URS) was engaged by Bass Coast Shire Council (BCSC) to undertake the *Inverloch Parking Study*.

Inverloch is a seaside community located on the coastline of Bass Strait approximately 140km southeast of Melbourne within the municipality of Bass Coast Shire (BCS). It has a relatively low population of 4,140 permanent residents (2006 ABS Census data) but encounters a high influx of tourists during peak periods. BCSC recently conducted preliminary investigations to extend an existing shared pedestrian and cycle path along the Foreshore/Surf Paradise as part of Council's Capital Works Programme.

This report examines the impact the extension of this path will have on parking in the area, focusing in particular on shifting demand patterns along Surf Parade and its adjoining residential streets. Mitigation measures are recommended to reduce the impact this change in parking patterns will have on local residents.

## Background Information

This section provides an outline of the study area, existing and proposed cycling/pedestrian infrastructure, seasonal variations, previous parking survey data and design guidelines and considerations.

### 2.1 Study Area

The study area covers a distance of approximately 3km mainly along the southern side of Surf Parade. The eastern terminus of the proposed path is located on Ramsey Boulevard approximately 70m east of Abbott Street with the western terminus at the Inverloch RACV Club Resort. The foreshore road located adjacent to the shared pathway is a combination of three roads – Ramsey Boulevard (approximate distance 200m); Surf Parade (approximate distance 2.2km); and Cape Paterson Road (approximate distance 700m).

The study area also includes adjacent residential streets along this 3km length of the proposed pathway. Ozone Street, Wave Street, Goroke Street, Lohr Avenue and Toorak Road are of particular interest as these are likely to be impacted by parking overflows. Ramsey Boulevard and Surf Parade have a posted speed limit of 50kph, while Cape Paterson Road has a posted speed limit of 80kph.

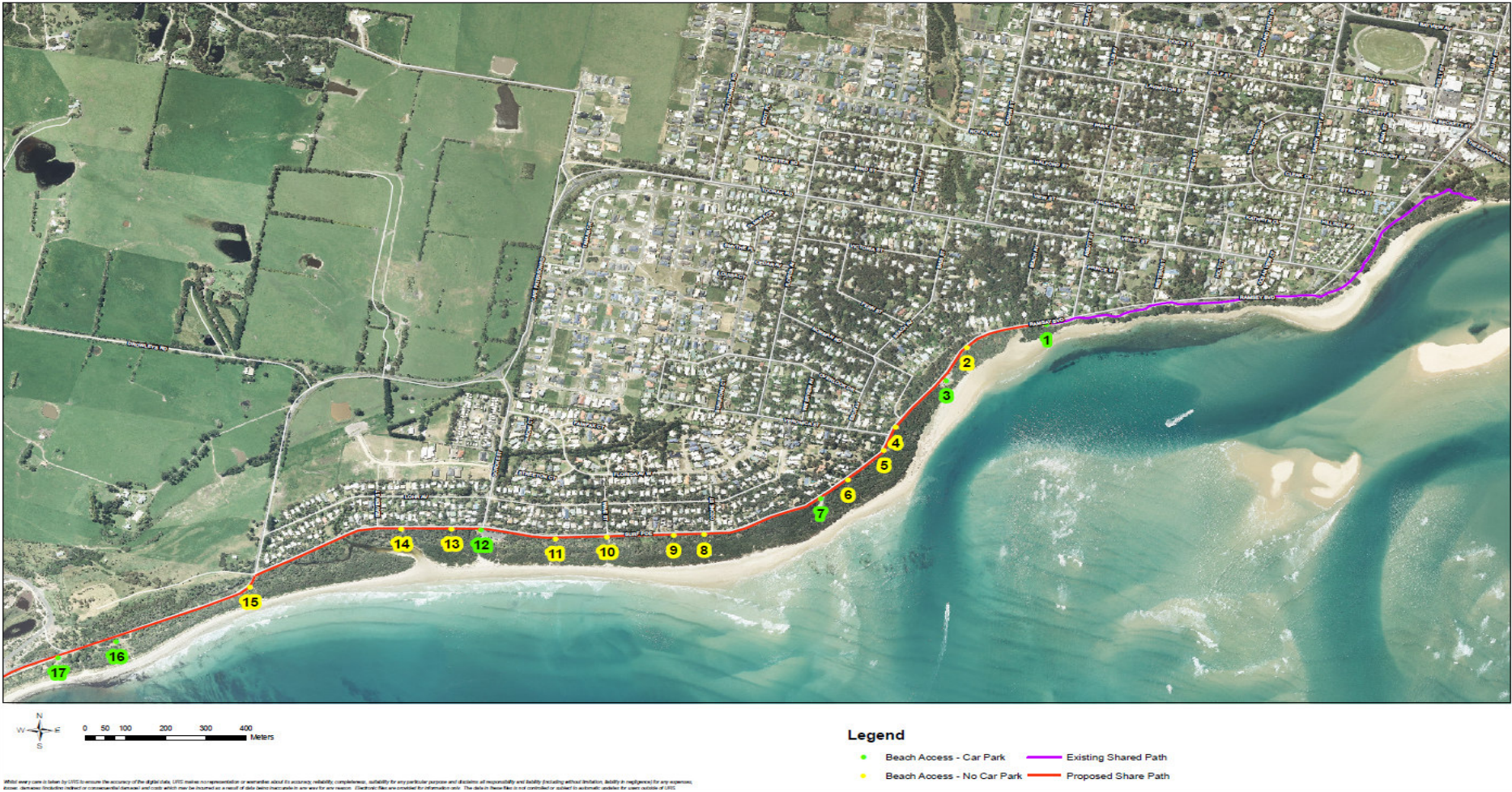
Within the study area there are a total of seventeen beach track accessed referred between T1 (the most eastern track on Ramsey Boulevard) to T17 (the most western track on Cape Paterson Road).

Figure 2-1 provides an overview of the existing and proposed pathway along Ramsey Boulevard, Surf Parade and Cape Paterson Road along with the beach access tracks.



2 Background Information

Figure2-1 Study Area and Proposed Pathway





## 2 Background Information

### 2.2 Cycling and Pedestrian Shared Pathway

#### 2.2.1 Existing Pathway

The existing shared pedestrian/cycle path is 2.2 metres wide and commences approximately 1km east of the study area between St Kilda Street and Scarborough Street. From here, it extends west along the southern side of Ramsey Boulevard for a distance of approximately 1.1km to a point eleven meters beyond the beach access point T1 where it discontinues.

