Wellington CBD to Miramar / Seatoun Route 2 Bus Infrastructure Improvements

Concept Stage Safe System Audit

Prepared for:
Wellington City Council

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Prepared by:
Stantec New Zealand

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A	Draft	J England	27/08/2025	C de Kock	27/08/2025		
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Acronyms / Abbreviations

CPTED	Crime Prevention Through Environmental Design
RSA	Road Safety Audit
SSAT	Safe System Audit Team
SSA	Safe System Audit
WCC	Wellington City Council
vpd	vehicles per day

1 Safe System Auditing for Transport Projects

A Safe System audit is an independent review of a future transport project to identify any safety concerns that may affect the safety performance and alignment to a Safe System. The audit team considers the safety of all road users and qualitatively reports on road safety issues or opportunities for safety improvement.

A Safe System audit is therefore a formal examination of a transport project, or any type of project which affects road users (including cyclists, pedestrians, mobility impaired etc), carried out by an independent competent team who identify and document Safe System alignment and road safety concerns.

A Safe System audit is intended to help deliver a safe road system and is not a review of compliance with standards.

1.1 Safe System Audit Procedure

The primary objective of a Safe System audit is to deliver a project that achieves an outcome consistent with the Safe System approach, that is, minimisation of death and serious injury. The Safe System audit is a safety review used to identify all areas of a project that are inconsistent with a safe system and bring those concerns to the attention of the client so that the client can make a value judgement regarding appropriate action(s) based on the risk guidance provided by the Safe System audit team.

The key objective of a Safe System audit is summarised as:

to deliver completed projects that contribute towards a Safe System by identifying and ranking potential safety concerns for all road users and others affected by a transport project.

A Safe System audit should be undertaken at project milestones such as:

- concept stage (part of a business case),
- scheme or preliminary design stage (part of pre-implementation),
- detail design stage (pre-implementation / implementation), and
- pre-opening / post-construction stage (implementation / post-implementation).

A Safe System audit is not intended as a technical or financial audit and does not substitute for a design check on standards or guidelines.

Any recommended treatment of an identified safety concern is intended to be indicative only, and to focus the design team on the type of improvements that might be appropriate. It is not intended to be prescriptive and other ways of improving the road safety or operational problems identified should also be considered.

In accordance with the procedures set down in the NZ Transport Agency Waka Kotahi Safe System Audit Guidelines, the audit report should be submitted to the client who will instruct the design team to

respond. The design team should consider the report and comment to the client on each of any concerns identified, including their cost implications where appropriate, and make a recommendation to either accept or reject the audit report recommendation.

For each audit team recommendation that is accepted, the client shall make the final decision and brief the design team to make the necessary changes and/or additions. As a result of this instruction the design team shall action the approved amendments. The client may involve a safety engineer to provide commentary to aid with the decision.

Decision tracking is an important part of the Safe System audit process. A decision tracking table is embedded into the report format at the end of each set of recommendations to be completed by the design team, safety engineer and client for each issue documenting the design team's response, client decision and action taken.

A copy of the report including the design team's response to the client and the client's decision on each recommendation must be given to the Safe System audit team leader as part of the important feedback loop. The Safe System audit team leader will disseminate this to the team members.

1.2 Report Format

1.2.1 Safety concern ranking

The safe system auditors have ranked the identified safety concerns together with four categories of suggested actions as shown in Table 1-1.

Table 1-1: Safety concern ranking

Ranking	Suggested action
Serious	A serious safety concern that must be addressed and requires changes to avoid serious safety consequences.
Significant	A significant safety concern that should be addressed and requires changes to avoid serious safety consequences.
Moderate	A moderate safety concern that should be addressed to improve safety.
Minor	A minor safety concern that could be addressed where practical to improve safety.

The ranking of safety concerns is based on the probability of a crash combined with the most likely severity outcome of that crash, as indicated in Table 1-2.

Table 1-2. Safety concern risk matrix

		Severity Outcome				
		Non-injury	**Minor**		**Serious**	**Fatal**
		Property damage only (PDO).	Injury that is not serious but requires first aid, or that causes discomfort or pain to the person injured.	**Safe System Injury Threshold**	Injury (fracture, concussion, severe cuts, or other injury) requiring medical treatment or removal to and retention in hospital.	Death occurring as the result of injuries sustained in a crash within 30 days of the crash.
Probability of a crash	**Very likely**	**Minor**	**Moderate**		**Serious**	**Serious**
	Likely	**Minor**	**Moderate**		**Serious**	**Serious**
	Unlikely	**Minor**	**Minor**		**Significant**	**Serious**
	Very unlikely	**Minor**	**Minor**		**Significant**	**Significant**

Qualitative risk ranking requires professional judgement and a wide range of experience in projects of all sizes and locations. Factors that have been considered when qualitatively assessing the probability of a crash and the most likely severity outcome of that crash are described below.

Probability of a crash

The safe system auditors have drawn on historic crash rates or other research for similar elements of projects, or projects as a whole where appropriate, to assist in understanding the likely crash types, frequency, and likely severity that may result from a particular safety issue.

The probability of a crash in Table 1-2 has been qualitatively assessed on the basis of expected exposure (how many road users will be exposed to a safety issue) and the risk of a crash resulting from the presence of the issue.

It is sometimes helpful to use crash frequency as a surrogate indicator of crash probability as shown in Table 3.

Table 1-3. Crash frequency as an indicator of probability

Crash Frequency	Crash Probability
Multiple crashes (more than one per year)	Very likely
1 every 1 to 5 years	Likely
1 every 5 to 10 years	Unlikely
Less than 1 every 10 years	Very unlikely

Severity outcome

A crash of a particular type can result in a range of severity outcomes for the people involved. For the purposes of this assessment, the crash severity outcome in Table 1-2 has been qualitatively assessed as being the most likely or predominant severity outcome on the basis of factors such as speed, type of crash, type of vehicles, and the people likely to be involved.

The severity of an injury is determined in part by the ability of a person to tolerate the crash forces. A person wearing safety restraints in a modern motor vehicle will have a greater tolerance to the forces involved than a pedestrian or cyclist struck by a motor vehicle. The safe system auditors have also considered the likely user composition, and hence the likely severity of injury to the people involved in the crash. An able-bodied adult may have a greater ability to recover from higher trauma injuries than a child, whereas an elderly person may have poor ability to recover from high trauma injuries.

1.2.2 Comments

In addition to the ranked safety issues, it may be appropriate for the Safe System audit team to provide additional comments with respect to items that may have a safety implication but lie outside the scope of the Safe System audit. A comment may include items where the safety implications are not yet clear due to insufficient detail for the stage of project, and items outside the scope of the audit such as existing issues not impacted by the project or an opportunity for improved safety but not necessarily linked to the project itself. While typically comments do not require a specific recommendation, the auditors may give suggestions in some instances.

Decision tracking of safety concerns ranked as a comment is optional.

2 Safe System Audit Details

2.1 Type of Audit

This is a Concept stage Safe System audit, which has been carried out by the team named in Section 2.2 as far as has been practicable in accordance with the guidelines for Safe System audits. (NZ Transport Agency, 2022)

This audit is for the bus improvements on the Wellington CBD to Miramar / Seatoun Bus Route 2.

2.2 Audit Team

This Safe System audit has been undertaken, by:

- Jon England, Senior Principal Road Safety Engineer / Project Management Lead – Lower North Island, Stantec New Zealand
- Cobus de Kock, Senior Principal Road Safety Engineer & Project Manager / Traffic Engineering, Design & Road Safety Lead – Wellington, Stantec New Zealand

2.3 Meetings and Site Inspections

A daytime site visit was conducted on Wednesday 20th August 2025 during overcast showery conditions. A night-time site visit was not deemed necessary given the existing lighting along the route.

No briefing or exit meetings were held with Wellington City Council.

2.4 Previous Road Safety and Safe System Audits

The SSAT is not aware of any other previous safety audits related to this project.

2.5 Documents Provided

The following documents were provided for the audit:

Table 2-1: Documents Provided

DRAWING LIST				
		DRAWING NUMBER	REV	TITLE
GENERAL				
1	✓	1097521.0000-0001	1	DRAWING LIST & LOCALITY PLAN
GENERAL LAYOUT PLANS				
2	✓	1097521.0000-0010	1	OVERVIEW PLAN
3	✓	1097521.0000-0101	1	ELIZABETH STREET - STOPS 6212/7212
4	✓	1097521.0000-0102	1	BROUGHAM STREET - STOPS 6213/7213
5	✓	1097521.0000-0103	1	BROUGHAM STREET / PIRIE STREET
6	✓	1097521.0000-0104	1	PIRIE STREET - STOPS 6214/7214
7	✓	1097521.0000-0105	1	PIRIE STREET - STOPS 6215/7215
8	✓	1097521.0000-0106	1	WAITOA ROAD - STOPS 6216/7216
9	✓	1097521.0000-0107	1	WAITOA ROAD - STOPS 6217/7217
10	✓	1097521.0000-0108	1	MOXHAM AVENUE - STOPS 6218/7218
11	✓	1097521.0000-0109	1	MOXHAM AVENUE - STOPS 6219/7219
12	✓	1097521.0000-0110	1	KUPE STREET - STOPS 6220/7220
13	✓	1097521.0000-0111	1	HAMILTON ROAD - STOPS 6221/7221
14	✓	1097521.0000-0112	1	KILBIRNIE CRESCENT - STOPS 6222/7222
15	✓	1097521.0000-0113	1	KILBIRNIE CRESCENT - STOPS 6223/7223
16	✓	1097521.0000-0114	1	RONGOTAI ROAD - STOPS 6027/7027
17	✓	1097521.0000-0115	1	RONGOTAI ROAD - STOPS 6028/7028
18	✓	1097521.0000-0116	1	COUTTS STREET / ONEPU ROAD
19	✓	1097521.0000-0117	1	ROSS STREET / COUTTS STREET
20	✓	1097521.0000-0118	1	MIRAMAR AVENUE - STOPS 6080/7080
21	✓	1097521.0000-0119	1	MIRAMAR AVENUE / PARK ROAD
22	✓	1097521.0000-0120	1	PARK ROAD - STOPS 6234/7234
23	✓	1097521.0000-0121	1	PARK ROAD - STOPS 6235/7235
24	✓	1097521.0000-0122	1	PARK ROAD - STOPS 6236/7236
25	✓	1097521.0000-0123	1	ROTHERHAM TERRACE - STOPS 6237/7237
26	✓	1097521.0000-0124	1	DARLINGTON ROAD - STOPS 6238/7238
27	✓	1097521.0000-0125	1	DARLINGTON ROAD - STOPS 6239/7239
28	✓	1097521.0000-0126	1	DARLINGTON ROAD - STOPS 6240/7240
29	✓	1097521.0000-0127	1	DARLINGTON ROAD - STOPS 6241/7241
30	✓	1097521.0000-0128	1	HOBART STREET - STOPS 6232/7232
31	✓	1097521.0000-0129	1	HOBART STREET - STOPS 6086/7086

