ADDITIONAL VEHICLE RAMPS BRUNY ISLAND FERRY SERVICE

TRAFFIC IMPACT ASSESSMENT

Hubble Traffic
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1. Introduction

Hubble Traffic has been engaged by Burbury Consulting Engineers to prepare an independent Traffic Impact Assessment, to consider the traffic impacts and issues of implementing additional loading and unloading ramps at each of the existing Bruny Island Ferry terminals at Kettering and Roberts Point.

Bruny Island has become a hot-spot for tourists in recent years which has led to a significant increase in vehicular traffic accessing the island. The only access to the island is by the Bruny Island vehicular ferry that operates between terminals located at Kettering and Roberts Point. The ferry service operates every day of the year, with the first service commencing around 5.30am and last ferry around 8pm.

Traditionally a single ferry made a returned trip every hour. Due to the increase in user demand, additional ferry crossings were added to the schedule through operating another ferry at peak periods.

This surge in user demand has substantially increased the number of ferry crossings, placing a higher demand on the ramp loading and unloading infrastructure.

With the need for the ferry to operate continually, routine maintenance to the ramp infrastructure is becoming extremely difficult, and without proper routine maintenance, the risk of catastrophic failure of the ramp mechanics is significantly elevated.

The State Government recognises the age of the existing ramp infrastructure and the risk for unexpected interruptions. To protect the reliability of the ferry service, an additional ramp at each terminal has been identified as important. This will provide a redundancy of the loading and unloading infrastructure and ensure regular maintenance can occur.

While the principal purpose of the additional loading and unloading ramps are to ensure on-going reliability of the ferry service, there will be secondary benefits, in terms of improved transport outcomes for users and implementation of a pre-booking system.

This report will focus on traffic engineering matters that deal with the following:

- changes to road layouts,
- management of vehicles that overflow the existing marshalling areas
- pre-booking system; and
- review road signage requirements.

This report has been prepared to satisfy the requirements of Austroads, Guide to Traffic Management Part 12: Traffic Impacts of Developments, 2019. This assessment has referred to the following information and resources:

- Kingborough Council Planning Scheme
- Relevant Australian Standards
- Austroads series of Traffic Management and Road Design
- Vehicle loading data from the Ferry Operator
- Google Earth imagery
2. Site Description

This development proposal is for the construction of additional loading and unloading vehicle ramps at the existing terminals of Kettering and Roberts Point.

Both terminals are owned by the State Government and leased to the Bruny Island Ferry Operator.

The Kettering ferry terminal is located off Ferry Main Road at Kettering, while the Roberts Point terminal is located at the end of Lennon Main Road on Bruny Island.

2.0 Map – Locations of the two existing terminals.
3. The additional ramps proposal

The principal objective of this proposal is to implement and operate two loading and unloading vehicle ramps at each terminal to ensure ongoing service reliability and ramp infrastructure redundancy.

The construction works to achieve this objective will be defined in the Development Application developed and submitted by Burbury Consulting Engineers.

From a traffic engineering perspective, the construction works will be undertaken whilst maintaining the current level of service to the ferry users and operator.

Map 3.0 - Proposed development layout at Kettering

Map 3.01 – Proposed development layout at Roberts Point
4. Existing terminal infrastructure

There are two terminal facilities, one operating from Kettering and the other at Roberts Point.

4.1. Kettering ferry terminal

The Kettering terminal is located off Ferry Main Road about 730 metres east of the Channel Highway. This terminal has an off-road marshalling area than can accommodate some 60 (six metre vehicle length equivalents) vehicles in four storage lanes. This area allows the vehicles to wait before being loading onto the ferry.

To enter this marshalling area all vehicles are required to pass-by a ticket booth, where the driver pays the attendant a return journey fee for the service. This payment method can be slow and problematic due to the increased demand in service. The Ferry Operator has implemented two new methods to reduce the payment time:

- pre-purchased tickets; and
- operating an additional ticket booth during heavy demand periods.

