

# **Bus Priority Infrastructure Program On-time running improvements Hornsby to Blacktown corridor**

## **Submissions report**

Roads and Maritime Services | November 2017

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# **Bus Priority Infrastructure Program On-time running improvements Hornsby to Blacktown Corridor**

## **Submissions report**

**January 2018**

Prepared by NGH Environmental and Roads and Maritime Services

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## Document controls

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### Approval and authorisation

<b>Title</b>	Bus Priority Infrastructure Program On-time running improvements Hornsby to Blacktown Corridor
<b>Accepted on behalf of Roads and Maritime NSW by</b>	Roopa Jogunoori Project Manager Busway Program, Easing Sydney's Congestion PMO, Sydney Division
<b>Signed</b>	
<b>Dated</b>	17 January 2018

# Executive summary

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## The proposal

Transport for NSW, in partnership with Roads and Maritime, is proposing to improve the reliability of buses by making changes to bus stops along the corridor between Hornsby and Blacktown (the proposal). The corridor predominantly links Blacktown to Castle Hill, serviced by T70/T71, and Castle Hill to Hornsby, serviced by Metrobus M60, as well as other local and suburban routes which use parts of the corridor.

The key features of the proposal are:

- Rationalising bus stop locations to optimise the spacing between bus stops
- Lengthening some bus stops to improve access for buses and assist passenger boarding and alighting
- Relocating some bus stops to optimise spacing and / or address traffic and safety issues
- Improving bus stop infrastructure at some locations including changes to bus stop signage
- Providing new stops to address customer demand.

The original proposal (as presented in the REF which went on public display) included the following and is illustrated in Figure 1-2 to

Figure 1-9:

- Nine bus stop removals (including the removal of signage and other bus stop infrastructure)
- Four bus stop improvements (including extensions)
- Three bus stop relocations
- Bus stop consolidation (four existing bus stops consolidated into two new stops)
- One new bus stop.

Following a review of the submissions received, changes to the proposal have been made. These are discussed in Chapter 4 (Changes to the proposal) and a summary table of the changes made to the original proposal by bus stop location is provided in Table 0-1.

## Display of the REF

Roads and Maritime sought community feedback on the review of environmental factors (REF) between Monday 28 August 2017 and Monday 25 September 2017. As the proposal covered a large area, the proposal was explained in four community updates. Each update focused on changes to bus stops in a specific area and was distributed via letter box drop to residents and businesses along the impacted routes.

Signage was provided at bus stops that were proposed to be removed, extended or relocated. Advertisements were also placed in local papers, as well as updates on the Roads and Maritime website. Stakeholder meetings were offered to schools, businesses and aged care facilities in the affected areas.

The REF was placed on the Roads and Maritime project website and made available for download. The website link was advertised in the following publications:

- Hills News
- Hills Shire Times
- Hornsby Upper North Shore Advocate

## Issues raised

A total of 56 submissions were received in response to the display of the REF. All submissions received were from the community. There were no submissions from government agencies.

Each submission has been examined individually to understand the issues being raised. The issues raised in each submission have been extracted and collated, and corresponding responses to the issues have been provided. Where similar issues have been raised in different submissions, only one response has been provided.

Of the 56 submissions received in regards to the 21 bus stop locations where works are being proposed:

- 14 bus stops received objections
- Between one and 24 objections on individual bus stops were received, with the highest number of objections received for bus stops #108 (24 objections), bus stops #62 and #64 combined (20 objections), bus stop #49 (11 objections), bus stop #64 (10 objections) and bus stop #71 and #72 combined (10 objections)<sup>1</sup>
- Seven bus stops received submissions that supported the proposed works in these locations (between one and two in support for each of these bus stops), but they also had objectors, except for bus stops #67, #68, #71, #72 and bus stop #41
- The proposal wide submissions received 21 objections and two submissions in support.<sup>2</sup>

A total of 139 issue points were raised (excluding out of scope issues) within the 56 submissions received. The key issues raised included the following:

- Increased walking distance as a result of removing/relocating bus stops, in particular where it would impact on the elderly (25 issues raised)
- Overall justification of the proposed works, in terms of whether the scope of works would improve bus travel times (32 issues raised)
- Decreased pedestrian safety as a result of removing/relocating bus stops in areas that did not appear to provide safe pedestrian crossings (19 issues raised).

## Proposal changes

The following table (Table 0-1) provides a summary of the changes to the original proposal as a result of the public display of the REF and feedback received from stakeholders and the local community as described in this report.

*Table 0-1 Changes made to the proposal following the submissions period*

Ref#	Location	Original proposal	Changes to the proposal
#46	Castle Hill Road new westbound stop opposite bus stop #45 (TSN #2145185)	Not included.	New bus stop at this location to pair with bus stop #45.

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<sup>1</sup> Based on specific issue points raised within submissions in relation to bus stops or the proposal as a whole. Some submissions raised more than one issue point and/or referred to multiple bus stop locations.

<sup>2</sup> As above.

Ref#	Location	Original proposal	Changes to the proposal
#62	Macquarie Drive opposite Francis Greenway Drive (westbound stop, TSN #2126153)	Remove bus stop #62 and replace with two car parking spaces.	The existing bus stop will be retained at its current location.
#64	Francis Greenway Drive before Penrose Avenue (westbound stop, TSN #212694)	Relocate bus stop #64 about 120 metres to the west. Replace existing stop with parking and install hardstand, seat, plinth sign and bus zone sign at new location. Remove of one street tree at new location.	The existing bus stop will be retained at its current location.

## Next steps

The submissions report will be endorsed by Transport for NSW / Roads and Maritime and REF determination prior to release of closeout community update. Prior to implementation, the relevant local authorities will be consulted for coordination of bus stop changes within their local government area.

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# 1 Introduction and background

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## 1.1 The proposal

Transport for NSW, in partnership with Roads and Maritime, is proposing to improve the reliability of buses by making changes to bus stops along the corridor between Hornsby and Blacktown (the proposal) (Figure 1-1). The corridor predominantly links Blacktown to Castle Hill, serviced by T70/T71, and Castle Hill to Hornsby, serviced by Metrobus M60, as well as other local and suburban routes which use parts of the corridor. The routes along this corridor provide access to important centres including Norwest Business Park and also provide opportunities for transport interchange at railway stations on the T1 North Shore and Northern Line.

The proposal site traverses the suburbs of Baulkham Hills, Castle Hill, West Pennant Hills, Cherrybrook, Pennant Hills, Thornleigh, Normanhurst and Hornsby and is within The Hills Shire and Hornsby local government areas.

The key features of the proposal are:

- Rationalising bus stop locations to optimise the spacing between bus stops
- Lengthening some bus stops to improve access for buses and assist passenger boarding and alighting
- Relocating some bus stops to optimise spacing and / or address traffic and safety issues
- Improving bus stop infrastructure at some locations including changes to bus stop signage
- Providing new stops to address customer demand.

The original proposal (as presented in the REF which went on public display) included the following and is illustrated in Figure 1-2 to

Figure 1-9:

- Nine bus stop removals (including the removal of signage and other bus stop infrastructure)
- Four bus stop improvements (including extensions)
- Three bus stop relocations
- Bus stop consolidation (four existing bus stops consolidated into two new bus stops)
- One new bus stop.

### 1.1.1 Need for the proposal

The proposal forms part of the Bus Priority Infrastructure Program and supports *Sydney's Bus Future* (Transport for NSW, 2013) by delivering projects that make buses more reliable. The Bus Priority Infrastructure Program is consistent with, recognises and progresses NSW Government policies and plans, including the *NSW Premier Priorities* and *Sydney's Bus Future*. The current program focuses on improvements in Rapid and Suburban routes, as outlined in *Sydney's Bus Future*, and targeted corridors that experience lower service reliability.

The Bus Priority Infrastructure Program supports targeted improvements for bus on-time running through a range of initiatives, including:

- Combining or removing some bus stops where they are spaced close together
- Lengthening some bus stops to accommodate longer articulated buses
- Making it easier for buses to move in and out of bus stops by removing or relocating on-street parking
- Reducing potential delays for buses at traffic signals by moving stops to the departure side of the intersection.

This initiative is the first stage aimed at achieving on-time running improvements of buses. Any future proposal by the NSW Government to develop the corridor into a Rapid route would involve further reviewing the bus services along this corridor and consideration of other road and traffic management improvements. This would be subject to further consultation.

### 1.1.2 Objectives of the proposal

The objectives of the proposal are to:

1. Achieve more reliable travel times for bus customers
2. Improve on-time running for buses consistent with the State Priority to maintain or improve reliability of public transport services
3. Minimise impacts for users of suburban and local services
4. Minimise impacts on the environment and the community.

### 1.1.3 Proposal background and methodology

Every year, Transport for NSW and bus operators receive thousands of complaints about slow and unreliable bus services. This can affect people's perception of bus service quality compared to other travel choices and their ability to reliably access employment, education, medical and other services. A number of measures have been identified to address these issues targeting particular bus corridors that currently experience lower service reliability including bus routes from Hornsby to Blacktown via Castle Hill, mainly serviced by the Metro M60 and T70/T71.

Adjusting the number and location of bus stops along a bus corridor is one measure that can help reduce the risk of delays to customers. It limits the need for buses to continually pull in and out of traffic from poorly located bus stops where the number of customers may be considerably lower compared to other adjacent stops along the route, or where buses may miss green traffic lights or get caught in queues behind turning cars.

Maintaining suitable access to bus stops and adjacent land uses which the bus stop services is an important consideration when determining if a bus stop should be removed or relocated. The proposal aims to strike a balance between:

- maintaining a suitable walking distance to bus stops (i.e. within a 400 metre radius or an average five minute walk<sup>3</sup>) and those key land uses which they service, and
- providing a bus service that can keep to time and enable bus customers to reach their destinations quickly and reliably.

While at individual locations the proposed changes may only seem to have small benefits, collectively they can deliver an important cumulative benefit to service reliability across the corridor.

The methodology for selecting the preferred option was an iterative process that involved several stages of evaluation as described below:

#### **Stage 1 – Preliminary investigations**

- Performance study carried out by Transport NSW along key corridors outlined in *Sydney's Bus Future* (Transport for NSW, 2013).

#### **Stage 2 – Field investigation / site observations**

- Inspect bus routes by riding the buses during peak periods to understand the bus route operation and identify operational issues
- Review bus stop location, topography and adjacent land use
- Conduct a survey on each bus stop to determine the number of customers using the bus stop and user's profiles (also reviewing Opal data)
- Carry out an audit of each bus stop to prepare an inventory of existing infrastructure at the bus stop.

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<sup>3</sup> Based on a 'walkable' catchment area of 400 metres (or a five minute walk) as described in '*Integrating Land Use and Transport: Improving Transport Choice – Guidelines for planning and development*', prepared for NSW Department of Urban Affairs and Planning, August 2001, 99/77, ISBN 0 7347 0076 8. This is also consistent with the guidelines of *Sydney's Bus Future* which states an average five minute walk to a bus route.

### **Stage 3 – Early stakeholder engagement**

- Engage with stakeholders such as bus operators and councils regarding the proposal corridor.

### **Stage 4 – Initial assessment**

- Review the survey data and identify deficiencies of existing bus stop infrastructure against the draft *Bus Stop Location Guidelines Sydney Metropolitan Area* (Transport for NSW, 2014).
- Carry out a preliminary assessment for each bus stop to determine whether the bus stop should be retained, modified, relocated or consolidated, including a review and analysis of:
  - Customer number counts (Opal data) to identify usage at each stop including identifying the busiest times and the relative numbers of seniors/pensioners and students
  - Public Transport Information and Priority System (PTIPS) data showing bus performance along routes, compared with schedule
  - Key customer number generators
  - Topography and bus stop spacing having regard to the 400 metre spacing guideline in *Sydney's Bus Future* (which helps with efficient bus operation) whilst maintaining a suitable walking distance to bus stops (i.e. within a five minute walk or 400 metre radius).
- In the initial assessment phase, Roads and Maritime's Network and Safety team undertook a safety review of the bus stop locations identified for potential relocation/removal/extension, taking into consideration the following factors:
  - Curvature of the road and sight distance
  - Location in relation to traffic signals and pedestrian crossings
  - Adjacent land uses
  - Vegetation and street tree plantings
  - Adjacent traffic or parking restrictions
  - Distances to adjacent bus stops
  - Developing the proposed scheme of bus stop changes in order to determine overall location of bus stops along the route
  - Consultation with Transport for NSW and local bus operators (Hillsbus and CDC) to ensure the proposed changes are suitable.

### **Stage 5 – Detailed assessment**

- Carry out additional surveys at the identified bus stops during peak periods covering extended periods for both weekday and weekend
- Prepare concept drawings (to scale) for each bus stop where modifications are proposed, identifying new / removed / relocated infrastructure
- Prepare a plan of work including ownership of assets and cost estimate for bus stop modification, relocation and consolidation.

### **Stage 6 – Environmental assessment**

- Prepare a REF and assess the potential environmental impacts of the proposal.

### **Stage 7 – Wider community and stakeholder consultation**

- Publicly display the REF and invite community and stakeholder comment
- Consider community / stakeholder views and modify the proposal as appropriate.

Key considerations for developing the proposal were derived from the *Sydney's Bus Future* (Transport for NSW, 2013), *Improving Transport Choice - guidelines for planning and development*

(NSW Department of Urban Affairs and Planning<sup>4</sup>, 2001) and the draft *Bus Stop Location Guidelines Sydney Metropolitan Area* (Transport for NSW, 2014) and were as follows:

1. Generally aiming for a standardised spacing of about 400 metres between bus stops, with a greater than 400 metre spacing accepted at some locations to minimise the number of bus stop relocations across the corridor (acknowledging that bus stop spacings of around 800 metres would still maintain a walking catchment of 400 metres to the nearest bus stop, however a 800 metre spacing was not an aim of this proposal).
2. Ensure bus stops are located close to major customer number generators and community facilities to maximise the efficiency of a bus stop and eliminating redundant and underutilised stops.
3. Locate bus stops on the departure side of signalised intersections to improve traffic conditions and help buses to meet the timetable using Public Transport Information and Priority System (PTIPS).
4. Adjust and locate bus stops to maintain and/or improve pedestrian safety.
5. Provide suitable bus zone length to allow buses to move in and out of bus stops easily without obstructing the adjacent lane.

An important consideration in developing the proposal was to ensure bus stops used by local and suburban services in the corridor remained accessible, factoring in site specific considerations such as topography, walking distance, adjacent land uses and safe crossing facilities.

*Improving Transport Choice - guidelines for planning and development* (NSW Department of Urban Affairs and Planning<sup>5</sup>, 2001) is an important part of the State government's commitment to promote urban areas in NSW as attractive, accessible and convenient places in which to live and work. The guidelines are part of a package of initiatives to improve the integration of land use and transport planning and provide principles, initiatives and best practice to improve access to more sustainable transport modes including public transport (buses and trains), walking and cycling.

The guidelines recognise that the proximity of housing and other key land uses such as commercial centres and community facilities to public transport services is an important determinant in improving transport choice and managing travel demand in urban areas. In relation to land use and bus services, the guidelines recommend a maximum of 400 metres (about a five minute walk) from a bus route accessing a metropolitan railway station or equivalent mass transit node served at least every 20 to 30 minutes. This is generally consistent with the guidelines in *Sydney's Bus Future* which recommend that people are within an average five minute walk to a bus stop (Transport for NSW, 2013). In denser urban areas with higher frequency services, the *Improving Transport Choice* guidelines state that the walking catchment could be 600 to 800 metres.

Where distances between bus stops have exceeded 400 metres, consideration was given to ensure that the proposed spacing maintained a 400 metre walking catchment (or five minute walk) to the nearest bus stop in accordance with the guidelines of *Sydney's Bus Future* and *Improving Transport Choice* guidelines described above.

Based on these guidelines, stop spacings of up to 800 metres would maintain an accessible walking catchment to the nearest bus stop of 400 metres, however proposed bus stop spacings have generally been kept well below 800 metres to maintain a duplicate coverage area that potentially provides bus users with a choice of bus stops in some locations. Where removing a bus stop would result in excessive distance between bus stops for local and / or suburban routes, no changes have been proposed.

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<sup>4</sup> Now the Department of Planning and Environment

<sup>5</sup> Now the Department of Planning and Environment

The position and dimensions of new and relocated bus stops (and those existing bus stops subject to significant alteration as a result of the proposal) would be assessed against the requirements of *AS 1428.1-2001 Design for Access and Mobility* prior to becoming operational. A further safeguard has been included to address this in Chapter 6 (Environmental Management) of this report. The provision of accessible bus stops is a shared responsibility between both council and Transport for NSW. Roads and Maritime would liaise directly with the relevant local council and Transport for NSW during implementation of the proposal to ensure that resulting bus stop infrastructure changes (ie. new or relocated bus stops and existing bus stops subject to major alteration as a result of the proposal) have been considered against these requirements.





Figure 1-1 Location of the proposal as presented in the REF which went on public display

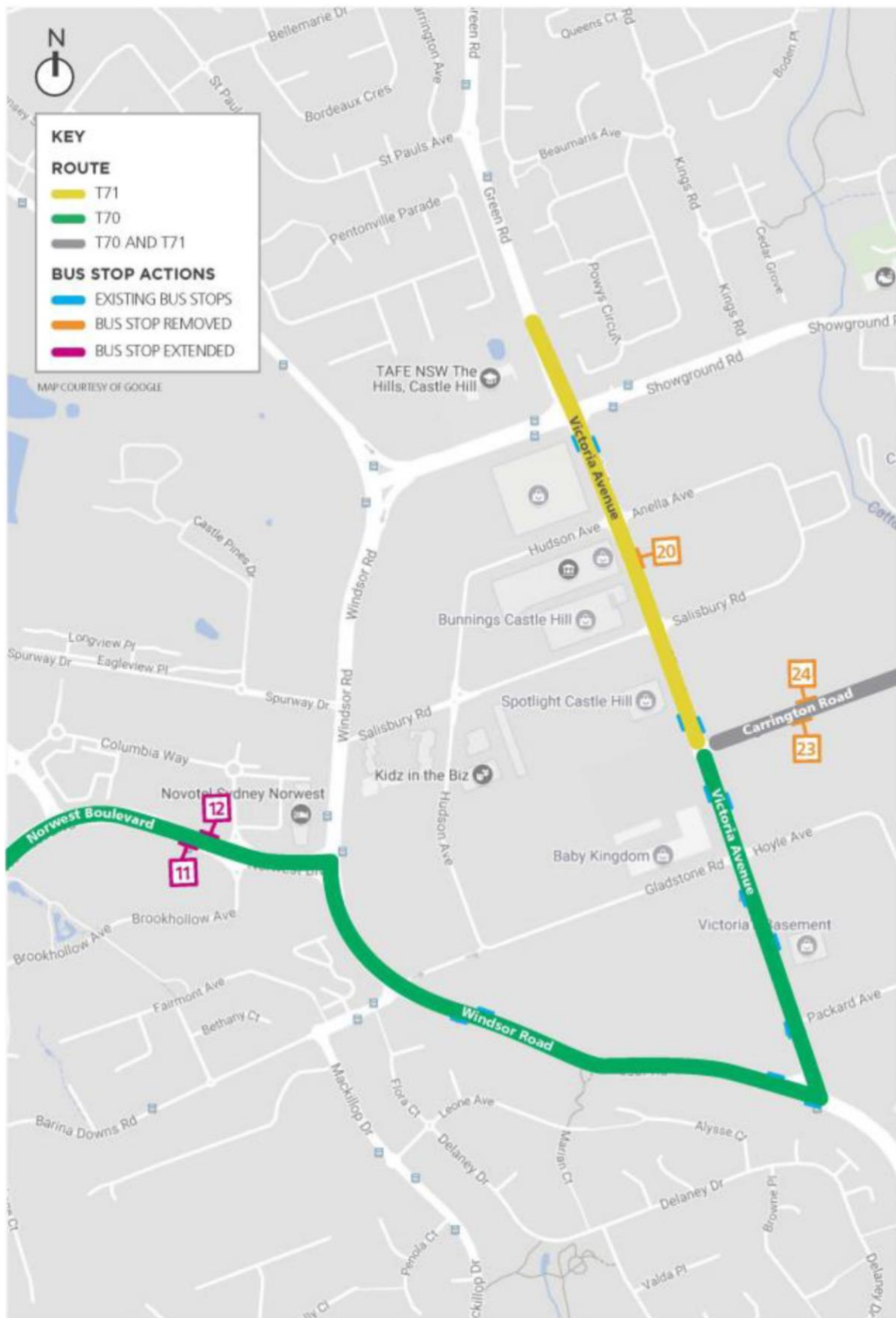


Figure 1-2 Proposed changes on the corridor from Hornsby to Blacktown as presented in the REF which went on public display (Map 1) – Bus stop locations #11, #12, #20, #23 and #24



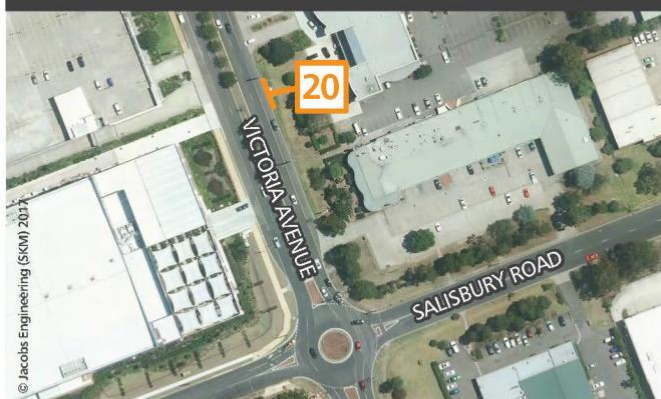
### NORWEST BOULEVARD AND COLUMBIA COURT, BAULKHAM HILLS



**11** Extend bus stop about 15 metres west

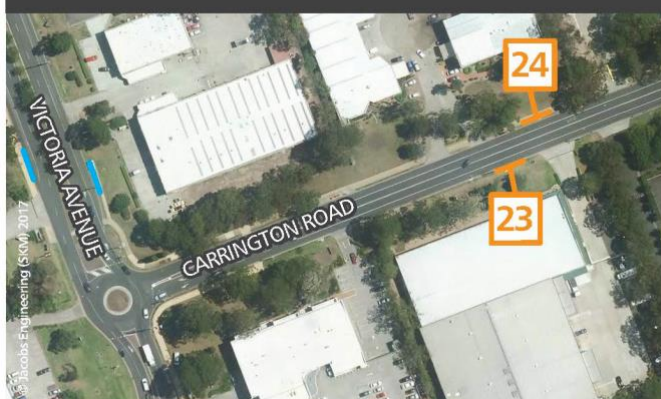
**12** Extend bus stop about 15 metres west

### VICTORIA AVENUE AND SALISBURY ROAD, CASTLE HILL



**20** Remove bus stop and replace with no stopping zone

### CARRINGTON ROAD AND VICTORIA AVENUE, CASTLE HILL



**23** Remove bus stop and replace with no parking zone

**24** Remove bus stop and replace with no parking zone

*Figure 1-3 Detail of proposed changes as presented in the REF which went on public display (Locations #11, #12, #20, #23 and #24)*