DRAWING LIST				
		DRAWING NUMBER	REV	TITLE
GENERAL LAYOUT PLANS				
32	✓	1097521.0000-0130	1	HOBART STREET - STOPS 6032/7032
33	✓	1097521.0000-0131	1	HOBART STREET / BROADWAY - STOPS 6033/7033
34	✓	1097521.0000-0132	1	BROADWAY - STOPS 6034/7034
35	✓	1097521.0000-0133	1	BROADWAY - STOPS 6035/7035
36	✓	1097521.0000-0134	1	BROADWAY - STOPS 6036/7036
37	✓	1097521.0000-0135	1	BROADWAY - STOPS 6037/7037
38	✓	1097521.0000-0136	1	BROADWAY - STOPS 6038/7038
39	✓	1097521.0000-0137	1	FERRY STREET - STOPS 6039/7039
40	✓	1097521.0000-0138	1	DUNDAS STREET - STOPS 6040/7040
41	✓	1097521.0000-0139	1	DUNDAS STREET - STOPS 6041/7041
42	✓	1097521.0000-0140	1	MONRO STREET - STOP 6042
43	✓	1097521.0000-0141	1	HECTOR STREET - STOP 7042
VISIBILITY PLANS				
44	✓	1097521.0000-0201	1	HOBART STREET / CALEDONIA ROAD
VEHICLE TRACKING PLANS				
45	✓	1097521.0000-0301	1	BROUGHAM STREET / PIRIE STREET
46	✓	1097521.0000-0302	1	WAITOA ROAD
47	✓	1097521.0000-0303	1	COUTTS STREET / ONEPU ROAD
48	✓	1097521.0000-0304	1	ROSS STREET / COUTTS STREET
49	✓	1097521.0000-0305	1	MIRAMAR AVENUE / PARK ROAD / HOBART STREET
50	✓	1097521.0000-0306	1	HOBART STREET / BROADWAY
	✓	DENOTES DRAWINGS IN THIS ISSUE: 04/08/2025		

3 Project Description

3.1 Project Background and Objectives

Wellington City Council (WCC) is proposing to utilise longer articulated “bendy” buses on the Metlink #2 Bus Route between Karori and Miramar / Seatoun to increase the passenger capacity on this route.

The objective of the project is to implement improvements to the various bus stops along this route to ensure that the longer articulated “bendy” buses can be safely accommodated.

The extent of the separate locations under consideration is provided in Figure 3-1.

Figure 3-1: Location of Project Extents

3.2 Existing Conditions and Context

3.2.1 Function

The Wellington CBD to Miramar / Seatoun No 2 Bus Route travels via numerous roads. As a result, there are a number of sections of road that are under consideration in this safe system audit. These roads have been listed below. There are also two intersections that have been included due to their proximity to the Kilbirnie Bus Depot

- Coutts Street / Onepu Road intersection
- Coutts Street / Ross Street

Table 3-1: List of Roads along the No 2 Bus Route eastbound from Wellington CBD

Road Name	Hierarchy	Traffic Volume (vehicles per day)
Elizabeth Street	Primary Collector	2,920
Brougham Street	Primary Collector	3,000
Pirie Street	Primary Collector	2,810
Hataitai Bus Tunnel	Secondary Collector	420
Waitoa Road	Primary Collector	2,511
Moxham Ave	Arterial	8,404
Hamilton Road	Arterial	6,708
Kilbirnie Crescent	Arterial	9,899
Rongotai Road	Arterial	6,161
Miramar Avenue	Arterial	19,963
Park Road	Arterial	5,873
Rotherham Terrace	Primary Collector	1,160
Darlington Road	Primary Collector	3,170
Hobart Street	Primary Collector	2,240
Broadway	Arterial	12,394
Seatoun Tunnel	Arterial	1,847
Ferry Street	Arterial	4,563
Dundas Street	Arterial	3,235
Monro Street	Access	440

The majority of the route cyclists are required to merge with the traffic via sharrow markings. However, there are cycle lanes provided on Rongotai Road and Miramar Avenue.

The current traffic volumes vary from approximately 3,000 vehicles per day (vpd) in Mount Victoria, 2,500 to 8,300 vpd in Hataitai, 9,899 vpd in Kilbirnie, 19,963 to 3,170 vpd in Miramar and approximately 4,500 vpd in Seatoun.

3.2.2 Speed environment

The majority of the speed limits for the route are 50 km/h. There are localised sections of 30 km/h speed limits in Hataitai Village, Kilbirnie Shopping Centre, Miramar Town Centre, Strathmore Park Shops and Seatoun Shops. There is one section of 70 km/h along Cobham Drive

The current speed limits are not proposed to change.

3.2.3 Road users

There are many different types of road users present along this corridor due to the varying nature of the route. The bulk of the route is residential as it passes through the various suburbs that the bus route services. There are elderly pedestrians. There are school children using the route because there are a number of local schools located throughout. In addition to the village/shopping centres in the various suburbs, there are also the key community facilities of the Wellington Regional Aquatic Centre and the Ākau Tangi Sports Centre. There are cyclists who use the existing cyclist facilities where provided.

3.2.4 Vehicle composition

The percentage of heavy commercial vehicles using the various roads along the bus route varies between 4% to 18% which will account for buses, delivery and service vehicles. The highest proportion, unsurprisingly, it's the Hataitai Bus Tunnel at 95%. The No 2 Bus Route travels along a key public transport route which carries several regular bus services in addition to the No. 2 at regular frequencies.

Table 3-2: List of Roads along the No 2 Bus Route eastbound from Wellington CBD

Road Name	Hierarchy	% Heavy Vehicles
Elizabeth Street	Primary Collector	9
Brougham Street	Primary Collector	7
Pirie Street	Primary Collector	12
Hataitai Bus Tunnel	Secondary Collector	95
Waitoa Road	Primary Collector	17
Moxham Avenue	Arterial	8
Hamilton Road	Arterial	11
Kilbirnie Crescent	Arterial	11
Rongotai Road	Arterial	9
Miramar Avenue	Arterial	6
Park Road	Arterial	4
Rotherham Terrace	Primary Collector	18
Darlington Road	Primary Collector	10
Hobart Street	Primary Collector	11
Broadway	Arterial	4
Seatoun Tunnel	Arterial	10
Ferry Street	Arterial	5
Dundas Street	Arterial	7
Monro Street	Access	4

3.3 Proposed Works

The proposed improvements include changes to line marking, kerbs, the removal of bus stops, the creation of new bus stops, the shifting of bus stops, the extension of bus stops, the addition/extension of traffic islands/kerb build-outs, the removal of traffic islands at an intersection.

4 Assessment of Safe System Alignment

4.1 Project Design Safe System Assessment Summary

Given that the proposed project works are minor in nature, a Safe System Assessment has not been undertaken for this project.

The auditors have applied the principles of the Safe System assessment when considering their assessment of issues, and the application of safe system treatments, where applicable.

5 Safety Concerns

5.1 General Comments

5.1.1 BUS STOP marking within bus stop Minor

The drawings show that the bus stops are proposed to be marked with the words BUS STOP positioned parallel to the traffic lane. The existing bus stops are shown with the bus stop markings shown perpendicular to the traffic lane. It is important to ensure that a consistent approach to the implementation of these markings is taken in line with the NZTA recommendations (copied below).

> The marking 'BUS STOP' can be positioned and oriented in two different ways: parallel to the roadway (figure below) or perpendicular (as per Traffic Control Devices Rule, Schedule M3-2). Either text orientation is legal, but we recommend that in a city or region, the same orientation is implemented consistently.

It is noted that, as an example, at the Kilbirnie Bus Interchange the bus stop markings have been implemented perpendicular to the traffic lane.

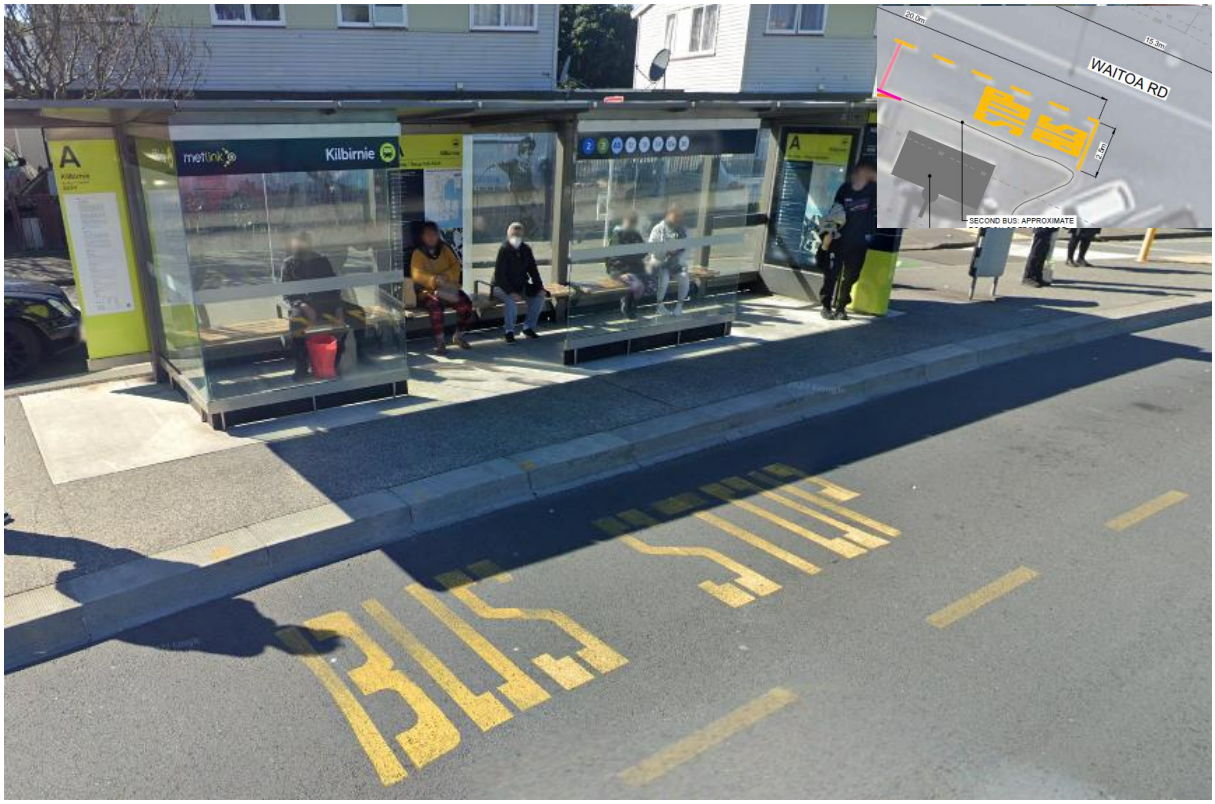


Figure 5-1:Existing BUS STOP markings at a Kilbirnie bus stop marked perpendicular to the roadway. INSET proposed bus stop markings on a bus stop in Hataitai.