Figure 2-2 illustrates the terminating point of the existing pathway near beach access point T1.

**Figure 2-2 Terminating Point of Existing Pathway at Beach Access T1**



#### 2.2.2 Proposed Shared Pathway

The proposed cycling and pedestrian shared pathway will connect to the existing shared path outlined in Section 2.2.1 (and defined in Figure 2-1) and continue west for a distance of approximately 3km along Ramsey Boulevard, Surf Parade and Cape Paterson Road. *AustRoads Guide to Road Design Part 6A: Pedestrian and Cycle Paths* states that a minimum width of 2.5m is desirable for shared paths. However, it further states that a lesser width may be adopted “where cyclist volumes and operational speeds will remain low”.



## 2 Background Information

This condition applies along Ramsey Boulevard and Surf Parade where there is a posted speed of 50km/h and cyclist volumes are relatively low, based on information provided by BCSC. Therefore the proposed shared path could maintain a width of 2.2 metres from its eastern terminus to the intersection of Surf Parade and Cape Paterson Road, with further restrictions required at locations where roadway widths do not allow this width to be maintained.

The posted speed limit increases to 80km/h along Cape Paterson Road and despite the low cycle volumes, widening the shared pathway to 2.5m should be considered.

### 2.3 Seasonal Parking Considerations

The study area attracts high volumes of tourists due to its coastal location and experiences significant seasonal parking demand variations as a result. The Surf Life Saving Club is a focal point along the Surf Parade foreshore and as such is expected to experience a large proportion of the parking demand in the study area. Peak parking demand occurs for a period of approximately six weeks per year with the highest volumes recorded during school holidays. The Christmas (mid-December to mid-January) and Easter school breaks form the pinnacle of the peak period while the remaining forty-six weeks of the year are considered off-peak.

During these peak times, vehicles park on both sides of Surf Parade as in-formal on-street parking. The existing road width of Surf Parade (maximum of 6m) and adjacent vegetation and abutting property boundaries results in restricted traffic movements to one traffic stream in various locations where on-street parking occurs on both the northern and southern sides. There are several off-street parking facilities at beach accesses T1, T3, T7, T12, T16 and T17 (locations are shown in Figure 2-1). In addition, there is high pedestrian activity throughout the study area during peak times in accessing each track and this creates an additional interaction (and potential safety issue) with parked vehicles and through traffic.

No residential properties are located on the coastal side of Ramsey Boulevard/Surf Parade/Cape Paterson Road and as such it is mainly vegetated with only six road access points to the six off-street parking facilities. The northern side is however predominantly abutting residential properties and as such there are numerous driveways and adjacent streets.

Figure 2-3 depicts the difference between the coastal (vegetated) and northern (residential) sides to Surf Parade.

## 2 Background Information

**Figure 2-3 Typical Cross-section of Surf Parade (looking west)**



### 2.4 Bass Coast Shire Council Parking Survey

BCSC conducted three parking surveys over the 2010/2011 summer period; two during peak periods and one during off-peak periods. The results of these surveys are shown in Table 2-1.

The peak demand surveys were carried out on Wednesday 29 December 2010 and Thursday 6 January 2011. The survey carried out on Thursday 6 January 2011 recorded the higher of the two parking volumes and therefore the data from this survey is used in this report to represent peak conditions. Off-peak data was collected on Wednesday 9 February 2011 coinciding with the normal school term.

## 2 Background Information

**Table 2-1 Bass Coast Shire Council Parking Survey - Summary of Demand by Beach Access Track**

Beach Access Track	Highest Peak Parking Demand		Highest Off-Peak Parking Demand	Peak Parking Demand Utilisation Category *
	29/12/10	06/01/11	09/02/11	
T1	8	14	2	Low
T2	3	3	0	Low
T3	23	24	1	Medium
T4	1	2	0	Low
T5	1	2	0	Low
T6	1	2	0	Low
T7	20	20	3	Medium
T8	11	20	1	Medium
T9	24	40	2	High
T10	13	20	1	Medium
T11	32	42	1	High
T12	62	68	11	High
T13	29	45	5	High
T14	6	15	0	Low
T15	3	6	1	Low
T16	4	10	1	Low
T17	4	10	1	Low

Notes:

\* The following criteria have been used to determine the peak parking demand utilisation category: Low = less than 20 vehicles; Medium = 20 to 39 vehicles; and High = 40 vehicles and over.

Table 2-1 illustrates that high parking demand is mostly concentrated around beach access tracks surrounding the Surf Life Saving Club (T7 to T13), which is consistent with expectations given the activity at the Club and that the adjacent sections of beach provide the safest swimming location along the foreshore. The figures also show that increased demand at locations with formalised parking areas exist compared to the demand at nearby trails without formalised parking.

### 2.5 Parking Facilities Design Guidelines

The following Australian Standards and AustRoads guidelines have been used to determine parking capacity and design considerations in this study:

- AS2890.1 (Parking Facilities: Off-street car parking);
- AS2890.5 (Parking Facilities: On-street car parking);
- AS2890.6 (Parking Facilities: Off-Street parking for people with disabilities); and
- Austroads *Guide to Road Design – Part 6A: Pedestrian and Cyclist Paths*.

## Existing Conditions

This section analyses the existing parking conditions along Ramsey Boulevard, Surf Parade and Cape Paterson Road during peak and off-peak periods. It should be noted that as this is a baseline assessment it considers that the proposed pathway is not constructed and therefore on-street parking remains available on both sides of the road. The impact of constructing the pathway on parking conditions is considered in section 4.

### 3.1 Description of Characteristics

There are a number of parameters used to determine the characteristics of parking demand and each of these are described in this section.

#### 3.1.1 Existing Parking Capacity

This parameter is a sum of the number of parking spaces available along both sides of Ramsey Boulevard, Surf Parade and Cape Paterson Road within the study area and the six off-street parking facilities outlined in Section 2.

Parking capacity is calculated for each trail by firstly calculating the total parking length available within reasonable walking distance of a particular trail. This value is assumed to be half the length between this particular trail and the next tracks located to the east and west of the location.

Parking interruption lengths along the northern side of the road (e.g. driveways, continuous white lines) are deducted from each trail's total parking length. A further localised reduction factor of 50% is applied where these interruptions are located in close proximity (i.e. two driveways located in very close distance and unable to cater for one parked vehicle).

A parking length of 6m per space is assumed in accordance with AS 2890.5. The number of parking spaces available for a particular trail can then be calculated for the northern and southern sides separately by taking the total distance to the two adjacent trails, deducting the parking interruption lengths and reductions, and dividing this value by 6m. The capacity of any off-street parking facility associated with the beach access track is then added to produce the total parking capacity.