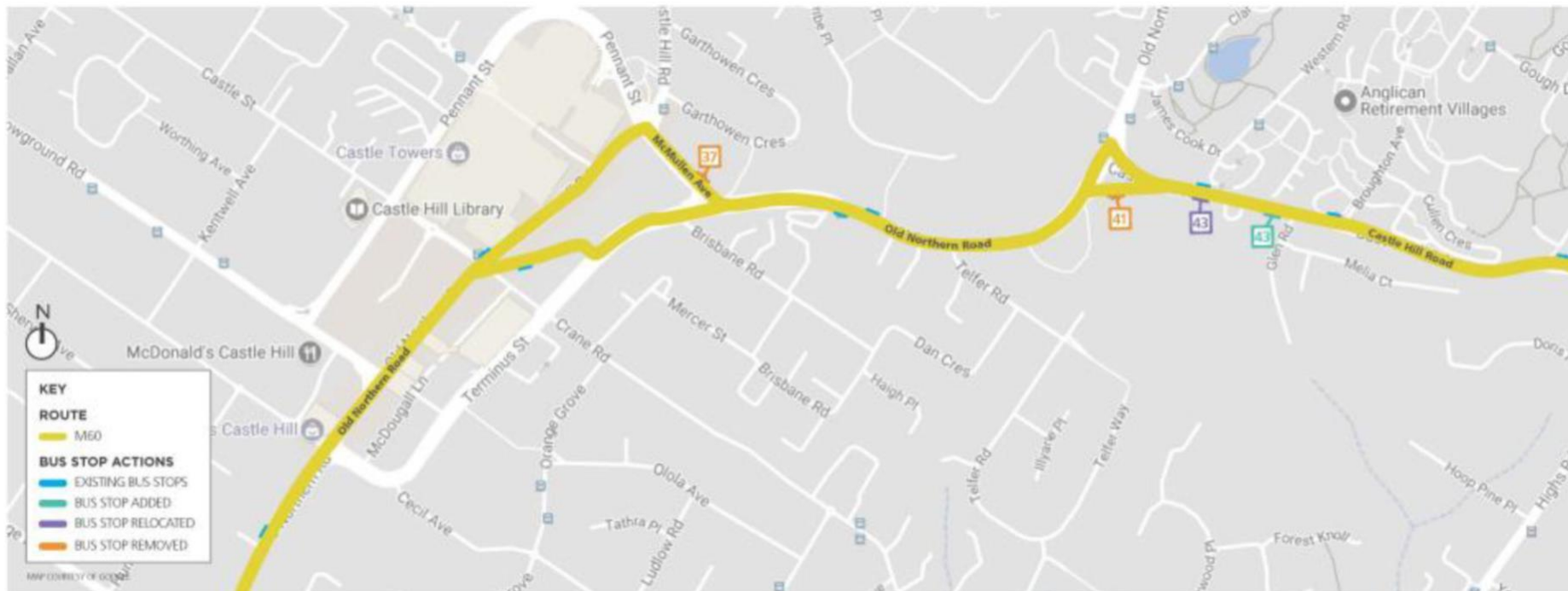


Figure 1-4 Proposed changes on the corridor from Hornsby to Blacktown as presented in the REF which went on public display (Map 2)- Bus stop locations #37, #41 and #43



### MCMULLEN AVENUE AND OLD NORTHERN ROAD, CASTLE HILL



**37** Remove bus stop and replace with no stopping zone

### OLD NORTHERN ROAD AND CASTLE HILL ROAD, CASTLE HILL



**41** Remove bus stop and replace with no stopping zone

### CASTLE HILL ROAD AND GLEN ROAD, CASTLE HILL



**43** Relocate bus stop and replace with no stopping zone

**43** New relocated stop replaces no stopping zone

*Figure 1-5 Detail of proposed changes as presented in the REF which went on public display (Locations #37, #41 and #43)*

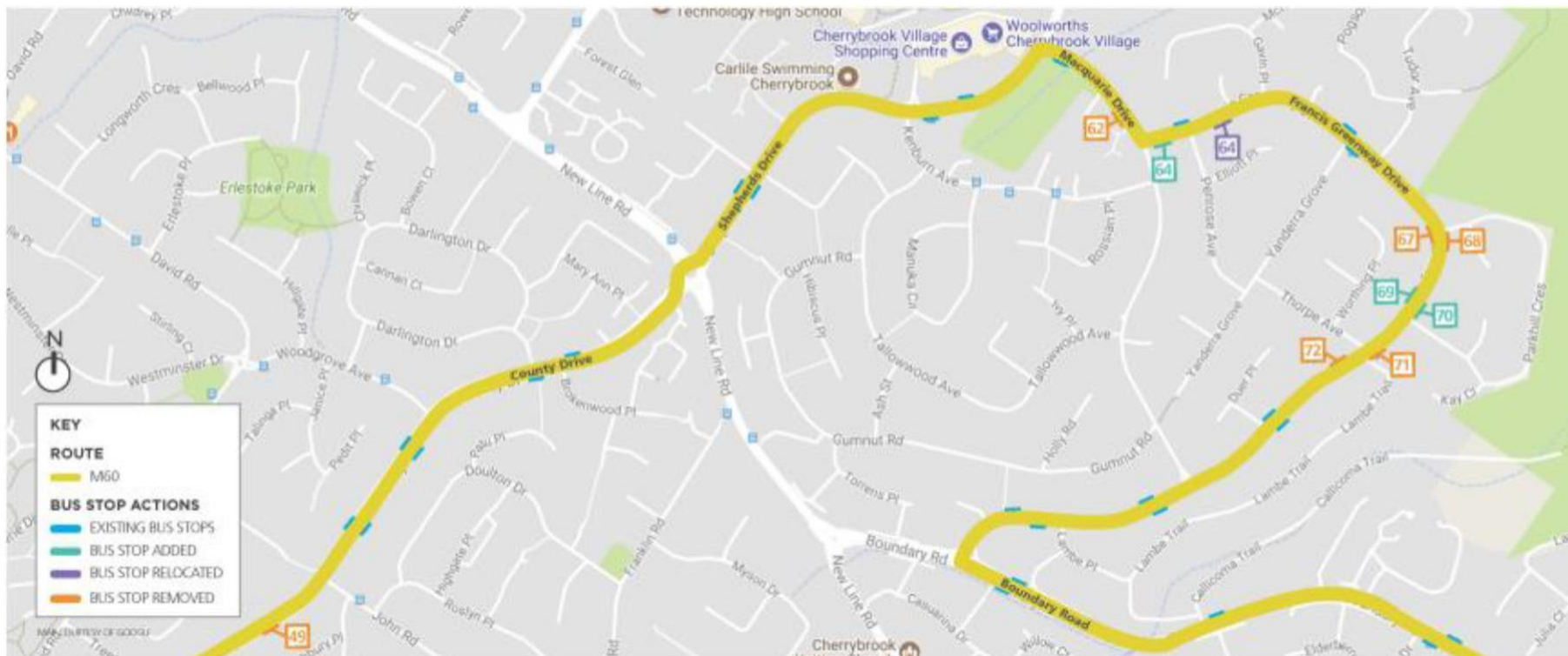
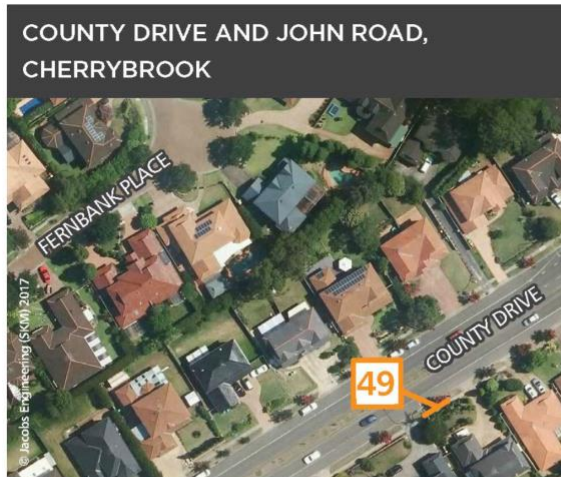


Figure 1-6 Proposed changes on the corridor from Hornsby to Blacktown as presented in the REF which went on public display (Map 3)- Bus stop locations #49, #62, #64, #67, #68, #69, #70, #71 and #72





- 49** Remove bus stop and replace with parking (+2 spaces)



- 62** Remove bus stop and replace with parking (+2 spaces)  
**64** Relocate bus stop  
**64** New bus stop replaces parking (-3 spaces) and remove one tree



- 67** Remove bus stop and replace with parking (+3 spaces)  
**68** Remove bus stop and replace with parking (+2 spaces)  
**69** New bus stop replaces parking (-3 spaces)  
**70** New bus stop replaces parking (-5 spaces)  
**71** Remove bus stop and replace with parking (+4 spaces)  
**72** Remove bus stop and replace with parking (+4 spaces)

*Figure 1-7 Detail of proposed changes as presented in the REF which went on public display (Locations #49, #62, #64, #67, #68, #69, #70, #71 and #72)*

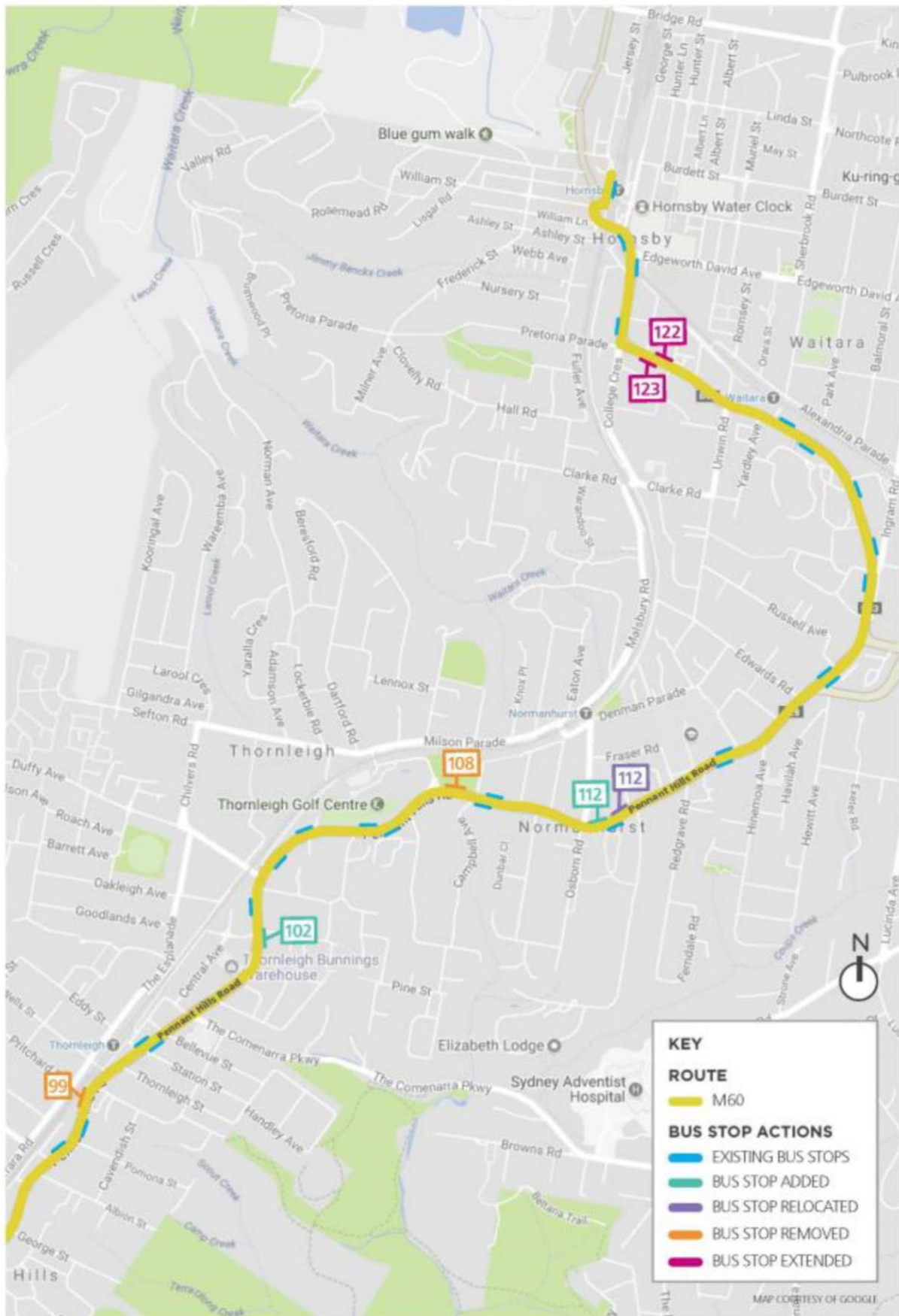


Figure 1-8 Proposed changes on the corridor from Hornsby to Blacktown as presented in the REF which went on public display (Map 4) – Bus stop locations #99, #102, #108, #112, #122 and #123





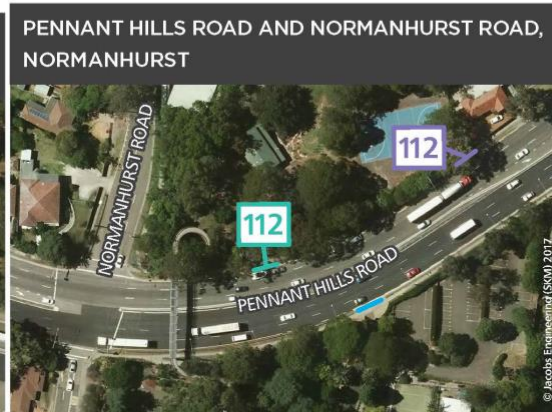
**99** Remove bus stop and replace with clearway



**102** New bus stop replaces no stopping zone

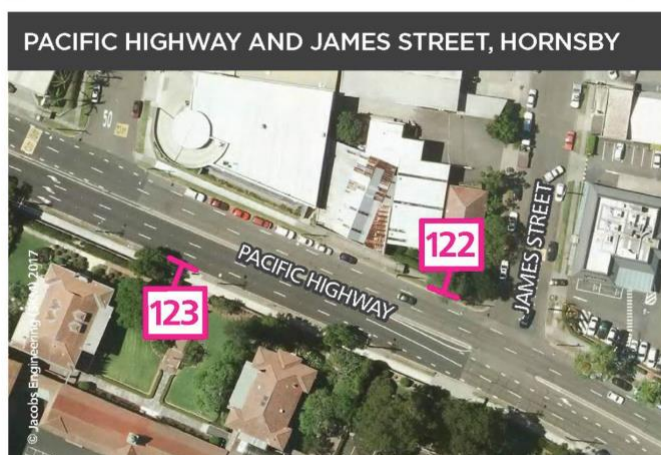


**108** Remove bus stop and replace with no parking zone



**112** Relocate bus stop and replace with no parking zone

**112** New bus stop replaces a no parking zone



**122** Extend bus stop about 15 metres west  
(-2 parking spaces)

**123** Extend bus stop about 15 metres east  
(-2 parking spaces)

*Figure 1-9 Detail of proposed changes as presented in the REF which went on public display (Locations #99, #102, #108, #112, #122 and #123)*

## 1.2 REF display

Roads and Maritime sought community feedback on the REF between Monday 28 August 2017 and Monday 25 September 2017. As the proposal covered a large area, the proposal was explained in four community updates. Each update focused on changes to bus stops in a specific area and was distributed to residents and businesses along the impacted routes. The communication activities undertaken by Roads and Maritime is summarised in Table 1-1.

Signage was provided at bus stops that were proposed to be removed, extended or relocated. Advertisements were also placed in local papers, as well as updates on the Roads and Maritime website. Stakeholder meetings were offered to schools, businesses and aged care facilities in the affected areas.

*Table 1-1 Communication activities undertaken for the proposal during public display of the REF*

Date	Communication activity	Targeted stakeholders
Monday 28 August 2017	<ul style="list-style-type: none"><li>• Community updates letter box dropped to distribution areas</li><li>• Direct stakeholder letters and email sent to stakeholders</li><li>• Media release (drafted by RMS media)</li><li>• Web page updated</li><li>• Signs displayed at affected bus stops</li></ul>	Local residents, business and community
Tuesday 29 August 2017	<ul style="list-style-type: none"><li>• Local newspaper advertising in:<ul style="list-style-type: none"><li>○ Hills News</li><li>○ Hills Shire Times</li></ul></li><li>• Local advertisements were placed in the Hornsby Upper North Shore Advocate</li></ul>	

## 1.3 Purpose of the report

This submissions report relates to the REF prepared for the Bus Priority Infrastructure Program On-time running improvements Hornsby to Blacktown, and should be read in conjunction with that document (Bus Priority Program – On-time running improvements Hornsby to Blacktown Corridor REF, August 2017).

The REF was placed on public display and submissions relating to the proposal and the REF were received by Roads and Maritime.

Each submission has been examined individually to understand the issues being raised. The issues raised in each submission have been extracted and collated, and corresponding responses to the issues have been provided.

This submissions report summarises the issues raised and provides responses to each issue as well as outlines the proposed changes to the proposal as a result of the issues raised in submissions and the associated environmental impacts. Additional amendments to the safeguards and mitigation measures for inclusion within the REF are also outlined to address issues raised in submissions.

This submissions report is structured as follows:

- Chapter 2 (Summary of issues)
- Chapter 3 (Response to issues)



- Chapter 4 (Changes to the proposal)
- Chapter 5 (Additional assessment)
- Chapter 6 (Environmental management)

## 2 Summary of issues

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Roads and Maritime received 56 submissions from the community between Monday 28 August 2017 and Monday 25 September 2017. Appendix A lists the respondents and each respondent's allocated submission number. Appendix A also indicates where the issues from each submission have been addressed in Chapter 3 (Response to issues) of this report.

### 2.1 Overview of issues raised

A total of 56 submissions were received in response to the display of the REF. All submissions received were from the community. There were no submissions from government agencies.

Each submission has been examined individually to understand the issues being raised. The issues raised in each submission have been extracted and collated, and corresponding responses to the issues have been provided. Where similar issues have been raised in different submissions, only one response has been provided.

The issues raised in submissions have been categorised by location (ie. by individual bus stops or proposal wide) as the issues raised primarily related to specific bus stops. The issues have been further categorised and summarised based on the nature of the comments raised for each bus stop (ie. safety, increased walking distance). Figure 2-1 provides an overview of the number of submissions received with identified support or objection to the proposed works at specific bus stops and the proposal as a whole.

Of the 21 bus stops locations where works are being proposed:

- 14 bus stops received objections.
- Between one and 24 objections on individual bus stops were received, with the highest number of objections received for bus stop #108 (24 objections), bus stops #62 and #64 combined (20 objections), bus stop #49 (11 objections), bus stop #64 (10 objections) and bus stop #71 and #72 combined (10 objections)<sup>6</sup>
- Seven bus stops received submissions that supported the proposed works (between one and two in support for each of these bus stops), but they also had objectors, except for bus stops #67, #68, #71, #72 and bus stop #41.<sup>7</sup>
- The proposal wide submissions received 21 objections and two submissions in support.<sup>8</sup>

Figure 2-2 provides an overview of the issues raised by the community in their submissions for all bus stop locations combined, including the proposal as a whole. A total of 139 issues were raised (excluding out of scope issues). The key sub issues raised included the following:

- Increased walking distance as a result of removing/relocating bus stops, in particular where it would impact on the elderly (25 issues raised)
- Overall justification of the proposed works, in terms of whether the scope of works would improve bus travel times (32 issues raised)
- Decreased pedestrian safety as a result of removing/relocating bus stops in areas that do not appear to provide safe pedestrian crossings (19 issues raised).

Furthermore, 28 issues raised were considered outside the scope of the proposal.

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<sup>6</sup> Based on specific issue points raised within submissions in relation to bus stops or the proposal as a whole. Some submissions raised more than one issue point and/or referred to multiple bus stop locations.

<sup>7</sup> As above

<sup>8</sup> As above

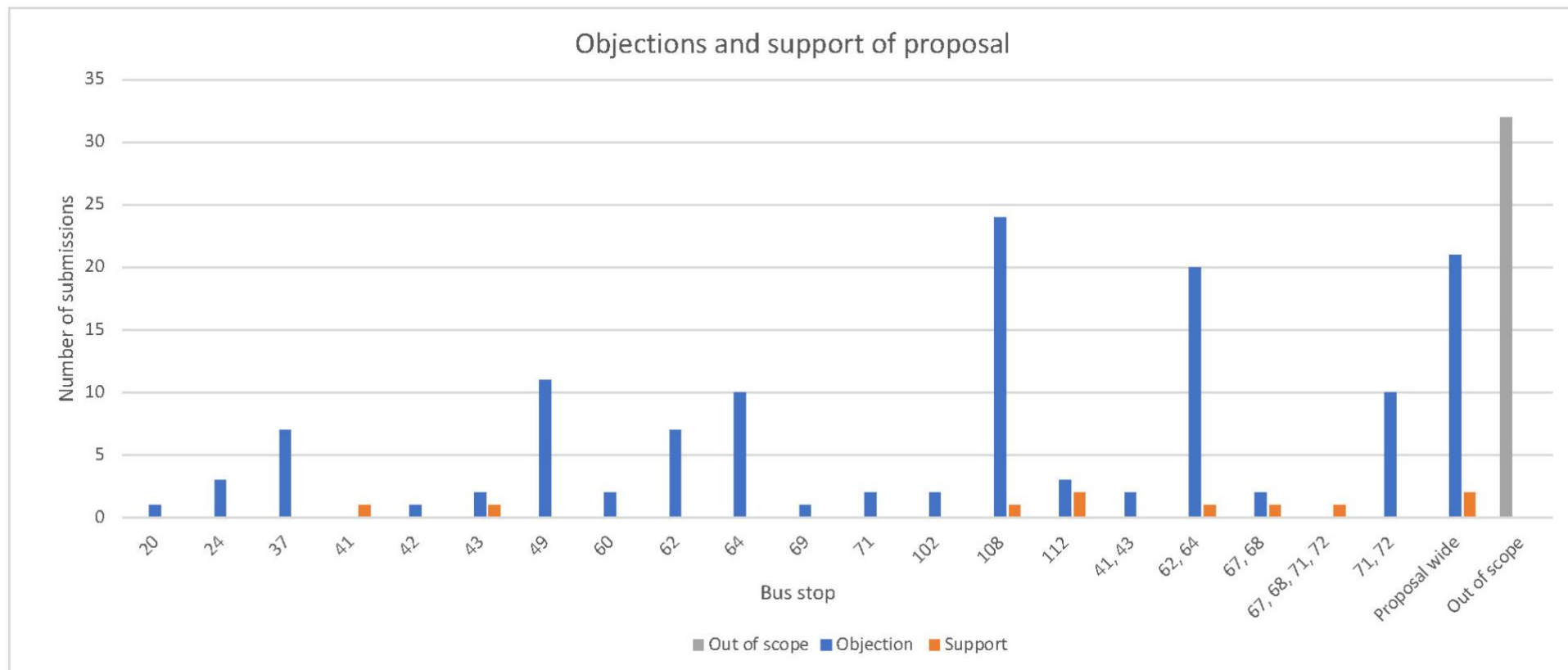
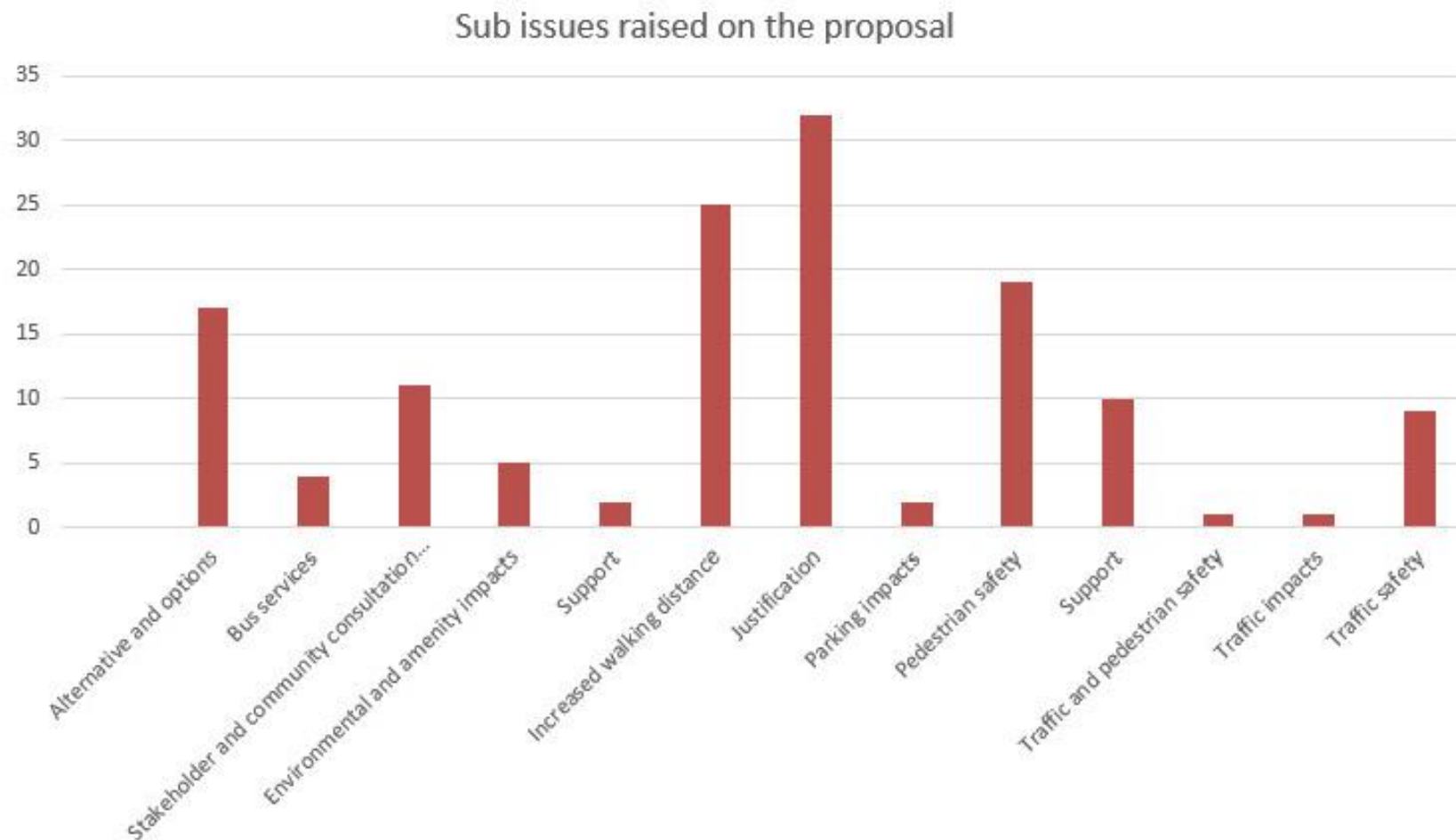


