

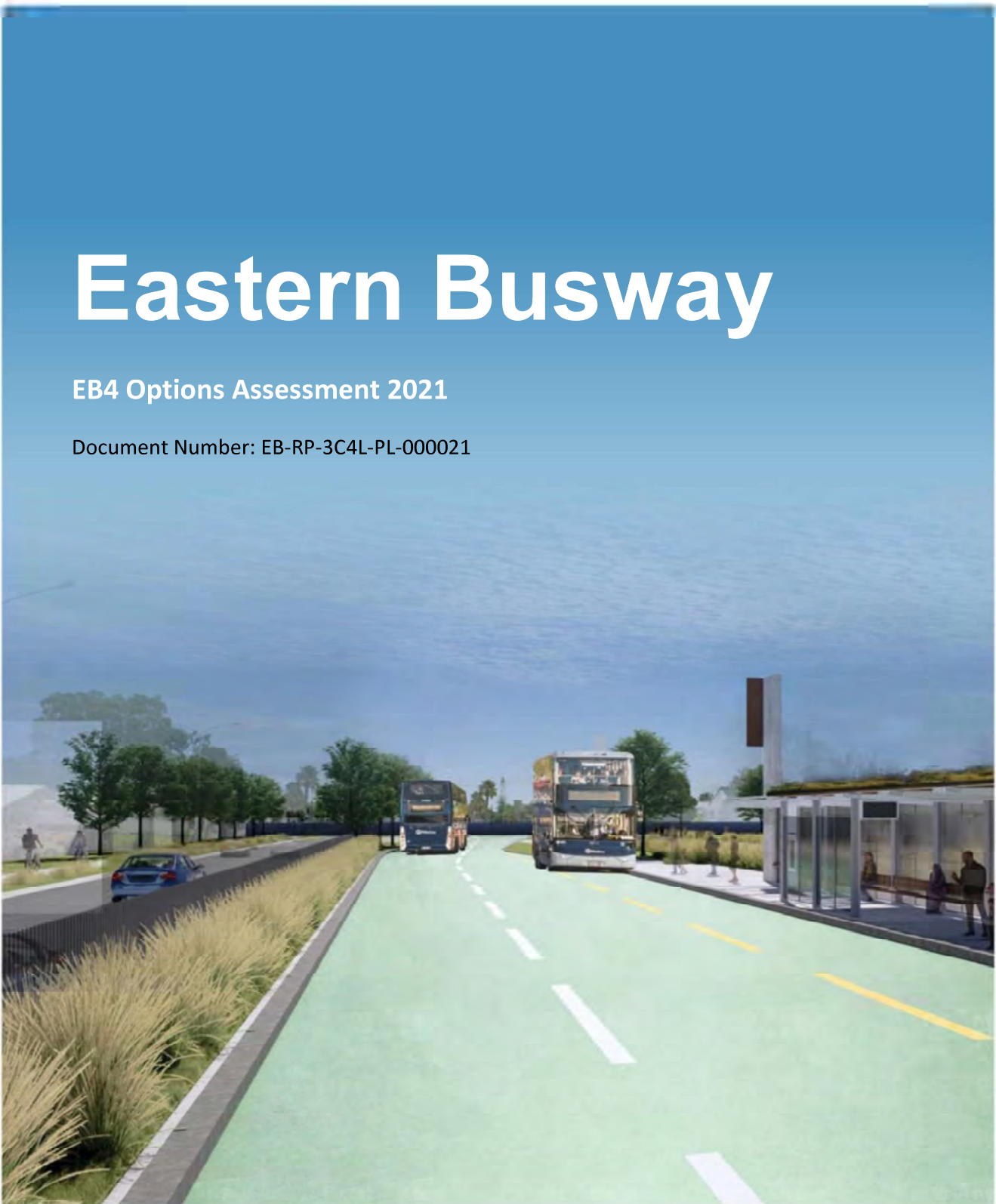
Appendix 31

Options Assessment – EB4L

Eastern Busway

EB4 Options Assessment 2021

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Eastern Busway EB4 Options Assessment 2021

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Abbreviations and definitions