Risk Ranking

The safe system audit team has assigned the following risk ranking to this safety concern.

Probability of a crash	Crashes resulting from this safety concern are very unlikely.
Severity outcome rating	The predominant outcome of a crash resulting from this safety concern is likely to be non -injury.
Risk ranking	The safety concern is therefore deemed to be minor

Recommendation(s)

1. Designers to ensure that the proposed BUS STOP markings are shown as perpendicular to the roadway to ensure consistency with existing markings at bus stops in Wellington.

Decision Tracking

Design team response	We do not consider this issue to be a safety concern; however, we agree with the SSAT that the bus stop marking should be consistently installed. We note that bus stop markings across Wellington are not currently consistent, and many stops do not have the 'BUS STOP' wording. We request that WCC confirm their preferred approach for consistent markings (words perpendicular to the roadway, words parallel to the roadway, or no words marked).
Client safety engineer comment	The BUS STOP marking should be placed in accordance with the TCD guidance.
Client decision	Bus Stop marking will be painted meet the guidance in clause 12.5 of the TCD Rule – Parallel to the roadway. (As shown in the Kilbirnie Bus Interchange image above). Ref: Bus stop markings | NZ Transport Agency Waka Kotahi
Action taken	Direct designers to show parallel "Bus Stop" marking applied consistently to all updated and proposed bus stops along the route.

5.2 Mount Victoria

5.2.1 Pedestrian drop kerbs on one side of road **Serious**

At the intersection of Brougham Street / Pirie Street, the inside kerb of the main route (Brougham to Pirie) is being realigned, and the existing pedestrian drop kerb (cut down) is being removed. Additionally, there are a number of traffic islands that will also be removed as the central median at the corner is being realigned.

The outcome of these improvements is to make it less safe for pedestrians to cross directly over Brougham St / Pirie Street at the corner as the receiving pedestrian drop kerb (cut down) is no longer provided.

Therefore, it is recommended that the existing pedestrian drop kerbs (cut downs) on the opposing corners of Pirie Street and Brougham Street respectively are removed.

Figure 5-2: Pedestrian drop kerbs (cut downs) that should be removed.

It is noted that there is a pedestrian crossing on Pirie Street located to the east of this intersection (refer to Figure 5-2 above, far right – blue rectangle) that pedestrians wishing to cross at this location could safely use instead.

Risk Ranking

The safe system audit team has assigned the following risk ranking to this safety concern.

The crash is based on a pedestrian crossing across the road in the middle of the curve and being struck by a motorist who is not expecting a pedestrian to appear on the inside of the curve.

Probability of a crash	Crashes resulting from this safety concern are likely.
Severity outcome rating	The predominant outcome of a crash resulting from this safety concern is likely to be serious.
Risk ranking	The safety concern is therefore deemed to be serious

Recommendation(s)

1. Remove existing pedestrian drop kerbs (cut downs) at the Pirie Street / Brougham Street intersection.

Decision Tracking

Design team response	We agree with the SSAT that both pedestrian drop kerbs indicated in Figure 5.2 should be removed (noting that the cutdowns across the give-way and stop-controlled legs of Brougham Street and Pirie Street should remain). The SSAT has noted that there is an existing zebra crossing on Pirie Street to the east of the intersection. While this crossing will provide a safe crossing opportunity for some pedestrians in this area, it will only serve pedestrians that are coming to/from the eastern leg of Pire Street (ex. it won't be used by pedestrians travelling north-south on Brougham Street). We believe that this intersection does not currently provide sufficiently safe crossing opportunities for pedestrians, and removing the drop kerbs and traffic islands will only make it less safe to cross.

	Improving pedestrian crossing opportunities at this intersection has been confirmed as outside of the project scope. We recommend that WCC gives further consideration to improving pedestrian crossing opportunities at the intersection either as part of this project or through a separate project that is installed at the same time.
Client safety engineer comment	There should be no changes until the layout for this intersection has been agreed. Pedestrian desire lines must be reflected in that layout. An additional priority crossing of Pirie west of the intersection has also been discussed.
Client decision	There will be no changes, until there is an agreed design. A new pedestrian crossing is being proposed on Pirie St west of this intersection.
Action taken	Request designers to update plans to capture this new proposed crossing with consideration for the removal of existing desire lines.

5.2.2 Bus stop 7214- reduced footpath width **Significant**

The proposed provision of a slimline bus shelter outside #78 Pirie Street at the new location for Bus Stop 7214 results in the available remaining footpath width being 1.3m as noted by the designers. This creates issues for mobility impaired pedestrians negotiating their way past the shelter on the footpath.

It is the view of the SSAT that an inline bus stop should be considered for Bus Stop 7214. This would provide additional width to provide a new bus shelter whilst minimising the width restrictions to the adjacent footpath.

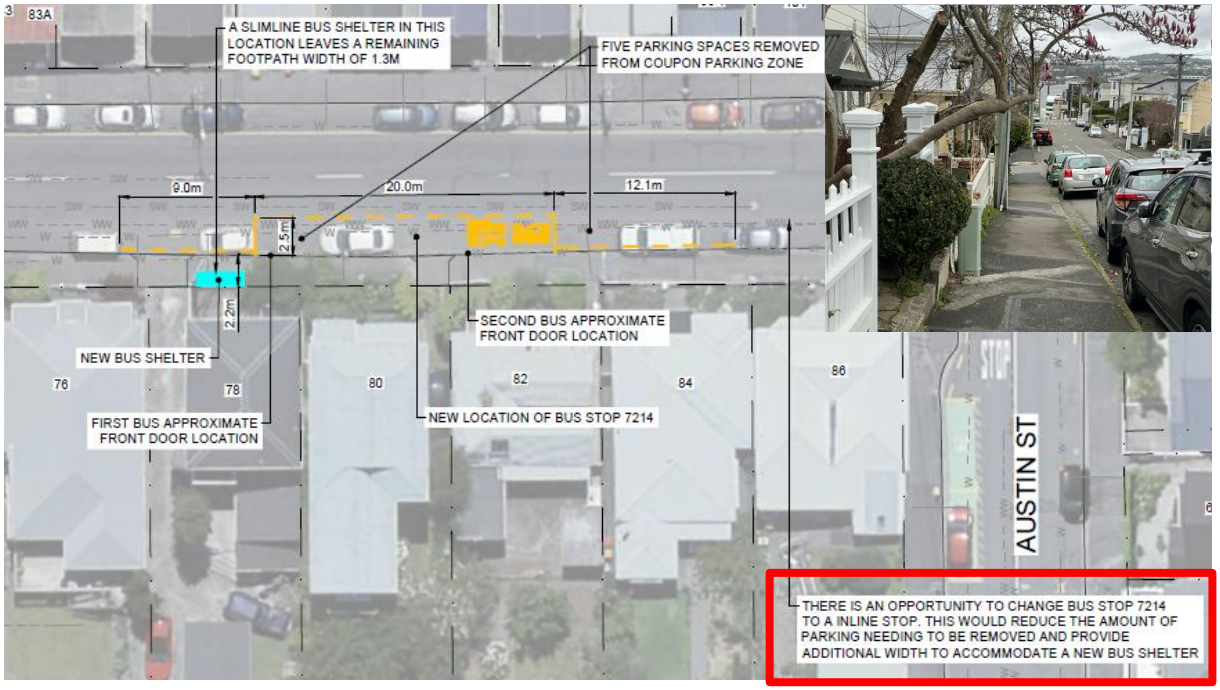


Figure 5-3: Relocated Bus Stop 7214 proposed design. INSET: Existing footpath width – view west.

Risk Ranking

The safe system audit team has assigned the following risk ranking to this safety concern.

Probability of a crash	Crashes resulting from this safety concern are likely
Severity outcome rating	The predominant outcome of a crash resulting from this safety concern is likely to be minor.
Risk ranking	The safety concern is therefore deemed to be moderate.

Recommendation(s)

1. Change the relocated bus stop 7214 to an inline bus stop so that the new bus shelter can be accommodated clear of the existing footpath.

Decision Tracking

Design team response	We agree with the SSAT's finding and recommendation. An alternative option would be to retain this stop in its existing position, where a building canopy provides shelter for waiting passengers without reducing the footpath width.
Client safety engineer comment	Consider both options and provide a recommendation.
Client decision	Due to budget constraints, bus route efficiency, and a change in level of service, the design should retain existing bus stops.

Action taken	For the Traffic Resolution and consultation, designs show existing bus stops retained.

5.3 Hataitai

5.3.1 Hamilton Road approach to SH1 **Significant**

The existing bus stop (No 6221) located on the Hamilton Road approach to the intersection with SH1 (Wellington Road) and Kilbirnie Crescent is proposed to be lengthened and shifted closer to the traffic signals. The available space from the limit lines at the signalised intersection and the front of the bus stop is shown as 10.7m on the plans provided (refer to Figure 5-4 below).

The existing lane configuration will require the bus to move across into the straight ahead and turn right lane in order to proceed across the signalised intersection to continue their route towards Kilbirnie. This movement will result in the bus driver straddling both lanes due to the limited available space and increase the likelihood of the bus blocking both lanes and the associated traffic behind. When combined with the potential for the bus being held behind a motorist waiting to turn right at the intersection, there is an increased risk of traffic movements on this approach being delayed beyond a single phase.