Figure 2-1 Objections and support for proposed works at individual bus stops by submission issue. It includes issues considered outside the scope of works being proposed



*Figure 2-2 Sub issues themes raised in the submissions for all bus stops combined, including the proposal as a whole (excludes out of scope submissions)*

## 3 Response to issues

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This chapter addresses the community submissions made in relation to the proposal. Proposal wide comments made regarding the proposal as a whole are addressed in section 3.1. Specific comments on individual bus stop locations are addressed in sections 3.2 to 3.20. Out of scope submissions are addressed in section 3.21.

### 3.1 Proposal wide

#### 3.1.1 Justification

##### Submission number(s)

7, 14, 36, 37, 41

##### Issue description

*Bus reliability will not improve by removing bus stops*

- Questions the purpose of the proposal and whether bus stop removal will improve on time running of buses when weighed up against the inconvenience caused to customers who have to walk further to the nearest bus stop.

*Removal of bus stops that are used by fewer than about 20 customers per weekday*

- Removal of bus stops that are used by fewer than about 20 customers per weekday will not save time for bus services that are not required to stop because there are no customers.

*Bus reliability is impacted by road traffic*

- Is happy with the current level of service on this route. Bus reliability is impacted by the volume of traffic on the road not the number of bus stops.

*Bus reliability could be addressed by improving the timetable*

- Reliability and variability could be addressed by improving the timetable and punctuality of buses rather than inconveniencing those who catch the bus.

*Bus priority program*

- The Bus Priority Program should be renamed to include customer's interest and remove priority as the proposal does not give buses priority over general traffic.

*Departure side bus stops*

- There is no explanation in the REF how reducing potential delays for buses at traffic signals by moving bus stops to the departure side of the intersection reduces departure delays.

##### Response

*Bus reliability will not improve by removing bus stops*

*Removal of bus stops that are used by fewer than about 20 customers per weekday*

*Bus reliability impacted by road traffic*

Easing Sydney's Congestion Program Office (ESCPO) is developing projects on the State road network, in accordance with government initiatives, for managing and improving traffic congestion and road safety within the Sydney region.

The proposal forms part of the Bus Priority Infrastructure Program under the ESCPO and supports Sydney's *Bus Future* (Transport for NSW, 2013). Buses are a key part of Sydney's growing and evolving public transport network. Sydney's *Bus Future* is the NSW Government's long term plan

to redesign our city's bus network to meet customer needs now and into the future (Transport for NSW, 2013). Sydney's buses provide more than 220 million trips a year across the city. As Sydney grows, the bus system needs to meet the challenges growth brings. *Sydney's Bus Future* sets out step-by-step actions to deliver fast and reliable bus services for customers where and when they are needed.

Road and Maritime supports *Sydney's Bus Future* by delivering projects in the Bus Priority Infrastructure Program that make bus services faster and more reliable. These projects help to provide:

- Bus lanes
- Bus priority at traffic lights
- More efficient bus stop placement

Transport for NSW and bus operators regularly receive thousands of complaints annually about slow and unreliable bus services. This can affect people's perception of bus service quality compared to other travel choices and their ability to reliably access employment, education, medical and other services. A number of measures have been identified to address these issues targeting particular bus corridors that currently experience lower service reliability.

Making adjustments to the number and location of bus stops along a bus corridor is one measure that can help reduce the risk of delays to customers. It limits the need for buses to continually pull in and out of traffic from poorly located stops where there are less customers compared to other adjacent bus stops along the route or where buses may miss green traffic lights or get caught in queues behind turning cars.

Chapter 2 (Need and options considered) of the REF describes the strategic need for the proposal and establishes its consistency with key strategic planning and policy documents. As noted in Section 2.1 of the REF, the proposal forms part of the Bus Priority Infrastructure Program which focuses on improvements in Rapid and Suburban routes, as outlined in *Sydney's Bus Future* (Transport for NSW, 2013), and targets corridors that experience lower service reliability. Overall the proposal, as part of the Bus Priority Infrastructure Program, supports targeted improvements for bus on-time running through a range of initiatives, including:

- Reducing the number of locations at which buses need to stop by combining, removing or relocating some bus stops
- Lengthening some bus stops to improve access for buses and assist passenger boarding and alighting
- Improving bus stop infrastructure at some locations including changes to bus stop signage
- Reducing potential delays for buses by moving bus stops to the departure side of traffic lights, allowing them to take advantage of the Public Transport Information and Priority System (PTIPS).

While it is acknowledged that the road network can be highly congested resulting in delays and poor reliability for some bus services, the proposal would still improve bus reliability by reducing common sources of delay. A key issue is delays associated with servicing bus stops that are positioned too close together and which are underutilised. Numerous bus stops positioned closely together multiply the delays associated with a bus leaving the traffic stream, allowing customers to board / alight and then waiting to re-enter the traffic stream. While the Opal system has reduced some delays on Sydney bus services, reliability issues have still been identified along the Blacktown to Castle Hill corridor (served by T70/T71), and the Castle Hill to Hornsby corridor, (served by Metrobus M60), as well as other local and suburban routes which use parts of these corridor.

Improvements to the reliability of bus services are expected to encourage public transport use. While for some people optimisation of bus stop spacing would mean additional walking distance and reduced convenience, the proposed changes would still mean the bus services using the corridor would be accessible and would remain an attractive transport option.

Section 1.1.3 of this submissions report details how options were assessed to achieve these objectives. Transport for NSW took into account bus stop popularity at preceding and following bus

stops, existing and future developments (including major business and residential centres), and the demography of the area when determining the proposed scope of works to ensure users of suburban and local services were not severely impacted.

Bus stop popularity was determined by analysing the customer usages of bus stops, from Opal data, at bus stops in the area. To determine if a bus stop had high or low customer use at the preceding and following bus stops, Opal data was analysed to determine the least used bus stop in the area. There was no threshold of less than 20 customers being applied to bus stops affected by the proposal to determine whether they were more frequently used or not.

Improving bus service reliability would encourage more people to use public transport which would contribute to easing current traffic congestion on our roads. While at individual locations the proposed changes may only seem to have small benefits, collectively they can deliver an important cumulative benefit to service reliability across the corridor as a whole. Improving bus reliability would reduce bunched platoons of buses.

#### *Bus reliability could be addressed by improving the timetable*

Changes to the bus timetable are considered to be outside the scope of works being proposed. The proposal is for the purpose of improving the reliability of bus services along the proposal route by:

- Combining or removing some bus stops where they are spaced close together
- Lengthening some bus stops to accommodate longer articulated buses
- Making it easier for buses to move in and out of bus stops by removing or relocating on-street parking, or
- Reducing potential delays for buses at traffic signals by moving stops to the departure side of the intersection.

#### *Rename the bus priority program*

The proposal is one of a range of initiatives and projects within the Bus Priority Infrastructure Program under the Easing Sydney's Congestion Program office.

The Bus Priority Infrastructure Program forms part of the NSW Government's long term plan to future proof the State's bus network. The program uses various methods to improve services, such as installing more bus lanes, making buses the priority at traffic lights, changing parking restrictions on clearways, and relocating bus stops hence the program is named Bus Priority Infrastructure Program.

#### *Explanation of departure side bus stops*

Where bus stops are on the approach side of traffic signals, delays can arise where buses departing a bus stop are immediately stopped by a red light. Hence it is preferable to have a bus stop after the traffic signals to avoid further delays caused by red lights at an intersection.

### **3.1.2 Bus services**

#### **Submission number(s)**

37

#### **Issue description**

##### *Bus stop pairing*

- Bus stops should be in pairs, one in each direction. This simplifies customers' trip planning.

##### *Pedestrian crossings*

- Bus stops should be near safe pedestrian crossings and greater attention to safety should have been provided in the REF.

### *Detour through Cherrybrook*

- M60 bus route is primarily for long-distance trips that will be lengthened by detour through Cherrybrook. It is preferable to defer any adjustments until Sydney Metro station is open. Route M60 should be altered to stay on New Line Road and local buses should be arranged as railway feeders.

## **Response**

### *Bus stop pairing*

Roads and Maritime acknowledges that bus stops should be in pairs to improve the customer experience by allow boarding and alighting to happen near each other, with the opposite bus stop clearly visible.

While this is the ideal situation, adjacent land uses, specific local road layouts, road widths and traffic arrangements may constrain the ability to install pairs of bus stops in close proximity to each other. Wherever possible, the proposal has considered and provided for bus stop pairing when removing and relocating existing bus stops or including new bus stops.

### *Pedestrian crossings*

As detailed in section 1.1.3 of this report, a key consideration in the development of the proposal was to ensure (as far as practicable) that bus stops were adjusted and located in a manner that maintained or improved pedestrian safety. Section 6.10 (Hazards and Risks) of the REF recognises potential hazards or risks associated with the operation of the proposal including the potential for changed pedestrian behaviour as a result of new bus stop locations (for example, crossing major roads away from signalised crossings). As detailed in section 6.10.2 (Environmental safeguards and management measures) of the REF, a safeguard has been proposed that a further safety review of all new bus stop locations be conducted during the design phase prior to implementation to identify whether any additional pedestrian safety measures are required at any new bus stop locations.

### *Detour through Cherrybrook*

The proposal does not include lengthening the M60 bus route by detouring the routes through Cherrybrook. All bus routes at Cherrybrook are currently being reviewed as part of the planning for bus network changes to be introduced with the opening of the Sydney Metro North West in 2019.

## **3.1.3 Stakeholder and community consultation**

### **Submission number(s)**

2, 29, 45, 47, 54

### **Issue description**

#### *Request for more information*

- Requests more information on the proposal as the web address provided on bus stop notice did not work.

*Bus stops near Milson Parade near Pennant Hills Road (southbound) (bus stops #107 (TSN #207615), #109 (TSN #207668) and #111 (TSN #207667))*

- Question if the bus stops near Milson Parade near Pennant Hills Road (southbound) will be removed.

#### *Project documentation errors*

- The project documentation is incorrect. There is an additional bus stop at Shepherds Drive near Macquarie Street missing from the community consultation materials.



- The proposal map provided in the Pennant Hills, Thornleigh, Normanhurst and Hornsby update is wrong. The bus stop shown on the map adjacent to Thornleigh Golf Centre does not exist (TSN #212025).
- The REF and leaflets don't discuss the bus stop outside 379 Old Northern Road immediately west of Telfer Street (bus stop #40 (TSN #2154187)).

*Comments to be included as part of consultation*

- Comments to be included as part of consultation.

## **Response**

*Request for more information*

The project team did experience some difficulties with the functionality of the email address and the phone line during public display and apologise for any inconvenience this caused.

*Bus stops near Milson Parade near Pennant Hills Road (southbound)*

There are no proposed changes to the southbound bus stops on Pennant Hills Road near Milson Parade (bus stops #107 (TSN #207615), #109 (TSN #207668) and #111 (TSN #207667)).

*Project documentation errors*

Thank you for raising this matter. We confirm that bus stops #40 (near 379 Old Northern Road) and #60 (near Macquarie Drive after Shepherds Drive (eastbound)) should have been included within the 'Changes to bus stops in Castle Hill' and 'Changes to bus stops in Cherrybrook' community updates. There are no changes proposed at bus stops #40 and #60. Roads and Maritime apologises for any inconvenience or confusion this may have caused.

Roads and Maritime has checked and re-confirmed that the bus stop shown on this map adjacent to Thornleigh Golf Centre (TSN #212025) currently exists in this location.

*Comments to be included as part of consultation*

All feedback received from the community and other stakeholders during the REF display period has been considered, summarised and responded to in this submissions report.

### **3.1.4 Support**

#### **Submission number(s)**

5, 8, 16, 53

#### **Issue description**

- Bus route M60 is an excellent route.
- Supports the proposal as it would reduce travel times.
- Submitter thanks the transport operators for the service they provide.

#### **Response**

Roads and Maritime and Transport for NSW acknowledge the support for the proposal.

### **3.1.5 Alternatives and options**

#### **Submission number(s)**

2, 8

#### **Issue description**

*Bus stop #60*

- Bus stop #60 should be relocated to clear the intersection as buses tend to regularly stop with their tail blocking the intersection.

### *Bus zone enforcement*

- Bus zones, including turn in and turn out distances, should be either marked or enforced. Buses angle parking to set down or pick up customers regularly block these streets.

### *Sighting distances*

- Sighting distances for stopped buses to be seen by other road users (particularly on road rises and curves), seeing the approach of buses (the removal of visual obstructions).

### *Bus stop #40*

- Would you consider relocating the Telfer Road bus stop (bus stop #40) to a point closer to the junction of Castle Hill Road and Old Northern Road? This would be of considerable benefit to everyone living north of this junction.

## **Response**

### *Bus stop #60*

Transport for NSW and the local bus operator (Hillsbus) will take comments regarding further bus stop locations into consideration as part of future bus service reviews in the area.

No issues or opportunities were identified at this particular bus stop location during the scheme development process. Bus stop #60 was retained to maintain an optimised bus stop spacing along Macquarie Drive in general accordance with the 400 spacing guideline in *Sydney's Bus Future*. Further details on the matters considered with respect to bus stops along the route during the scheme development stages are outlined in section 1.1.3 of this report.

Bus stop #60 is located about 30 metres south east of the roundabout at Shepherds Drive and Macquarie Drive and includes a bus zone for customer pick up and drop off. Bus stop #60 is a pair with bus stop #61 (TSN #2126143) and has existing facilities including a concrete platform and bus shelter. It is easily accessible to customers of the shopping centre on Shepherds Drive and there is a pedestrian refuge for crossing the road located about 25 metres away.

### *Bus zone enforcement*

Transport for NSW and the local bus operator (Hillsbus) will take comments regarding the enforcement of bus zone lengths into consideration as part of future bus service reviews in the area.

Enforcement of bus zones is the responsibility of the local council (on local roads) and Roads and Maritime (on State roads). Roads and Maritime will take these comments into consideration.

As part of the scheme development process, existing bus zone lengths were reviewed in all locations affected by this proposal to ensure that there was adequate space available for bus operations to avoid the need for buses to angle park and block general traffic.

### *Sighting distances*

Thank you for your comments. Sighting distances are an important consideration for Transport for NSW and the local bus operator (Hillsbus) when determining bus stop locations. Sight distances and traffic safety were assessed by Road and Maritime's Network Safety Team for all bus stops subject to this proposal.

### *Bus stop #40*

No issues or opportunities were identified at this particular bus stop location during the development of the proposal. Bus stop #40 was retained to maintain an optimised bus stop spacing along Old Northern Road in general accordance with the 400 metre spacing guideline in *Sydney's Bus Future* as a result of the removal of bus stop #41. It was also retained as it is conveniently located next to St Bernadette's Primary School with a safe signalised pedestrian crossing close by.

Further details on the matters considered with respect to bus stops along the route during the scheme development stages are outlined in section 1.1.3 of this report.

## 3.2 Changes to bus stops in Castle Hill

### 3.2.1 Alternatives and options

#### Submission number(s)

37

#### Issue description

- The leaflet's map has a serious error. Between the intersections of Old Northern Road with Terminus Street and with Crane Road all buses divert via Terminus Street and Crane Road, in both directions. This is not to serve any bus stops nor save any time. It may be to appease shopkeepers on Old Northern Road who complained about the presence of buses outside their shops. The diversion adds about two minutes to every bus journey, involving extra curves, corners and hills with consequent discomfort for customers. The map shows buses continuing along Old Northern Road, which they don't although they should. Re-instating buses along this section of Old Northern Road would be greatly beneficial to customers, reducing every journey time. It might even be beneficial for shopkeepers.

#### Response

The existing nominated bus route is not supposed to divert via Terminus Street and Crane Road, and bus drivers should not be diverting from the designated route. Your comments have been noted by Transport for NSW and the local bus operator.

Changing bus routes was not within the scope of this proposal. All bus routes in this location will be reviewed in the future as part of the planning for bus network changes to be introduced with the opening of the Sydney Metro North West in 2019.

## 3.3 Changes to bus stops in Cherrybrook

### 3.3.1 Support

#### Submission number(s)

2, 43

#### Issue description

- Support for the bus stop changes in Cherrybrook.
- Appreciates the project documentation.

#### Response

Roads and Maritime and Transport for NSW acknowledge the support for the proposal.

## 3.4 Changes to bus stops in Pennant Hills, Thornleigh, Normanhurst and Hornsby

### 3.4.1 Justification

#### Submission number

33

#### Issue description

- Moving bus stops will not make a difference due to the existing traffic conditions on the road.

## Response

Easing Sydney's Congestion Program Office (ESCPO) is developing projects on the State road network, in accordance with government initiatives, for managing and improving traffic congestion and road safety within the Sydney region.

The proposal forms part of the Bus Priority Infrastructure Program under the ESCPO and supports *Sydney's Bus Future* (Transport for NSW, 2013). Buses are a key part of Sydney's growing and evolving public transport network. *Sydney's Bus Future* is the NSW Government's long term plan to redesign our city's bus network to meet customer needs now and into the future (Transport for NSW, 2013). Sydney's buses provide more than 220 million trips a year across the city. As Sydney grows, the bus system needs to meet the challenges growth brings. *Sydney's Bus Future* sets out step-by-step actions to deliver fast and reliable bus services for customers where and when they are needed.

Road and Maritime supports *Sydney's Bus Future* by delivering projects in the Bus Priority Infrastructure Program that make bus services faster and more reliable. These projects help to provide:

- Bus lanes
- Bus priority at traffic lights
- More efficient bus stop placement

Transport for NSW and bus operators regularly receive thousands of complaints annually about slow and unreliable bus services. This can affect people's perception of bus service quality compared to other travel choices and their ability to reliably access employment, education, medical and other services. A number of measures have been identified to address these issues targeting particular bus corridors that currently experience lower service reliability.

Making adjustments to the number and location of bus stops along a bus corridor is one measure that can help reduce the risk of delays to customers. It limits the need for buses to continually pull in and out of traffic from poorly located stops where there are less customers compared to other adjacent stops along the route or where buses may miss green traffic lights or get caught in queues behind turning cars.

Chapter 2 (Need and options considered) of the REF describes the strategic need for the proposal and establishes its consistency with key strategic planning and policy documents. As noted in Section 2.1 of the REF, the proposal forms part of the Bus Priority Infrastructure Program which focuses on improvements in Rapid and Suburban routes, as outlined in *Sydney's Bus Future* (Transport for NSW, 2013), and targets corridors that experience lower service reliability. Overall the proposal, as part of the Bus Priority Infrastructure Program, supports targeted improvements for bus on-time running through a range of initiatives, including:

- Reducing the number of locations at which buses need to stop by combining, removing or relocating some bus stops
- Lengthening some bus stops to improve access for buses and assist passenger boarding and alighting
- Improving bus stop infrastructure at some locations including changes to bus stop signage
- Reducing potential delays for buses by moving bus stops to the departure side of traffic lights, allowing them to take advantage of the Public Transport Information and Priority System (PTIPS).

While it is acknowledged that the road network can be highly congested resulting in delays and poor reliability for some bus services, the proposal would still improve bus reliability by reducing common sources of delay. A key issue is delays associated with servicing bus stops that are positioned too close together and which are underutilised. Numerous bus stops positioned closely together multiply the delays associated with a bus leaving the traffic stream, allowing customers to board / alight and then waiting to re-enter the traffic stream. While the Opal system has reduced some delays on Sydney bus services, reliability issues have still been identified along the M60 and T70/71 bus routes.

### 3.4.2 Alternatives and options

#### Submission number(s)

37

#### Issue description

##### *Pennant Hills Station*

- The time cost to Parramatta bound M60 services of the current arrangements at Pennant Hills station is much larger than the likely savings from any of the other changes put forward in the REF and leaflets. If the Parramatta-bound M60 bus stop at Pennant Hills Station were moved 70 metres to the southern side of Pennant Hills Road, trips would be about five minutes quicker (and safer for the buses, avoiding two awkward lane changes). The same logic does not apply to Hornsby-bound M60 services; using Railway Street is not as delaying for them and is convenient for waiting passengers who can compare and choose between bus and train for trips to Hornsby.

##### *Railway bridges in Thornleigh*

- The bus stops proposed for the Thornleigh area do not recognise the trip-generating potential of the railway bridges in Dartford Road, Duffy Avenue and Wells Street which connect to areas on the north-western side of the railway. There should be bus stops serving both directions at Dartford Road, either Duffy Avenue or Phyllis Avenue, Station Street, Wells Street, Albion Street and Railway Street. The Wells Street traffic signals should have pedestrian lights and buttons.