Abbreviation and definitions	Description
A2B Project	Airport to Botany Rapid Transit Network Project
AMETI	Auckland Manukau Eastern Transport Initiative
ALT	Alliance Leadership Team
AT	Auckland Transport
CPTED	Crime Prevention Through Environmental Design
EB1	Eastern Busway 1 (Panmure to Pakuranga)
EB2	Eastern Busway 2 (Pakuranga Town Centre Station)
EB3	Eastern Busway 3 (East of Pakuranga Town Centre to West of Botany Town Centre)
EB4	Eastern Busway 4 (Botany Town Centre Station)
EBA	Eastern Busway Alliance
FOA	Further Options Assessment
IPAB	Interim Project Alliance Board
MCA	Multi Criteria Assessment
NPS- FM	National Policy Statement – Freshwater Management 2020
RTN	Rapid Transit Network
SAR	Scheme Assessment Report
SME	Subject Matter Expert

Executive Summary

The Eastern Busway Alliance (EBA) has undertaken an options assessment for Eastern Busway 4 section of the project (EB4) to determine the preferred option. EB4 is proposed to act as an interchange for local services with the Eastern Busway and with services intended to service a future Airport to Botany Rapid Transit Network (RTN). EB4 is proposed to comprise of a bus station in the vicinity of the Botany Town Centre and a link road between the bus station and the EB3 busway on Ti Rakau Drive at Huntington Drive/ Guys Reserve

A total of six bus station options and three link road options have been considered in detail for EB4. These options were identified by the EBA through a process involving a long list to short list screening process followed by a Multi Criteria Assessment of the selected options, with technical specialists providing input (as undertaken for other stages of the Eastern Busway project).

In summary, the MCA found that:

- All options considered scored positively against the project objectives, Busway performance and permanent transport effects.
- The options located within private property (the AMP site) scored negatively against property considerations.
- Station options 8, 9 and 13 and Link Road option 3 scored negatively against the ecological and legislative criteria recognising that environmental mitigation will be required if these options are to be progressed.
- Four combined bus station and link road options were assessed, with no cumulative issues identified.
- The four combined bus station and Link Road options did not present significant adverse impacts that could not be consented under the RMA. Mitigation could also be incorporated into the design in most cases to reduce the adverse effects of the options being considered.

Following the MCA workshop and sensitivity analysis:

- Bus Station Option 6 and Link Road Option 3 (Guy's Reserve Link Road) were selected as the preferred options for EB4.

An assessment of the best performing station options combined with the link road options was also undertaken using the MCA approach. Overall, the preferred option identified by the Technical Assessors in the Combined Options Assessment is **Option A** (being a combination of Option 6 and Link Road Option 3) because although it did not perform best on the safety or environmental weighted scores (given the alignment through Guys Reserve), this option performed best on the transport effects and cost scores and overall, the MCA showed that the options considered did not present adverse impacts that could not be consented under the RMA. Mitigation could also be incorporated into the design in most cases to reduce the adverse effects of the options being considered.

1 Introduction

This report outlines the options assessment work undertaken for Eastern Busway Stage 4 (EB4) in 2020-2021 by the Eastern Busway Alliance (EBA). Several options have been developed and assessed against a range of criteria to determine the technically preferred option.

The Eastern Busway Project (the Project) is part of the Auckland Manukau Eastern Transport Initiative (AMETI) programme of initiatives to improve performance of the transport system in the East Auckland/Manukau area and to provide increased transport choices to support the existing and forecast growth in transport demand. A key initiative of the AMETI programme included a busway linking Panmure to Botany. Key initiatives completed to date include the Panmure Bus Rail Interchange, whilst the first stage of the busway, Eastern Busway 1 – EB1, is nearing completion.

Figure 1 provides a map of the wider Project and the surrounding area. The Pakuranga to Botany section is identified in Blue below and forms the project extent for the EBA.



Figure 1. Project Extent, Including EB1, EB2, EB3 and EB4. Source EBA 2020.