The SSAT consider that the designers should review the lane configuration on this approach to the intersection with a view to altering the left lane to accommodate straight ahead and left turn movements, leaving the right lane for right turn movements only. This would have the advantage of the bus driver being able to proceed straight ahead from the bus stop into the (now) straight ahead / left turn lane in order to continue south on Kilbirnie Crescent towards Kilbirnie.

The new lane arrow markings should also be provided on the approach to the bus stop to ensure approaching motorists are aware of the lane configuration when a bus is at the bus stop.

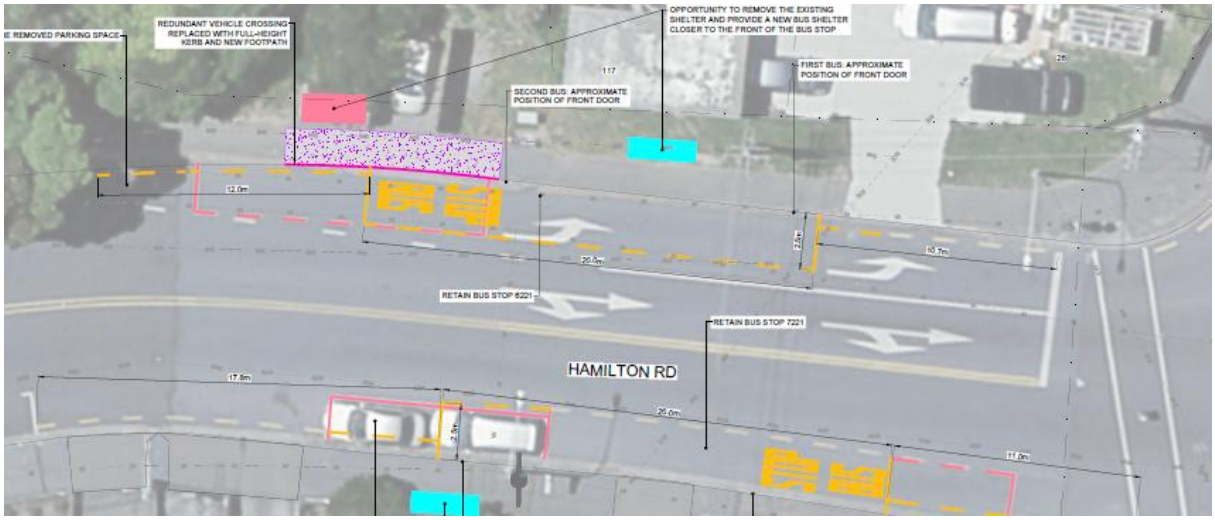


Figure 5-4: View of Bus Stop 6221 on Hamilton Road approach to SH1 (Wellington Road)

Risk Ranking

The safe system audit team has assigned the following risk ranking to this safety concern.

The crash is based on a frustrated motorist overtaking the cars and bus in front of them in order to proceed south/east and colliding with opposing motorists.

Probability of a crash	Crashes resulting from this safety concern are unlikely
Severity outcome rating	The predominant outcome of a crash resulting from this safety concern is likely to be serious.
Risk ranking	The safety concern is therefore deemed to be significant.

Recommendation(s)

1. Alter the lane configuration on the Hamilton Road approach to this intersection such that the left lane is straight ahead / left turn and the right lane is a right turn lane only; and
2. Ensure the new lane configuration arrow road markings are provided in advance of the proposed adjusted bus stop.

Decision Tracking

Design team response	1. We agree with the SSAT's finding and agree that altering the lane configuration as they've proposed is a potential option. However, before confirming a change to the lane configuration, we recommend undertaking an investigation of the turning movements at the intersection to assess how a change to the lane configuration would impact vehicle delays. 2. We agree with the SSAT.
Client safety engineer comment	Agre with Designer's responses.
Client decision	Agree with responses and comments. An investigation and review of the impacts will be undertaken within this project.
Action taken	Do not make any changes to the lane allocation as shown in TR drawings. Alternative solutions to this stop to be proposed in next stage of design.

5.4 Kilbirnie

5.4.1 Red surfacing adjacent to removed bus stops Significant

There are two existing bus stops on Rongotai Road that are proposed to be removed. These are bus stops 6027 and 7027. Both of these bus stops have a cycle lane positioned between the footpath and the bus stop, which is flush with the adjacent surfaces and as such incorporates the red warning surfacing as shown in Figure 5-5 below.

As the bus stops are to be removed and replaced with standard parking spaces, there now no need to require cyclists to slow down and prepare to stop for bus passengers. As such it is recommended that the red surfacing on the cycle lanes at these two locations be replaced with green surfacing. This would confirm to cyclists that they no longer need to be concerned with bus passengers and serve to remind any pedestrians utilising the new parking spaces at this location to be aware of the potential for cyclists on the adjacent cycle lane.

Figure 5-5: Rongotai Road cycle lanes with red surfacing adjacent to bus stops to be removed.

Risk Ranking

The safe system audit team has assigned the following risk ranking to this safety concern.

The crash is based on a cyclist colliding with a pedestrian who has not checked for an approaching cyclist before crossing to/from their vehicle.

Probability of a crash	Crashes resulting from this safety concern are unlikely
Severity outcome rating	The predominant outcome of a crash resulting from this safety concern is likely to be serious.
Risk ranking	The safety concern is therefore deemed to be significant.

Recommendation(s)

1. Replace the red surfacing within the cycle lanes at the removed bus stops with green surfacing.

Decision Tracking

Design team response	Discussions with the client led to these buildouts being retained as retaining them was not seen as a safety concern and would save on projects costs. We do agree with the SSAT that, with the removal of the bus stops and based on the latest design guidance, green cycle markings could be more appropriate for this location as cyclists will have priority. However, without grade separation between the pedestrian and cyclist spaces, pedestrians will be more likely to cross into the cycle lane without first checking for approaching cyclists than at other locations with grade separation. We believe that the red surfacing will help signal to both pedestrians and cyclists that they are entering a higher conflict zone, encouraging both users to slow down and look for each other. We don't believe that the red surfacing will detract from safe outcomes and recommend that the buildouts and markings are retained.
Client safety engineer comment	Agree with Designer's response.
Client decision	Agree with responses and comments. Retain red markings.
Action taken	TR drawings retain red surface markings.

5.4.2 Coutts Street / Onepu Road Intersection **Serious**

The south-east corner of the Coutts Street / Onepu Road intersection is proposed to accommodate longer articulated "bendy" buses turning left to access the Kilbirnie Bus Depot. As shown in Figure 5-6 below, the bus will not be able to undertake this manoeuvre without crossing over the existing kerbline. This would result in the bus colliding with the existing power pole and the traffic signal poles located on this corner of the intersection, as well as the potential to collide with any pedestrians waiting to cross the road at this location. As there is a retirement village located on this corner, the likelihood of the pedestrians being elderly and with less mobility is high and thus less able to readily move clear of a bus mounting the kerb.

It is noted that this issue has been identified by the designers as per the note on the drawing.

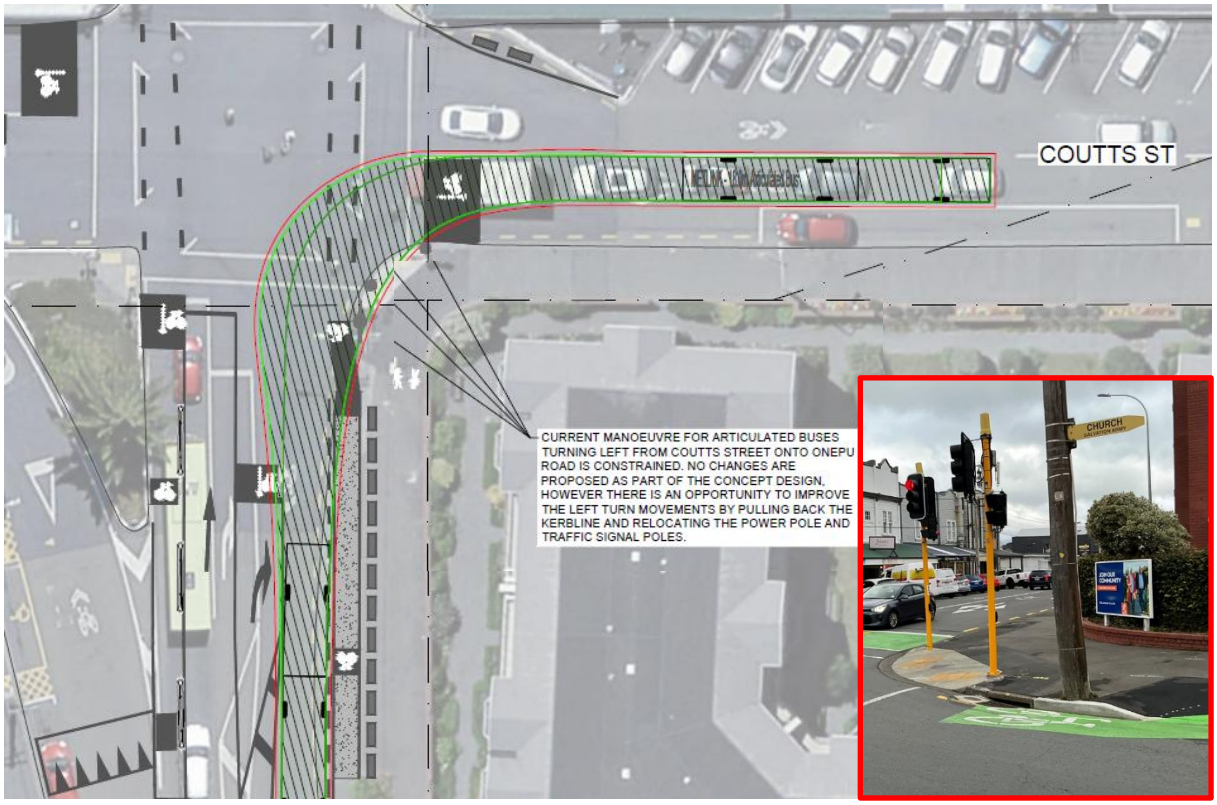


Figure 5-6: Swept path of longer articulated "bendy" bus left turn into Onepu Road from Coutts St showing overrun of existing kerb and adjacent utility poles (power and traffic signal). INSET: View of south-east corner of intersection with traffic signal poles and power pole.

Risk Ranking

The safe system audit team has assigned the following risk ranking to this safety concern.