#### Response

##### *Pennant Hills Station*

This matter has been raised with the bus operator (Hillsbus) who have since advised that all existing services must remain in this location due to the existing train connections and pedestrian safety concerns, particularly for school students. The issue is maintaining accessible and comfortable interchange for customers between buses and trains heading both north and south, as well as between buses at Pennant Hills Station. Removing southbound route M60 services from common bus stops at Pennant Hills Station would increase inconvenience, confusion and walking distances for interchanging customers.

##### *Railway bridges in Thornleigh*

Traffic lights are the responsibility of the relevant local council and Roads and Maritime's Network Operations Team and are outside the scope of this proposal. These concerns will be raised.

The local bus operator (Hillsbus) has been consulted about the issues raised regarding these bus stops. Their field officers/supervisors/drivers continuously expressed concerns regarding poor visibility, inadequate sight distance and near miss incidents in these locations and this will be investigated further in the future.

Opal boarding and alighting data has been analysed for all bus stops with careful consideration of bus stops that attract high usage compared to other adjacent bus stops along the route. The distances between bus stops have likewise been carefully considered and the need for additional bus stops is not justified at this time. Ongoing monitoring of bus services along Pennant Hills Road will identify whether further changes to existing bus stops are required to respond to changing customer demand and population numbers over time as well as potential pedestrian safety and interchange concerns in this location.

### 3.5 Removal of bus stop #20, Victoria Avenue after Anella Avenue, Castle Hill (TSN #215467)

#### 3.5.1 Justification

##### Submission number(s)

37

##### Issue description

- Does not support removing T71 bus stop with shelter in Victoria Avenue (proposed action #20). It is quite well-placed, being outside Bunnings Warehouse and Service NSW. Suggests it would be better to add a corresponding bus stop on the opposite side of the road.

##### Response

Bus stop #20 is located 180 metres from the previous bus stop #19 (TSN #215466) and 300 metres from the next bus stop #22 (TSN #215468). This bus stop has a low number of customers relative to adjacent bus stops with Opal data showing an average 24-hour weekday demand of 18 customers, compared with 31 for bus stop #19 (TSN #215466) and 26 for bus stop #22 (TSN #215468).

There is an opportunity to optimise the spacing of bus stops at this location to reduce delays by removing this bus stop. The resulting spacing between the preceding and next bus stops would be about 480 metres. While the spacing between bus stops would increase, the proposed bus stop locations in this area would still maintain a walkable catchment to an alternative bus stop in this location (i.e. bus stops within a 400 metre radius or a five minute walk) consistent with the *Improving Transport Choice* and *Sydney's Bus Future* guidelines (refer to section 1.1.3 for further information about bus stop accessibility). The nearest alternative bus stop (bus stop #19) on Victoria Avenue is still considered to be conveniently located to Bunnings Warehouse and Service NSW.

### 3.6 Removal of bus stop #37, McMullen Avenue before Old Northern Road, Castle Hill (TSN #2154386)

#### 3.6.1 Justification

##### Submission number(s)

31,37

##### Issue description

- Members of the Castle Hill Senior Citizens Club use bus stop #37 for collecting and dropping of customers for various organised trips. Removing bus stop #37 would inconvenience club members, including seniors, who use this bus stop.
- Action 37 is to remove bus stop #37 in McMullen Ave. We understand that M60 buses never stop here. The matter should be investigated in case some error would be compounded by removal of bus stop #37.

##### Response

The proposal forms part of the Bus Priority Infrastructure Program and supports *Sydney's Bus Future* (Transport for NSW, 2013) by delivering projects that make buses more reliable. As detailed in the REF, the removal of bus stop #37 is part of a broader program aimed at improving reliability by:

- Reducing the number of locations at which buses need to stop by combining, removing or relocating some bus stops
- Lengthening some bus stops to improve access for buses and assist passenger boarding and alighting



- Improving bus stop infrastructure at some locations including changes to bus stop signage
- Reducing delays for buses by moving bus stops to the departure side of traffic lights, allowing them to take advantage of the Public Transport Information and Priority System (PTIPS).

While at individual locations the proposed changes may only seem to have small benefits, collectively they can deliver an important cumulative benefit to service reliability across the corridor as a whole.

The objectives of the Bus Priority Infrastructure Program (refer to section 1.1.2) do not include maintaining bus stop access for non-public buses used for organised trips, including for the Castle Hill Senior Citizens Club. The Castle Hill Senior Citizens Club will need to seek an alternative location nearby. This may include Garthowen Crescent or other suitable alternatives subject to consultation with the local council.

Bus stop #37 is located 326 metres from the previous bus stop #37A (TSN #2154351) and 300 metres from the next bus stop #39 (TSN #2154193). There is a gentle to moderate grade uphill or downhill from McMullen Avenue to the nearest adjacent bus stops (uphill to bus stop #39 and downhill to bus stop #37A).

Opal data indicates that bus stop #37 has a low number of customers relative to adjacent bus stops with an average 24-hour weekday demand of 15 customers, compared with about 2,000 customers for bus stop #37A (TSN #2154351) and 40 for bus stop #39 (TSN #2154193).

It should be noted that bus stop #37A was excluded from the REF and community updates as a result of an error. Roads and Maritime apologises for any inconvenience or confusion this may have caused.

There is an opportunity to optimise the spacing of bus stops at this location to reduce delays by removing this bus stop on approach to the intersection. The preceding and next bus stops would be about 626 metres apart. While the spacing between bus stops would increase, the proposed bus stop locations in this area would still maintain a walkable catchment to an alternative bus stop in this location (i.e. bus stops within a 400 metre radius or a five minute walk) consistent with the *Improving Transport Choice* and *Sydney's Bus Future* guidelines (refer to section 1.1.3 for further information about bus stop accessibility). Furthermore, in close proximity to this location, changes associated with Sydney Metro North West in 2019 will see all bus routes in the area being reviewed.

As detailed in section 1.1.3 of this report, the removal of the bus stops has taken into account the population size, demography, local facilities, current and future land use development, and other relevant factors when determining which bus stops to remove or relocate to ensure users of suburban and local services were not severely impacted. The REF has considered all bus services running along the M60 and T70/71 routes that use these bus stops and distance from adjacent bus stop locations.

### 3.6.2 Increased walking distance to next stop

#### Submission number(s)

27, 31, 37, 55

#### Issue description

- Removal of bus stop #37 would mean greater walking distance for elderly people of Anglican Retirement Village and members of the Castle Hill Senior Citizens Club for accessing buses for their various organised trips.
- Removal of bus stop #37 will require the customer to walk uphill which is difficult as the customer has a disability.

#### Response

There is an opportunity to optimise the spacing of bus stops at this location to improve the overall reliability of the bus route. While the spacing between stops would increase, the proposed bus stop locations in this area would still maintain a walkable catchment (i.e. stops within a 400 metre radius or a five minute walk) consistent with the *Improving Transport Choice* and *Sydney's Bus Future* guidelines (refer to section 1.1.3 for further information about bus stop accessibility).

As detailed in section 1.1.3 of this report, the removal of the bus stops has taken into account the population size, demography, local facilities, current and future, and other relevant factors when determining which bus stops to remove or relocate to ensure users of suburban and local services were not severely impacted. The REF has considered all bus services running along the M60 and T71/70 bus routes that use these bus stops. Section 6.1 (Socio-economic) of the REF assessed the impacts of the removal of bus stops on other routes. By removing bus stop #37 acceptable spacing is maintained for all bus routes in accordance with *Sydney's Bus Future*.

Removal of bus stop #37 will require customers to walk to an alternative bus stop. Bus stop #37 is located 326 metres from the previous bus stop #37A (TSN #2154351) and 300 metres from the next bus stop #39 (TSN #2154193). There is an opportunity to optimise the spacing of bus stops at this location to reduce delays by removing this bus stop. The resulting spacing between the preceding and next bus stops would be about 626 metres. While the spacing between bus stops would increase, the proposed bus stop locations in this area would still maintain a walkable catchment to an alternative bus stop in this location (i.e. bus stops within a 400 metre radius or a five minute walk) consistent with the *Improving Transport Choice* and *Sydney's Bus Future* guidelines (refer to section 1.1.3 for further information about bus stop accessibility). Furthermore, in close proximity to this location, changes associated with Sydney Metro North West in 2019 will see all bus routes in the area being reviewed. There is a gentle to moderate grade uphill or downhill from McMullen Avenue to the nearest adjacent bus stops (uphill to bus stop #39 and downhill to bus stop #37A).

The objectives of the Bus Priority Infrastructure Program (refer to section 1.1.2) do not include maintaining bus stop access for non-public buses used for organised trips, including for the Castle Hill Senior Citizens Club. The Castle Hill Senior Citizens Club will need to seek an alternative location nearby. This may include Garthowen Crescent or other suitable alternatives subject to further consultation with the local council.

It should be noted that bus stop #37A was excluded from the REF and community updates as a result of an error. Roads and Maritime apologises for any inconvenience or confusion this may have caused.

Opal data indicates that bus stop #37 has a low number of customers relative to adjacent bus stops with an average 24-hour weekday demand of 15 customers, compared with about 2,000 customers for bus stop #37A (TSN #2154351) and 40 for bus stop #39 (TSN #2154193).

Bus stop #37 is likely to become redundant in the near future as new bus routes are planned around the completed Castle Hill Metro Station upgrades.

### **3.7 Removal of bus stop #41, Castle Hill Road before Old Northern Road, Castle Hill (TSN #2154186)**

#### **3.7.1 Support**

##### **Submission number(s)**

51

##### **Issue description**

- Supports the removal of bus stop #41.

##### **Response**

Roads and Maritime and Transport for NSW acknowledge the support for the proposal.



### 3.8 Removal of bus stop #41, Castle Hill Road before Old Northern Road, Castle Hill (TSN # 2154186) and relocation of bus stop #43, Castle Hill Road after Glen Road, Castle Hill (TSN #2154173)

#### 3.8.1 Justification

##### Submission number(s)

8

##### Issue description

- Bus stops #41 and #43 are located near the Anglican Retirement Village and other retirement villages and is not supported.

##### Response

The proposal forms part of the Bus Priority Infrastructure Program and supports *Sydney's Bus Future* (Transport for NSW, 2013) by delivering projects that make buses more reliable. As detailed in the REF, the removal of bus stop #41 and relocation of bus stop #43 is part of a broader program aimed at improving reliability by:

- Reducing the number of locations at which buses need to stop by combining, removing or relocating some bus stops
- Lengthening some bus stops to improve access for buses and assist passenger boarding and alighting
- Improving bus stop infrastructure at some locations including changes to bus stop signage
- Reducing delays for buses by moving bus stops to the departure side of traffic lights, allowing them to take advantage of the Public Transport Information and Priority System (PTIPS).

While at individual locations the proposed changes may only seem to have small benefits, collectively they can deliver an important cumulative benefit to service reliability across the corridor as a whole.

There is an opportunity to optimise the spacing of bus stops at this location to improve the overall reliability of the bus route. While the spacing between bus stops would increase, the proposed bus stop locations in this area would still maintain a walkable catchment to an alternative bus stop in this location (i.e. bus stops within a 400 metre radius or a five minute walk) consistent with the *Improving Transport Choice* and *Sydney's Bus Future* guidelines (refer to section 1.1.3 for further information about bus stop accessibility).

As detailed in section 1.1.3 of this report, the removal and relocation of the bus stops has taken into account the population size, demography, local facilities, current and future land use development, and other relevant factors when determining which bus stops to remove or relocate to ensure users of suburban and local services were not severely impacted. The REF has considered all bus services running along the M60 and T71/70 routes that use the bus stops. Section 6.1 (Socio-economic) of the REF assessed the impacts of the removal and relocation of bus stops on other routes.

##### *Bus stop #41*

Bus stop #41 is currently located 170 metres from the previous bus stop #43 (TSN #2154173) and 500 metres from the next bus stop #40 (TSN #2154187). Bus stop #43 is proposed to be relocated about 100 metres further away from bus stop #41.

Bus stop #41 has a low number of customers relative to adjacent bus stops with Opal data showing an average 24-hour weekday demand of eight customers, compared with 28 for bus stop #43 and 22 for bus stop #40.

There is an opportunity to optimise bus stop spacing in this location to reduce delays by removing bus stop #41. The resulting spacing between the preceding bus stop #43 and next bus stop #40 would be about 600 metres (including the proposed relocation of bus stop #43 in front of 157

Castle Hill Road). While the spacing between bus stops would increase, bus stop #43 would provide a greater catchment in this location and a safer pedestrian crossing option for customers.

#### *Bus stop #43*

Bus stop #43 is currently located about one kilometre from the previous bus stop #47 (TSN #2126137). Roads and Maritime propose to relocate bus stop #43 about 100 metres further away from bus stop #41 (TSN #2154186) and now propose to construct a new previous westbound bus stop (bus stop #46) between westbound bus stops #43 and #47 (refer to Chapter 4 (Changes to the proposal) of this report). Bus stop #46 would be about 500 metres away from relocated bus stop #43.

The next bus stop from bus stop #43 is bus stop #41 (TSN #2154186) about 160 metres away. However, removal of bus stop #41 and relocation of bus stop #43 will result in the next bus stop being bus stop #40 located about 600 metres away.

There is an opportunity to optimise the spacing of bus stops at this location by removing bus stop #41, relocating bus stop #43 and installing a new bus stop between bus stop #43 and #47 (bus stop #46). The resulting spacing at relocated bus stop #43 would be about 500 metres from the new previous bus stop #46 and about 600 metres to the next bus stop #40 with the removal of bus stop #41.

Opal data indicates bus stop #43 has an average 24-hour weekday demand of 28 customers compared to 47 customers for the existing previous bus stop #47 and 8 customers for the existing next bus stop #41.

### **3.8.2 Increased walking distance to next stop**

#### **Submission number(s)**

8

#### **Issue description**

- Removal of bus stop #41 and relocation of bus stop #43 would increase the walking distance for elderly residents of the Anglican Retirement Village (ARV), other retirement villages in the area, and residents of Castle Ridge.

#### **Response**

There is an opportunity to optimise the spacing of bus stops at this location to improve the overall reliability of the bus route. While the spacing between bus stops would increase, the proposed stop locations in this area would still maintain a walkable catchment (i.e. bus stops within a 400 metre radius or a five minute walk) consistent with the *Improving Transport Choice* and *Sydney's Bus Future* guidelines (refer to section 1.1.3 for further information about bus stop accessibility).

As detailed in section 1.1.3 of this report, the removal and relocation of the bus stops has taken into account the population size, demography, local facilities, current and future land use development, and other relevant factors when determining which bus stops to remove or relocate to ensure users of suburban and local services were not severely impacted.

The REF has considered all bus services running along the M60 and T71/70 routes that use the bus stops. Section 6.1 (Socio-economic) of the REF assessed the impacts of the removal and relocation of bus stops on other routes. By removing bus stop #41 and relocating bus stop #43 acceptable spacing is maintained for all bus routes in general accordance with the *Improving Transport Choice* and *Sydney's Bus Future* guidelines.

#### *Bus stop #41*

Bus stop #41 is located 170 metres from the previous bus stop #43 (TSN #2154173) and 500 metres from the next bus stop #40 (TSN #2154187). Bus stop #43 is proposed to be relocated about 100 metres further away from bus stop #41.

Bus stop #41 has a low number of customers relative to adjacent bus stops with Opal data showing an average 24-hour weekday demand of eight customers, compared with 28 for bus stop #43 and 22 for bus stop #40.

There is an opportunity to optimise bus stop spacing in this location to reduce delays by removing bus stop #41. The resulting spacing between the preceding bus stop #43 and next bus stop #40 would be about 600 metres (including the proposed relocation of bus stop #43 in front of 157 Castle Hill Road). While the spacing between bus stops would increase, bus stop #43 would provide a greater catchment in this location and a safer pedestrian crossing option for customers.

#### *Bus stop #43*

Bus stop #43 is currently located about one kilometre from the previous bus stop #47 (TSN #2126137). Roads and Maritime propose to relocate bus stop #43 about 100 metres further away from bus stop #41 (TSN #2154186) and construct a new previous westbound bus stop (bus stop #46) between westbound bus stops #43 and #47 (refer to Chapter 4 (Changes to the proposal) of this report). Bus stop #46 would be about 500 metres away from relocated bus stop #43.

The next bus stop from bus stop #43 is bus stop #41 (TSN #2154186) about 160 metres away. However, removal of bus stop #41 and relocation of bus stop #43 will result in the next bus stop being bus stop #40 located about 600 metres away.

There is an opportunity to optimise the spacing of bus stops at this location by removing bus stop #41, relocating bus stop #43 and installing a new bus stop between bus stops #43 and #47 (bus stop #46). The resulting spacing at relocated bus stop #43 would be about 500 metres from the new previous bus stop #46 and about 600 metres to the next bus stop #40 with the removal of bus stop #41.

Opal data indicates bus stop #43 has an average 24-hour weekday demand of 28 customers compared to 47 customers for the existing previous bus stop #47 and 8 customers for the existing next bus stop #41.

### **3.9 Relocation of bus stop #43, Castle Hill Road after Glen Road, Castle Hill (TSN #2154173)**

#### **3.9.1 Traffic safety**

##### **Submission number(s)**

5

##### **Issue description**

- Relocation of bus stop #43 could cause a traffic hazard as cars travel at high speeds down Glen Road through the traffic lights. Having the relocated bus stop immediately after the traffic lights may increase the risk of accidents.
- Residents of Melia Court are concerned they will be blocked when they try to turn out of Glen Road onto Castle Hill Road westbound.

##### **Response**

As detailed in section 1.1.3 of this report, a key consideration in the development of the proposal was to ensure (as far as practicable) that bus stops were adjusted and located in a manner that maintained or improved traffic safety. During the scheme development stage each new bus stop location was reviewed by Road and Maritime's Network Safety Team to ensure that the new bus stop locations did not result in potential traffic safety risks on road users. During this process, no traffic safety issues were identified at the time in relation to bus stop #43.

Bus stop #43 will be located clear of the intersection of Glen Road and Castle Hill Road and there is another westbound traffic lane to utilise on Castle Hill Road (as there are dual lanes in either direction along this road) if the kerbside lane is occupied by a bus stopping at this bus stop. The bus stop is situated on the departure side of a signalised intersection where vehicles should not be

travelling at high speeds in this location. Buses pulling into and out of this bus stop would only be temporary and over a short duration.

### 3.9.2 Increased walking distance to next stop

#### Submission number(s)

27

#### Issue description

- Relocation of bus stop #43 would mean greater walking distance for elderly people of the Anglican Retirement Village.

#### Response

There is an opportunity to optimise the spacing of bus stops at this location to improve the overall reliability of the bus route. While the spacing between bus stops would increase, the proposed stop locations in this area would still maintain a walkable catchment (i.e. bus stops within a 400 metre radius or a five minute walk) consistent with the *Improving Transport Choice* and *Sydney's Bus Future* guidelines (refer to section 1.1.3 for further information about bus stop accessibility).

As detailed in section 1.1.3 of this report, the removal and relocation of the bus stops has taken into account the population size, demography, local facilities, current and future, and other relevant factors when determining which bus stops to remove or relocate to ensure users of suburban and local services were not severely impacted.

Bus stop #43 is currently located about one kilometre from the previous bus stop #47 (TSN #2126137). However, Roads and Maritime propose to relocate bus stop #43 about 100 metres further away from bus stop #41 (TSN #2154186) and construct a new previous bus stop between bus stops #43 and #47 (bus stop #46) (refer to Chapter 4 (Changes to the proposal) of this report). Bus stop #46 would be about 500 metres away from relocated bus stop #43.

The next bus stop from bus stop #43 is bus stop #41 (TSN #2154186) about 160 metres away. However, removal of bus stop #41 and relocation of bus stop #43 will result in the next bus stop being bus stop #40 located about 600 metres away.

There is an opportunity to optimise the spacing of bus stops at this location by removing bus stop #41, relocating bus stop #43 and installing bus stop #46. The resulting spacing at relocated bus stop #43 would be about 500 metres from the new previous bus stop #46 and about 600 metres to the next bus stop #40.

Opal data indicates bus stop #43 has an average 24 hour weekday demand of 28 customers compared to 47 customers for existing previous bus stop #47 and 8 customers for existing next bus stop #41.

### 3.9.3 Bus stop facilities

#### Submission number(s)

50

#### Issue description

- Requests a bus stop seat at bus stop #43 but concerned there is a lack of space for it.

#### Response

It has been confirmed through a site inspection by Roads and Maritime that there is a suitable amount of space for a seat to be installed at the new location for bus stop #43 once it is relocated. The local council is responsible for provision of seating at bus stops and your feedback will be noted with the local council for consideration as part of the proposed works.

### 3.9.4 Support

#### Submission number(s)

### Issue description

- Support for the relocation of bus stop #43.

### Response

Roads and Maritime and Transport for NSW acknowledge the support for the proposal.

## 3.10 Removal of bus stop #49, County Drive and John Road, Cherrybrook (TSN #2126136)

### 3.10.1 Justification

#### Submission number(s)

23

#### Issue description

- Bus services need to be reliable and viable and should not impact, disrupt or inconvenience residents that frequently use bus stop #49.
- Bus stop #49 should remain as it is convenient to many customers including customers who access the bus stop from John Road, Haven Court, Norwich Place, Fernbank Place and County Drive (via a laneway).
- Bus stop #49 is safe and has existing infrastructure including sufficient floor platform for several commuters to stand in safety and a street light which illuminates the bus stop.

#### Response

The proposal forms part of the Bus Priority Infrastructure Program and supports *Sydney's Bus Future* (Transport for NSW, 2013) by delivering projects that make buses more reliable. As detailed in the REF, the removal of bus stop #49 (TSN #2126136) is part of a broader program aimed at improving reliability by:

- Reducing the number of locations at which buses need to stop by combining, removing or relocating some bus stops
- Lengthening some bus stops to improve access for buses and assist passenger boarding and alighting
- Improving bus stop infrastructure at some locations including changes to bus stop signage
- Reducing delays for buses by moving bus stops to the departure side of traffic lights, allowing them to take advantage of the Public Transport Information and Priority System (PTIPS).

While at individual locations the proposed changes may only seem to have small benefits, collectively they can deliver an important cumulative benefit to service reliability across the corridor as a whole.

There is an opportunity to optimise the spacing of bus stops at this location to improve the overall reliability of the bus route.

The removal of bus stop #49 would only be a minor inconvenience to customers who use bus stop #49 as the resulting spacing between the preceding bus stop #51 (TSN #212619) and next bus stop #47 (TSN #2126137) would be about 490 metres. While the spacing between bus stops would increase, the proposed bus stop locations in this area would still maintain a walkable catchment (i.e. bus stops within a 400 metre radius or a five minute walk) consistent with the *Improving Transport Choice* and *Sydney's Bus Future* guidelines (refer to section 1.1.3 for further information about bus stop accessibility).

Customers who access bus stop #49 from John Road, Haven Court, Norwich Place, Fernbank Place and County Drive (via a laneway) would be required to use bus stops #47 (TSN #2126137)



or #51 (TSN #212619). Bus stop #49 is located 250 metres from the previous bus stop #51 and 240 metres from the next bus stop #47.

The existing alternative bus stops have similar street lighting conditions and standing room to bus stop #49. Any further facilities to be provided at the nearest alternative bus stops (bus stops #47 and #49) would be the responsibility of the local council.

### 3.10.2 Increased walking distance to next stop

#### Submission number(s)

23

#### Issue description

- Removal of bus stop #49 would require customers to walk up a large hill to the next bus stop (bus stop #51).