#### 3.1.2 Maximum Off-Peak Parking Demand

Maximum off-peak parking demand for a particular trail is assumed to be as recorded on Wednesday 9 February 2011 – aligning with the results of BCSC's parking survey for conditions during the normal school term.

#### 3.1.3 Existing Parking Surplus (+) / Deficit (-) during Off-Peak

Existing surplus and deficit at a particular trail refers to the difference between the off-peak parking demand and the existing parking capacity (or supply). At locations where parking supply exceeds demand a surplus is recorded while deficits are recorded at locations where parking demand exceeds supply. A parking deficit indicates a location where parking may encroach onto surrounding residential streets. It should be noted that all seventeen trails recorded a parking surplus during the off-peak period.



### 3 Existing Conditions

#### 3.1.4 Maximum Peak Parking Demand

This level of demand is calculated in a similar way to that during the off-peak period outlined in Section 3.1.2, however is based on the data collected on 6 January 2011 as this represents the peak period conditions.

#### 3.1.5 Existing Parking Surplus (+) / Deficit (-) during Peak

These values are calculated in a similar way to that during the off-peak period outlined in section 3.1.3, however is based on the data collected on 6 January 2011 as this represents the peak period conditions.

### 3.2 Existing Parking Conditions

Table 3-1 illustrates the existing parking conditions within the study area during the defined off-peak and peak periods based on the data collected by BCSC. The data confirms that parking shortages (or deficits) do not occur at any beach access track during off-peak periods.

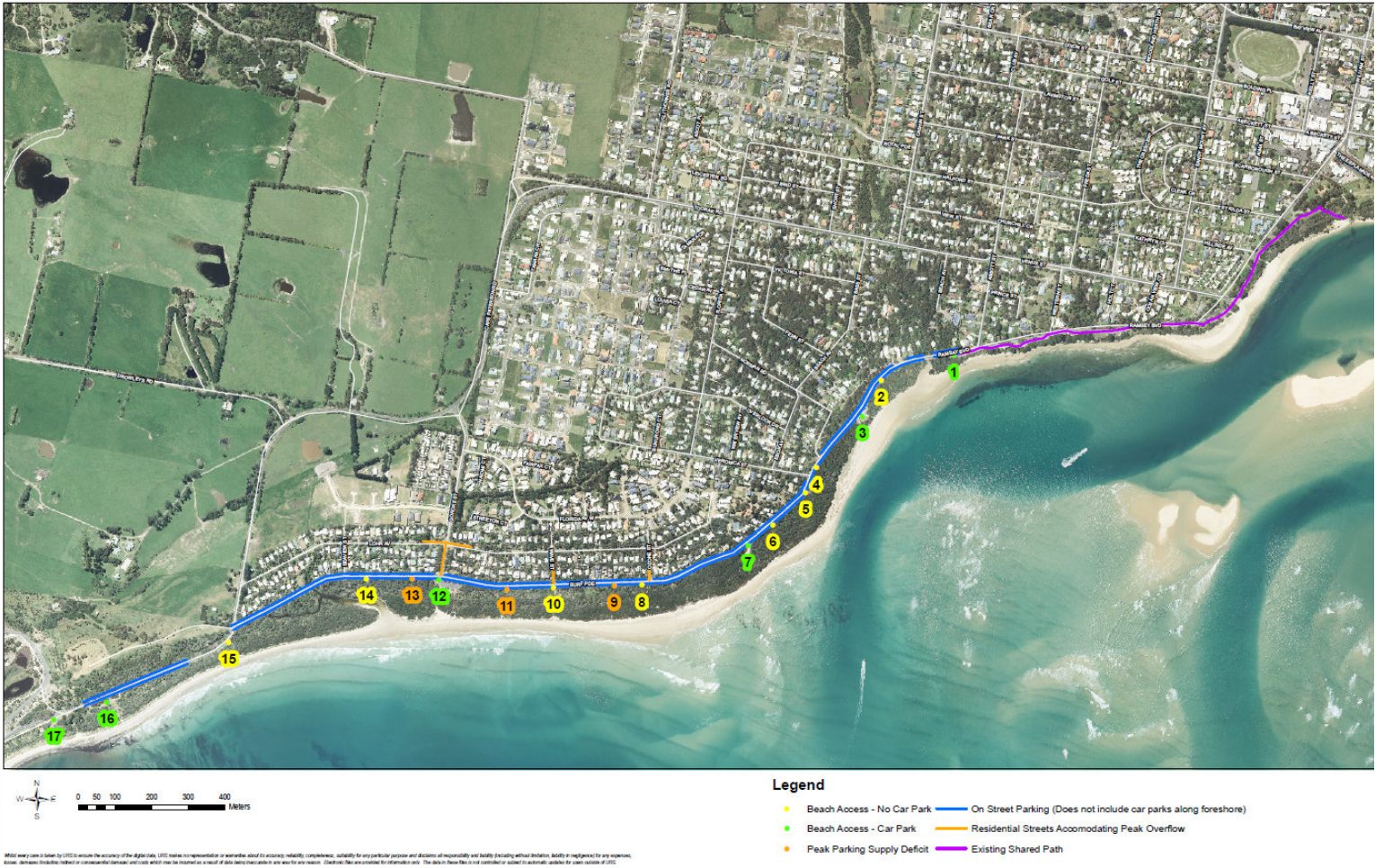
However, during Peak periods parking shortages occur at three beach access trails surrounding the Surf Life Saving Club – T9, T11 and T13. Together these three access tracks have a parking deficit of approximately 35 vehicles. It is assumed that these 35 vehicles will overflow onto adjacent streets (Ozone Street, Wave Street and Goroke Street) and the extent of this is illustrated in Figure 3-1.