Probability of a crash	Crashes resulting from this safety concern are likely
Severity outcome rating	The predominant outcome of a crash resulting from this safety concern is likely to be serious.
Risk ranking	The safety concern is therefore deemed to be serious.

Recommendation(s)

1. Alter the kerbing and relocated the power pole and traffic signal pole to accommodate the tracking of the articulated "bendy" bus left turn movement into Onepu Road.

Decision Tracking

Design team response	We agree with the SSAT's finding and recommendation to relocate the power pole and traffic signal poles. Another option that has been considered is to pull back the limit lines on the southern leg of Onepu Road. However, we note that the existing limit line for the right turn bay is already located significantly far back from the intersection (approximately 13m) and space to the south is constrained to be able to provide sufficient stacking length. An alternative option could be to combine the

	through and right turn lanes into one shared lane, noting that an assessment should be done to confirm the impact on vehicle delays.
Client safety engineer comment	Further assessment and a recommendation required.
Client decision	Agree with responses and comments. An investigation and review of the impacts will be undertaken. Review design of limit line being pulled back.
Action taken	WCC to instruct design engineer to investigate impacts on vehicle delays, and tracking.

5.5 Miramar

5.5.1 Left Turn movement at Park Road **Significant**

The proposed adjustments for the left turn movement from Miramar Avenue into Park Road are shown in Figure 5-7 below. It is noted that the left turn movement is such that left turning vehicles will have no option but to track across the proposed hatched road markings. Additionally, there is no edgeline guidance for motorists beyond the existing pedestrian crossing, to ensure that they are guided past the parked vehicle space to the north.

Furthermore, by providing such a large left flush island there is a risk of light vehicle drivers deciding to shortcut the roundabout by tracking over the flush island. In turn creating an acute angle towards the western side of the zebra crossing, resulting in an increased risk of drivers looking right (towards the roundabout) and not seeing a pedestrian on the pedestrian zebra crossing until they are upon it. The provision of a mountable kerbside island under the flush road markings should be considered. This will force the majority of left turning drivers to proceed to the roundabout and after navigating that intersection orient their vehicles perpendicular to the pedestrian zebra crossing, thus providing improved sight lines towards any pedestrians crossing from the western side. Larger vehicles, such as buses will be able to track over the mountable island to accommodate their vehicle swept path.

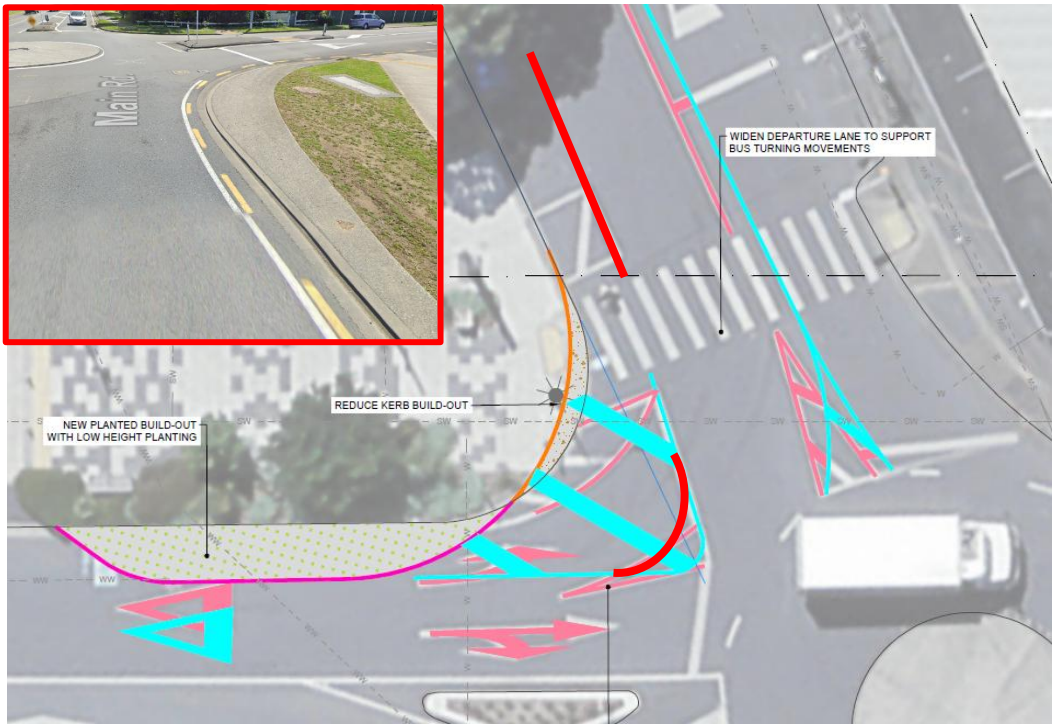


Figure 5-7: Proposed road markings / intersection adjustments at Miramar Avenue / Park Road. INSET: Example of raised apron at roundabout in Tawa with mountable kerb.

Risk Ranking

The safe system audit team has assigned the following risk ranking to this safety concern.

The crash risk is associated with a driver turning left and not seeing a pedestrian entering the pedestrian crossing from the western side.

Probability of a crash	Crashes resulting from this safety concern are unlikely
Severity outcome rating	The predominant outcome of a crash resulting from this safety concern is likely to be serious.
Risk ranking	The safety concern is therefore deemed to be significant.

Recommendation(s)

1. Alter the extent of the proposed road markings so that a 95th percentile vehicle can safely carry out a left turn manoeuvre into Park Road without crossing into the hatched shoulder area; and
2. Provide a mountable apron with mountable kerb for the left turn movement into Park Road.
3. Add an edgeline to the north of the existing pedestrian crossing to guide motorists past the parking spaces to the north (refer to red line on Figure 5-7).

Decision Tracking

Design team response	1. We agree with the SSAT's recommendation to alter the hatched shoulder marking. The shoulder design will be finalised during detailed design based on tracking envelopes for left-turning vehicles. 2. We agree with the SSAT's recommendation to provide a mountable apron. We do note that consideration will need to be given to ensuring that there is clear separation between the apron and the footpath to ensure that there is a clear separation between the road and the pedestrians space. 3. We agree with the SSAT's recommendation to add an edgeline on Park Road. We recommend that, in addition to the edgeline, hatched shoulder markings are included so it is clear that this is not a separate traffic lane.
Client safety engineer comment	Agree with Designer's responses.
Client decision	Agree with responses and comments. Complete shoulder marking, include a mountable apron, add edgeline, and include hatched shoulder marking in detailed design.
Action taken	WCC to direct engineer to complete shoulder marking, include a mountable apron, add edgeline, and include hatched shoulder marking in detailed design.

5.5.2 Non cycle friendly grate at bus stop

Minor

There is a non-cycle friendly grate in the bus stop at this location (refer to Figure 5-8). The drawing notes that this area is subject to proposed transitional cycleway changes. Consideration should be

given to changing the drainage grate to a cycle friendly grate in advance of the proposed transitional cycleway changes.

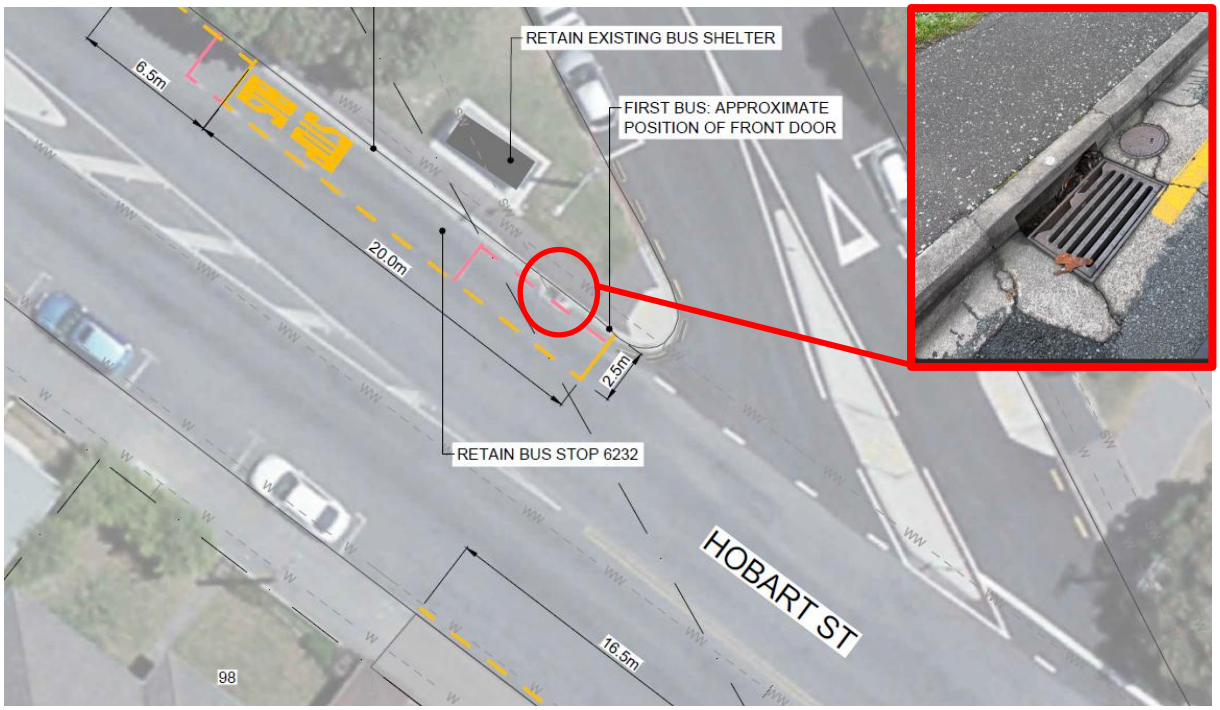


Figure 5-8: View of existing bus stop 6232 on Hobart St with non-cycle friendly grate (see INSET).

Risk Ranking

The safe system audit team has assigned the following risk ranking to this safety concern.

Probability of a crash	Crashes resulting from this safety concern are unlikely
Severity outcome rating	The predominant outcome of a crash resulting from this safety concern is likely to be minor.
Risk ranking	The safety concern is therefore deemed to be minor.

Recommendation(s)

1. Replace the existing drainage grate with a cycle friendly grate.

Decision Tracking

Design team response	This item is out of scope of the Route 2 Bus Infrastructure improvements project. However, we do agree with the SSAT finding and recommend that replacement of this grate is added to WCC's schedule of maintenance works.
Client safety engineer comment	Agree with Designer's response.
Client decision	Agree with responses and comments. Replace existing grate with cycle friendly grate.