#### Response

There is an opportunity to optimise the spacing of bus stops at this location to improve the overall reliability of the bus route. While the spacing between bus stops would increase, the proposed bus stop locations in this area would still maintain a walkable catchment (i.e. bus stops within a 400 metre radius or a five minute walk) consistent with the *Improving Transport Choice* and *Sydney's Bus Future* guidelines (refer to section 1.1.3 for further information about bus stop accessibility).

As detailed in section 1.1.3 of this report, the removal of bus stops has taken into account the population size, demography, local facilities, current and future land use development, and other relevant factors when determining which bus stops to remove or relocate to ensure users of suburban and local services were not severely impacted.

The REF has considered all bus services running along the M60 and T70/71 routes that use the bus stops. Section 6.1 (Socio-economic) of the REF assessed the impacts of the removal of bus stops on other routes. By removing bus stop #49 an acceptable spacing still is maintained for all bus routes in accordance with *Sydney's Bus Future*.

Removal of bus stop #49 will require customers to walk to alternative bus stops. Bus stop #49 is located 250 metres from the previous bus stop #51 (TSN #212619) and 240 metres from the next bus stop #47 (TSN #2126137). The resulting spacing between the preceding bus stop #51 (TSN #212619) and next bus stop #47 (TSN #2126137) would be about 490 metres.

The submission appears to have mixed up the associated numbering for adjacent bus stop locations. Customers walking from bus stop #49 to bus stop #51 would be required to descend a gentle slope for 250 metres, therefore would not be required to ascend a large hill to get to this stop. Those customers walking from bus stop #49 to bus stop #47 would be required to ascend a gentle slope of 240 metres.

### 3.10.3 Traffic and pedestrian safety

#### Submission number(s)

23

#### Issue description

- Bus stop #49 should be retained because it has clear visibility to see oncoming traffic and flag the driver.

#### Response

An inspection of the proposed alternative bus stops #51 (TSN #212619) and #47 (TSN #2126137) by Roads and Maritime indicates there are no potential visibility hazards.

### 3.10.4 Parking impacts

#### Submission number(s)

### Issue description

- Removing bus stop #49 to provide two more car spaces does not achieve an improvement in parking.

### Response

The objective of the proposal is not to improve parking. The objectives of the proposal are to:

- Achieve more reliable travel times for buses customers
- Improve on-time running for buses consistent with the State Priority to maintain or improve reliability of public transport services
- Minimise impacts for users of suburban and local services
- Minimise impacts on the environment and the community.

Improvements in parking by the addition of new parking spaces on local roads are secondary to the rationalisation of bus stops to improve on-time running of buses and are determined by the local council during implementation of the proposal.

## 3.10.5 Alternatives and options

### Submission number(s)

23

### Issue description

- Removal of bus stops #51, #47 and #45 is more practical and feasible than removing bus stop #49 as they are grouped within 180 metres of one another.
- Bus stop #51 should be removed and bus stop #49 moved 100 metres further along County Drive because:
  - Bus stop #51 is dangerous as it is situated on the apex of a steep hill, is adjacent to the intersection of County Drive and Treetops Road and has overhanging vegetation.
  - When the bus stops at bus stop #51 during peak periods it prevents vehicles turning left onto Castle Hill Road and it blocks vehicles turning right from Treetops Road onto County Drive.
  - Elderly people are not able to use bus stop #51 as the climb up the hill to this bus stop is not viable for them.
  - The proposed future existing alternative bus stop #51 is dangerous as customers would be required to cross County Drive. There are no traffic lights, pedestrian islands or safe refuge for customers.
  - Bus stop #51 is close to the fence and has a very small standing platform which is inconvenient for pedestrians. Vegetation has caused the footpath to buckle and it is hazardous.

### Response

The submission appears to have mixed up the associated numbering for adjacent bus stop locations, particularly bus stop #51 (TSN #212619). This response has been prepared to address the submission as recorded.

Bus stop #45 (TSN #2154185) is not feasible to remove as it is on the northern side of Castle Hill Road and services eastbound customers. Bus stops #47 (TSN #2126137), #49 (TSN #2126136) and #51 (TSN #212619) are located on the southern side of Castle Hill Road and service westbound customers.

Removal of bus stops #47 and #51 would not optimise the spacing of bus stops at this location to improve the overall reliability of the bus route. Removal of bus stop #47 would result in a distance of about 900 metres between the preceding bus stop #49 and following bus stop #43. Removal of bus stop #51 would result in a distance of about 700 metres between the preceding bus stop #54 and following bus stop #49.



Bus stop #51 is not located on the apex of a steep hill. It is located near the base of a gentle slope with good visibility for motorists and bus operators. An inspection by Roads and Maritime did not observe any visibility issues at this location.

There is a signalised pedestrian crossing at the intersection of County Drive and John Road about 120 metres south west of bus stop #51. This signalised crossing is also about 120 metres from bus stop #49. The section of County Drive near bus stop #51 also has a landscaped median that would act as a pedestrian refuge for customers not choosing to use the signalised pedestrian crossing.

The bus stop review included careful consideration of road safety matters, with bus stop changes proposed (where justified) on traffic safety grounds. The review identified that bus stop #51 should be retained at its current location due to it being an important bus stop for use by school students.

Bus stop #47 cannot be relocated due to a lack of a safe alternative location to the north, particularly, given that road geometry results in poor sight distances.

### **3.11 Removal of bus stop #62, Macquarie Drive Opposite Francis Greenway Drive, Cherrybrook (TSN #2126153)**

#### **Submission number(s)**

7, 9, 34, 39, 48

#### **Issue description**

Five submissions were received which objected to the proposed removal of bus stop #62 with a number of concerns raised in relation to:

- Increased walking distance to the next bus stop for elderly residents
- Pedestrian safety of elderly residents
- Justification of the works
- Traffic safety when exiting the Francis Greenway Drive onto Macquarie Drive

#### **Response**

Following a review of the issues raised by the local community, Roads and Maritime and Transport for NSW have agreed that a number of bus stops needed to be retained to minimise impacts on the local community, in particular seniors/pensioners, children and concession card holders. The proposed changes are detailed in Chapter 4 (Changes to the proposal). Bus stop #62 is now proposed to be retained in its current location.

### **3.12 Relocation of bus stop #64, Francis Greenway Drive before Penrose Avenue, Cherrybrook (TSN #212694)**

#### **Submission number(s)**

3, 7, 13, 18, 39, 49

#### **Issue description**

Six submissions were received which objected to the proposed relocation of bus stop #64 with a number of concerns raised in relation to:

- Traffic safety impacts when negotiating the intersection of Francis Greenway Drive and Macquarie Drive
- Removal of vegetation
- Pedestrian safety for young children, students and the elderly
- Justification of the works.

#### **Response**

Following a review of the issues raised by the local community, Roads and Maritime and Transport for NSW have agreed that a number of bus stops needed to be retained to minimise impacts on

the local community, in particular seniors/pensioners, children and concession card holders. The proposed changes are detailed in Chapter 4 (Changes to the proposal). Bus stop #64 is now proposed to be retained in its current location.

### **3.13 Removal of bus stop #62, Macquarie Drive opposite Francis Greenway Drive, Cherrybrook (TSN #2126153) and relocation of bus stop #64, Francis Greenway Drive before Penrose Avenue, Cherrybrook (TSN #212694)**

#### **Submission number(s)**

1, 9, 12, 26, 32, 35, 39

#### **Issue description**

Seven submissions were received which objected to the proposed removal of bus stop #62 and relocation of bus stop #64 with a number of concerns raised in relation to:

- Increased walking distance to next stop by the elderly
- Traffic safety impacts when negotiating the intersection of Francis Greenway Drive and Macquarie Drive
- Removal of vegetation
- Pedestrian safety for young children, students and the elderly when crossing Macquarie Drive
- Justification of the works
- Alternative and options including removing alternative bus stops

One submission supported the proposed changes to bus stops #62 and #64.

#### **Response**

Following a review of the issues raised by the local community, Roads and Maritime and Transport for NSW have agreed that a number of bus stops needed to be retained to minimise impacts on the local community, in particular seniors/pensioners, children and concession card holders. The proposed changes are detailed in Chapter 4 (Changes to the proposal). Bus stops #62 and #64 are now proposed to be retained in their current location.

### **3.14 Removal of bus stops #67, Francis Greenway Drive opposite Parkhill Crescent, Cherrybrook (TSN #212692) and #68, Francis Greenway Drive at Parkhill Crescent, Cherrybrook (TSN #212677)**

#### **3.14.1 Justification**

#### **Submission number(s)**

41

#### **Issue description**

- Bus stops #67 and #68 have a large catchment area and are frequently used.

#### **Response**

The proposal forms part of the Bus Priority Infrastructure Program and supports *Sydney's Bus Future* (Transport for NSW, 2013) by delivering projects that make buses more reliable. As detailed in the REF, the removal of bus stops #67 and #68 is part of a broader program aimed at improving reliability by:

- Reducing the number of locations at which buses need to stop by combining, removing or relocating some bus stops

- Lengthening some bus stops to improve access for buses and assist passenger boarding and alighting
- Improving bus stop infrastructure at some locations including changes to bus stop signage
- Reducing delays for buses by moving bus stops to the departure side of traffic lights, allowing them to take advantage of the Public Transport Information and Priority System (PTIPS).

While at individual locations the proposed changes may only seem to have small benefits, collectively they can deliver an important cumulative benefit to service reliability across the corridor as a whole.

There is an opportunity to optimise the spacing of bus stops at this location to improve the overall reliability of the bus route. While the spacing between bus stops would increase, the proposed bus stop locations in this area would still maintain a walkable catchment (i.e. bus stops within a 400 metre radius or a five minute walk) consistent with the *Improving Transport Choice* and *Sydney's Bus Future* guidelines (refer to section 1.1.3 for further information about bus stop accessibility).

There are several bus stops on Francis Greenway Drive positioned close to each other with a particularly low number of customers experienced at bus stops #67 and #68.

Bus stop #67 (TSN #212692) is within 300 metres of the previous bus stop #72 (TSN #212691) and 210 metres of the next bus stop #66 (TSN #212693). Opal data shows bus stop #67 has an average 24-hour weekday demand of 21 customers, compared with 47 for bus stop #72 and 48 for bus stop #66.

Similarly, bus stop #68 (TSN #212677) is within 600 metres of the previous bus stop #65 (TSN #212676) and 230 metres of the next bus stop #71 (TSN #212678). Opal data shows bus stop #68 has an average 24-hour weekday demand of 16 customers, compared with 70 for bus stop #65 and 43 for bus stop #71.

To reduce delays, there is an opportunity to remove bus stop #67 and #68 and consolidate these (along with two other bus stops in this area - bus stops #71 and #72) to create two new stops (bus stops #69 and #70).

The nearest alternative bus stops to new bus stop #69 would be 350 metres to the previous bus stop #74 (TSN #212690) and 300 metres to the next bus stop #66 (TSN #212693). The nearest alternative bus stop to new bus stop #70 would be 400 metres to the previous bus stop #65 (TSN #212676) and 300 metres to the next bus stop #73 (TSN #212679). The increased walking distances for customers to the new bus stops being created (bus stops #69 and #70) is considered acceptable and consistent with the *Improving Transport Choice* and *Sydney's Bus Future* guidelines.

### 3.14.2 Increased walking distance to next stop

#### Submission number

41

#### Issue description

- The removal of bus stops #67 and #68 would increase walking distances for customers.

#### Response

There is an opportunity to optimise the spacing of bus stops at this location to improve the overall reliability of the bus route. While the spacing between bus stops would increase, the proposed bus stop locations in this area would still maintain a walkable catchment (i.e. bus stops within a 400 metre radius or a five minute walk) consistent with the *Improving Transport Choice* and *Sydney's Bus Future* guidelines (refer to section 1.1.3 for further information about bus stop accessibility).

As detailed in section 1.1.3 of this report, the removal of the bus stops has taken into account the population size, demography, local facilities, current and future land use development, and other relevant factors when determining which bus stops to remove or relocate to ensure users of suburban and local services were not severely impacted.

The REF has considered all bus services running along the M60 and T70/71 routes that use these bus stops. Section 6.1 (Socio-economic) of the REF assessed the impacts of the removal of bus stops on other routes. By removing bus stops #67 and #68 acceptable spacing is maintained for all bus routes in accordance with *Sydney's Bus Future*.

There are several bus stops on Francis Greenway Drive positioned close to each other and have low customer numbers. Bus stop #67 (TSN #212692) is within 300 metres of the previous bus stop #72 (TSN #212691) and 210 metres of the next bus stop #66 (TSN #212693). Opal data shows bus stop #67 has an average 24-hour weekday demand of 21 customers, compared with 47 for bus stop #72 and 48 for bus stop #66.

Similarly, bus stop #68 (TSN #212677) is within 600 metres of the previous bus stop #65 (TSN #212676) and 230 metres of the next bus stop #71 (TSN #212678). Opal data shows bus stop #68 has an average 24-hour weekday demand of 16 customers, compared with 70 for bus stop #65 and 43 for bus stop #71.

To reduce delays, there is an opportunity to remove bus stops #67 and #68 and consolidate these (along with two other existing bus stops in this area - bus stops #71 and #72) to create two new stops (bus stops #69 and #70).

The nearest alternative bus stops to new bus stop #69 would be 350 metres to the previous bus stop #74 (TSN #212690) and 300 metres to the next bus stop #66 (TSN #212693). The nearest alternative bus stop to new bus stop #70 would be 400 metres to the previous bus stop #65 (TSN #212676) and 300 metres to the next bus stop #73 (TSN #212679). The increased walking distances for customers to the new bus stops being created (bus stops #69 and #70) is considered acceptable and consistent with the *Improving Transport Choice* and *Sydney's Bus Future* guidelines.

### 3.14.3 Support

#### Submission number

10

#### Issue description

- Support to remove bus stops #67 and #68 due to low usage.

#### Response

Roads and Maritime acknowledges support to remove bus stops #67 and #68 due to low utilisation.

## 3.15 Addition of bus stop #69, 79 Francis Greenway Drive, Cherrybrook (No TSN #<sup>9</sup>)

### 3.15.1 Environmental and amenity impacts

#### Submission number

56

#### Issue description

- Bus stop #69 will be constructed in front of 79 Francis Greenway Drive and the resident is concerned that the new bus stop will impact the noise environment (i.e. noise of buses stopping and children getting off) as the resident is a shift worker.

#### Response

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<sup>9</sup> TSN to be confirmed during implementation

Bus stops located on local roads in residential areas are not uncommon in the Sydney metropolitan area. A large number of bus stops are located directly in front of residential properties. It is recognised that the proposed works have the potential to impact residential amenity once operational as discussed in section 6.1 (Socio-economic) of the REF. This includes potential operational impacts from a new bus stop in front of a residential property (including short term noise from buses). However, the noise impacts are considered minor compared to the benefits. The potential noise generated is short term, infrequent and is already part of the existing environment in this location to some extent.

Operational noise from buses is already present along Francis Greenway Drive as it is part of the existing bus route in this location. Buses would typically stop very briefly and intermittently throughout the day in front of the driveway if needing to stop for customers in this location and would not be required to stop unless there were customers boarding or departing from the bus.

### **3.16 Removal of bus stop #71, Francis Greenway Drive opposite Thorpe Avenue, Cherrybrook (TSN #212678) and addition of new bus stop #70, 110 Francis Greenway Drive, Cherrybrook (No TSN #10)**

#### **3.16.1 Justification**

##### **Submission number**

36

##### **Issue description**

- Bus stop #71 is also used by other bus routes and provides alternative connectivity to other bus routes for customers. There is a large population of customers near bus stop #71 who will be highly inconvenienced if it is replaced with bus stop #70.

##### **Response**

The proposal forms part of the Bus Priority Infrastructure Program and supports *Sydney's Bus Future* (Transport for NSW, 2013) by delivering projects that make buses more reliable. As detailed in the REF, the removal of bus stop #71 and addition of bus stop #70 is part of a broader program aimed at improving reliability by:

- Reducing the number of locations at which buses need to stop by combining, removing or relocating some bus stops
- Lengthening some bus stops to improve access for buses and assist passenger boarding and alighting
- Improving bus stop infrastructure at some locations including changes to bus stop signage
- Reducing delays for buses by moving bus stops to the departure side of traffic lights, allowing them to take advantage of the Public Transport Information and Priority System (PTIPS).

While at individual locations the proposed changes may only seem to have small benefits, collectively they can deliver an important cumulative benefit to service reliability across the corridor as a whole.

There is an opportunity to optimise the spacing of bus stops at this location to improve the overall reliability of the bus route. While the spacing between bus stops would increase, the proposed bus stop locations in this area would still maintain a walkable catchment (i.e. bus stops within a 400 metre radius or a five minute walk) consistent with the *Improving Transport Choice* and *Sydney's Bus Future* guidelines (refer to section 1.1.3 for further information about bus stop accessibility).

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<sup>10</sup> TSN to be confirmed during implementation

An important consideration in developing the proposal was to ensure bus stops used by local and suburban services in the corridor remain accessible. A review of the impact of removal of bus stop #71 found that there would be limited impact on suburban and local services because all services (600, 620X, 621, 622, 626) stop at the preceding bus stop #65 and following bus stop #73.

There are several bus stops on Francis Greenway Drive positioned close to each other with a particularly low number of customers experienced at bus stops #68.

Bus stop #68 (TSN #212677) is within 600 metres of the previous bus stop #65 (TSN #212676) and 230 metres of the next bus stop #71 (TSN #212678). Opal data shows bus stop #68 has an average 24-hour weekday demand of 16 customers, compared with 70 customers for bus stop #65 and 43 for bus stop #71.

To reduce delays, there is an opportunity to remove bus stop #68 and #71 and consolidate these to create a new stop (bus stop #70).

The nearest alternative bus stop to new bus stop #70 would be 400 metres to the previous bus stop #65 (TSN #212676) and 300 metres to the next bus stop #73 (TSN #212679). The increased walking distances for customers to the new bus stop being created (bus stop #70) is considered acceptable and consistent with the *Improving Transport Choice* and *Sydney's Bus Future* guidelines.

### 3.16.2 Environmental and amenity impacts

#### Submission number

41

#### Issue description

- The removal of bus stop #71 and the establishment of a new bus stop #70 would negatively impact the visual amenity of the residents living at the proposed location.

#### Response

Bus stops located on local roads in residential areas are not uncommon in the Sydney metropolitan area. A large number of bus stops are located directly in front of residential properties. It is recognised that the proposed works have the potential to impact residential amenity as discussed in Section 6.1 (Socio-economic) of the REF. This includes potential short term impacts as a result of construction activities but also operational impacts from a new bus stop in front of a residential property (including visual amenity impacts). However, the impacts are considered minor compared to the benefits to the local community.

Infrastructure to be provided at new bus stop #70 would include hardstand, plinth sign, TGSI, bus zone signage and a 1.5 metre wide footpath from Parkhill Crescent to new bus stop #70 which is consistent with the design and scale of other bus stops on local roads.

### 3.17 Removal of bus stops #71, Francis Greenway Drive opposite Thorpe Avenue, Cherrybrook (TSN #212678) and #72, Francis Greenway Drive before Thorpe Avenue, Cherrybrook (TSN #212691)

#### 3.17.1 Justification

#### Submission number(s)

10, 24, 41

#### Issue description

- The removal of bus stops #71 and #72 is not supported as these are the most used bus stops in the vicinity for residents living on Worthing Place and Booth Place (28 houses), the top end of Yanderra Grove and Todd Close (28 houses) and Penrose Avenue (6 houses), Thorpe



Avenue (16 houses) and close by residents of Francis Greenaway Drive (15 houses). They are also the only available bus stops to residents who live along Lambe Trail (11 houses). Their removal will affect up to 104 houses.

- Bus stops #71 and #72 should remain as they have a large customer catchment from Penrose Avenue, Yanderra Avenue, Thorpe Avenue, Booth Place, Worthing Place, Kay Close, the southern end of Parkhill Crescent and northern end of Lambe Trail.

## Response

The proposal forms part of the Bus Priority Infrastructure Program and supports *Sydney's Bus Future* (Transport for NSW, 2013) by delivering projects that make buses more reliable. As detailed in the REF, the removal of bus stops #71 and #72 is part of a broader program aimed at improving reliability by:

- Reducing the number of locations at which buses need to stop by combining, removing or relocating some bus stops
- Lengthening some bus stops to improve access for buses and assist passenger boarding and alighting
- Improving bus stop infrastructure at some locations including changes to bus stop signage
- Reducing delays for buses by moving bus stops to the departure side of traffic lights, allowing them to take advantage of the Public Transport Information and Priority System (PTIPS).

While at individual locations the proposed changes may only seem to have small benefits, collectively they can deliver an important cumulative benefit to service reliability across the corridor as a whole.

There is an opportunity to optimise the spacing of bus stops at this location to improve the overall reliability of the bus route. While the spacing between bus stops would increase, the proposed bus stop locations in this area would still maintain a walkable catchment (ie bus stops within a 400 metre radius or a five minute walk) consistent with the *Improving Transport Choice* and *Sydney's Bus Future* guidelines (refer to section 1.1.3 for further information about bus stop accessibility).

An important consideration in developing the proposal was to ensure bus stops used by local and suburban services in the corridor remain accessible. Where distances between bus stops have exceeded 400 metres, consideration was given to ensure that the proposed spacing maintained a 400 metre walking catchment (or five minute walk) to the nearest bus stop in accordance with the guidelines of *Sydney's Bus Future* and *Improving Transport Choice*. Based on these guidelines, stop spacings of up to 800 metres maintain an accessible walking catchment to the nearest bus stop of 400 metres, however proposed bus stop spacings have generally been kept well below 800 metres to maintain a duplicate coverage area that potentially provides bus users with a choice of stops in some locations. Where removing a bus stop would result in excessive distance between stops for local and / or suburban routes, no changes have been proposed.

To reduce delays, there is an opportunity to remove bus stop #71, #72 and consolidate these (along with two other bus stops in this area - bus stops #67 and #68) to create two new stops (bus stops #69 and #70).

Bus stop #71 (TSN #212678) is within 230 metres of the previous bus stop #68 (TSN #212677) and 190 metres of the next bus stop #73 (TSN #212679). Opal data shows bus stop #71 has an average 24-hour weekday demand of 43 customers, compared with 16 customers for bus stop #68 and 23 for bus stop #73.

Bus stop #72 (TSN #212691) is within 140 metres of the previous bus stop #74 (TSN #212690) and 300 metres of the next bus stop #67 (TSN #212692). Opal data shows bus stop #72 has an average 24-hour weekday demand of 47 customers, compared with 20 customers for bus stop #74 and 21 for bus stop #67.

Customers who currently use bus stop #71 would be required to use new bus stop #70, or alternatively existing bus stop #73 (TSN #212679). The distance from bus stop #71 to new bus



stop #70 is about 105 metres. Alternatively, bus stop #73 is located about 190 metres from bus stop #71.

Customers who currently use bus stop #72 would be required to use new bus stop #69, or alternatively existing bus stop #74 (TSN #212690). The distance from bus stop #72 to bus stop #69 is about 170 metres. Alternatively, bus stop #74 is located about 130 metres from bus stop #72.

The increased walking distances for customers to the new bus stop being created (bus stops #69 and #70) is considered acceptable and consistent with the *Improving Transport Choice* and *Sydney's Bus Future* guidelines.

### 3.17.2 Increased walking distance to next stop

#### Submission number(s)

10, 41

#### Issue description

- The removal of bus stops #71 and #72 will increase walking distance for many residents in this location who utilise these bus stops.

#### Response

There is an opportunity to optimise the spacing of bus stops at this location to improve the overall reliability of the bus route. While the bus spacing between stops would increase, the proposed bus stop locations in this area would still maintain a walkable catchment (i.e. bus stops within a 400 metre radius or a five minute walk) consistent with the *Improving Transport Choice* and *Sydney's Bus Future* guidelines (refer to section 1.1.3 for further information about bus stop accessibility).