The attendant at the ticket booth also specifies which lane the vehicle should proceed to, for loading purposes, as heavy vehicles and long vehicles require special positioning on the ferries.

Ferry Main Road between the Channel Highway and the end of the ferry terminal is a State maintained road. Some eight years ago the Department of State Growth (Department) upgraded Ferry Main Road by widening the road carriageway to implement an additional traffic lane in the eastbound direction. The lane’s purpose is to act as an overflow for queue vehicles waiting to enter the marshalling area. These works included the provision of a concrete footpath along the southern side. ‘Keep Clear’ pavement markings were provided across the two eastbound traffic lanes to improve accessibility to properties located along the northern side.

This overflow queuing lane extends to the Channel Highway and measures about 700 metres in length. Excluding the ‘Keep Clear’ zones this lane can store approximately 75 standard length vehicles, if drivers don’t leave excessive gaps between vehicles.

Implementing this overflow queuing lane significantly improved amenity and accessibility for the residential and commercial properties along the road, and was successful in managing the demand until the last few years, when the tourism of the island has grown.
4.2. Overflow queuing area within the Hotel property

Over the past few years, the ferry demand has significantly increased to a point where the vehicle queue has extended beyond the length of the queuing lane, creating safety and operational problems along the Channel Highway. This extensive queuing has occurred on the busiest holiday periods, such as Easter, long weekends, and Christmas.

To prevent queuing extending to the Channel Highway, the Department provided a lease arrangement with the Hotel located at the top of Ferry Main Road. The Hotel owner built an off-road parking area on their property that is suitable to hold vehicles waiting for the ferry as required, on days of particular high demand.

The Ferry Operator manages this overflow queuing area when the highest demand days are predicted. The process to activate this area, includes opening a fold-out traffic sign in the morning located on the side of the Channel Highway prior to Ferry Road. Arranging for traffic controllers to be located at the beginning of Ferry Main Road to direct vehicles into the overflow area when necessary.

The traffic controllers will allow non-ferry vehicles to proceed past this checking point so that residents and business operators are not impacted. The overflow queuing area is principally only suitable for standard length vehicles and light weight campervans and trailers, larger or heavier vehicles are allowed to by-pass. On these extremely busy days, operators of large trucks are requested not to operate.

4.3. Roberts Point ferry terminal

This terminal is located on Bruny Island at the end of Lennon Main Road, which is part of the State road network managed by the Department.

The marshalling area of the terminal is not manned and relies on traffic signs to inform drivers on the queuing arrangement. The traffic lanes within the marshalling area can accommodate some 65 standard length vehicles.

Situated between the loading ramp and the marshalling lanes is a building that includes a general store, café and toilet. This general store receives custom from local residents and creates the need for a dedicated by-pass lane to enable local traffic to access the store, without the need to enter the marshalling area.

About eighteen months ago the Department undertook road improvements at this terminal. These works included:

- increasing the marshalling area,
- widening the verge to provide an overflow area separate to the marshalling area,
- provision of a turning facility to enable vehicles to drop off passengers without the need to enter the marshalling area, and
- provision of formal parking spaces for 20 vehicles.
5. User groups

Broadly there are four main user groups that rely on the ferry service every day:

**Local businesses**

The commercial businesses rely on the ferry service to transport produce off the island in a fast and efficient way.

Some tourist operators require their customers coming to the island to arrive promptly to maximise their tourism adventure. Delays to ferry services impacts the tourist operators ability to provide the full tour experience to the customer.

For these reasons, the local businesses have a genuine need for a pre-booking system to operate and provide certainty with travel time.

**Travellers and tourists**

The day trippers want to maximise their time on the island and excessive wait times can quickly erode their experience. Unpredictable waiting times can cause frustration and undermine their visit to the island.

This user group endeavour to arrive early at Kettering around 10 am. Large concentration of vehicles arriving in a small time period creates excessive queuing, as the arrival rate of vehicles exceed the capacity of the ferries.