A continuation of the dedicated busway will provide an efficient Rapid Transit Network (RTN) service between the Pakuranga and Botany town centres, while local bus networks will continue to provide more direct local connections within the town centre areas. The Project also includes the provision of new walking and cycling facilities, as well as modifications and improvements to the road network.

The Eastern Busway will provide reliable journey times, by connecting East Auckland with the city's wider Rapid Transit Network (RTN). Stage 1 (EB1) from Panmure to Pakuranga is currently under construction, expected to be completed by mid-2021.

For the delivery of stages 2, 3 and 4 (EB2, EB3, and EB4) of the Project, the Eastern Busway Alliance (EBA) was established in October 2020. The Alliance aims to have the Project completed by 2025.

EB4 is proposed to comprise of a bus station in the vicinity of the Botany Town Centre and a link road between the bus station and the EB3 busway on Ti Rakau Drive at Huntington Drive/Guys Reserve.

EB4 is proposed to eventually operate as an interchange for local services with the Eastern Busway Project and with services intended to service a future Airport to Botany Rapid Transit Network (A2B Project). The A2B Project was not the subject of this options assessment, however it informed aspects of the EBA's consideration of options.

As detailed in the Airport to Botany Rapid Transit and 20 Connect Single Stage Business Case 2021, the A2B project aims to greatly improve multi-modal access for South and East Auckland. The project intends to significantly enhance access to Auckland Airport and major employment areas, while supporting urban regeneration and whole-of-Government investment in jobs, housing and education in Manukau Central. A2B is part of the wider multi-modal Southwest Gateway Programme (SWGPP).

The A2B project Objectives (from the Single Stage Business case 2021) are:

- i. More equitable access and travel choices to jobs, learning, cultural and social activities in the south and east of Auckland, as well as airport areas.
- ii. Reliable, resilient and easy to use transport system in the South and East Auckland that also forms a gateway to the region from Auckland Airport.
- iii. To improve economic performance of the Airport area, Auckland and New Zealand.
- iv. Transport network that enables the efficient movement of goods and people.
- v. Urban regeneration and improved built environment.
- vi. Reduce impact of the transport system on the environment and taonga.
- vii. Safe and secure transport facilities in South and East Auckland.

A total of six bus station options and three link road options have been considered for EB4. The options assessment was undertaken using a multi-criteria analysis (MCA), with a range of technical specialists providing input into the process. The methodology used is generally consistent with previous MCAs undertaken for the Project, including EB1, EB2 and EB3.

This report provides:

- A summary of the previous option assessments undertaken;
- A summary of the options considered for EB4;
- Details of the options evaluation and MCA process; and
- The process undertaken by the Alliance Leadership Team (ALT) and Interim Project Alliance Board (IPAB) to select the technically preferred option.

2 Programme and Project Objectives

2.1 Programme Objectives

The overall AMETI Programme (which Eastern Busway is derived from) has overarching objectives (Programme Objectives) that were agreed in a Memorandum of Understanding (MoU) by the former legacy programme partners on 1 February 2016. The overarching Programme Objectives identified were:

To secure the ability to implement and, in due course, to develop integrated multi-modal transport infrastructure within AMETI which:

- Provides for sustainable movement of people, goods and services in a modern, planned and integrated manner;
- Provides connectivity between communities and businesses;
- Promotes economic development and the economic and social well-being of communities;
- Provides for Auckland's growth needs;
- Has a good urban design, a sense of place, physical safety, and environmental sensitivity; and
- Addresses travel demand requirements.

2.2 Project Objectives

The Eastern Busway Project has a set of clear objectives (as set out below and documented in the Consenting Strategy for the Eastern Busway Project April 2021), which guided the assessment of alternative options for EB4:

1. Provide a multimodal transport corridor that connects Pakuranga and Botany to the wider network and increases choice of transport options.
2. Provide transport infrastructure that integrates with existing land use and supports a quality, compact urban form.
3. Contribute to accessibility and place shaping by providing better transport connections between, within and to the town centres.
4. Provide transport infrastructure that improves linkages, journey time and reliability of the public transport network.
5. Provide transport infrastructure that is safe for everyone.
6. Safeguard future transport infrastructure required at (or in vicinity of) Botany Town Centre to support the development of a strategic public transport connection to Auckland Airport.