As detailed in section 1.1.3 of this report, the removal of the bus stops has taken into account the population size, demography, local facilities, current and future land use development, and other relevant factors when determining which bus stops to remove or relocate to ensure users of suburban and local services were not severely impacted.

There are several bus stops on Francis Greenway Drive positioned close to each other and have low customer numbers. There is an opportunity to reduce delays by consolidating four existing bus stops (bus stops #67, #68, #71 and #72) into two new bus stops (bus stops #69 and #70). Opal data indicates bus stop #67 (TSN #212692) has an average 24-hour weekday demand of 21 customers. Similarly, bus stop #68 (TSN #212677) has an average 24-hour weekday demand of 16 customers. Removing bus stops #67 and #68 due to low customer numbers requires the removal of bus stops #71 and #72 and adding bus stops #69 and #70 to maintain a walkable catchment (ie bus stops within a 400 metre radius or a five minute walk) consistent with the *Improving Transport Choice* and *Sydney's Bus Future* guidelines (refer to section 1.1.3 for further information about bus stop accessibility).

Customers who currently use bus stop #71 would be required to use new bus stop #70, or alternatively existing bus stop #73 (TSN #212679). The distance from bus stop #71 to new bus stop #70 is about 105 metres. Alternatively, bus stop #73 is located about 190 metres from bus stop #71.

Customers who currently use bus stop #72 would be required to use new bus stop #69, or alternatively existing bus stop #74 (TSN #212690). The distance from bus stop #72 to bus stop #69 is about 170 metres. Alternatively, bus stop #74 is located about 130 metres from bus stop #72.

### 3.17.3 Alternatives and options

#### Submission number(s)

10, 24, 41

#### Issue description

- Bus stops #71 and #72 should remain where they are and the bus stops located near the corner of Francis Greenway Drive and Duer Place (bus stops #73 and #74) be removed

- We suggest removing the bus stops at the intersection of Duer Place and Francis Greenway Drive (bus stops #73 and #74). These bus stops serve the least amount of residents within a 400 metre walking distance catchment. Whilst this would mean that the distance between the existing bus stops #71 and #72 near Thorpe Avenue and the bus stops near the Macquarie Drive roundabout (TSN #212689 and #212680) would only be slightly greater than 400 metres, the majority of residents would still be within 400m walking distance of existing bus stops.

## Response

The proposal forms part of the Bus Priority Infrastructure Program and supports *Sydney's Bus Future* (Transport for NSW, 2013) by delivering projects that make buses more reliable. As detailed in the REF, the removal of bus stops #71 and #72 is part of a broader program aimed at improving reliability by:

- Reducing the number of locations at which buses need to stop by combining, removing or relocating some bus stops
- Lengthening some bus stops to improve access for buses and assist passenger boarding and alighting
- Improving bus stop infrastructure at some locations including changes to bus stop signage
- Reducing delays for buses by moving bus stops to the departure side of traffic lights, allowing them to take advantage of the Public Transport Information and Priority System (PTIPS).

While at individual locations the proposed changes may only seem to have small benefits, collectively they can deliver an important cumulative benefit to service reliability across the corridor as a whole.

There is an opportunity to optimise the spacing of bus stops at this location to improve the overall reliability of the bus route. While the spacing between bus stops would increase, the proposed bus stop locations in this area would still maintain a walkable catchment (i.e. stops within a 400 metre radius or a five minute walk) consistent with the *Improving Transport Choice* and *Sydney's Bus Future* guidelines (refer to section 1.1.3 for further information about bus stop accessibility).

There are several bus stops on Francis Greenway Drive positioned close to each other. There is an opportunity to reduce delays by consolidating four bus stops (bus stops #67, #68, #71 and #72) into two bus stops (bus stops #69 and #70). The consolidation of bus stops in the area would result in bus stop spacing of less than 400 metres.

Removing bus stop #73 instead of bus stop #71 results in a bus stop spacing between bus stop #71 and bus stop #75 of 480 metres. Removing bus stop #74 instead of bus stop #72 results in a bus stop spacing between bus stop #72 and bus stop #76 of 420 metres.

The retention of bus stops #71 and #72 would also have a flow on impacts to the bus stop spacing and consolidation of bus stops #67, #68, #71 and #72 into bus stops #69 and #70 on Francis Greenway Drive.

### **3.18 Removal of bus stops #67, Francis Greenway Drive opposite Parkhill Crescent, Cherrybrook (TSN #212692), #68, Francis Greenway Drive at Parkhill Crescent, Cherrybrook (TSN #212677), #71 (TSN #212678), and #72, Francis Greenway Drive before Thorpe Avenue, Cherrybrook (TSN #212691) and addition of new bus stop #69, 79 Francis Greenway Drive, Cherrybrook (No TSN**

## **#<sup>11</sup>) and #70, 110 Francis Greenway Drive, Cherrybrook (No TSN #<sup>12</sup>)**

### **3.18.1 Support**

#### **Submission number**

18

#### **Issue description**

- Supports removal of Francis Greenway Drive bus stops #67, #68, #71 and #72 and have no objection to replacing them with two new ones, namely bus stops #69 and #70.

#### **Response**

Roads and Maritime acknowledges support to remove bus stops #67, #68, #71 and #72 and replace with new bus stops #69 and #70.

## **3.19 Removal of bus stop #108, Pennant Hills Road after Dartford Road, Normanhurst (TSN #207614)**

### **3.19.1 Justification**

#### **Submission number(s)**

4, 30, 33, 38, 40, 54

#### **Issue description**

- Bus stop #108 is the most frequently used bus stop in the area. Since the commencement of the M60 route it has been observed that hardly any or no commuters ever use the other bus stops near bus stop #108.
- Bus stop #108 should not be removed because it is centrally located and has connectivity to the Brickpit Basketball Stadium Playground, Milsons Parade via Kenley Park and Dartford Road and it allows pickup of customers from the bus stop and children from Kenley Park without having to drive onto Pennant Hills Road.
- Bus stop #108 is conveniently located for a large section of the Thornleigh-Normanhurst Area south or east of Pennant Hills Road, including residents of the Department of Housing complex.
- Bus stop #108 should not be removed and is it's one of the few existing bus stops with an existing shelter.

#### **Response**

Bus stop #108 is located on a curve which does not meet current sight stopping distances, and combined with a high number of heavy vehicles travelling in the outside lane, the sight distance is reduced even further. A number of near misses have been observed at this bus stop with general vehicles almost rear ending a stopped bus. Hence for safety reasons this bus stop needs to be removed and alternative existing bus stop #110 utilised.

Roads and Maritime crash history data for Pennant Hills Road from Nelson Street to Normanhurst Road indicates a high number of incidents for the period January 2012 to December 2016 including:

- 48 car crashes and 16 heavy vehicle crashes
- Crashes at intersections 60.3% of the time and at non-intersection 39.7% of the time
- 50% of crash types are rear end and 15.5% are from lane changing
- 29.4% of crashes include a serious injury and 52.9% include a moderate injury.

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<sup>11</sup> TSN to be confirmed during implementation

<sup>12</sup> TSN to be confirmed during implementation

Roads and Maritime have also consulted with the local bus operator for this area (Hillsbus). Hillsbus is supportive of removing bus stop #108 at Pennant Hills Road after Dartford Road as their field officers/supervisors/drivers have continuously expressed concerns regarding poor visibility, inadequate sight distance and near miss incidents in this location.

### 3.19.2 Environmental and amenity impacts

#### Submission number

30

#### Issue description

- If bus stop #108 was removed customers would be required to use bus stop #110. Bus stop #110 does not have shelter.

#### Response

Roads and Maritime would liaise directly with the relevant local council and Transport for NSW during implementation of the proposal to ensure that resulting bus stop infrastructure changes have considered the potential provision of shelters at alternative bus stops nearby where none are currently provided. The provision of bus shelters is the responsibility of the local council.

### 3.19.3 Increased walking distance to next stop

#### Submission number

4, 30, 38, 40, 52, 54

#### Issue description

- If bus stop #108 was removed customers would be required to walk further distances to bus stop #110, including those with disabilities, residents of the Department of Housing complex and the elderly who live in the surrounding area.

#### Response

There is an opportunity to optimise the spacing of bus stops at this location to improve the overall reliability of the bus route.

As detailed in section 1.1.3 of this report, the removal of the bus stops has taken into account the population size, demography, local facilities, current and future land use development, and other relevant factors when determining which bus stops to remove or relocate to ensure users of suburban and local services were not severely impacted.

The REF has considered all bus services running along the M60 route that use the bus stops. Section 6.1 (Socio-economic) of the REF assessed the impacts of the removal of bus stops on other routes.

By removing bus stop #108, an acceptable spacing is maintained for all bus routes in accordance with *Sydney's Bus Future*. The removal of bus stop #108 will require customers to walk to an alternative bus stop nearby (either bus stops #106 or #110). Bus stop #108 is located 350 metres from the previous bus stop #106 (TSN #212025) and 140 metres from the next bus stop #110 (TSN #207618). To access the nearest alternative bus stop (bus stop #110), customers would be required to walk 140 metres along a gentle slope downhill from bus stop #108. While the spacing between bus stops would increase, the proposed bus stop locations in this area would still maintain a walkable catchment (ie. bus stops within a 400 metre radius or a five minute walk) consistent with the *Improving Transport Choice* and *Sydney's Bus Future* guidelines (refer to section 1.1.3 for further information about bus stop accessibility).

### 3.19.4 Parking impacts

#### Submission number

30

### Issue description

- If bus stop #108 was removed customer pick up/drop off by private vehicles to/from bus stop #110 would be from Kenley Road. This is a no through road with limited parking.

### Response

Roads and Maritime understand that Dartford Road is commonly used for passenger pick ups and drop offs. The removal of bus stop #108 would require customers to walk to bus stop #110. Bus stop #110 is 150 metres further away from Dartford Road than bus stop #108. Roads and Maritime considers this an acceptable distance for customers to walk and it is visible from bus stop #108. The western side of Kenley Road has a number of dedicated off-road parking spaces (about 32 spaces) which is considered adequate for short term pick up and drop offs and a safer alternative to Dartford Road. Alternatively there is suitable on street parking available on Huddart Avenue located about 120 metres away to the east of bus stop #110.

### 3.19.5 Pedestrian safety

#### Submission number(s)

4, 30, 33, 38, 40, 54

### Issue description

- Bus stop #108 is located near traffic lights where customers can cross safely. The alternative bus stops require commuters to cross Pennant Hills Road which is busy and dangerous. These alternative bus stops do not have convenient access to signalised crossings.

### Response

Removal of bus stop #108 would require customers to use bus stop #110. Bus stop #110 is located about 180 metres from the traffic lights at Dartford Road and Pennant Hills Roads which is not considered an unreasonable distance to walk in order to cross Pennant Hills Road in this location.

Roads and Maritime acknowledges that this is inconvenient for customers. However, the removal of bus stop #108 is justified for a traffic safety reasons (refer to section 3.19.1).

### 3.19.6 Traffic impacts

#### Submission number

30

### Issue description

- If bus stop #108 was removed private vehicles performing customer pick up/drop offs would be required to travel further to return to the catchment north of Milson Parade.

### Response

Roads and Maritime understand that Dartford Road is commonly used for passenger pick up and drop off. The removal of bus stop #108 would require customers to walk to bus stop #110. Bus stop #110 is 150 metres further away from Dartford Road than bus stop #108. Roads and Maritime considers this an acceptable distance for customers to walk. As an alternative, if pick ups are carried out from Kenley Road, there are road connections available via Buckingham Ave, Denman Parade and Normanhurst Road for vehicles detour and return back onto the westbound lanes of Pennant Hills Road.

### 3.19.7 Support

#### Submission number

6

### Issue description

- Supports removal of bus stop #108 as there is another bus stop 100 metres up the road which is still accessible from the Church, Preschool and Guide Hall and closer to the residential



houses. The removal of bus stop #108 will also improve traffic conditions at the Pennant Hills Road and Dartford Road intersection.

## **Response**

Roads and Maritime acknowledges support to remove bus stop #108.

### **3.19.8 Alternatives and options**

#### **Submission number(s)**

38, 40

#### **Issue description**

- Bus stop #110 (Pennant Hills Road after Kenley Road, Thornleigh) is less accessible than the Dartford Road bus stop (bus stop #110) to more people, and is rarely used. Bus stop #110 should be removed instead of bus stop #108.
- Bus stop #110 is more suitable for removal than bus stop #108.

## **Response**

Opal data indicates that bus stop #108 is used by 26 customers compared to one customer at bus stop #110 (24 hour average weekday). However, bus stop #108 is more suitable to remove for the reasons described in section 3.19.1 of this report.

Bus stop #108 is located on a curve which does not meet current sight stopping distances, and combined with a high number of heavy vehicles travelling in the outside lane, the sight distance is reduced even further. A number of near misses have been observed at this bus stop with general vehicles almost rear ending a stopped bus. Hence for safety reasons, this bus stop needs to be removed and alternative existing bus stop #110 utilised.

Roads and Maritime have also consulted with the local bus operator for this area (Hillsbus) about the proposed removal of bus stop #108. Hillsbus is supportive on removing the bus stop #108 at Pennant Hills Road after Dartford Road as their field officers/supervisors/drivers have continuously expressed concerns regarding poor visibility, inadequate sight distance and near miss incidents in this location.

### **3.20 Relocation of bus stop #112, Pennant Hills Road after Normanhurst Road, Normanhurst (TSN #207619)**

#### **3.20.1 Traffic safety**

#### **Submission number**

14

#### **Issue description**

- Proposed location for bus stop #112 is located on a dangerous section of road with limited visibility for following traffic coming up the hill from the Thornleigh direction at speeds of 70 kph.

## **Response**

Bus stop #112 is on Pennant Hills Road is being relocated to improve traffic sight distances and address existing road safety issues in this location. Whilst the location of the proposed new bus stop does not fully meet the sight stopping distance that a location to the west would improve on slightly, it is still an improved location to where the bus stop is currently located.

Relocated bus stop #112 is on the exit of the intersection. This removes the traffic safety issue of left turning vehicles turning into Normanhurst Street trying to go around a stopped bus to turn left, and possibly cutting them off or getting caught. It also places a bus stop next to a pedestrian bridge, which provides a safe crossing point for pedestrians to cross Pennant Hills Road, as well as improves the travel time for buses and general vehicles. Hence the proposed location is considered acceptable and appropriate in this context.

Roads and Maritime crash history data for Pennant Hills Road from Nelson Street to Normanhurst Road indicates a high number of incidents in this location for the period January 2012 to December 2016 including:

- 48 car crashes and 16 heavy vehicle crashes
- Crashes at intersections 60.3% of the time and at non-intersection 39.7% of the time.
- 50% of crash types are rear end and 15.5% are from lane changing
- 29.4% of crashes include a serious injury and 52.9% include a moderate injury.

The local bus operator (Hillsbus) also supports the relocation of bus stop #112 for the following reasons:

- It provides better vision before the natural bending of the road, and
- No potential operational issues have been identified with bringing the bus stop closer to the pedestrian footbridge as this reduces the walking distance for the school students.

### 3.20.2 Pedestrian safety

#### Submission number

33

#### Issue description

- Bus stop #112 should remain where it is because it is closer to the pedestrian bridge where Loreto Girls High School Students and local residents catch the bus.

#### Response

Bus stop #112 would be relocated closer to the pedestrian bridge than what it currently is at present.

### 3.20.3 Support

#### Submission number

25, 52

#### Issue description

- Supports the proposal to relocate bus stop #112 to improve connectivity with an overhead pedestrian bridge and because the existing location has poor visibility for bus drivers of customers waiting for the bus.

#### Response

Roads and Maritime acknowledges support to relocate bus stop #112.

## 3.21 Out of scope

#### Submission number(s)

2, 11, 15, 17, 19, 21, 22, 23, 25, 28, 37, 44, 46, 50, 55

#### Issue description

Submissions raised a number of issues that are beyond the scope of the current proposal. These are grouped and summarised below based on common themes. In some cases, out of scope submissions regarding particular bus stops have been addressed under the specific bus stop location under the 'alternatives and options' heading.

#### *Legislative requirements*

- Please confirm that all new bus stops will comply with the provisions of *Disability Standards for Accessible Public Transport* 2002 (DSAPT 2002). This is Federal Legislation under subsections 31 (3) and (4) of the Disability Discrimination Act 1992. Please provide a date for existing bus stops to comply with DSAPT 2002 as some existing bus stops installed about eight years ago do not comply.
- Concern confirm that the design of the bus stops will comply with the following:
  - DSAPT 2002
  - *Human Rights and Equal Opportunity Commission (HREOC) Bus Stop Guidelines November 2010*
  - *Translink Universally Accessible Bus Stop Design Guidelines 2007 4. NSW Road Rules 2014*
  - *NSW Disability Action Plan 2012-2017 timetable.*

#### *Bus route timetable*

- Please provide a timetable for the implementation of this new initiative.
- Current timetable is unreasonable and doesn't allow for traffic delays.

#### *Land ownership*

- It is understood that the bus stops located on streets are owned by the local councils. It would appear from this initiative that Transport for NSW, in conjunction with Roads and Maritime, have now taken ownership for these sites. Please confirm.

#### *Additional changes to bus routes and bus stops*

- Request to add or reinstate bus stops at:
  - Southern side of Castle Hill Road opposite (or nearby) the current northern side stop just before County Drive.
  - Eastbound on Castle Hill Road near the construction site for Cherrybrook Railway Station opposite Glenhope Road in West Pennant Hills.
- Requests and comments regarding changes to bus stop #24 in relation to another bus route including:
  - Retaining the bus stop and constructing a bus bay at the location.
  - Relocation of bus stop #24 would increase walking distance for bus customers who shop at Stockland Mall and negatively impact lots of customers.
- Changes to bus stop #49 including:
  - A concrete platform should be installed at bus stop #49 to convenience customers waiting for the bus.
  - A sign on bus stop #49 should be installed stating "BUS STOP from XXX Hours AM to XXX Hours PM". This way residences can park in the Bus Stop area outside the usage hours of buses, providing the allocated extra spaces without jeopardising the actual bus stop.
- Not supporting the removal of bus stops #77 and #78 due to:
  - The large catchment of residents that would be required to walk to a further bus stop.
  - The bus stop being located on a quiet road with safe access.
- Requests new bus shelters are designed to protect users from the elements and that one be installed at relocated bus stop #112.
- The bus stops between Waitara and Hornsby (bus stops #120, #121, #122 and #123) are not placed near safe crossings. Two of them are outside and opposite the front gate of a school (Barker College) (bus stops #122 and #123) with no suitable means of crossing and should be moved to a safer location. The tidiest solution would probably be to have a pair of bus stops immediately west of the Unwin-Romsey junction and another pair at the College-Pretoria junction. The traffic signals should be adjusted to provide a safe right turn from the left-hand lane for Hornsby-bound buses at that point.

- The Hornsby-bound bus stop in Pacific Highway nearest to Waitara Railway Station is too far from any safe crossing of the highway. It is also too far from its corresponding Parramatta bound bus stop near Waitara Avenue and too far from the station.
- The northbound stop at Castle Towers has been depicted as being at the corner of Castle Street, while in fact the bus stop is some 150 metres towards Pennant Street. Is this illustrating a future change? If so, it would be beneficial to customers for the Castle Towers stops (A/B and C) to be moved closer together, for easier interchange between services. Some customers could miss connecting buses due to the undesirable distance between Stand A/B and Stand C.
- The bus stop outside 379 Old Northern Road immediately west of Telfer Street (bus stop #40 (TSN #2154187)) doesn't have a pair across the road and it's not near a safe crossing. It's quite close to the next bus stop outside St Bernadette's. Perhaps it should be deleted from M60.

#### *Changes to road infrastructure*

- Requests the addition of another traffic light in front of Pomona Street in Pennant Hills to reduce walking distance to M60 bus stop.
- Requests a pedestrian crossing in front of Pomona Street in Pennant Hills.
- The proposal does not assess the impacts to the bus services from Northconnex.
- There is no station signage visible from the bus stop. Consideration should be given to closing the median strip at Waitara Avenue and removing the right-turn lane, permitting the bus stop to be moved up to the traffic signals.
- The commuter car park should be reshaped to instead open into Romsey Street through the vacant 4A Romsey Street site. The bike lockers should be moved to near Waitara Avenue.

#### *Changes to train stations*

- How will train customer parking on County Drive be managed when the Cherrybrook Train Station on Castle Hill Road is complete? Envisages a massive influx of vehicles parking along County Drive and occupants walking to the Train Station to catch the train.
- The proposal does not assess the impacts to the bus services from new train stations at Cherrybrook and Castle Hill.

#### *Bus driver behaviour*

- Bus rides are uncomfortable because bus operators are poor drivers.

### **Response**

These issues are considered to be outside the scope of works being proposed. The proposal is for the purpose of improving the reliability of bus services along the M60 and T71/70 routes by.

- Combining or removing some bus stops where they are spaced close together
- Lengthening some bus stops to accommodate longer articulated buses
- Making it easier for buses to move in and out of bus stops by removing or relocating on-street parking, or
- Reducing potential delays for buses at traffic signals by moving stops to the departure side of the intersection.

The proposal is part of the Bus Priority Infrastructure Program, itself part of Easing Sydney's Congestion Program. The aim of the program is to reduce peak period congestion as measured by increased travel speeds, improvement of travel times, and decreased traffic volumes on the corridor. Key initiatives include the delivery of the *M4 Smart Motorway*, the *Parramatta Congestion Improvement Program* and accelerated *Pinch Point* and *Clearways* Programs.

#### *Legislative requirements*

The position and dimensions of new and relocated bus stops (and those existing bus stops subject to significant alteration as a result of the proposal) would be assessed against the legislative requirements, including *AS 1428.1-2001 Design for Access and Mobility*, prior to becoming operational. A further safeguard has been included to address this in Chapter 6 (Environmental Management) of this report.

The provision of accessible bus stops is a shared responsibility between both council and Transport for NSW. Roads and Maritime would liaise directly with the relevant local council and Transport for NSW during implementation of the proposal to ensure that resulting bus stop infrastructure changes (ie. new or relocated bus stops and existing bus stops subject to significant alteration as a result of the proposal) have been considered against these requirements and other relevant legislative requirements and standards.

#### *Bus route timetable*

It is intended that the proposal will be implemented within the first half of 2018.

Transport for NSW, Roads and Maritime and bus operators are continually endeavouring to improve bus service reliability; and bus timetables are updated where necessary. It is noted that variable traffic conditions at certain locations can make setting appropriate travel times for buses challenging.

#### *Land ownership*

Roads and Maritime and Transport for NSW do not own the physical infrastructure associated with bus stops or the land on which the bus stops are located on - this is owned by local councils.

Roads and Maritime and Transport for NSW will contribute to the costs of removing or relocating existing physical infrastructure associated with bus stops where necessary to implement this proposal.

#### *Additional changes to bus routes and bus stops*

The approval of a new bus stop is subject to consultation with the relevant local council, bus operators, the community and Transport for NSW. Roads and Maritime will discuss the request for additional bus stops with the local council and Transport for NSW bus operations team.

The potential for a bus stop on the southern side of Castle Hill Road opposite or near the current northern side bus stop before County Drive was identified as part of the project but not pursued due to existing road traffic and road geometry issues identified in this area.