It is expected that this user group would welcome a pre-booking system to guarantee travel time.

**Island residents**

A pre-booking system will give residents greater certainty in their ability to travel to and from work, meet appointments, make flights or meet other time-based commitments.

Reducing the demand peak through vehicles arriving at predetermined times will enable the loading of the ferries to occur in a more orderly and safer manner, benefiting all users. Residents will also appreciate the ability to have access to the current non-book system, which offers flexibility in non-peak periods.

**Landowner and shack owners**

Shack owners normally have the ability to travel outside of the peak demand periods. It is envisaged this user group will benefit with having the ability to pre-book to meet commitments, or simply continue to travel in the low demand periods.
6. Analysis of current loading data

Vehicle data for vehicles entering the Kettering marshalling area was provided by the Ferry Operator. This data does not specify the length of the vehicle, which makes the data slightly difficult to interpret as the ferry capacity is based on six metre standard length vehicles.

From this dataset, it has been assumed that on average every fifth vehicle is over the standard six metres in length.

The graph below shows total vehicles per day from 1 October to 31 December 2019. This data clearly shows a number of significant demand peaks, which occur around the weekends, and prior to holidays. Also, this dataset shows a gradual demand increase through November, with the demand significantly climbing in late December.

Table 6.0 - Number of vehicles carried between October and December 2019

[Graph showing daily vehicle total from 1 Oct to 31 Dec]

From this data, it is evident there are three distinct demand levels:

- the lowest demands occur on the earlier days of the week (Monday to Wednesday),
- later in the week the demand increases by an additional 40 percent (Thursday to Saturday) and
- prior to long weekends and holiday periods the demand can increase again by another 60 percent.

This means between the lowest and highest demand periods, the number of vehicles that need to be carried, more than doubles.

This creates a difficult and complex demand management problem, to develop a ferry service that deals with the everyday demands effectively with minimal queuing and delays. But also, having the ability to manage the extreme demand peaks, and still provide manageable queues and delays.

A snapshot from the data provided in the following graphs 6.0A and 6.0B indicates a heavy arrival rate by travellers and tourists over a two hour period between 9.30am and 11.30am. Local business movements occur early morning, and the movement for landowners and residents occur later in the afternoon. It is likely that some landowners and residents try to avoid the traveller and tourist peaks.
Graph 6.0A – Average vehicles carried per two hour interval for October

![Average Monday during October](chart)

Graph 6.0B – Average vehicles carried per two hour interval for Friday in October 2019

![Average Friday during October 2019](chart)
Pie Chart 6.0C – Proportion of vehicles by user group

The pie chart demonstrates the travellers and tourists user group creates the largest demand for the service at 61 percent, with residents the next at 20 percent.
7. Trip generation by this proposal

Although the purpose of this infrastructure upgrade is not to generate more traffic movements, it is acknowledged that the demand for the ferry service has steadily grown in recent years and this incremental growth is expected to continue. Therefore, the construction of an additional ramp at each terminal, provides a great opportunity to reconsider what is the most effective and efficient method to manage the current and future vehicle demands.

Vehicle demand is not constant throughout the day, at Kettering, vehicles tend to arrive in a cluster, spiking around 10.30 am. When a large influx of vehicles arrives over a short time period that exceeds the capacity of the ferries, it creates unwarranted vehicle queuing beyond the marshalling areas. This situation is intensified around long-weekends, Easter and the Christmas holidays when queuing becomes difficult to manage.

Currently, the Ferry Operator runs two ferries most days on a 30 minute schedule, the Mirambeena ferry and the newly launched Nirana ferry.

- Mirambeena has the capacity to carry 55 vehicles on two decks
- Nirana has the capacity to carry 26 vehicles on a single deck.

This means the two ferries can carry 81 (six metre length equivalents) vehicles per hour.