The following section provides background and an overview of the processes, outcomes and assessment criteria used to undertake previous option assessments for the Project.

3 Option assessment process

The following diagram provides an overview of the assessment process that has been undertaken for EB4. Each step is described in further detail in subsequent sections.

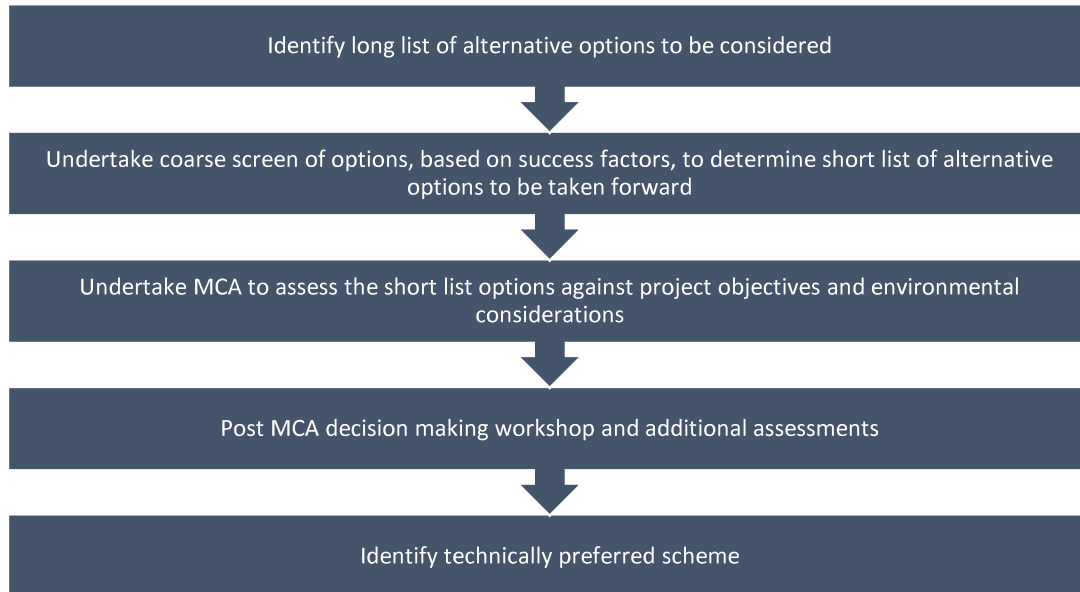


Figure 2. Assessment Process

4 Long List Considerations/ Sifting of Options

In 2020 the EBA developed a long list of options for EB4. This long list identified a total of 15 options for the bus station at Botany. The outcome of the long list assessment, attached at Appendix 1, determined the station options to be taken forward for further development/ refinement..

In the development of the options only three options were identified by the EBA to provide a link road between a bus station at Botany and the EB3 busway on Ti Rakau Drive at Huntington Drive/Guys Reserve. In this regard the three Link Road options were progressed to the short list assessment.

The three link road options were identified as follows:

- Link Road Option 1 – Central running along Ti Rakau Drive/ Te Irirangi Drive
- Link Road Option 2 – Ti Rakau Drive/ Te Koha Drive
- Link Road Option 3 - Guy’s Reserve

4.1 Long List Assessment Methodology

The long list assessment utilises a two-step filtering process. The first filter scores each option based on the scoring scale in Table 2 and the screening criteria noted below in Table 3. If any option does not meet one or more of the screening factors, the option is discounted. Options that ‘strongly meets criteria’ or ‘meets criteria with some impacts’, are taken forward for further assessment (second filter).

The first filter uses the scoring scale as shown in Table 1 below.

Table 1. First Filter Scoring Scale

Long List Assessment: First Filter Scoring Scale	
	Strongly meets criteria
	Meets criteria with some impacts
	Does not meet criteria

The screening factors used to assess the long list have been developed from the Project objectives but also consider affordability constraints as well as environmental effects. The combination of these factors are considered to provide a balanced approach in assessing the long list of options.