**Table 3-1 Existing Parking Conditions - Peak and Off-Peak Periods**

Beach Access Track	Existing Parking Capacity (both sides of road & car parks)	Peak		Off-Peak	
		Maximum Parking Demand	Existing Parking Surplus(+)/ Deficit(-)	Maximum Parking Demand	Existing Parking Surplus(+)/ Deficit(-)
T1	70	14	56	2	68
T2	47	3	44	0	47
T3	64	24	40	1	63
T4	38	2	36	0	38
T5	35	2	33	0	35
T6	25	2	23	0	25
T7	66	20	46	3	63
T8	50	20	30	1	49
T9	28	40	-12	2	26
T10	38	20	18	1	37
T11	40	42	-2	1	39
T12	72	68	4	11	61
T13	24	45	-21	5	19
T14	43	15	28	0	43
T15	54	6	48	1	53
T16	101	10	91	1	100
T17	44	10	34	1	43
Total	839	343	496	30	809

3 Existing Conditions

Figure 3-1 Existing Parking Conditions



## Parking Conditions with Inclusion of Shared Pathway

This section further develops the results from Section 3 but consider the additional construction of the shared pathway along the coastal side of Ramsey Boulevard, Surf Parade and Cape Paterson Road. The impact of removing on-street parking to the coastal side of these roads and the subsequent redistribution of parking on local residential streets is considered in this section. Mitigation measures to accommodate the additional overflow are outlined in Section 5.

### 4.1 Future Parking Conditions

The construction of the shared path would require the removal of parking on the coastal side of the Ramsey Boulevard, Surf Parade and Cape Paterson Road and this would significantly reduce the parking capacity at each trail entrance. At trails where the maximum parking demand is relatively low, the impact of removing parking on the southern side would be less. However, at trails where there is a high demand for parking during the peak demand period, the impact would be more pronounced.

Table 4-1 summarises the balance between future parking supply and demand during peak and off-peak periods. The parameters defined in section 3.1 are also applicable to this table but with the additional inclusion of the shared pathway and subsequent loss of on-street parking available on the coastal side of Ramsey Road, Surf Parade and Cape Paterson Road.

**Table 4-1 Future Parking Conditions - Peak and Off-Peak Periods**

<b>Beach Access Track</b>	<b>Future Parking Capacity (On-street parking northern side only and existing off-street parking)</b>	<b>Peak</b>		<b>Off-Peak</b>	
		<i>Maximum Peak Parking Demand</i>	<i>Future Parking Surplus(+)/ Deficit(-) [No Mitigation Measures]</i>	<i>Maximum Off-Peak Parking Demand</i>	<i>Future Parking Surplus(+)/ Deficit(-) [No Mitigation Measures]</i>
T1	47	14	33	2	45
T2	19	3	16	0	19
T3	41	24	17	1	40
T4	15	2	13	0	15
T5	15	2	13	0	15
T6	8	2	6	0	8
T7	39	20	19	3	36
T8	19	20	-1	1	18
T9	8	40	-32	2	6
T10	14	20	-6	1	13
T11	14	42	-28	1	13
T12	54	68	-14	11	43
T13	9	45	-36	5	4
T14	17	15	2	0	17
T15	7	6	1	1	6
T16	58	10	48	1	57
T17	12	10	2	1	11
Total	396	343	53	30	366

4 Parking Conditions with Inclusion of Shared Pathway

Table 4-1 illustrates that parking shortages (or deficits) do not occur at any beach access trail during the off-peak periods.

However, during peak periods parking shortages occur at six beach access trails: T8, T9, T10, T11, T12 and T13. These trails are all within close proximity of the Surf Life Saving Club and cumulatively present a parking deficit of 117 spaces.

This overflow value is significantly higher than the existing case where a parking deficit of 35 spaces occurs during peak demand period, highlighting the negative impact of removing parking on the southern side. These vehicles would overflow more expansively onto adjacent streets including Ozone Street, Wave Street, Goroke Street, Seaview Road and Lohr Avenue.

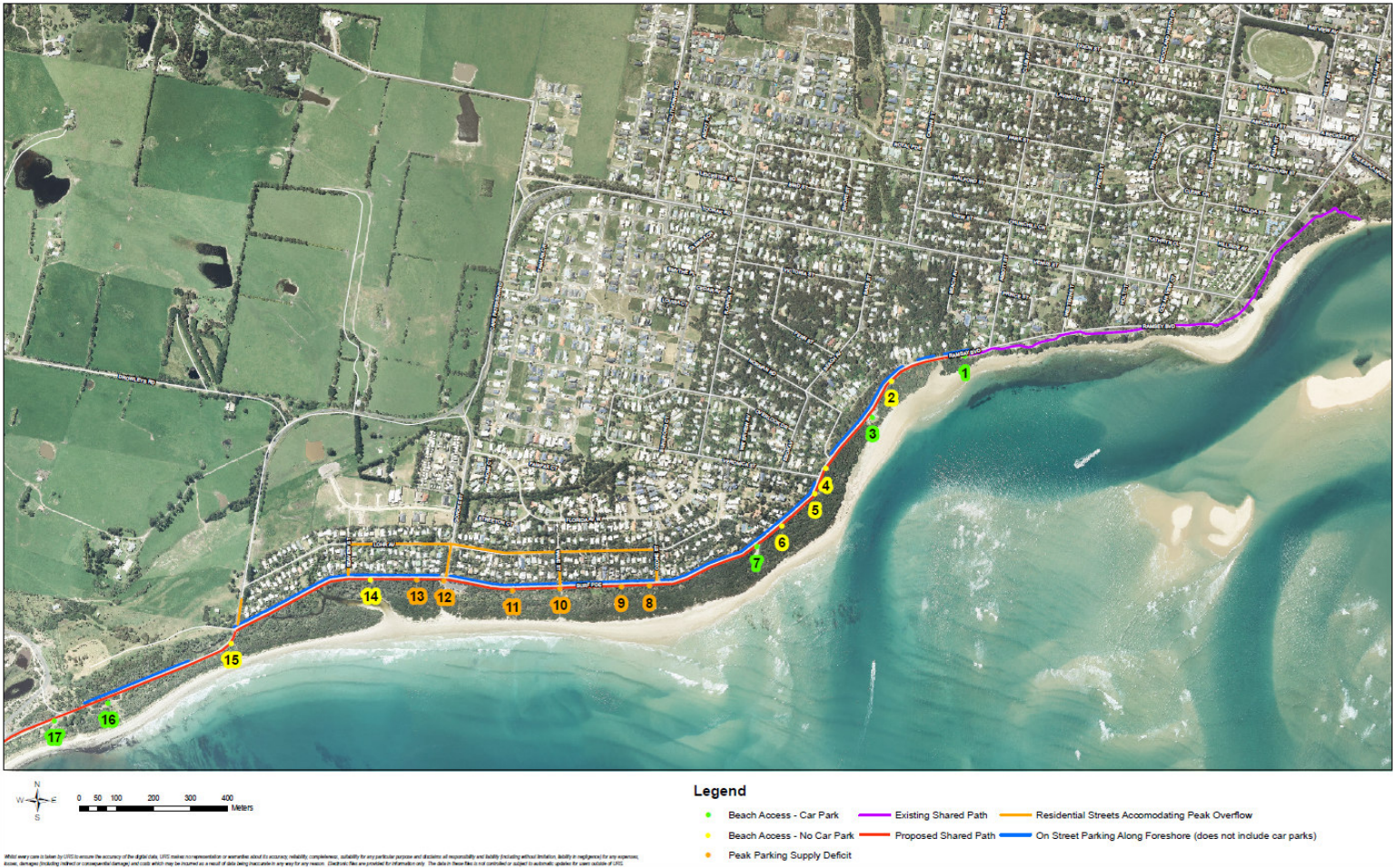
It should be noted that vehicles currently parking at T15 would no longer be able to park directly outside the entrance given that these will be removed by the shared pathway. Despite the availability of parking space along Surf Parade, vehicles would be more inclined to park to the north along Toorak Road. However this is a low demand trail and, given that no properties front onto Toorak Road within close proximity of its junction with Surf Parade and Cape Paterson Road, the overflow of vehicles onto Toorak Road would have a negligible impact on the area.