The Nirana is a modern purpose built single-deck fast ferry with faster loading and unloading times. A further purpose built ferry is due to be operating in early 2021. The two new ferries can provide a higher frequency timetable with the capacity to depart each terminal every 20 minutes.

The Ferry Operator also has the Bowen ferry at their disposal. The Bowen can carry 26 vehicles and operate on a 30 minute timetable. The Ferry Operator is expected to replace the Mirambeena with the Bowen in the near future.

7.1. Capacity increase from operating two ramps

The two ramps arrangement at each terminal provides the opportunity to create a two-speed ferry service, with a 20 minute and 30 minute timetables, delivering an increase as shown in Table 7.1.

Table 7.1 – two speed ferry service

<table>
<thead>
<tr>
<th>System</th>
<th>Ferry arrangement</th>
<th>Individual capacity</th>
<th>Total capacity per hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td>Mirambeena and Nirana Operate on a 30 minute timetable using the existing ramp.</td>
<td>55 vehicles per hour, 26</td>
<td>81 vehicles per hour</td>
</tr>
<tr>
<td></td>
<td></td>
<td>vehicles per hour</td>
<td></td>
</tr>
<tr>
<td>Proposed</td>
<td>Bowen operates on a 30 minute timetable using the existing ramp and Two</td>
<td>26 vehicles per hour, 78</td>
<td>104 vehicles per hour</td>
</tr>
<tr>
<td></td>
<td>purpose built ferries operate on 20 minute timetable using the new ramps.</td>
<td>vehicles per hour</td>
<td></td>
</tr>
</tbody>
</table>
Table 7.1 demonstrates that using two ramps at each terminal enables the Ferry Operator to run a two-speed ferry service, this can achieve an increase in the number of vehicles carried from 81 to 104 vehicles per hour. This increase represents a 28 percent uplift.

With three ferries operating on a two-speed service, a two ticketing system could be implemented. The Bowen to operate on the current non-booking system, while a slightly faster service would operate using the newly purposed built ferries, where users can pre-book.

The 28 percent uplift in capacity represents an increase of 23 vehicles per hour. This increase is expected to reduce the current queuing demand, and improve waiting times in peak demand periods.

### 7.2. Capacity increase through vehicle pre-booking

As demonstrated in the two graphs 6.0A and 6.0B, ferries departing Kettering before 9.30am leave with spare vehicle capacity. It is expected that the pre-booking system will cause some of the demand to spread to the earlier ferries.

It is likely that the traveller and tourist user group would the opportunity to catch earlier ferries. This user group is accustomed to research their journey and mode of transport, including pre-booking.

Optimising the capacity of earlier ferries is expected to deliver another capacity uplift, particularly during the heavy demand periods.

### 7.3. Summary of potential capacity increase

Operating two ramps with a two-speed ferry service is expected to deliver an increase in the number of vehicles that can be carried per hour.

The pre-book system is expected to optimise the spare capacity of ferries between 8.30 and 9.30am and based on the available data, it appears on average there is at least five spaces unoccupied on the ferries in this time period. It is likely this time slot will become more popular during the high demand periods, as the pre-book system will encourage users to optimise earlier ferries.

However, the 7.30am to 8.30am period is probably too early to attract significant user behaviour change, and a much smaller increase in vehicles is expected in this period.

With the faster loading and unloading of the Bowen and operating two ramps provides the potential for four ferries to operate on the service at any one time.
Based on four ferries leaving the Kettering terminal each hour the potential increase is demonstrated in table 7.3.

Table 7.3 – Total potential increase in vehicles carried prior to 9.30am.