Table 3, below, sets out the screening factors/criteria that were developed by the EBA and used to assess the long list of options for EB4.

Table 2. Long List Screening Factors

Long List Assessment: Screening factors	
1	Does this option integrate the busway and station with the current and future land uses acceptably?
2	Does this option meet the affordability threshold?
3	Does this option create an attractive transport system which will promote public transport usage in a safe environment for all users?
4	Does this option provide a highly reliable journey time for PT users?
5	Does this option degrade current safety and travel performance for vehicles and buses?
6	Does this option have a lesser degree of difficulty for statutory approvals?
7	Does this option minimise impacts to property for the Botany Station and for the connection busway?
8	Is this option consistent with the long-term A2B project objectives?

9	Can an affordable Stage 1 version of this option be implemented without significant impact to the A2B Project's objectives?
---	-----------------------------------------------------------------------------------------------------------------------------

A second filter was then applied to the long list options given a green or amber rating. Any option given an amber rating (meets criteria with some impacts) in the first filter was given a score of 0. For the affordability and busway alignment screening factors (factors 1 and 2 in the list above), the remaining options (with a green rating) were given a score between 1 and 5, with 1 given to options that are considered least to meet the screening factors, and 5 given to options which mostly meet the screening factors.

Once scored, the options were ranked using the total scores against the affordability and busway alignment criteria to prioritise which options should progress. The scoring scale used for the second filter is provided in Table 3 below.

Table 3. Long List Second Filter

Long List Assessment: Second Filter Scoring Scale	
0	Meets criteria with some impacts
1	Contributes
2	Moderate contribution
3	Moderate to strong contribution
4	Strong contribution
5	Strongest contribution

4.2 Assessment of Long List Options – First Filter

After application of the first filter, eight options were discounted as one or more of the assessment criteria were not met. The options that were discounted are outlined in Table 4.

Table 4. Options Discounted After First Filter Assessment

Options discounted by first filter		
Option	Name/ option description	Reason not taken forward
1	A2B Business Case Recommended Option – Online station on Te Irirangi Drive north of Town Centre.	Does not meet screening factors 1 to 3
2a	Online Parallel Platforms in Te Irirangi Drive – south Town Centre Drive – no turnaround	Does not meet screening factors 2, 5 and 8
2b	Online Te Irirangi Drive – south Town Centre Drive – turnaround	Does not meet screening factor 2
3a	Offline “Sausage” – Ti Rakau – Te Irirangi Drive – South East Corner – no Schedule Adherence and Bus Driver Rest Bays	Does not meet screening factors 1, 5 to 7
3b	Offline “Sausage” – Ti Rakau – Te Irirangi Drive – South East Corner – Schedule Adherence and Bus Driver Rest Bays	Does not meet screening factors 1, 5 to 7
7	Offline Parallel Platforms – South of Town Centre Drive with turnarounds	Does not meet screening factors 2 and 7
10	Offline Parallel Platforms – South of Te Koha Road with turnarounds	Does not meet screening factors 2 and 7
11	Offline “Sausage” – North of Te Koha Road in ‘The Hub’ – schedule adherence or bus driver rest bays	Does not meet screening factors 1, 2 and 7

4.3 Assessment of Long List Options – Second Filter

The second filter was used to assess the remaining seven options in relation to screening factors 1 and 2 (refer to Table 5).

Table 5. Second Filter Assessment

Second filter assessment of options				
Option	Name/ description	Score	Ranking	Reason
4	Offline North of Town Centre Drive – Schedule Adherence Bays	4	2	Integrates well with town centre and supports both existing and future catchments. Impacts existing commercial properties. Station design facilitates convenient interchanging for customers and provides positive customer experience. Schedule adherence bays provided. Progress for further development.
5a	Offline “triangle” – South of Town Centre Drive. No schedule adherence or bus drive rest bays	0	n/a	Option not progressed as it does not provide schedule adherence bays (compared to Option 5b). Option not progressed for further development.
5b	Offline “triangle” – South of Town Centre Drive. Schedule adherence or bus drive rest bays	5	1	Integrates well with town centre and supports both existing and future catchments. Impacts to commercial properties. Station design facilitates convenient interchanging for customers and provides a good customer experience. Land requirement is very large, however potential for over site development opportunities may offset large land take. Schedule adherence and bus driver rest bays provided. Progress for further development.
6a	Offline “Sausage” – south of Town Centre Drive. No schedule adherence or bus drive rest bays	0	n/a	Option not progressed as it does not provide schedule adherence bays (compared to Option 6b). Option not progressed for further development.
6b	Offline “Sausage” – south of Town Centre Drive. Schedule	5	1	Integrates well with town centre and supports both existing and future catchments. Impacts to commercial properties. Station design facilitates convenient interchanging for customers and