Figure 4-1 illustrates the future parking conditions that would occur in the study area during peak periods if the proposed shared path is constructed and no additional mitigation measures are implemented.



4 Parking Conditions with Inclusion of Shared Pathway

Figure 4-1 Future Parking Conditions - Without Mitigation Measures



## Mitigation Measures

This section provides recommendations to the extent of overflow to surrounding residential streets identified in Section 4 following the construction of the shared pathway.

### 5.1 Mitigation Measure Options

In order to offset the negative impact the construction of the shared pathway will have on future parking conditions, a number of mitigation measures are proposed for implementation in the study area. Without the implementation of any mitigation measures, six beach accesses (T8 to T13), would cumulatively encounter a parking shortage of 117 spaces during peak periods.

Mitigation measures have been proposed at locations where parking demand exceeds parking supply. Identified measures would reduce the parking shortage by 101 vehicles to an overflow of just 16 vehicles. This would provide parking for 86% of the future peak demand. It would also reduce parking overflows during peak period from the existing overflow figure of 35 vehicles to an overflow of 16 vehicles providing a significant improvement on the existing parking condition. It is likely the remaining 16 vehicles would overflow onto Ozone Street and Wave Street.

It should be noted that at this stage parking restrictions are not recommended given the majority (85%) of vehicles are being accommodated in the proposed mitigation measures. Consideration should be given to implementing parking restrictions in the future based on tourist influx growth increasing this overflow onto local residential streets.

Table 5-1 provides a summary of the sites where mitigation measures are proposed, the type of mitigation measures proposed at each location and the number of additional spaces proposed at each beach access location.

## 5 Mitigation Measures

**Table 5-1 Summary of Mitigation Measures**

<b>Beach Access Track</b>	<b>Future Parking Surplus (+) / Deficit (-) during Peak</b>	<b>Recommended Mitigation Measure</b>	<b>Reference</b>
T1	+33	N/A	Section 5-2
T2	+16	N/A	Section 5-2
T3	+17	N/A	Section 5-2
T4	+13	N/A	Section 5-2
T5	+13	N/A	Section 5-2
T6	+6	N/A	Section 5-2
T7	+19	N/A	Section 5-2
T8	-1	4 spaces located at track access	Section 5-3
T9	-32	6 spaces located at track access	Section 5-4
T10	-6	4 spaces located at track access	Section 5-3
T11	-28	6 spaces located at track access	Section 5-4
T12	-14	Off-street parking area on eastern side of Goroke Street – 48 to 60 spaces  On-street parking (unformed) on western side of Goroke Street – 27 spaces	Section 5-5, 5-6, 5-7 and 5-8
T13	-36	6 spaces located at track access	Section 5-4
T14	+2	N/A	Section 5-2
T15	+1	N/A	Section 5-2
T16	+48	N/A	Section 5-2
T17	+2	N/A	Section 5-2
Total Deficit	-117		
Recommended Total Mitigation (Additional Surplus)		+101 to +113	

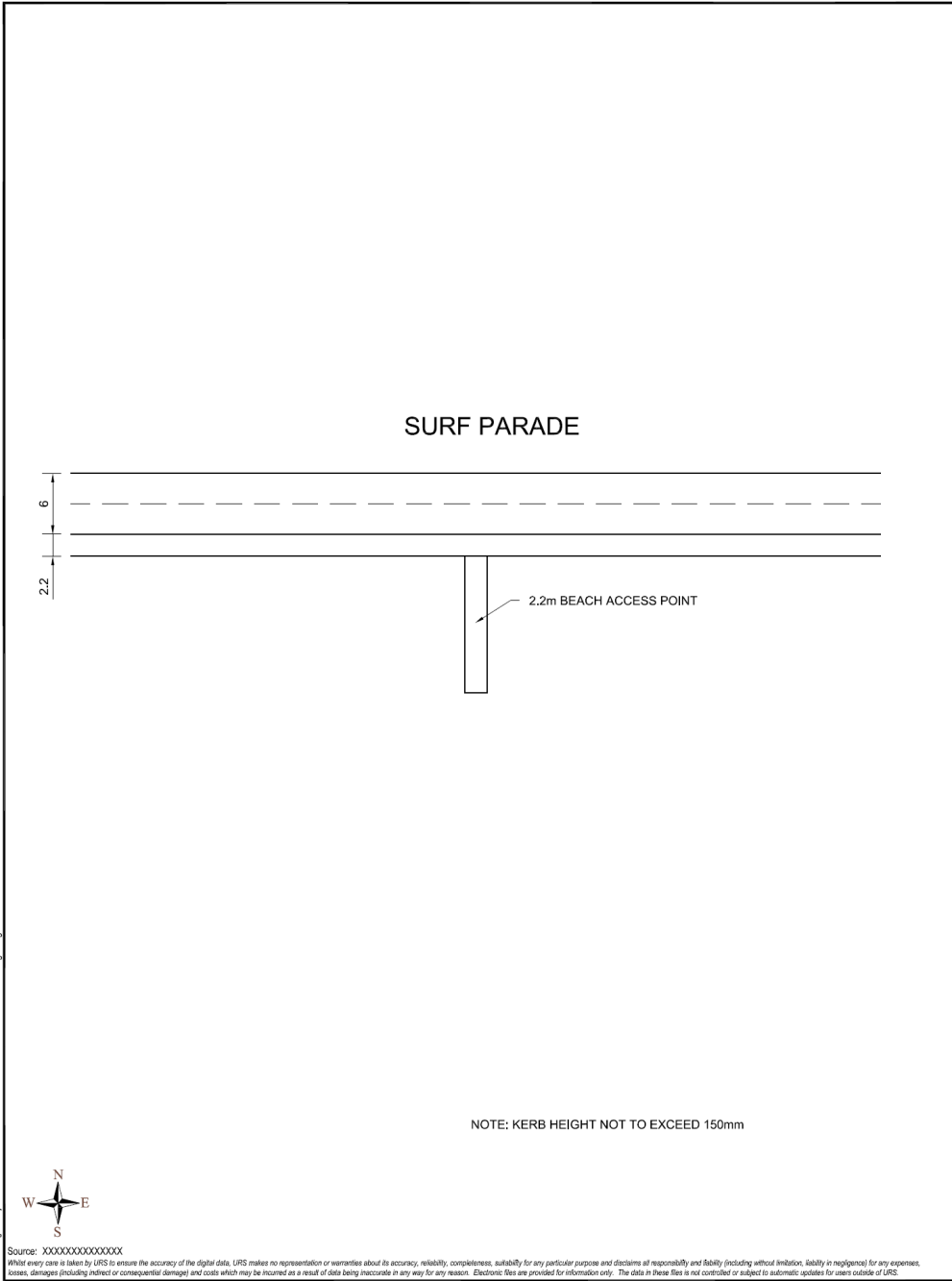
### 5.1.1 Option 1: No Localised Mitigation Measure Required