<table>
<thead>
<tr>
<th>Time period</th>
<th>Increase capacity with operating two ramps</th>
<th>Utilisation of the extra capacity of the two ramps</th>
<th>Expected increased through Pre-booking earlier ferries</th>
<th>Expect total increase in number of vehicles carried</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.30 to 8.30am</td>
<td>23</td>
<td>5</td>
<td>8</td>
<td>13</td>
</tr>
<tr>
<td>8.30 to 9.30am</td>
<td>23</td>
<td>23</td>
<td>16</td>
<td>39</td>
</tr>
<tr>
<td>Total</td>
<td>46</td>
<td>28</td>
<td>24</td>
<td>52</td>
</tr>
</tbody>
</table>

It is evident that an increase in the number of vehicles carried can occur prior to 9.30am, potentially an additional 52 standard length vehicles.

Combine this increase with the additional 23 vehicles carried between 9.30am and 10.30am, and a substantially uplift can occur. Potentially, an additional 78 vehicles can be carried before the 10.30am spike. The 78 vehicles also represent a linear distance of 468 metres based on standard vehicle lengths, this is about two-thirds the distance between the marshalling area and the Channel Highway.
8. Pre-book system

As discussed previously, the principal need for the additional ramps is to provide redundancy of the existing ramp infrastructure to ensure ongoing reliability of the ferry service. The additional ramps also provide the opportunity to implement a pre-book system.

8.1. Purpose of the pre-book system

Some of the benefits of a pre-book system includes:

- ability to plan travel and minimise the need to turn up very-early at peak times to guarantee travel on a particular ferry,
- provide users with greater certainty in their ability to travel to and from work, meet appointments, or meet other time-based commitments,
- enable customers and tourists to arrive promptly to the island to maximise their experiences,
- offer commercial operators greater reliability for transporting their produce, and
- managing user demand in a more orderly and safer manner.

8.2. Expected operation of the pre-book system

The pre-book system will be available for travel on the newly purpose built ferries that will use the new ramp infrastructure.

The pre-book system will provide the user a 30 minute time slot, rather than booking a particular ferry. This provides the user with some time flexibility, which may arise from various traffic conditions on the journey to the terminal.

It is expected that some pre-book users will arrive slightly outside their allocated time slot, but they will still be entitled to proceed through the pre-book system. This can create an uneven arrival rate and place unknown demands on the allocated marshalling area.

To accommodate for this unevenness in the arrival rate and to maximise the available marshalling areas, its only possible to allocate 60 percent of the ferry to pre-booking. However, the ferries will load up to 20 pre-booked vehicles (which is 80 percent capacity) if pre-booked vehicles are waiting. This system will allow the two allocated marshalling lanes to meet the demand.

Limiting pre-booking to 60 percent of the purpose built ferries when the system is introduced, is a conservative approach to ensure the pre-book marshalling lanes do not overflow on to Ferry Main Road. This limit can be reviewed once the system is operating and monitored. It is highly likely that the introductory level of 60 percent could be lifted to 70 or 80 percent.

60 percent pre-booking levels represents 48 vehicles per hour, while 80 percent pre-booking levels represents 63 vehicles per hour. At the pre-booking level of 70 percent, this means the vehicles
carried each hour could consist of equal portions of pre-booked and non-booked vehicles, which represents an equitable system for users.

It is important to maximise the available marshalling areas, this can be achieved by allocating queuing lanes one and two for pre-booked vehicles, and lanes three and four to non-booked vehicles.

All ferries leaving the terminal will be loaded to capacity if vehicles are waiting.

8.3. Pre-book users accessing the designated marshalling area

Improved road signage along Ferry Main Road and information obtained when booking a time slot will direct pre-book users to drive in the second left hand traffic lane along Ferry Main Road to the pre-book checking station. At this point the users will access the marshalling area using a ticket scanner system.

9. Non-book system

The current non-book system will be retained for users who prefer to turn-up and take their chances with the queuing length and waiting time.

The Ferry Operator has advised that in time, the Bowen will replace the Mirambeena. The Bowen will be allocated for non-booked vehicles and will operate on a 30 minute timetable, using the existing loading and unloading ramp infrastructure.