	adherence or bus driver rest bays			provides a good customer experience. Schedule adherence and bus driver rest bays provided, offering operating cost efficiencies. Size of footprint is an issue however considered worthy of further investigation to potentially remove some bus driver rest stops. Progress for further development.
8	Split level station south of Town Centre Drive	5	1	Integrates well with town centre and supports both existing and future catchments. Large footprint impacts commercial properties as well as Whaka Maumahara (Guy's Reserve). Turnarounds provide for efficient operations for services. No schedule adherence or bus driver rest stops not preferred. Poor customer experience with large distances between platforms including vertical level changes. Has potential for staging and considered worthy of further development. Progress for further development.
9	Parallel platforms in reserve (Guy's Reserve) west of Te Irirangi Drive	3	3	Location of station while centrally located does not address Botany Town Centre optimally. Property requirements in costly commercial land minimised. Turnarounds provide for efficient operations for services. No schedule adherence or bus driver rest stops not preferred. Poor customer experience with large distances between platforms. Has potential as option is considered affordable and therefore worthy of further development. Progress for further development.

Based on the application of the second filter, five options: Options 4, 5b, 6b, 8 and 9 were selected to take forward for development and short list assessment (MCA).

An additional option (Option 13) was developed post long list assessment, being a variant of Option 9. Option 13 provided an island platform for customers and provided for more efficient circulation of buses as option 9 provided opposing platforms for customers and included roundabouts at each end of the platforms to achieve circulation of buses. This additional option was included in the short list options to be assessed, as discussed below.

The matrix used for the long list assessment is provided in **Appendix 1**.

4.4 Identified Options to be taken forward

The short list of options included six bus station options and three link road options. Table 6 provides a summary of the bus station options with Table 8 providing a summary of the Link Road options. Drawings of the short list options are provided in Appendix 2.

Table 6. EB4 Bus Station Options

Bus Station Options		
Option	Location	Key features
Option 4 Variant of A2B Business Case Preferred	East of Te Irirangi Drive, North of Town Centre Drive.	<ul style="list-style-type: none"> Island platform Customer overpasses provided at north and south ends of station Schedule adherence bays provided on site Direct impact upon adjacent buildings Occupies land currently used as car parking
Option 5 Offline Town Centre 'Hash Brown' (identified as Option 5b for long list assessment)	East of Te Irirangi Drive, South of Town Centre Drive, North of Park Way Drive.	<ul style="list-style-type: none"> Tringle shaped layout, with centrally located platforms Customer overpasses provided to east and west of station Schedule adherence bays provided on site Occupies large area currently used as car parking

Option 6 Offline Town Centre Island Platform (identified as Option 6b for long list assessment)	East of Te Irirangi Drive, South of Town Centre Drive, North of Park Way Drive.	<ul style="list-style-type: none"> Island platform Customer overpass provided from centre of platform, connecting to east and west of station Schedule adherence bays provided on site Occupies land currently used as car parking
Option 8 Grade separated with elevated platform	Between Town Centre Drive and Park Way Drive/ Haven Drive. Elements located within centre of Te Irirangi Drive, Town Centre car parking and Guy's Reserve	<ul style="list-style-type: none"> Multi-level station, with three sets of platforms Platforms located on overbridge above Te Irirangi Drive, platform located on centre of Te Irirangi Drive, and platforms offset to the east of Te Irirangi Drive No schedule adherence bays provided on site Complex customer transport within station complex Impact to town centre car park and Guy's Reserve
Option 9 Guy's Reserve with opposing platforms	Located in Guy's Reserve, between Te Koha Road and the stormwater pond.	<ul style="list-style-type: none"> Opposing platforms Customer overpasses provided to the east and west of station No schedule adherence bays provided on site Occupies part of Guy's Reserve
Option 13 Guy's Reserve with island platform (Variation of Option 9, developed post long list assessment)	Located in Guy's Reserve, between the stormwater pond and Te Koha Road/ Te Irirangi Drive.	<ul style="list-style-type: none"> Island platform Customer overpass provided in centre of platform, connecting to corner of Te Koha Road/ Te Irirangi Drive No schedule adherence bays provided on site Occupies part of Guy's Reserve