Action taken	Direct designers to replace existing with a cycle friendly grate in the design drawings.

5.5.3 Priority changes at Devonshire / Caledonia **Serious**

The intersection of Devonshire / Caledonia / Hobart is proposed to be altered so that Hobart Street has priority (refer to Figure 5-9 below). The drawings indicate a change in the road markings but do not indicate any proposed changes to the signage on each approach.

The existing gated STOP signs present on the respective Hobart Street approaches will need to be relocated to the Devonshire Road and Caledonia Street approaches. It is noted that there is no central island on the Devonshire Road approach to accommodate a secondary STOP sign. Given that this is a change to an existing intersection, particularly care needs to be taken to ensure that it is clear to motorists on the approaches that previously had the right of way that they are now required to give way.

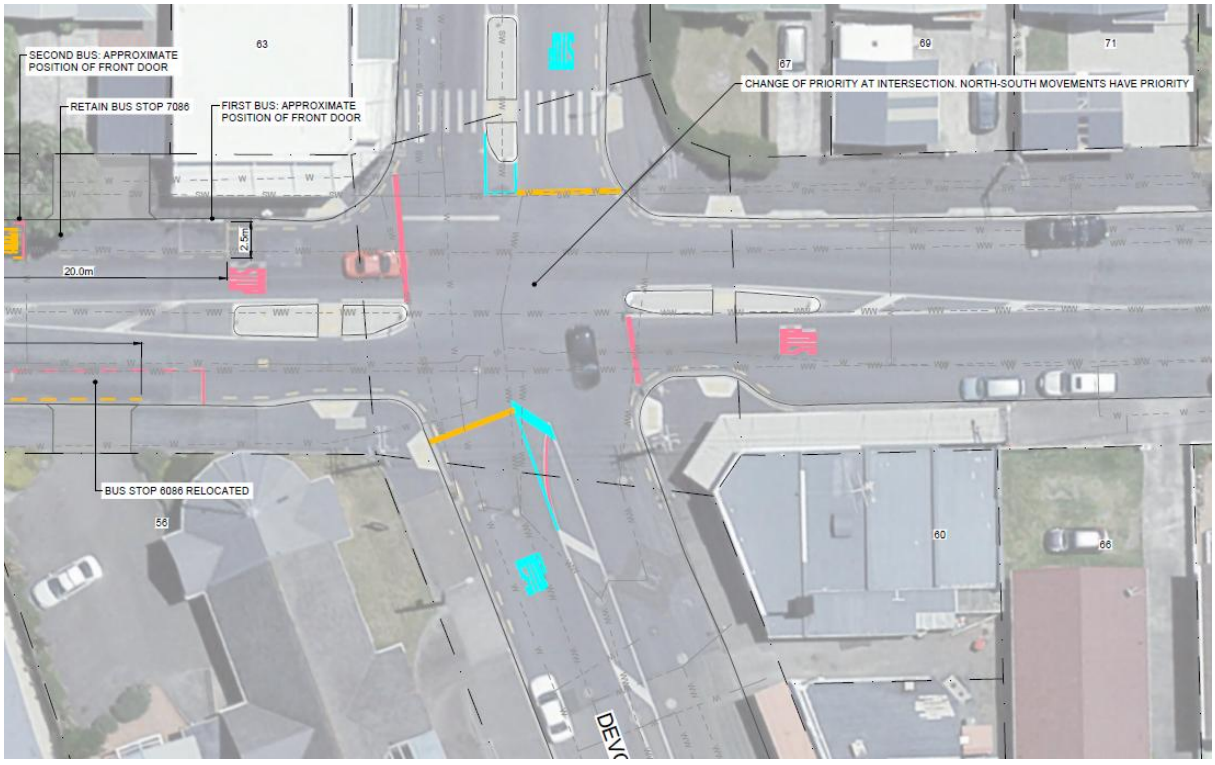


Figure 5-9: Proposed priority changes at Devonshire / Caledonia / Hobart intersection.

Risk Ranking

The safe system audit team has assigned the following risk ranking to this safety concern.

Probability of a crash	Crashes resulting from this safety concern are likely
Severity outcome rating	The predominant outcome of a crash resulting from this safety concern is likely to be serious.

Risk ranking	The safety concern is therefore deemed to be serious.

Recommendation(s)

1. Ensure that the changes to the signage are incorporated into the design at the detailed design stage; and
2. Provide a central traffic island close to the limit line on the Devonshire Road approach to enable a secondary STOP sign to be accommodated on the right-hand side of this approach.

Decision Tracking

Design team response	1. We agree with the SSAT's recommendation. Signage has not been detailed at the concept design staged. The full extent of signage works will be shown at the detailed design stage. We would also recommend installing temporary "New Road Layout" signage at the intersection to warn drivers of the change in priority. 2. We agree with the SSAT's recommendation. Providing a median traffic island on Devonshire Road would also improve safety for pedestrians crossing Devonshire Road by provide a crossing refuge. The existing flush median is approximately 2.5m wide, which provides suitable width to install a refuge island.
Client safety engineer comment	Agree with Designer's responses.
Client decision	Agree with responses and comments. In the detailed design, provide signage detail and median traffic island on Devonshire Rd.
Action taken	Direct the designers to include in detailed design drawings, signage detail and median traffic island on Devonshire Rd.

5.5.4 Hobart St / Broadway Intersection **Significant**

The realignment of the Hobart St approach will better define the intersection. As part of this realignment there is new kerb buildout on the western side of Hobart St which results in the western pedestrian drop kerb (cut down) being relocated on the new kerbline (refer to Figure 5-10 below). Visually impaired pedestrians will likely find it more difficult to locate the new pedestrian drop kerb (cut down). Consideration should be given to providing directional tactile pavers to guide pedestrians to the new pedestrian drop kerb (cut down).

It was noted on site that the outbound bus stop on Hobart Street at Broadway has already been relocated back to the original location (refer to INSET (top) in Figure 5-10 below) on Broadway. This temporary bus stop location on Hobart Street was only in place while construction work to the church was underway in 2022. The bus stop on Broadway will have a large power pole (refer to INSET (bottom) in Figure 5-10 below) located in the middle of the bus stop. As this bus stop is the closest one to the Wellington Airport (excluding the more expensive Airport Express (AX) Bus Route), there is likely to be bus passengers alighting with luggage. Designers to satisfy themselves that the rear door on a longer articulated "bendy" bus will not be blocked by the power pole and impacting the egress of bus passengers.

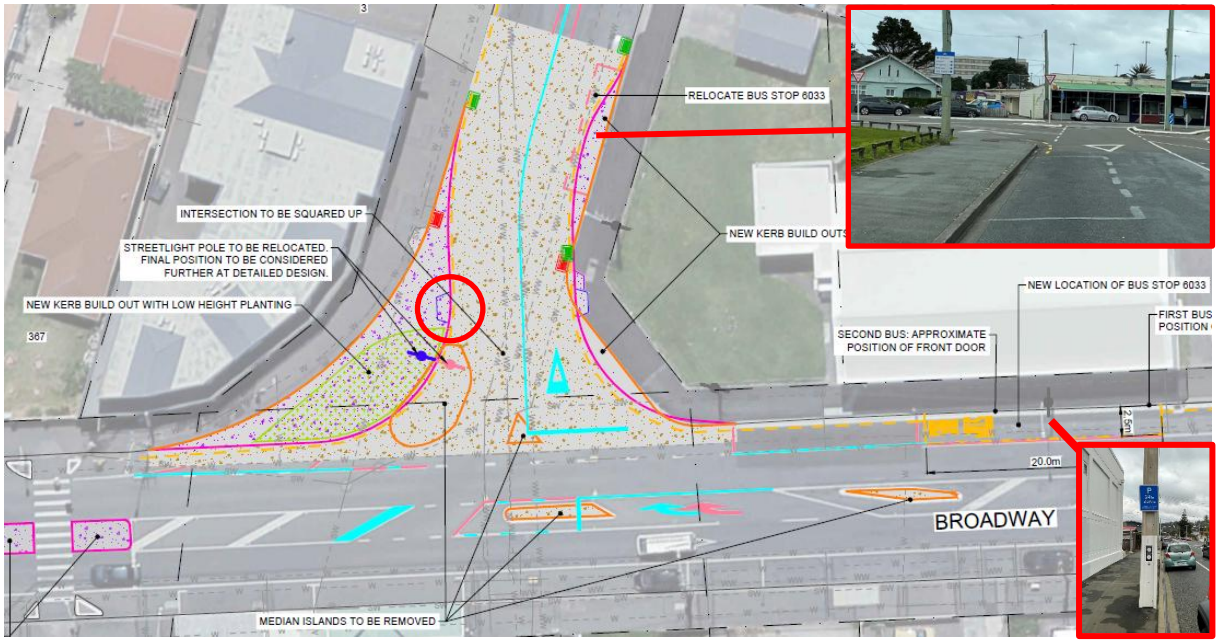


Figure 5-10: Proposed changes to Hobart Street / Broadway intersection. INSET (top): Hobart St approach to Broadway, note the already removed bus stop. INSET (bottom): Existing power pole at location of relocated bus stop.

Risk Ranking

The safe system audit team has assigned the following risk ranking to this safety concern.

Probability of a crash	Crashes resulting from this safety concern are unlikely
Severity outcome rating	The predominant outcome of a crash resulting from this safety concern is likely to be serious.
Risk ranking	The safety concern is therefore deemed to be significant.

Recommendation(s)

1. Provide directional tactile pavers to guide pedestrians to the new pedestrian drop kerb (cut down) on the western side of Hobart Street; and
2. Ensure that the rear door on a longer articulated “bendy” bus will not be blocked by the power pole and impacting the egress of bus passengers.

Decision Tracking

Design team response	1. We agree with the SSAT’s recommendation. Tactile pavers have not been included as part of the concept designs; they will be included at the detailed design stage. 2. The back door of an articulated bus is located 10.5m to 12.5m from the front of the bus. The pole is located approximately 9.5m from the front of the bus stop. If a bus is aligned properly with the front of the stop, the power pole will not obstruct any doors. However, there is a risk of conflict if a bus stops further forward that the front of the stop.