Option 1 proposes no mitigation measures to the parking arrangement at the beach access tracks. Cyclists travelling on the shared path along the foreshore should be given prior warning of the trail access point and be instructed to give way to pedestrians at the entrance point.

A concept drawing of Option 1 is provided in Figure 5-1.

5 Mitigation Measures

Figure 5-1 Concept Drawing of Option 1



BASS COAST  
SHIRE COUNCIL

INVERLOCH PARKING ALTERNATIVES

OPTION 1 (NO PARKING SPACES)

Figure: 1

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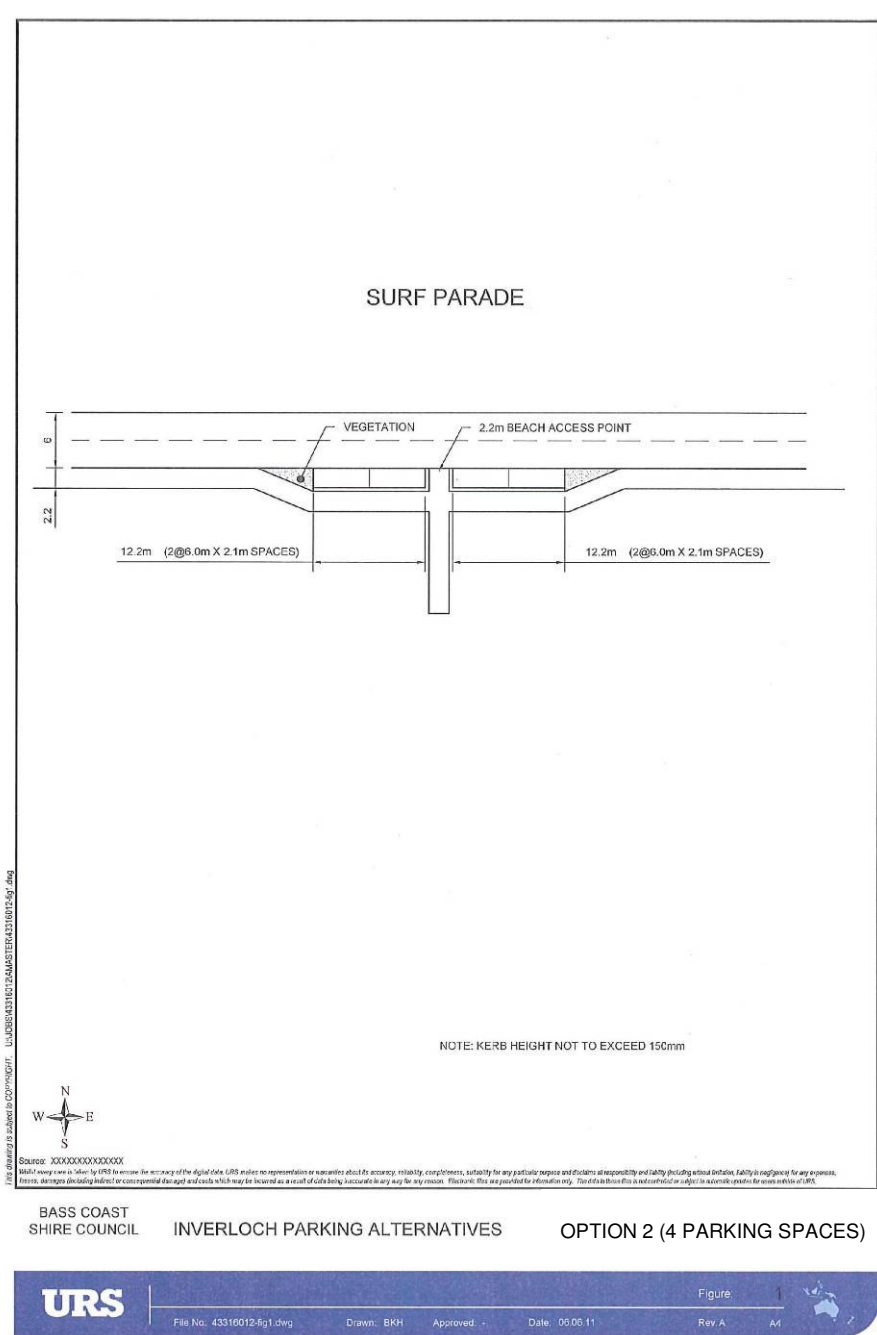
5 Mitigation Measures

5.1.2 Option 2: On-Street Parking for Four Vehicles at Access Track

Option 2 includes an indented parking area on the coastal side of Surf Parade at a particular access track. Provision for four light vehicles will be permitted given the minimal overflow of vehicles it is designed to alleviate. Similarly to Option 1, cyclists travelling on the shared path along the foreshore should be given prior warning of the trail access point and be instructed to give way to pedestrians at the entrance point.

A concept drawing of Option 2 is provided in Figure 5-2.