Table 7. EB4 Link Road Options

Link Road Options		
Option	Location	Key features
Link Road Option 1	Central running along Ti Rakau Drive/ Te Irirangi Drive	<ul style="list-style-type: none"> Central running busway Walking and cycling facilities Requires widening of road corridor, resulting in property acquisitions along part of the alignment
Link Road Option 2	Ti Rakau Drive/ Te Koha Drive	<ul style="list-style-type: none"> Central running busway Walking and cycling facilities Requires widening of Ti Rakau Drive road corridor, resulting in property acquisitions along part of the alignment Busway would run through The Hub retail park
Link Road Option 3	Guy's Reserve	<ul style="list-style-type: none"> Offline busway, situated in part of Guy's Reserve, to the south of The Hub retail park Constructed on retaining structure No walking and cycling facilities provided on alignment

5 Short List Options for Assessment

The MCA considered a total of nine options: six bus station options and three link road options. The preferred scheme option was identified by the EBA as being an option comprising a combination of the preferred bus station option and link road option.

Pre-MCA workshop briefing sessions were held on 19 and 24 February 2021 for Technical Assessors to gain an understanding of the options to be assessed. A briefing pack was issued to the Technical Assessors on 1 March 2021.

An additional option (Option 13) was developed post long list assessment, being a variant of Option 9. and was added to the options for assessment on 4 March 2021. This was provided to the Technical Assessors and included in the MCA Workshop.

Below is an overview of the options that were assessed. Plans of the options are provided in **Appendix 2**.

5.1 Bus Station Options

5.1.1 Bus Station Option 4

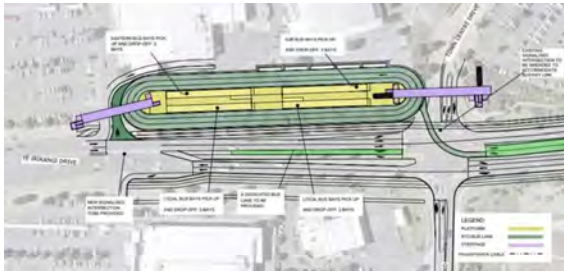


Figure 3 Bus Station Option 4

This option is a variant of the A2B offline preferred business case option and consists of an island platform located to the east of Te Irirangi Drive, and to the north of Town Centre Drive. The bus station would be located on land that is currently used as car parking for Botany Town Centre.

Pedestrian access to the station is provided with elevated overbridges to the north and south.

Due to the width of the bus station, existing buildings on the east side of Te Irirangi Drive would be impacted. The carriageway of Te Irirangi Drive would need to be realigned towards the east. This would result in some land being required on the west of Te Irirangi Drive to accommodate the footpath/cycleway.

This bus station option is provided with schedule adherence bays (layover bays) and driver rest stops. Bus access to the station is from the intersection of Town Centre Drive/ Te Irirangi Drive. An exit access is provided to the north of the station, connecting to Te Irirangi Drive.

5.1.2 Bus Station Option 5



Figure 4. Bus Station Option 5

Triangle shaped or 'hash brown' shaped bus station located to the east side of Te Irirangi Drive, to the south of Town Centre Drive. The station would be located on land currently used to provide car parking for Botany Town Centre.

Pedestrian access to the station would be via elevated overbridges to the east (towards Botany Town Centre) and west (toward Te Irirangi Drive).