	An alternative option considered was to align the front of the bus stop with the power pole. However, an articulated bus would not be able to track into the stop properly after turning left from Hobart Street.
Client safety engineer comment	Further work required at the design stage to identify the preferred solution.
Client decision	Agree with responses and comments. Provide directional tactiles, and further detail that the rear door of articulated bus will not be impacted by pole location.
Action taken	Designer has shown in the TR drawings that stop has been shifted to avoid conflict with pole. Direct designer to provide directional tactiles in detail design drawings.

5.6 Seatoun

5.6.1 Relocated bus stop 7040

Minor

The relocated inbound bus stop 7040 located on the Dundas Street approach to Falkirk Avenue has been positioned such that there is an existing power pole present in the middle of the bus stop on the footpath. There is the potential for the rear door on a longer articulated “bendy” bus to be blocked by the presence of the power pole affecting the ability of passengers to exit the bus from the rear door.

It is likely that this bus stop is well utilised given its proximity to the local supermarket located on the south-east corner of the intersection.

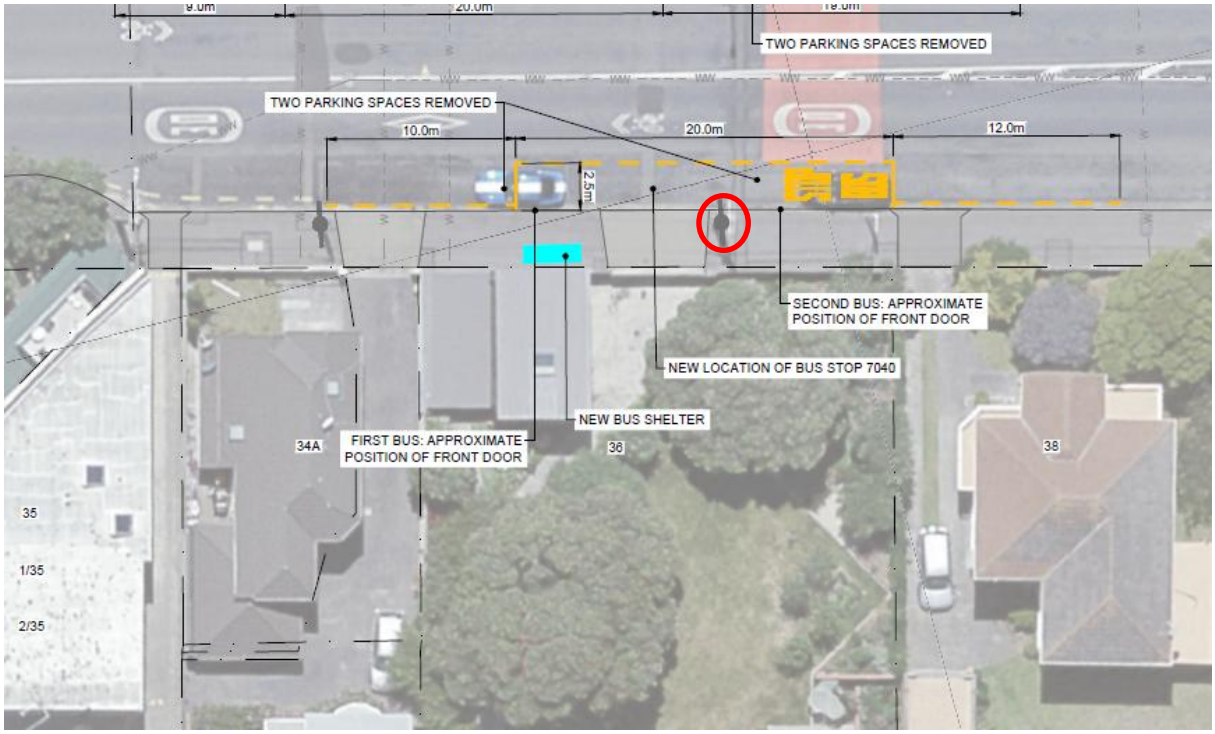


Figure 5-11: Relocated inbound bus stop 7040 on Dundas Street prior to Falkirk Avenue. Note the power pole (circled in red) located midway along the bus stop.

Risk Ranking

The safe system audit team has assigned the following risk ranking to this safety concern.

Probability of a crash	Crashes resulting from this safety concern are unlikely
Severity outcome rating	The predominant outcome of a crash resulting from this safety concern is likely to be minor.
Risk ranking	The safety concern is therefore deemed to be minor.

Recommendation(s)

1. Designers to review the position of the bus stop relative to the rear door on a longer articulated “bendy” bus to ensure that the existing power pole does not impact the ability of bus passengers to exit the bus from the rear door(s).

Decision Tracking

Design team response	The back door of an articulated bus is located 10.5m to 12.5m from the front of the bus. The pole is located approximately 11m from the front of the proposed bus stop location. We recommend that the bus stop is moved east by approximately 1m, which can be accommodated without affecting the accessibility of the front door of the first or the second bus, and the front of the stop would still be located at the proposed bus shelter location.
Client safety engineer comment	Agree with Designer’s response and recommendation.
Client decision	Agree with responses and comments. Move bus stop east 1m.
Action taken	Direct designers to move bus stop east 1m in Traffic Resolution drawings.

5.6.2 Existing trees adjacent to bus stop 6042 Minor

The existing bus stop 6042 on Monro Street is proposed to have a new landing area provided as indicated in

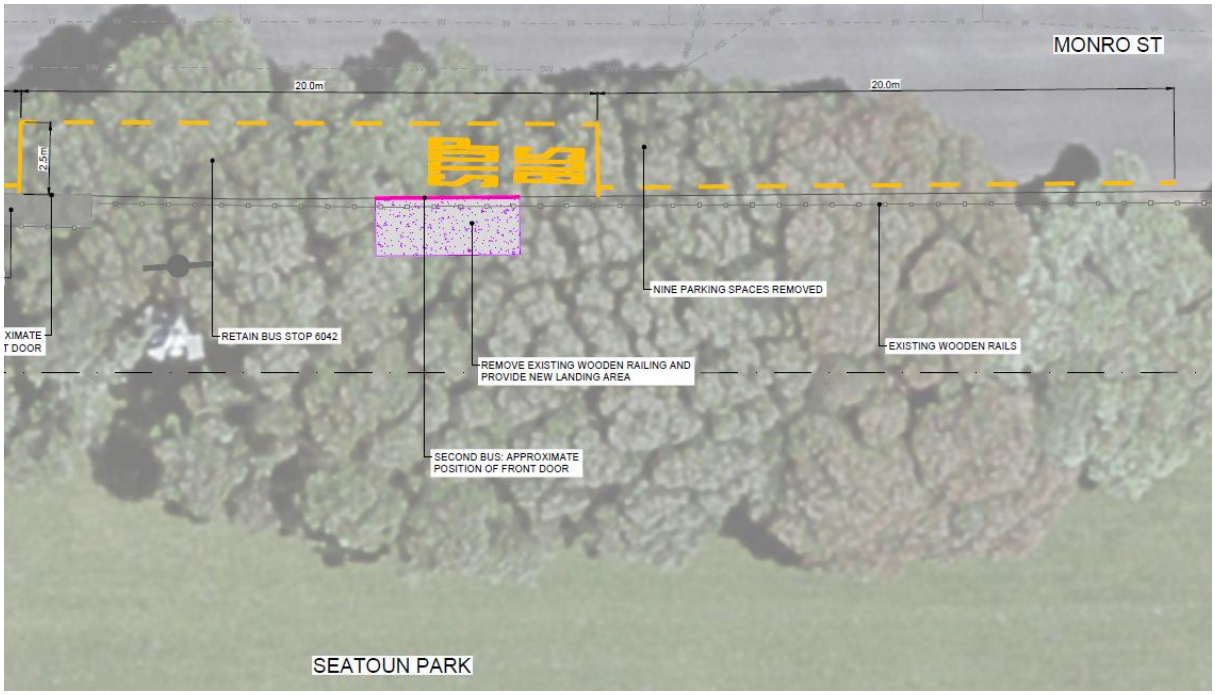


Figure 5-12 below. There are large Pohutukawa trees located along the edge of Seatoun Park and one is positioned directly in front of where the landing is proposed. It is not clear whether the rear door(s) on a longer articulated “bendy” bus would be clear of the large Pohutukawa tree located within

the bus stop (refer to the INSET in

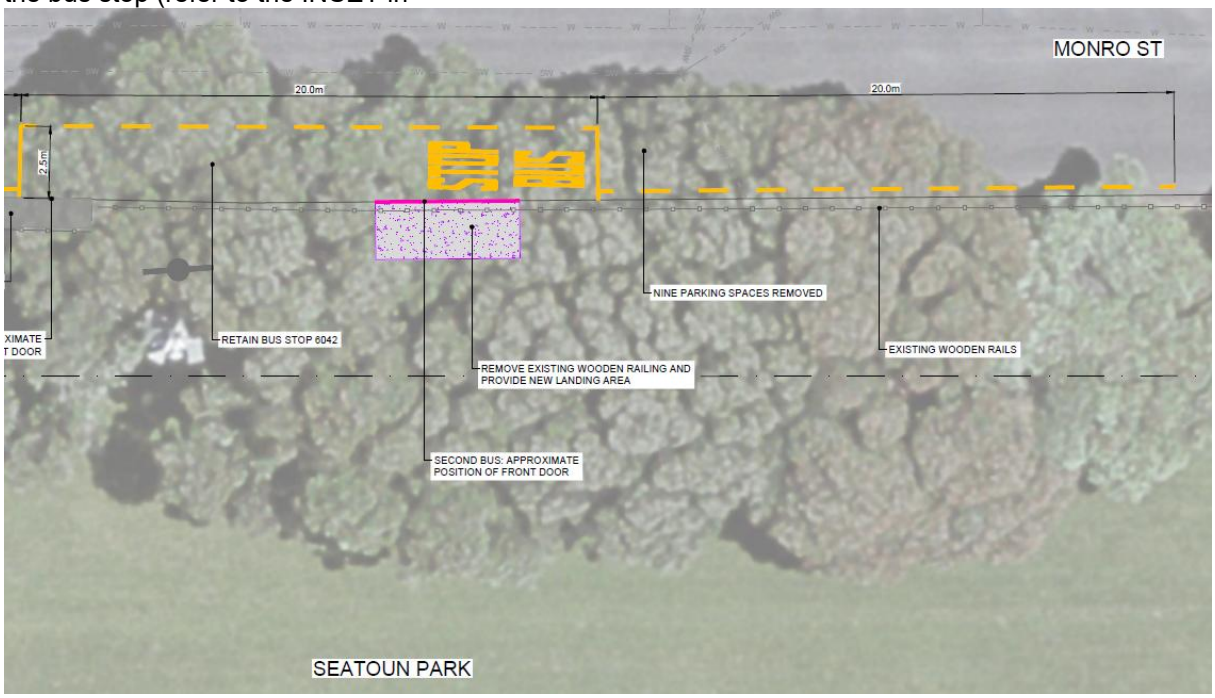


Figure 5-12 below).