Figure 5-2 Concept Drawing of Option 2



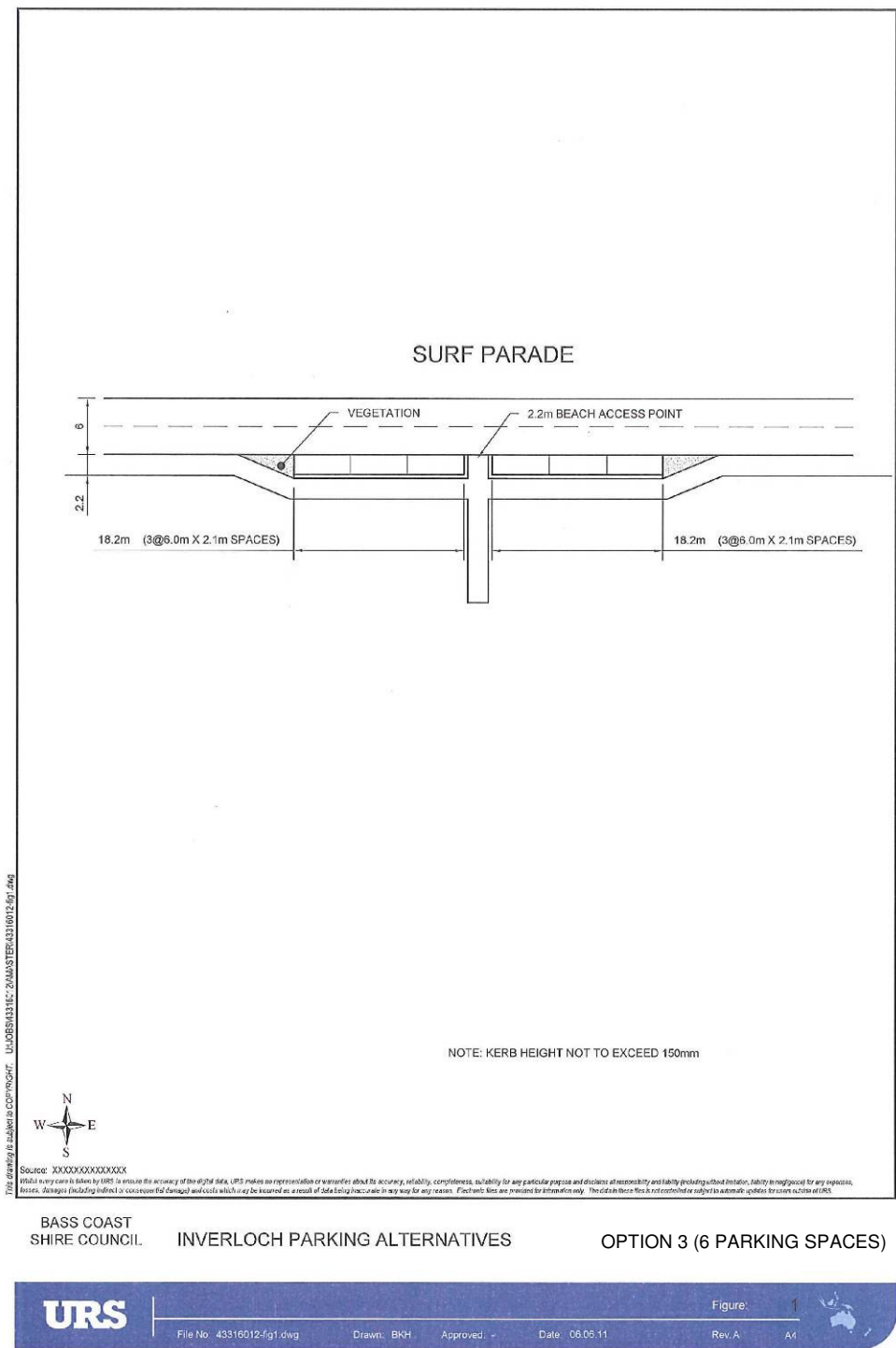
5 Mitigation Measures

5.1.3 Option 3: On-Street Parking for Six Vehicles at Access Track

Option 3 follows on from Option 2 however permits parking for a total of six light vehicles given the slightly higher parking demand at the particular beach access track.

A concept drawing of Option 3 is provided in Figure 5-3.

Figure 5-3 Concept Drawing of Option 3



## 5 Mitigation Measures

### 5.1.4 Option 4A: Goroke Street Off-Street Parking Facility (60 parking spaces)

The Option 4A carpark is the first of three car park options located within close proximity of the Surf Life Saving Club and T12. It is bounded by Surf Parade to the south, Lohr Avenue to the north, Goroke Street to the west and by residential properties to the east. Due to width restrictions, it has a one-way traffic flow stream (northbound) with access from Surf Parade and egress onto Lohr Avenue with 90-degree angle parking on both sides.