Queueing lanes numbered three and four within the marshalling area will be allocated for non-booked vehicles and will accommodate 30 standard six metre vehicles. The left hand lane on Ferry Main Road will be available for non-booked vehicles that exceed the capacity of the two marshalling lanes.
10. Changes to the marshalling areas

10.1. Kettering terminal

To accommodate the two ticketing systems some minor modifications to the entry layout of the marshalling area will be required. It is proposed to create two separate entries, one entry for non-book vehicles and another entry for pre-book vehicles. Non-book vehicles will enter via the left-hand lane on Ferry Main Road and occupy the marshalling lanes currently numbered three and four. Any overflow of non-booked traffic would queue along the left-hand lane as they do now.

A small traffic island will be implemented to separate the two entries. This traffic island will contain a new ticket booth, with the attendant having the ability to operate and oversee access to both entry lanes.

Pre-book vehicles will enter using the free flow lane on Ferry Main Road and bypass any queued vehicles waiting for the non-booked service.

A pre-book ticket will contain a bar code, which will be used to operate a ticket scanner attached to a boom gate, allowing access to the booked marshalling lanes. Incorporated in the ticket scanner will be an intercom system to allow communication between the driver and ticket attendant, who will have access to override the boom gate, as necessary.

One of the benefits of the proposed entry arrangement is to allow for a simple bypass, where a vehicle arriving without a valid booking, can be diverted out of the lane back to Ferry Main Road. The vehicle can then utilise the existing roundabout to turn around to join the end of the non-booked queue.

Removable bollards would be used to separate the two marshalling areas.

Adjustment to the existing overhead gantry and revised signage will be undertaken as part of the upgrade.

10.2. Roberts Point terminal

At the Roberts Point terminal, minor road changes will be required to facilitate the two ticketing systems.

It will be necessary to extend the recently constructed overflow lane to the marshalling lanes, to create two separate feeding lanes into the marshalling lanes. The traffic arrangement will be similar to the Kettering layout, where the left-hand lane is used for non-booked vehicles. The extension of the overflow lane will allow for the non-booked vehicles to feed straight into the marshalling lanes numbered one, two and three. Any overflow vehicle would queue back in the left-hand lane.

Pre-book vehicles will use the free flow traffic lanes to access the ticket scanner and boom gate to enter the pre-booked marshalling lanes currently numbered four and five. The ticket scanner and boom gate will be positioned to take advantage of the current turning facility to return vehicles that
arrive without a valid booking. Once again, the ticket scanner will have an intercom connection with the attendant located in the Kettering ticketing booth, with an override facility.

The adjustments in the road layout and current median island will ensure the turning facility accommodates a u-turn manoeuvre that is required by the local school bus operator.

The existing kiosk and toilet building will remain in its current position, with the local bypass traffic lane retained to enable local traffic to access the kiosk facility without the need to enter the marshalling areas.

Ultimately, replacing this building in a different location, further up Lennon Main Road nearer to the parking spaces would be a desirable outcome from a traffic perspective, as the local bypass lane could be utilized as part of the marshalling areas.

Removable bollards will be used to separate the different marshalling areas.
11. Terminal layout to accommodate the new ramps

The additional ramp at the Kettering terminal will be located on a separate berth located immediately south of the current berthing infrastructure.

For traffic efficiency, the access ramp will be constructed with a hard surface that offers high traction properties, the grade of the ramp will ensure laden heavy vehicles can climb easily from a stationary condition off the ferry onto the ramp. The design will ensure that any rate of grade change will not cause any vehicle clearance issues for commercial or light vehicles.

Although the pre-book vehicles will be predominately loaded using the new ramps, and non-book vehicles using the existing ramp, it is important that either ramp can load a vehicle from any of the marshalling lanes. Burbury Consulting Engineers has undertaken the necessary checks using swept paths, to ensure a vehicle from any marshalling lane can be easily loaded using the new ramps, the swept paths are available on Burbury plans SK17 and SK37.