The bus stop eastbound on Castle Hill Road near the construction site for Cherrybrook Railway Station was required to be removed due to the railway station construction. The future configuration of bus stops in this location will be determined once construction of the station is complete. The reinstatement of this bus stop will depend on the direction of future bus movements at the Cherrybrook Station, which are yet to be determined.

There are no changes proposed for bus stops #24, #49, #77 and #78 or on the south side of Castle Hill Road. We understand that bus stop #24 referred to in the submission relates to another on-time running project where bus stop changes are proposed (the on-time running improvements to the Castle Hill to M2 Motorway corridor which was also displayed for comment this year). Bus stop #24 in that proposal is now proposed to be retained as a result of the submissions period.

The design and construction of bus shelters and concrete platforms, including bus stop #49 and #112, will be undertaken by council and is outside the scope of this proposal.

Roads and Maritime acknowledge that there are issues with the existing pedestrian crossings between Waitara and Hornsby (bus stops #120, #121, #122 and #123). The bus stops in this location are required to be maintained for service coverage reasons, including the servicing of Barker College.

The Hornsby-bound bus stop on Pacific Highway nearest to Waitara Railway Station is too far from any safe crossing of the highway due to existing traffic turning arrangements at the Waitara



Avenue intersection. The local bus operator (Hillsbus) will review this matter and discuss with the relevant local council, Roads and Maritime and Transport for NSW.

Changes at Castle Towers are subject to the future Castle Hill Interchange Upgrade Plans. Bus stops and traffic arrangements on Old Castle Hill Road at Castle Towers are currently being impacted by the Metro Station construction and no changes are proposed in this location as part of this proposal. The local bus operator (Hillsbus) will discuss this matter further with Transport for NSW, local council and Roads and Maritime as part of the future network changes once the railway station is open.

The bus stop outside 379 Old Northern Road immediately west of Telfer Street bus stop (bus stop #40 (TSN #2154187)) is being retained to ensure bus stops along the route are located within reasonable walking distance (ie. within a 400 metre radius or a five minute walk) for the majority of the community. It is not within the scope of this proposal to construct a pedestrian crossing or a bus stop pair at this location.

### *Changes to road infrastructure*

The scope of the proposal does not include the construction of pedestrian crossings or traffic lights. Local traffic management is the responsibility of the relevant local council and should be directed to the relevant local council.

Ongoing monitoring of bus services will determine whether further changes will be required in response to the opening of Northconnex.

The concerns over wayfinding signage and bus stops improvements at Waitara have been noted by Transport for NSW.

Changes to the Romsey Street commuter car park and bike lockers are beyond the scope of the proposal. The suggestions have been noted by Transport for NSW.

### *Changes to train stations*

The potential impacts to parking from the development of Cherrybrook Train Station are considered outside of the scope of the proposal. The parking impacts for this development have been assessed in the Sydney Metro Northwest Environmental Impact Statement and will be addressed by the local council.

The bus stop changes at Cherrybrook and Castle Hill are considered appropriate irrespective of the types of services that may travel along the corridor. Ongoing monitoring of bus services will determine whether further changes will be required in response to the opening of the Metro Station in this location.

### *Bus driver behaviour*

Thank you for your feedback and it has been noted by the local bus operator (Hillsbus).

Bus operators are responsible for monitoring and managing the behaviour of drivers. Specific concerns should be directed to 131500 or [www.transportnsw.info](http://www.transportnsw.info) for resolution by the bus operator. Please note that complaints should detail the specific bus route, time, bus registration and / or a specific driver in order for the bus operator to review and assess the particular driver.

## 4 Changes to the proposal

### 4.1 Overview

Following consideration of the submissions received from the community, three key changes to the proposal are now proposed. Table 4-1 below provides an overview of the proposed changes to the proposal as a result of the public display and review of submissions received and has taken into consideration feedback from the local community as described in the earlier chapters of this report.

*Table 4-1 Changes made to the proposal following the submissions period*

Ref#	Location	Original proposal	Changes to the proposal
#46	Castle Hill Road new westbound stop opposite bus stop #45 (TSN #2145185)	Not included	New bus stop at this location
#62	Macquarie Drive opposite Francis Greenway Drive (westbound stop TSN #2126153)	Remove bus stop #62 and replace with two car parking spaces.	The existing bus stop will be retained at its current location.
#64	Francis Greenway Drive before Penrose Avenue (westbound stop TSN #212694)	Relocate bus stop #64 about 120 metres to the west. Replace existing stop with parking and install hardstand, seat, plinth sign and bus zone sign at new location. Remove of one street tree at new location.	The existing bus stop will be retained at its current location.

As a result of the changes the final proposal includes:

- Eight bus stop removals (including the removal of signage and other bus stop infrastructure)
- Four bus stop improvements (including extensions)
- Two bus stop relocations
- Bus stop consolidation (four existing bus stops consolidated into two new stops)
- Two new bus stops.

A copy of the revised concept drawings for the proposal is provided in Appendix B.

## 5 Additional assessment

### 5.1 New bus stop #46, Castle Hill Road, Castle Hill (No TSN #<sup>13</sup>)

The following chapter provides an assessment of the proposed new bus stop #46 on Castle Hill Road as identified in the Chapter 4 (Changes to the proposal). This bus stop location was not assessed under the original proposal in the REF which went on public display.

#### 5.1.1 Description

Roads and Maritime propose to construct a new westbound bus stop on Castle Hill Road about 70 metres west of Highs Road (referred to as 'bus stop #46' – TSN to be confirmed during implementation). Table 5-1 provides a summary of the justification for the new bus stop in this location. The proposed location and the resulting works required to establish this new bus stop is shown on Figure 5-1.

Table 5-1 Proposed works at new bus stop location #46

Ref#	Location	Identified bus stop issues / adjustments	Proposed action
#46	Castle Hill Road westbound opposite bus stop #45 (TSN #2145185)	<p>During the review phase of this submissions report it was identified that bus stop #45 did not have a paired westbound bus stop for travel in the opposite direction and that the resulting spacing between adjacent westbound bus stops in this area was not consistent with spacing recommended in <i>Sydney's Bus Future</i> (ie. much greater than the recommended 400 metre spacing).</p> <p>Based on the above, Transport for NSW, Roads and Maritime and council agreed that a paired bus is required at this location.</p>	<p>New bus stop #46 is proposed to include installation of new signposts, hardstand, TGSi and a plinth (refer to Figure 5-1).</p> <p>No parking spaces will be removed or gained.</p> <p>No additional consultation has been undertaken as the new bus stop is not located in front of any businesses or residential properties that gain access from Castle Hill Road in this location.</p>

The nearest residential properties to proposed bus stop #46 are 9 Highs Road and 13 Doris Hirst Place located about 10 metres away to the south. These properties do not have any direct access or active frontage to Castle Hill Road.

The construction methodologies would be the same as the methodologies provided in Chapter 3 (Description of the proposal) in the REF and include:

- Pour concrete for new hardstand area at the same level as the existing footpath.
- Check that there is no sag point and that water drains away from the area sufficiently.
- Install new bus stop plinth, signage and TGSi.

#### 5.1.2 Environmental assessment

Table 5-2 details the potential environmental impacts of bus stop #46 on the environmental aspects described in the REF. Additional management and mitigation measures have been recommended where required.

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<sup>13</sup> TSN to be confirmed during implementation

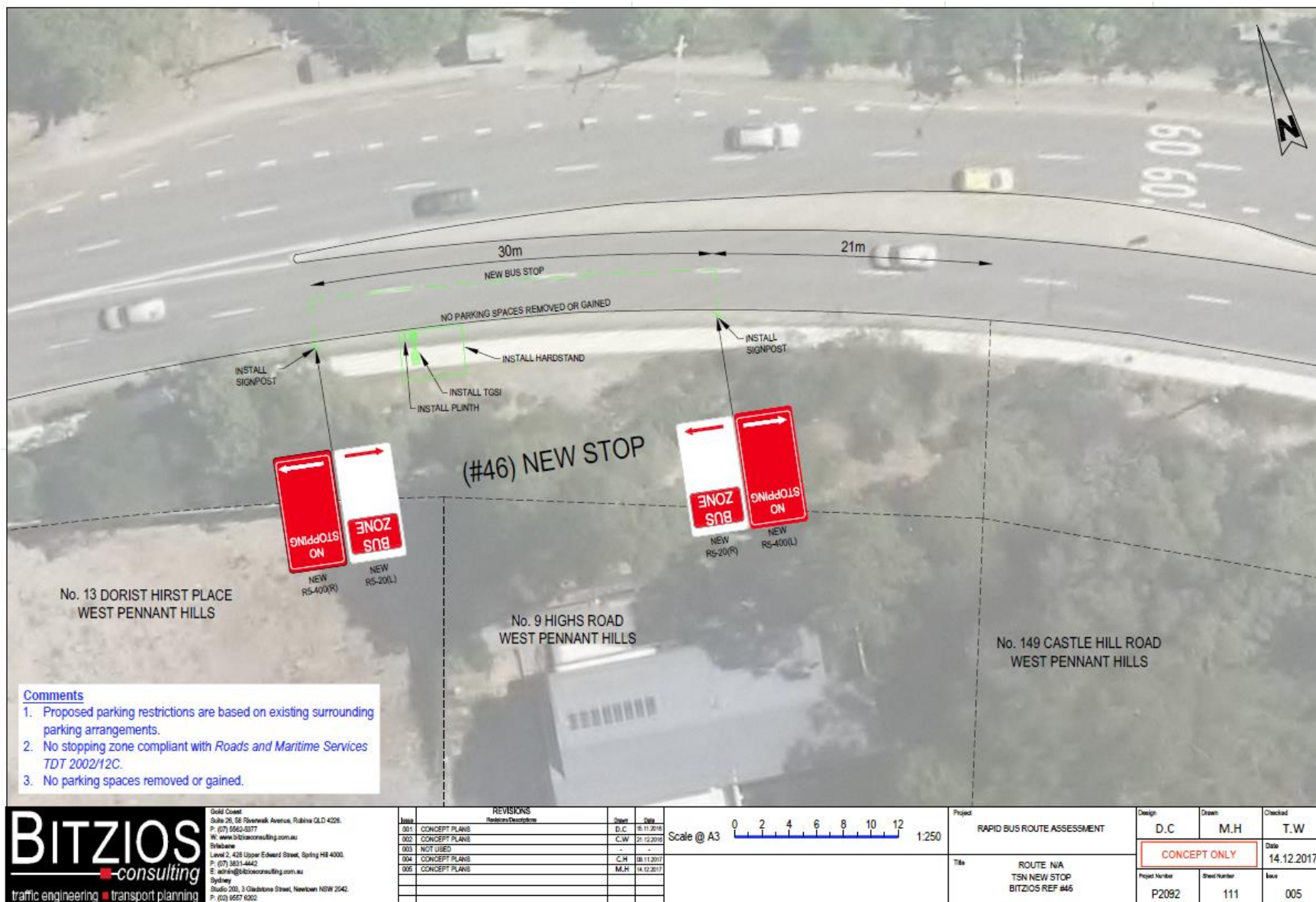


Figure 5-1 Proposed location of new bus stop #46 (source: Bitzios concept design)

Table 5-2 Environmental impact assessment - new bus stop location #46

Environmental aspect	Existing environment	Potential impacts	Additional management and mitigation measures
Socio economic	Refer to section 5.1.3 of this report.	Refer to section 5.1.3 of this report.	Refer to section 5.1.3 of this report.
Biodiversity	The site is a highly urbanised environment and does not include remnant native vegetation. Some landscaped areas occur adjacent to the footpath.	The construction of the hardstand may encroach landscaped areas including <i>Lomandra longiolia</i> , however care would be taken to minimise any vegetation clearance required in this location and appropriate measures would be applied to replace any vegetation cleared on the road reserve (where feasible) in accordance with the safeguards in the REF. There would be no impact to mature trees.	No additional management and mitigation measures from those identified in the REF are required.
Visual amenity	The visual impact has been assessed in accordance with the <i>Guidelines for landscape character and visual impact assessment</i> (Roads and Maritime Services, 2013) as described in section 6.3 (Visual amenity) of the REF.  New bus stop #46 has been assessed as moderate sensitivity as it occurs in an urban arterial road environment with minimal visual interface with adjacent development due to dense screening vegetation along the property boundary.	Due to the low sensitivity of the area and small scale of works (i.e. construction of a hardstand, plinth and signage) there would be negligible visual impact associated with the bus stop relocation.	No additional management and mitigation measures from those identified in the REF are required.



Environmental aspect	Existing environment	Potential impacts	Additional management and mitigation measures										
Noise and vibration	Existing noise in the area is dominated by road traffic noise. The nearest sensitive residential receiver is 9 Highs Road located about 10 metres away.	<p>The Roads and Maritime <i>Construction Noise and Vibration Guideline</i> (Roads and Maritime Services, 2016) and associated <i>Construction Noise Estimator</i> were used to determine the potential for construction noise impacts at the nearest residential receivers as described in section 6.4 (Noise and vibration) of the REF.</p> <p><b>Construction</b></p> <p>Due to the proximity of receivers, noise management levels are likely to be exceeded for the nearest residential and commercial receivers.</p> <table><tr><th>Ref#</th><th>Receiver distance (metres)</th><th>NML</th><th>Prediction L<sub>Aeq</sub> 15min dBA</th><th>Exceedance above NMLA (standard hours)</th></tr><tr><td>#46</td><td>10</td><td>60</td><td>91</td><td>31</td></tr></table> <p>Construction noise is summarised in the table below.</p> <p>Having regard to the types of equipment that could be used and the typical distance to nearby buildings, vibration is not expected to be an issue in terms of both structural damage and human response.</p> <p>Transport for NSW’s <i>Construction Noise Strategy</i> (Transport for NSW, 2012) sets out minimum working distances for vibration intensive plant to</p>	Ref#	Receiver distance (metres)	NML	Prediction L <sub>Aeq</sub> 15min dBA	Exceedance above NMLA (standard hours)	#46	10	60	91	31	No additional management and mitigation measures from those identified in the REF are required.
Ref#	Receiver distance (metres)	NML	Prediction L <sub>Aeq</sub> 15min dBA	Exceedance above NMLA (standard hours)									
#46	10	60	91	31									

Environmental aspect	Existing environment	Potential impacts	Additional management and mitigation measures												
		<p>avoid building damage and human response. These are summarised below.</p> <table> <tr> <th>Plant Item</th><th>Rating / Description</th><th colspan="2">Safe Working Distance</th></tr> <tr> <td></td><td></td><th>Cosmetic Damage</th><th>Human Response</th></tr> <tr> <td>Jackhammer</td><td>Hand held</td><td>1 m (nominal)</td><td>Avoid contact w/structure</td></tr> </table> <p><b>Operation</b></p> <p>The proposal would not result in changes to road geometry, traffic volumes or traffic mix and therefore a change in operational road traffic noise is not expected. The proposal would not introduce new sources of vibration during operation and therefore vibration impacts are not expected.</p>	Plant Item	Rating / Description	Safe Working Distance				Cosmetic Damage	Human Response	Jackhammer	Hand held	1 m (nominal)	Avoid contact w/structure	
Plant Item	Rating / Description	Safe Working Distance													
		Cosmetic Damage	Human Response												
Jackhammer	Hand held	1 m (nominal)	Avoid contact w/structure												
Non-Aboriginal heritage	<p>A search of the NSW State Heritage Inventory was undertaken for The Hills Shire and Hornsby Shire local government areas on 23 April 2017 as detailed in section 6.5 (Non-Aboriginal heritage) of the REF. The searches returned 1,032 records. A similar search of the Australian Heritage Database returned 50 records.</p> <p>No items were recorded near new bus stop #46 (refer to Figure 5-2).</p>	<p>Based on the background searches undertaken for the original REF and the nature of the proposed works, there is unlikely to be any non-Aboriginal heritage impacts.</p>	<p>No additional management and mitigation measures from those identified in the REF are required.</p>												

Environmental aspect	Existing environment	Potential impacts	Additional management and mitigation measures
Aboriginal heritage	The proposal site has been highly disturbed by urban development, road construction and the utilities placement. Aboriginal cultural heritage impacts are not expected as a result of the proposal as detailed in section 6.6 (Aboriginal heritage) of the REF.	Based on the background searches undertaken for the original REF and the nature of the proposed works, there is unlikely to be any Aboriginal heritage impacts.	No additional management and mitigation measures from those identified in the REF are required.
Water Quality	New bus stop #46 is within the Excelsior Creek catchment which forms part of the Parramatta River. Water quality is generally poor in this location and flows are altered by the constructed stormwater system. Stormwater from the urban catchment is generally not treated (except for gross pollutants). Common urban stormwater pollutants would include gross pollutant and litter, sediments and suspended solids, nutrients, toxic organics, heavy metals and hydrocarbons.	There would be no additional water quality impacts from those already assessed in the REF in section 6.7 (Water quality).	No additional management and mitigation measures from those identified in the REF are required.

Environmental aspect	Existing environment	Potential impacts	Additional management and mitigation measures
Air quality	The main influence on air quality at the proposal site is road traffic. The nearest Environment Protection Authority air quality monitoring site is in William Lawson Park at Prospect. Table 6-11 in the REF displays recorded air quality in the area.	There would be no additional air quality impacts from those already assessed in the REF in section 6.8 (Air quality).	No additional management and mitigation measures from those identified in the REF are required.
Traffic and transport	New bus stop #46 is located on Castle Hill Road. Castle Hill Road at this location has two-lanes in the westbound direction and three lanes, including a turn right lane, in the eastbound direction. Castle Hill Road is divided by a concrete median at this location and is classified as a Main Road (MR156).	There would be no additional construction traffic and transport impacts from those already assessed in the REF in section 6.9 (Traffic and transport).  Operation of the proposal, including the removal of bus stop #41, relocation of bus stop #43 and installation new bus stop #46, would improve the consistency of bus stop spacing in this area of Castle Hill Road and maintain a walkable catchment (ie bus stops within a 400 metre radius or a five minute walk), consistent with the <i>Improving Transport Choice</i> and <i>Sydney's Bus Future</i> guidelines (refer to section 1.1.3 for further information about bus stop accessibility).	No additional management and mitigation measures from those identified in the REF are required.
Hazards and risks		Potential hazards and risks are described in Section 6.10 (Hazards and risks) of the REF. There are no additional hazards and risks associated with the new bus stop #46. There is a signalised pedestrian crossing at the High Road intersection for safe pedestrian crossing of Castle Hill Road to the new bus stop (bus stop #46).	No additional management and mitigation measures from those identified in the REF are required.
Waste minimisation		Transport for NSW and Roads and Maritime are committed to ensuring the responsible management of unavoidable waste and promotes the reuse of	No additional management

Environmental aspect	Existing environment	Potential impacts	Additional management and mitigation measures
and management		such waste in accordance with the resource management hierarchy principles outlined in the <i>Waste Avoidance and Resource Recovery Act 2001</i> . Further details are provided in section 6.11 (Waste minimisation and management) of the REF. There would be no additional waste impacts from those already assessed in section 6.11 (Waste minimisation and management) of the REF.	and mitigation measures from those identified in the REF are required.
Cumulative impacts		A discussion of potential cumulative impacts is discussed in section 6.12 (Cumulative impacts) of the REF. There are no additional potential cumulative impacts associated with the addition of bus stop #46.	No additional management and mitigation measures from those identified in the REF are required.



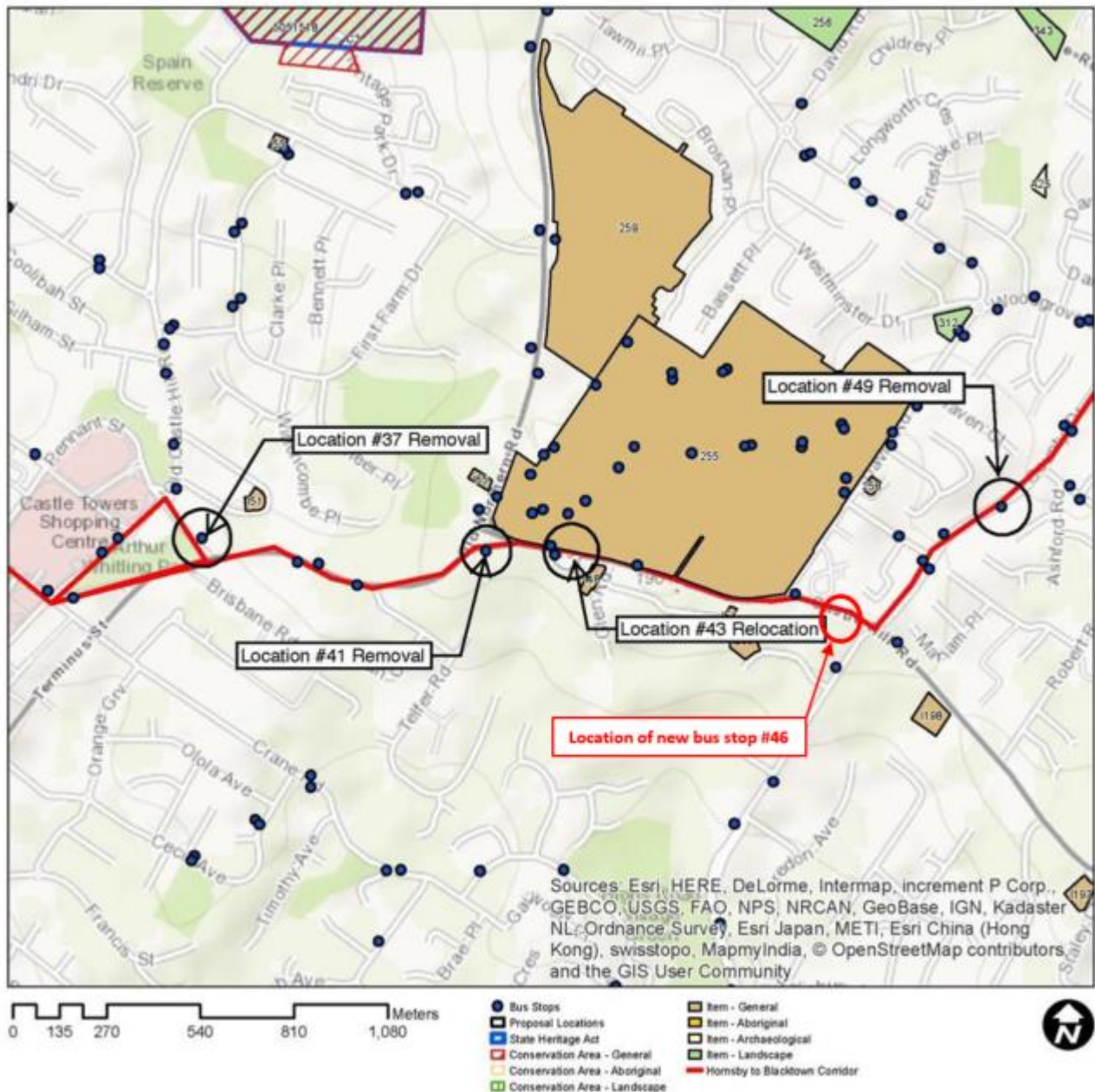


Figure 5-2 Heritage items near new bus stop #46 as presented in the REF which went on public display

### 5.1.3 Socio-economic

#### 5.1.3.1 Existing environment

The location for new bus stop #46 occurs in an urban context on Castle Hill Road within Castle Hill. The immediate area is primarily residential. There are a number of existing bus stops near the proposed location of bus stop #46 which are noted below.

- Eastbound bus stops:
  - #44 (TSN #2154184)
  - #45 (TSN #2154185) (pair to new bus stop #46)
  - #48 (TSN #2126156)
- Westbound bus stops:
  - #47 (TSN #2126137)
  - #43 (TSN #2154173) (being relocated as part of this proposal).