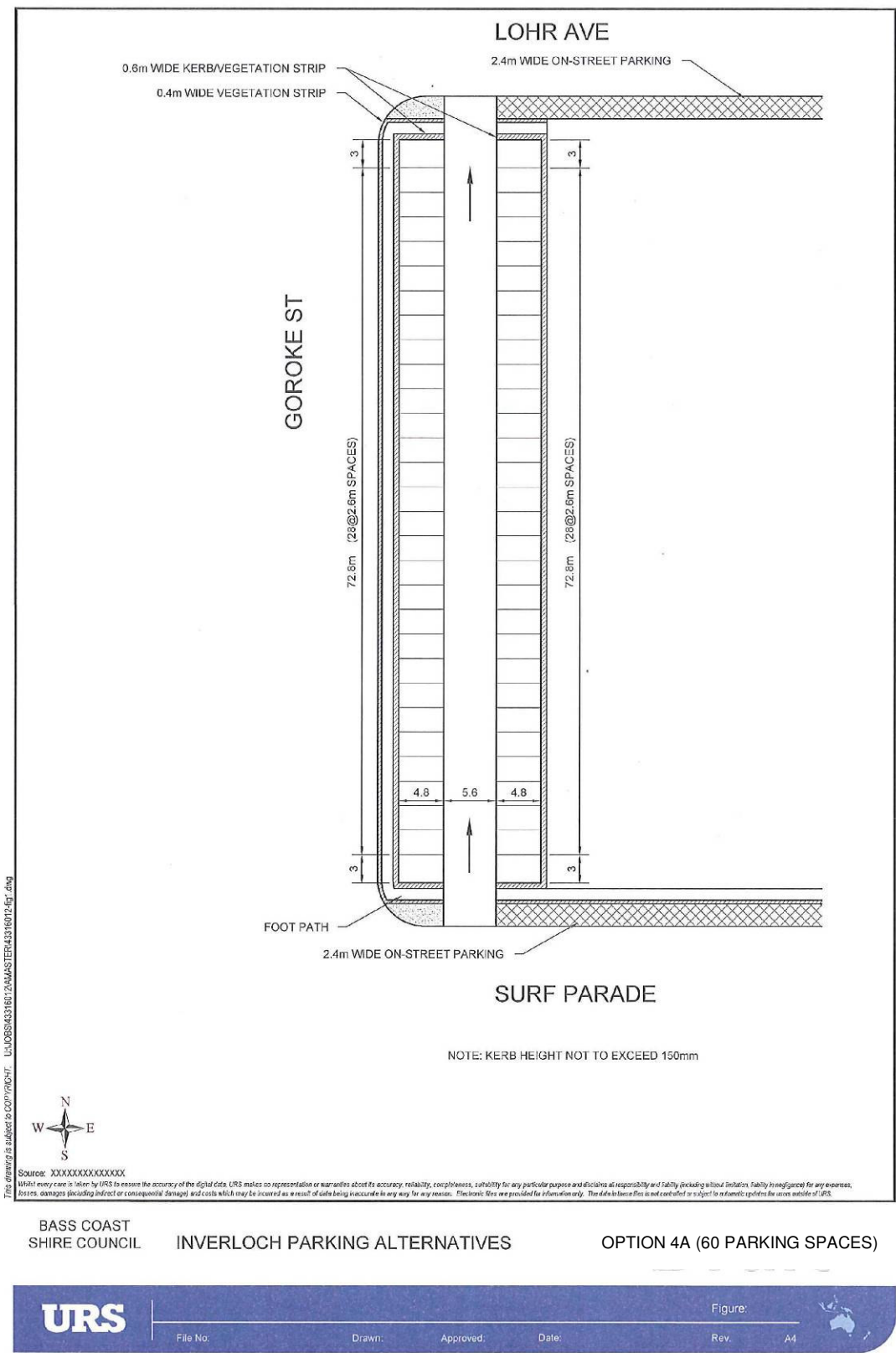
A footpath is provided on the western side with a small kerb and vegetation area separating the footpath from the parking including provision for vehicular overhang above the kerb. A similar area is provided on the eastern side of the parking facility facing the residential properties.

This option will provide sixty parking spaces but will remove an existing driveway. This will therefore require either the acquisition of one residential property (10-12 Goroke Street) or the provision of an alternate access arrangement via a rear easement onto Surf Parade.

A concept drawing of Option 4A is provided in Figure 5-4.

5 Mitigation Measures

Figure 5-4 Concept Drawing of Option 4A





A concept drawing of Option 4B is provided in Figure 5-5.

Technical drawing of a road intersection showing GOROKE ST and LOHR AVE. The drawing includes dimensions for kerb width (0.6m), vegetation strip (0.4m), on-street parking (2.4m), and road width (7.2m). It also shows lane markings, footpaths, and a north arrow.

Labels and dimensions:

- 0.6m WIDE KERB/VEGETATION STRIP
- 0.4m WIDE VEGETATION STRIP
- 2.4m WIDE ON-STREET PARKING
- GOROKE ST
- 54.6m (21@2.6m SPACES)
- 72.6m (28@2.6m SPACES)
- 7.4
- 4
- 0.3
- 4.8
- 5.6
- 4.8
- 3
- LINE MARKINGS ON PAVEMENT (NO VEGETATION)
- FOOT PATH
- 2.4m WIDE ON-STREET PARKING
- LOHR AVE
- SURF PARADE

NOTE: KERB HEIGHT NOT TO EXCEED 150mm

Source: XXXXXXXXXXXXXXXX

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BASS COAST  
SHIRE COUNCIL     INVERLOCH PARKING ALTERNATIVES     OPTION 4B (51 PARKING SPACES)

A concept drawing of Option 4C is provided in Figure 5-6.

[illegible]



## 5 Mitigation Measures

### 5.2 Recommended Mitigation Measures

The following mitigation measures are recommended for each access track based on the analysis of peak parking conditions (and catering for the majority of overflow) and minimising impact on existing residential properties:

- No mitigation measures (Option 1);
  - T1 to T7 and T14 to T17
- On-street parking for four vehicles at beach access track (Option 2);
  - T8 and T10
- On-street parking for six vehicles at beach access track (Option 3); and
  - T9, T11 and T13
- Off-street parking facilities at T12.
  - Option 4C on eastern side of Goroke Street between Surf Parade and Lohr Avenue (48 spaces)
  - Option 5 on western side of Goroke Street between Surf Parade and Lohr Avenue (27 spaces)



## Conclusion

The Inverloch foreshore is an attractive tourist location and as such experiences significant seasonal parking demand patterns. During peak demand periods the study area currently experiences a parking shortage of 35 vehicles along the foreshore within close proximity of the Surf Life Saving Club. During peak demand periods, these vehicle overflow onto surrounding residential streets including Ozone Street, Wave Street, and Goroke Street.

The extension of the existing shared pedestrian and cycling path will remove parking on the southern side of the foreshore. If no mitigation measures were imposed the existing parking shortage problem in the area would be worsened during peak periods from a current shortage of 35 vehicles to a future shortage of 117 vehicles. This would create a more expansive overflow area whereby vehicles would park on residential streets including Ozone Street, Wave Street, Goroke Street, Seaview Road and Lohr Avenue.

Various on-street and off-street mitigation measures within the study area are proposed in order to offset the negative impact of this overflow based on the construction of the shared pathway. Collectively these mitigation measures will cater for between 86% (using the recommended mitigation measures) and 97% (requiring property acquisition or alternate access arrangements) of the peak parking demand.

## Limitations

URS Australia Pty Ltd (URS) has prepared this report in accordance with the usual care and thoroughness of the consulting profession for the use of Bass Coast Shire Council and only those third parties who have been authorised in writing by URS to rely on the report. It is based on generally accepted practices and standards at the time it was prepared. No other warranty, expressed or implied, is made as to the professional advice included in this report. It is prepared in accordance with the scope of work and for the purpose outlined in the Proposal dated 23 March 2011.

The methodology adopted and sources of information used by URS are outlined in this report. URS has made no independent verification of this information beyond the agreed scope of works and URS assumes no responsibility for any inaccuracies or omissions. No indications were found during our investigations that information contained in this report as provided to URS was false.

This report was prepared between May 2011 to October 2011 and is based on the conditions encountered and information reviewed at the time of preparation. URS disclaims responsibility for any changes that may have occurred after this time.

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