11.1. Managing the operation of two ferries at one terminal

When three ferries are operating with two ramps, the timetable is expected to be scheduled to avoid having more than one ferry at a terminal. However, it is inevitable that there will be occasions when two ferries are at one terminal.

A priority management procedure will be operated to ensure loading and unloading can occur efficiently without creating any conflict with vehicles and pedestrians. A priority management procedure will be the responsibility of the Ferry Operate to design, implement, and audit.

Table 11.1 demonstrates a possible priority management system to avoid vehicle and pedestrian conflicts.

<table>
<thead>
<tr>
<th>Existing ramp</th>
<th>New ramp</th>
<th>Conflict</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loading</td>
<td>Unloading</td>
<td>No conflict</td>
<td>Simultaneously loading and unloading</td>
</tr>
<tr>
<td>Loading</td>
<td>Loading</td>
<td>Possible conflict</td>
<td>First ferry to arrive</td>
</tr>
<tr>
<td>Unloading</td>
<td>Loading</td>
<td>Conflict</td>
<td>Unloading ferry</td>
</tr>
<tr>
<td>Unloading</td>
<td>Unloading</td>
<td>Conflict</td>
<td>First ferry to arrive</td>
</tr>
</tbody>
</table>
12. **Traffic improvements**

12.1. **Upgrade to the road signage**

To ensure efficient movement of traffic under the two ticketing systems, an upgrade of the road signage along both Ferry Main Road and Lennon Main Road will be necessary, to ensure users approaching the terminal areas clearly understand which traffic lane they should be in.

The traffic signage will be designated so that non-book vehicles use the left hand lane, while booked vehicles can proceed to the checking station, using the free flow lane. The exact wording on the traffic signs will need to be carefully considered to ensure the correct message is convey to the drivers.

These signs might appear like this:

<table>
<thead>
<tr>
<th>Non-booked vehicles</th>
<th>Booked vehicles</th>
</tr>
</thead>
<tbody>
<tr>
<td>use and queue left lane</td>
<td>proceed to checking station</td>
</tr>
</tbody>
</table>

12.2. **Other traffic improvements**

At the Kettering terminal pedestrian access will be improved by marked pedestrian crossings, to assist access to the ramps. Pedestrians accessing the new ramp will be able to wait in a new designated area located between the two ramps.

The proposal will include a formal DDA car parking space with a ramp access to the pedestrian waiting areas. This is detailed on Burbury plan SK50.

There are no pedestrian changes required at the Roberts Point terminal, as the existing layout incorporates a gravel pathway where pedestrians can access the ramps from the designated parking spaces or turning facility.

It has been reported that some international drivers when leaving the Kettering terminal can proceed along the wrong side of the roadway creating conflict with opposing vehicles. To address this issue, this project will implement pavement arrows to signify the direction of travel along Ferry Main Road.

It has been reported that when vehicles park on the southern kerb of Ferry Main Road opposite the Marshalling area, these vehicles can restrict the traffic flow leaving the Kettering terminal. No standing restrictions will be implemented.
13. **Impacts from traffic generated by this development proposal**

Although the purpose of this infrastructure proposal upgrade is not to generate more traffic movements, it is acknowledged that the demand for the ferry service is expected to grow. As indicated earlier in this report, the provision of the additional loading and unloading ramps at each terminal will provide secondary benefits of an uplift in the number of vehicles carried per hour. The additional ramps also facilitate the implementation of a pre-book system to offer users better travel planning.

13.1. **Traffic impacts**

This development proposal is not expected to create any adverse safety or transport efficiency issues, but deliver improved traffic outcomes for the ferry users through an uplift in vehicle carrying capacity.

The ability to pre-plan and book a time slot, is expected to spread the peak demand across a longer time period, to reduce the queuing length.

To reduce the likelihood of pre-booked vehicles queuing outside the marshalling lane, the system will only allow 16 vehicles of each ferry to be booked, but load 20 vehicles from the pre-book lanes, to ensure there is sufficient space to accommodate arriving vehicles.