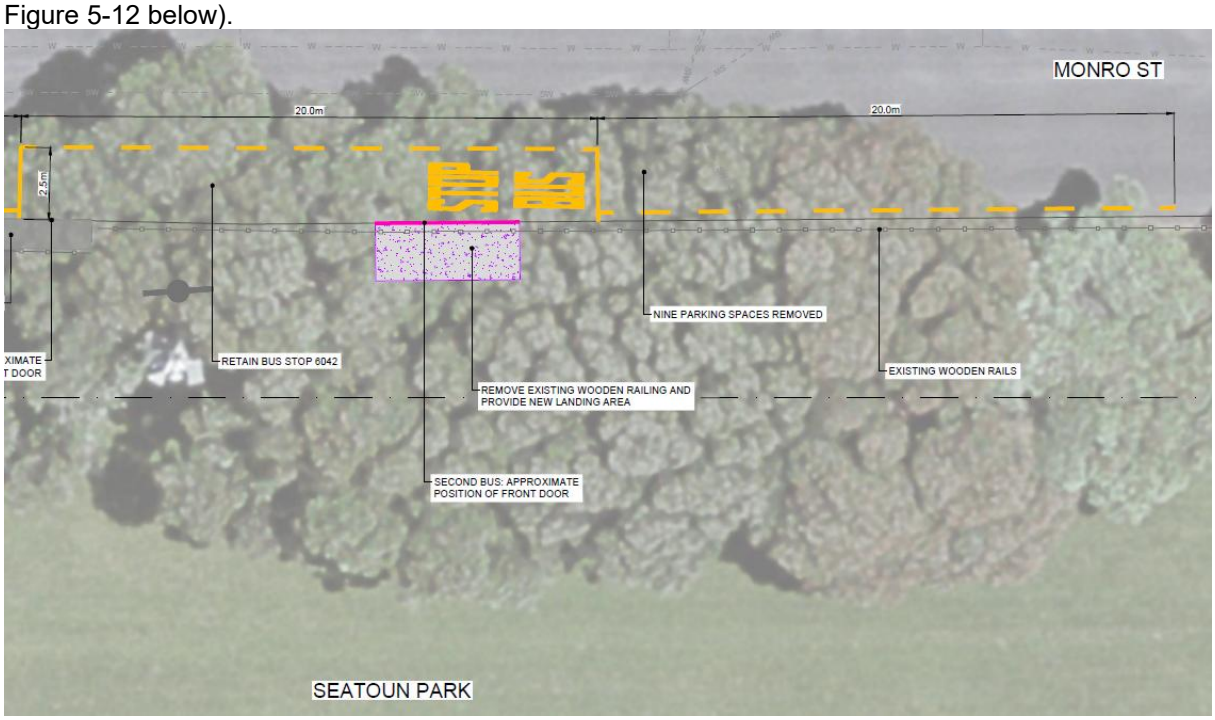


Figure 5-12

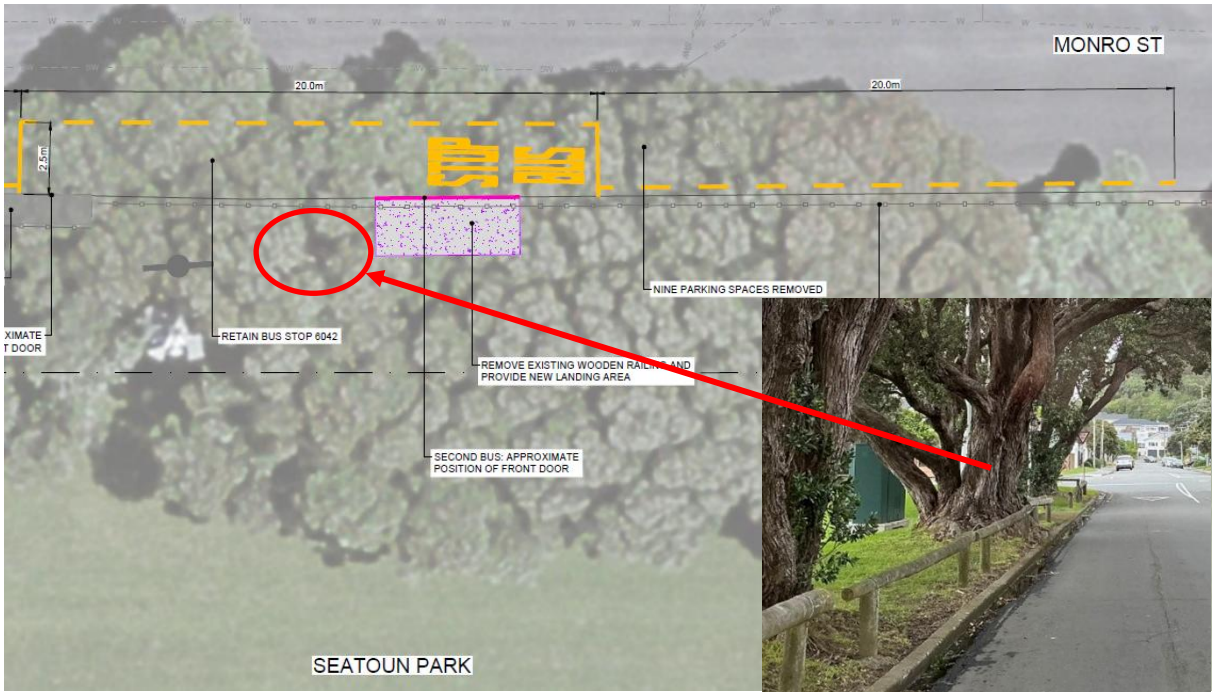


Figure 5-12: Proposed layout of bus stop 6042 on Monro Street. INSET: View of bus stop showing large pohutukawa tree potentially blocking the rear door(s) of a longer articulated “bendy” bus.

Risk Ranking

The safe system audit team has assigned the following risk ranking to this safety concern.

Probability of a crash	Crashes resulting from this safety concern are unlikely
Severity outcome rating	The predominant outcome of a crash resulting from this safety concern is likely to be minor.
Risk ranking	The safety concern is therefore deemed to be minor.

Recommendation(s)

1. Designers to review the position of the bus stop relative to the rear door on a longer articulated “bendy” bus to ensure that the existing trees do not impact the ability of bus passengers to exit the bus from the rear door(s).

Decision Tracking

Design team response	Due to the location of the trees along Monro Street, it is unlikely that both the rear door of an articulated bus and the front door of a second bus could both be accommodated without obstruction of the doors unless tree(s) are removed. The design prioritises providing access to the front door of the second bus, as the articulated bus is accessible via its front doors. An alternative option could be to provide a kerb buildout with a platform in front of the trees, converting the stop to an inline stop.
Client safety engineer comment	Further work required at the design stage to identify the preferred solution.

Client decision	Agree with responses and comments. Detail design to define appropriate solution. Cost to be considered, then additional benefits for access.
Action taken	Direct designers to investigate appropriate solution within cost and as per conversations with accessibility community.

6 Safe System Audit Statement

We declare that we remain independent of the design team and have not been influenced in any way by any party during this safe system audit.

We certify that we have used the available plans and have examined the specified roads and streets to assess the Safe System alignment and identified any safety concerns that could be changed, removed, or modified to improve road safety outcomes. The safety concerns identified have been noted in this report.

Signed  Date 28 / 08 / 2025

Team leader Jon England, BE, CMEngNZ, CPEng, IntPE(NZ), RPEQ, PMP
Senior Principal Road Safety Engineer, Stantec

Signed  Date 28 / 08 / 2025

Team member Cobus de Kock, CPEng, BEng, MScEng, CMEngNZ, PrEng
Senior Principal Road Safety Engineer & Project Manager / Traffic Engineering, Design & Road Safety Lead – Wellington, Stantec New Zealand

7 Response and Decision Statements

System designers and the people who use the roads must all share responsibility for creating a road system where crash forces do not result in death or serious injury.

7.1 Design Team's Responses

We have studied and considered the auditors' safety concerns and recommendations for safety improvements set out in this report and we have responded accordingly to each safety concern with the most appropriate and practical solutions and actions, which are to be considered further by the safety engineer (if applicable) and project manager.

Signed  Date 16/09/2025

Janine Sziklasi.
Transport Engineer, Tonkin + Taylor

7.2 Safety Engineer's Comment (if applicable)

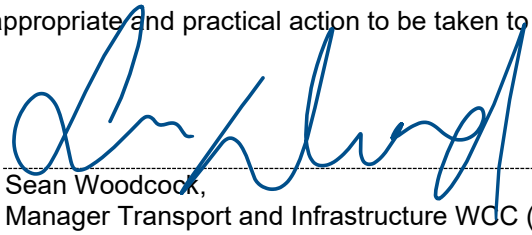
I have studied and considered the auditors' safety concerns and recommendations for safety improvements set out in this report together with the designer's responses. Where appropriate, I have added comments to be taken into consideration by the project manager when deciding on the action to be taken.

Signed Date 17.09.2025

Dennis Davis,
Principal Transport Engineer, WCC

7.3 Client's Decisions

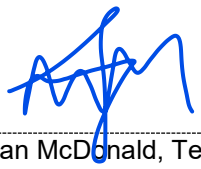
I have studied and considered the auditors' safety concerns and recommendations for safety improvements set out in this report, together with the designer's responses and the comments of the safety engineer (if applicable) and having been guided by the auditor's ranking of concerns have decided the most appropriate and practical action to be taken to address each of the safety concerns.

Signed  Date 03/10/2025

Sean Woodcock,
Manager Transport and Infrastructure WCC (acting)

7.4 Safe System Audit Close Out

The project manager is to distribute the audit report incorporating the decisions to the designer, Safe System audit team leader, safety engineer, and project file.

Signed  Date 03-OCT-2026

Megan McDonald, Team Leader Project Development, WCC

8 References

NZ Transport Agency. (2022, August). Safe System audit guidelines. *Safe System auditing procedures for transport projects - Road to Zero edition*. Wellington.

Stantec

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