The bus stop would be located outside 13 Doris Hirst Place and 9 Highs Road, West Pennant Hills. These two properties are approximately 10 metres south from the proposal site and have no direct access or active frontage onto Castle Hill Road (refer to Figure 5-1). The proposed location of new bus stop #46 is also presented in Figure 5-3.

Further details on the existing environment are provided in section 6.1 (Socio-economic) of the REF.





*Figure 5-3 Location of new bus stop #46 looking west on Castle Hill Road*

#### **5.1.4 Potential impacts**

##### **5.1.4.1 Construction**

General amenity impacts during construction of the proposal would be minor and temporary. There would be no additional construction impacts from those already assessed in section 6.1 (Socio-economic) of the REF.

##### **5.1.5 Operation**

###### Accessibility

New bus stop #46 would improve the accessibility for westbound bus customers within the vicinity of Castle Hill Road. New bus stop #46 would be located 300 metres after previous bus stop #47 (TSN #2126137) and 580 metres before relocated bus stop #43 (TSN #2154173). This is

considered acceptable based on *Improving Transport Choice* and *Sydney's Bus Future* guidelines explained in sections 1.1.3 of this report.

#### Service reliability

With the proposal, bus customers along the route would benefit from improved service reliability and reduced journey times.

New bus stop #46 would be paired with bus stop #45. Its location on the departure side of the Castle Hill Road, Highs Road and Country Drive intersection would improve the convenience and efficiency of travel for those needing to catch connecting buses.

#### Loss of parking

The location of the new bus stop would not impact parking as currently no parking is currently permitted in the proposed bus stop location.

#### Business impacts

There are no businesses in the vicinity of the new bus stop location.

### **5.1.6 Revised management and mitigation measures**

No additional management and mitigation measures from those identified in the REF are required.

## 6 Environmental management

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The REF for the Bus Priority Infrastructure Program On-time running improvements Hornsby to Blacktown identified the framework for environmental management, including safeguards and management measures that would be adopted to avoid or reduce environmental impacts (Chapter 7 (Environmental management) of the REF).

After consideration of the issues raised in the public submissions and changes to the proposal, the safeguard and management measures contained in the REF are considered adequate with the exception of one further safeguard to be incorporated into the proposal as described in section 5.2 and Table 6-1 below.

Should the proposal proceed, environmental management will be guided by the framework and measures outlined below.

### 6.1 Environmental management plans (or system)

A number of safeguards and management measures have been identified in order to minimise adverse environmental impacts, including social impacts, which could potentially arise as a result of the proposal. Should the proposal proceed, these management measures would be incorporated into the detailed design and applied during the construction and operation of the proposal.

A Project Environmental Management Plan (PEMP) and a Construction Environmental Management Plan (CEMP) will be prepared to describe safeguards and management measures identified. The PEMP and CEMP will provide a framework for establishing how these measures will be implemented and who would be responsible for their implementation.

The PEMP and CEMP will be prepared prior to construction of the proposal and must be reviewed and certified by environment staff, Sydney region, prior to the commencement of any on-site works. The CEMP will be a working document, subject to ongoing change and updated as necessary to respond to specific requirements. The PEMP and CEMP would be developed in accordance with the specifications set out in QA Specification G36 – Environmental Protection (Management System), QA Specification G38 – Soil and Water Management (Soil and Water Plan), QA Specification G40 – Clearing and Grubbing and QA Specification G10 - Traffic Management.

### 6.2 Summary of safeguards and management measures

The review of environmental factors for the Bus Priority Infrastructure Program On-time running improvements Hornsby to Blacktown identified a range of environmental outcomes and management measures that would be required to avoid or reduce the environmental impacts.

After consideration of the issues raised in the public submissions, the environmental management measures for the project (refer to Chapter 7 (Environmental management) of the REF) are considered adequate, with the exception of one further safeguard to be incorporated into the proposal as a result of the submissions period (SOE6) which is outlined in bold in Table 6-1. Should the project proceed, the environmental management measures in Table 6-1 will guide the subsequent phases of the Bus Priority Program On-time running improvements Hornsby to Blacktown project.



Table 6-1 Summary of environmental safeguards and management measures

No.	Impact	Environmental safeguards	Responsibility	Timing
GEN1	General - minimise environmental impacts during construction	<p>A CEMP will be prepared and submitted for review and endorsement of the Roads and Maritime Environment Manager prior to commencement of the activity.</p> <p>As a minimum, the CEMP will address the following:</p> <ul style="list-style-type: none"> <li>• Any requirements associated with statutory approvals</li> <li>• Details of how the project will implement the identified safeguards outlined in the REF</li> <li>• Issue-specific environmental management plans</li> <li>• Roles and responsibilities</li> <li>• Communication requirements</li> <li>• Induction and training requirements</li> <li>• Procedures for monitoring and evaluating environmental performance, and for corrective action</li> <li>• Reporting requirements and record-keeping</li> <li>• Procedures for emergency and incident management</li> <li>• Procedures for audit and review.</li> </ul> <p>The endorsed CEMP will be implemented during the undertaking of the activity.</p>	Contractor / Roads and Maritime	Pre-construction / detailed design

No.	Impact	Environmental safeguards	Responsibility	Timing
GEN2	General - notification	<p>All businesses, residential properties and other key stakeholders (eg schools, local councils) affected by the activity will be notified at least five days prior to commencement of the activity. The notification letter will include (as a minimum):</p> <ul style="list-style-type: none"> <li>• Contact name and phone number</li> <li>• Working hours and proposed construction period</li> <li>• Complaints process.</li> </ul>	Contractor / Roads and Maritime	Pre-construction
GEN1	General - minimise environmental impacts during construction	<p>A CEMP will be prepared and submitted for review and endorsement of the Roads and Maritime Environment Manager prior to commencement of the activity.</p> <p>As a minimum, the CEMP will address the following:</p> <ul style="list-style-type: none"> <li>• Any requirements associated with statutory approvals</li> <li>• Details of how the project will implement the identified safeguards outlined in the REF</li> <li>• Issue-specific environmental management plans</li> <li>• Roles and responsibilities</li> <li>• Communication requirements</li> <li>• Induction and training requirements</li> <li>• Procedures for monitoring and evaluating environmental performance, and for corrective action</li> <li>• Reporting requirements and record-keeping</li> <li>• Procedures for emergency and incident management</li> <li>• Procedures for audit and review.</li> </ul> <p>The endorsed CEMP will be implemented during the undertaking of the activity.</p>	Contractor / Roads and Maritime	Pre-construction / detailed design

No.	Impact	Environmental safeguards	Responsibility	Timing
GEN3	General – environmental awareness	<p>All personnel working on site will receive training to ensure awareness of environment protection requirements to be implemented during the project. This will include up-front site induction and regular "toolbox" style briefings.</p> <p>The environmental awareness training is to include (as a minimum):</p> <ul style="list-style-type: none"> <li>• Environmentally sensitive locations</li> <li>• Requirement to report and the process for reporting environmental issues ineffective environmental controls</li> <li>• Erosion and sediment control measures</li> <li>• Incident management process</li> <li>• Site staff environmental responsibilities.</li> </ul>	Contractor / Roads and Maritime	Pre-construction / detailed design
GEN4	General - notification	The Roads and Maritime Project Manager must notify the Roads and Maritime Regional Environmental Officer at least five working days prior to commencement of works.	Roads and Maritime	Pre-construction

No.	Impact	Environmental safeguards	Responsibility	Timing
SOE1	Socio-economic - communication	<p>A Communication Plan will be prepared and included in the CEMP. The Communication Plan will include (as a minimum):</p> <ul style="list-style-type: none"> <li>• Requirements to provide details and timing of proposed activities to affected residents</li> <li>• Contact name and number for complaints</li> <li>• Procedure to notify adjacent land users for changed conditions during the construction period such as traffic, pedestrian or driveway access.</li> </ul> <p>The communication plan will be prepared in accordance with G36 requirements and the Roads and Maritime Community Engagement and Communications Manual (2012).</p>	Contractor	Detailed design / pre-construction
SOE2	Socio-economic - complaints	<p>A complaints handling procedure and register would be included in the CEMP and maintained for the duration of the project. The environmental awareness training is to include (as a minimum):</p> <ul style="list-style-type: none"> <li>• Environmentally sensitive locations and/or no go zones</li> <li>• Requirement to report and the process for reporting environmental issues on site</li> <li>• Requirement to report and the process for reporting damaged environmental controls</li> <li>• Erosion and sediment control</li> <li>• Incident management process</li> <li>• Site staff environmental responsibilities.</li> </ul>	Contractor	Pre-construction / construction

No.	Impact	Environmental safeguards	Responsibility	Timing
SOE3	Socio-economic – interruptions to utility services	In the event that utilities relocation would be required, residents would be informed prior to any interruptions to utility services that may be experienced as a result of utilities relocation.	Contractor	Pre-construction / construction
SOE4	Socio-economic – access	Road users, pedestrians and cyclists would be informed of changed conditions, including likely disruptions to access during construction.	Contractor	Pre-construction / construction
SOE5	Socio-economic – access	Access to residences, businesses and retained bus stops will be maintained during construction.	Contractor	Construction
SOE6	<b>Socio-economic – access</b>	<b>The position, design and dimensions of new and relocated bus stops (and those existing stops subject to significant alteration as a result of the proposal) would be assessed by a suitably qualified person against the requirements of AS 1428.1-2001 Design for Access and Mobility (and any other associated relevant standards for bus stops as applicable). If site conditions preclude full compliance with AS 1428.1-2001, a design review will be conducted to ensure all practicable measures are implemented to address access and mobility requirements.</b>	Contractor	Detailed design
BIO1	Unexpected threatened species impact	If unexpected threatened flora or fauna are discovered, works would stop immediately and the Roads and Maritime <i>Unexpected Threatened Species Find Procedure</i> , identified in the Roads and Maritime <i>Biodiversity Guidelines</i> (Roads and Traffic Authority, 2011) will be implemented.	Contractor	Construction



No.	Impact	Environmental safeguards	Responsibility	Timing
BIO2	Impacts to fauna	Prior to removal, trees will be checked for nesting birds and arboreal mammals. If present, fauna would be relocated by a qualified wildlife handler.	Contractor	Construction
VIS1	Loss of street trees - landscape character / visual amenity	Opportunities to provide replacement tree plantings (Francis Greenway Drive) or otherwise mitigate streetscape impacts will be explored in consultation with the relevant local council.	Transport for NSW / Roads and Maritime	Pre-construction
VIS2	Construction related visual impacts	The work site would be left in a tidy manner at the end of each work day.	Contractor	Construction
VIS3	Bus stop design	Bus stop signage and other infrastructure will comply with applicable Transport for NSW requirements and standards.	Transport for NSW / Roads and Maritime	Detailed design

No.	Impact	Environmental safeguards	Responsibility	Timing
NV11	Construction noise and vibration	<p>A Construction Noise and Vibration Management Plan (CNVMP) would be prepared as part of the CEMP, in accordance with the Roads and Maritime <i>Construction Noise and Vibration Guideline</i> (2016). This plan would include but not be limited to:</p> <ul style="list-style-type: none"> <li>• A map indicating the locations of sensitive receivers including residential properties</li> <li>• Management measures to minimise the potential noise impacts from the quantitative noise assessment (including implementation of EPA <i>Interim Construction Noise Guideline</i> (DECCW, 2009)</li> <li>• A risk assessment to determine potential risk for activities likely to affect receivers</li> <li>• Mitigation measures to avoid noise and vibration impacts during construction activities</li> <li>• A process for assessing the performance of the implemented mitigation measures</li> <li>• A process for updating the plan when activities affecting construction noise and vibration change</li> <li>• A process for documenting and resolving issues and complaints</li> <li>• Identify in toolbox talks where noise and vibration management is required</li> </ul>	Contractor	Pre-construction / construction
NV2	Construction noise and vibration - complaints	During work hours, a community liaison phone number and site contact would be provided to enable complaints to be received and responded to.	Contractor	Construction

No.	Impact	Environmental safeguards	Responsibility	Timing
NV3	Construction noise and vibration - complaints	If deemed necessary, attended compliance noise and vibration monitoring would be undertaken upon receipt of a complaint. Monitoring would be reported as soon as possible. In the case that exceedances are detected, the situation would be reviewed in order to identify means to minimise the impacts to residences, the appropriate changes made and the NVMP updated accordingly.	Contractor	Construction
NV4	Construction noise and vibration - training	<p>The environmental induction program will include specific noise and vibration issues awareness training including, but not limited to, the following:</p> <ul style="list-style-type: none"> <li>• Avoiding use of radios during work outside normal hours</li> <li>• Avoiding shouting and slamming doors</li> <li>• Where practical, operating machines at low speed or power and switching off when not being used rather than left idling for prolonged periods</li> <li>• Avoiding dropping materials from height and avoiding metal to metal contact on material.</li> </ul>	Contractor	Pre-construction / construction
NV5	Construction noise and vibration impacts	Where feasible and reasonable, construction will be carried out during the standard daytime working hours. Work generating high noise and/or vibration levels will be scheduled during less sensitive time periods.	Contractor	Construction
NV6	Construction noise and vibration impacts	Quieter and less vibration emitting construction methods will be used where feasible and reasonable.	Contractor	Construction

No.	Impact	Environmental safeguards	Responsibility	Timing
NV7	Construction noise and vibration impacts	The noise levels of plant and equipment must have operating Sound Power or Sound Pressure Levels compliant with the criteria in Appendix H of the <i>Construction Noise and Vibration Guideline</i> (Roads and Maritime Services, 2016).	Contractor	Construction
NV8	Construction noise and vibration impacts	Night time construction noise shall be limited to two consecutive nights High noise generating works will be completed before 11:00pm.	Contractor	Construction
NAH1	Unexpected impacts on heritage values	If unexpected heritage item/s, archaeological remains or potential relics are uncovered during the works, all works would cease in the vicinity of the material / find and the <i>Standard Management Procedure: Unexpected Heritage Finds</i> (Roads and Maritime Services, 2015) would be followed.	Roads and Maritime Contractor	Construction
NAH2	Inadvertent impacts on known heritage items and unexpected impacts on heritage values	Non-Aboriginal heritage awareness training would be provided for workers prior to commencement of construction work to communicate potential heritage items (including those associated with Windsor Road) that may be impacted during works, and the procedure required to be carried out in the event of discovery of historical heritage materials, features or deposits.	Roads and Maritime Contractor	Construction
ABH1	Disturbance of Aboriginal objects	The <i>Standard Management Procedure: Unexpected Heritage Finds</i> (Roads and Maritime Services, 2015) will be followed in the event that an unknown or potential Aboriginal object/s, including skeletal remains, is found during construction. Work will only re-commence once the requirements of that procedure have been satisfied.	Roads and Maritime Contractor	Construction

No.	Impact	Environmental safeguards	Responsibility	Timing
WQU1	Erosion and sedimentation	<p>Erosion and sediment control measures will be documented in the CEMP and implemented and maintained in accordance with <i>Managing Urban Stormwater: Soils and Construction</i> (Landcom, 2004) to:</p> <ul style="list-style-type: none"> <li>• Minimise sediment moving off-site and sediment laden water entering any water course, drainage lines, or drain inlets</li> <li>• Reduce water velocity and capture sediment on site</li> <li>• Minimise the amount of material transported from site to surrounding pavement surfaces</li> <li>• Divert off site water around the site.</li> </ul>	Contractor	Construction
WQU2	Erosion and sedimentation	Erosion and sedimentation controls are to be checked and maintained on a regular basis and after a rain event of 10 millimetres or greater (including clearing of sediment from behind barriers) and records kept and provided on request.	Contractor	Construction
WQU3	Erosion and sedimentation	Any material transported onto pavements will be swept and removed at the end of each working shift and prior to rainfall.	Contractor	Construction
WQU4	Erosion and sedimentation	Erosion and sediment control measures are not to be removed until the works are complete or areas are stabilised.	Contractor	Construction
WQU5	Pollution from site runoff	Refuelling, storage of fuels, vehicle wash down and concrete washout will occur at a dedicated location offsite.	Contractor	Construction



No.	Impact	Environmental safeguards	Responsibility	Timing
WQU6	Spills	An emergency spill kit is to be kept on site at all times. All staff are to be made aware of the location of the spill kit and trained in its use. If a spill or incident occurs, the <i>Environmental Incident Classification and Management Procedure</i> (Roads and Maritime Services, 2015) is to be followed and the Roads and Maritime Contract Manager notified immediately.	Contractor	Construction
WQU7	Stockpiling	If temporary stockpiles are required on site they would be located away from drainage lines and removed before the end of each shift.	Contractor	Construction
WQU8	New hardstand	Concrete for new hardstand is to be poured so that there is no sag point and water drains away from the area sufficiently.	Contractor	Construction
AQU1	Dust	Measures (including watering or covering exposed areas) will be documented in the CEMP and used to minimise or prevent air pollution and dust, where necessary	Contractor	Construction
AQU2	Dust and other emissions	Vehicles transporting waste or other materials that may produce odours or dust will be covered during transportation.	Contractor	Pre-construction / construction

No.	Impact	Environmental safeguards	Responsibility	Timing
AQU3	Other emissions	<p>Works (including the spraying of paint and other materials) will not be carried out during strong winds or in weather conditions where high levels of dust or air borne particulates are likely.</p> <p>Plant, vehicles and equipment will be maintained in good condition and in accordance with manufacturer's specifications.</p> <p>Plant and machinery will be turned off when not in use.</p>	Contractor	Construction
AQU4	Dust and other emissions	Visual monitoring of air quality will be undertaken to verify the effectiveness of controls and enable early intervention	Contractor	Construction
TTR1	Road safety and impacts to traffic flow.	A traffic management plan will be prepared and implemented in accordance with <i>Traffic control at worksites</i> (Roads and Traffic Authority, 2010).	Contractor	Pre-construction / construction
TTR2	Property access	Vehicular property access would be maintained where possible including pre- schools, places of worship and all commercial premises.	Contractor	Construction
TTR3	Pedestrian and cyclist access	<p>Pedestrian and cyclist access is to be maintained throughout construction.</p> <p>Provision of signs outlining the pedestrians and cyclists diversion routes would be displayed during construction.</p> <p>There will be advance notification of any construction works that affect pedestrians and cyclists.</p>	Contractor	Construction

No.	Impact	Environmental safeguards	Responsibility	Timing
TTR4	Bus stop access	Access for bus passengers to bus stops would be maintained during construction.	Contractor	Construction
HZR1	Construction hazards and risks	As part of the site specific CEMP, a Hazard and Risk Management Plan, including an emergency response plan, will be prepared. The plan will identify construction phase hazards and risks detail measures to mitigate those risks.	Contractor	Pre-construction
HZR2	Pedestrian safety	A safety review of all new bus stop locations will be conducted during the design phase to identify whether any additional pedestrian safety measures are required.	Roads and Maritime	Design
HZR3	Contamination	In the event that indications of contamination are encountered (known and unexpected, such as odorous or visually contaminated materials), work in the area would cease until a contamination assessment can be prepared to advise on the need for remediation or other action, as deemed appropriate.	Contractor	Construction
WMM1	Construction waste management	<p>The following resource management hierarchy principles will be followed:</p> <ul style="list-style-type: none"> <li>• Avoid unnecessary resource consumption as a priority</li> <li>• Avoidance would be followed by resource recovery (including reuse of materials, reprocessing, and recycling and energy recovery)</li> <li>• Disposal would be undertaken as a last resort (in accordance with the <i>Waste Avoidance and Resource Recovery Act 2001</i>).</li> </ul>	Roads and Maritime Contractor	Construction

No.	Impact	Environmental safeguards	Responsibility	Timing
WMM2	Construction waste management	<p>All wastes will be managed in accordance with the <i>Protection of the Environment Operations Act 1997</i>.</p> <p>All wastes will be disposed of legally in accordance with their classification under the <i>Waste Classification Guidelines Part 1: Classifying Waste</i> (Department of Environment, Climate Change and Water, 2009)</p>	Contractor	Construction
WMM3	Resource use	Procurement will endeavour to use materials and products with a recycled content where that material or product is cost and performance effective.	Roads and Maritime Contractor	Detailed design / pre-construction
WMM4	Waste tracking	Types of waste collected, amounts, date/time and details of disposal are to be recorded in a waste register.	Contractor	Pre-construction / construction
WMM5	Litter	Works sites would be maintained, kept free of rubbish and cleaned up at the end of each working day.	Contractor	Construction
WMM6	Waste disposal	<p>Suitable waste disposal locations would be identified and used to dispose of litter and other wastes on site during construction. Suitable containers would be provided for waste collection.</p> <p>Wastes would be removed from each site at the end of each work shift.</p>	Contractor	Pre-construction / construction

No.	Impact	Environmental safeguards	Responsibility	Timing
CUI1	Construction phase cumulative impacts	The CEMP will be revised to consider potential cumulative impacts from surrounding development activities as they become known. This will include a process to review and update mitigation measures as new work begins or complaints are received.	Contractor	Pre-construction / construction
WMM4	Waste tracking	Types of waste collected, amounts, date/time and details of disposal are to be recorded in a waste register.	Contractor	Pre-construction / construction
WMM5	Litter	Works sites would be maintained, kept free of rubbish and cleaned up at the end of each working day.	Contractor	Construction



### **6.3 Licensing and approvals**

Where required, an applicable Road Occupancy Licence would be in place prior to the commencement of works.

No other specific licencing/approval requirements have been identified.

## 7 References

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<sup>14</sup> Now referred to as the 'Department of Planning and Environment'

<sup>15</sup> Now referred to as Roads and Maritime

<sup>16</sup> Now referred to as Roads and Maritime

# Appendix A

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## Respondents

Submission No.	Respondent	Section number where issues are addressed
1	Individual	3.13
2	Individual	3.1, 3.3, 3.21
3	Individual	3.12
4	Individual	3.19
5	Individual	3.1, 3.9
6	Individual	3.19
7	Individual	3.1, 3.11, 3.12
8	Individual	3.1, 3.8
9	Individual	3.11, 3.13
10	Individual	3.14, 3.17
11	Individual	3.21
12	Individual	3.13
13	Individual	3.12
14	Individual	3.1, 3.20
15	Individual	3.21
16	Individual	3.1
17	Individual	3.21
18	Individual	3.12, 3.18
19	Individual	3.21
20	Individual	3.3
21	Individual	3.21

Submission No.	Respondent	Section number where issues are addressed
22	Individual	3.21
23	Individual	3.10, 3.21
24	Individual	3.17
25	Individual	3.20, 3.21
26	Individual	3.13
27	Individual	3.6, 3.9
28	Individual	3.21
29	Individual	3.1
30	Individual	3.19
31	Individual	3.6
32	Individual	3.13
33	Individual	3.4, 3.19, 3.20
34	Individual	3.11
35	Individual	3.13
36	Individual	3.1, 3.16
37	Individual	3.1, 3.2, 3.4, 3.5, 3.6, 3.21,
38	Individual	3.19
39	Individual	3.11, 3.12, 3.13
40	Individual	3.19
41	Individual	3.1, 3.14, 3.16, 3.17
42	Individual	3.1
43	Individual	3.3
44	Individual	3.21
45	Individual	3.1

Submission No.	Respondent	Section number where issues are addressed
46	Individual	3.21
47	Individual	3.1
48	Individual	3.11
49	Individual	3.12
50	Individual	3.9, 3.21
51	Individual	3.7
52	Individual	3.19, 3.20
53	Individual	3.1
54	Individual	3.1, 3.19
55	Individual	3.6, 3.21
56	Individual	3.15

# Appendix B

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Revised concept drawings





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