13.2. **Traffic amenity impacts**

Residents along Ferry Road feel they are generally inconvenienced by the ferry operating from the Kettering terminal. The upgrade undertaken by the Department in 2012 substantially improved the residential amenity through the provision of the additional lane set aside for ferry traffic to queue. This allowed two traffic lanes for non-ferry traffic to move freely and access properties along both side of the Ferry Main Road.

This development proposal is not expected to create any adverse amenity impact to properties along Ferry Main Road, but is expected to deliver shorter waiting queues.

The potential for the ferry queue to extend to the Channel Highway is significantly reduced.

13.3. **Traffic safety impacts**

This development proposal is not expected to create any adverse safety impacts.
14. Planning scheme

14.1. E5.0 Road and Rail Assets Code

E5.5.1 Existing road accesses and junction

This development proposal will utilise the existing accesses to the two marshalling areas at Kettering and Roberts Point. No extra traffic is expected to be generated from this proposal. The changes to the entry points to the marshalling areas are considered to be minor in nature and maintains the current traffic functionality. For these reasons, it is considered this development proposal complies with the acceptable solution A3.

14.2. E6.0 Parking and Access Code

E6.6 Number of Car Parking Spaces

The primary purpose of this development proposal is to improve the reliability of the ferry service by the construction of additional loading and unloading ramps at both terminals.

As demonstrated in this report, the additional ramp infrastructure provides a secondary benefit of increasing the number of vehicles that can be carried per hour, and this reduces the waiting time and length of queued vehicles.

For these reasons, the number of Car Parking Spaces is not affected and therefore it is considered this development proposal complies with the acceptable solution A1.
15. Conclusions

This development proposal seeks to implement additional loading and unloading ramps at both Kettering and Roberts Point ferry terminals, to ensure reliability of the ferry service, by providing suitable redundancy of the ramp infrastructure.

This ferry service provides the only access to Bruny Island and it is crucial the service is able to maintain its daily timetable. The additional ramps will facilitate regular routine maintenance to be scheduled to the ramp infrastructure to preserve its operational performance.

Additional ramps provide a secondary benefit in delivering improved travel outcomes for users, these include:

- operating three ferries on a two-speed service, with the purpose built ferries operating on a 20 minute timetable utilising the new ramps, with the Bowen operating on a 30 minute timetable using the current ramp infrastructure,
- this level of service provides an uplift in the number of vehicles that can be carried per hour. At peak demand periods, this represents significant improvement in the performance, and will lead to shorter queues and waiting times,
- allows for the implementation of a pre-book system to offer users with an alternative to the current non-book system which will be retained. The pre-book system delivers the following benefits:
  - allow users to plan travel and minimise wait time,
  - provide greater certainty for landowners and residents to meet appointments or other time-base commitments,
  - enable tourist operators to schedule prompt delivery to the island to maximise the tourist experience, and
  - commercial operators on the island can operate with greater reliability to transport their produce.

The road changes required to implement the two-ticketing system will be minor in nature and can be implemented without disrupting the ferry operation. Similarly, the construction of the two additional ramps can be undertaken without major disruption to the ferry service.

Geometric review of the additional ramp layouts indicates they are expected to operate successfully without creating any conflict issues, with the need for the Ferry Operator to develop and implement a priority management procedure to operate when two ferries are at one terminal.

Burbury Consulting Engineers has demonstrated through using swept paths of design vehicles that a vehicle from any marshalling lane can be loaded using the new ramps. They also, advised that the grades of the new ramps will not cause any issues for laded vehicles and there will be sufficient ground clearance.

Some minor changes to the traffic management will be required at both terminals, but they will not alter the functionality of the traffic control.

From a traffic and safety perspective, this development proposal is not expected to create any adverse safety, amenity or transport efficiency issues.

This assessment found no reason for this proposal not to proceed.