The station would be situated at the same level of Te Irirangi Drive, requiring earthworks to be undertaken. No existing buildings are directly impacted by this station design, however a large area of car parking would be removed from the town centre.

This bus station option is provided with schedule adherence bays and driver rest stops. Bus access to the station is from the intersection of Town Centre Drive/ Te Irirangi Drive and Park Way Drive/ Te Irirangi Drive.

5.1.3 Bus Station Option 6

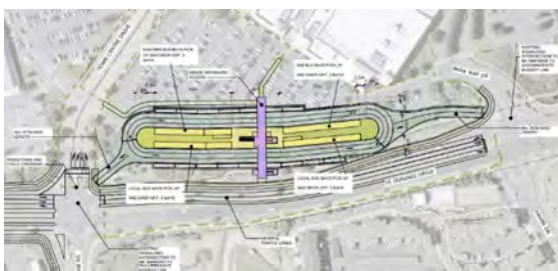


Figure 5. Bus Station Option 6

Island platform bus station located to the east side of Te Irirangi Drive, to the south of Town Centre Drive. The station would be located on land currently used to provide car parking to Botany Town Centre. The area occupied for this option is less than Option 5. The station would be provided to the same grade as the existing car park.

Pedestrian access would be via an elevated overbridge from the centre of the platform, connecting to the east and west sides of the station.

No buildings are directly impacted by this option. The carriageway of Te Irirangi Drive would need to be altered; however, this can be accommodated within the existing western kerb line.

The station is provided with schedule adherence bays and driver rest stops. Bus access to the station is from the intersection of Town Centre Drive/ Te Irirangi Drive and Park Way Drive/ Te Irirangi Drive.

5.1.4 Bus Station Option 8

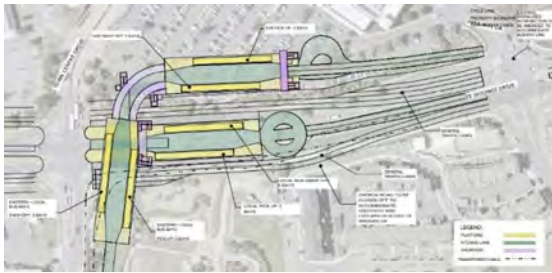


Figure 6. Bus Station Option 8

This station design would provide three sets of platforms. A set of platforms would be located within the centre of Te Irirangi Drive, another set would be to the east of Te Irirangi Drive (occupying land currently used as car parking), and another set are elevated above Te Irirangi Drive. Buses travelling to/from the busway would enter the station from the west, using the elevated platforms above Te Irirangi Drive. Other bus services would access the bus station at existing intersections on Te Irirangi Drive.

The carriageway alignment of Te Irirangi Drive would be modified to provide for the online platforms, resulting in the road corridor being widened to the west. Various passenger connections would be provided between the platforms and the town centre.

This option does not include any schedule adherence bays or driver rest stops.

5.1.5 Bus Station Option 9

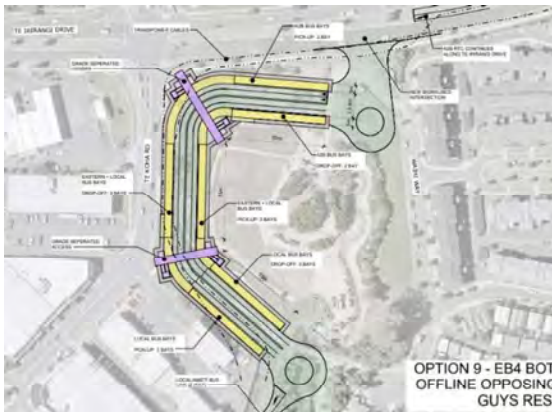


Figure 7. Bus Station Option 9

This option would provide a bus station located within Guy's Reserve adjacent to Te Koha Road. The bus station has been designed to sit around the existing stormwater pond. Bus access to the station would be from the west (via a link road to/from EB3) and the east with a new intersection on Te Irirangi Drive.

Bus turnaround facilities are provided in this design to the east and west of the bus station. The turnaround facility to the west would be positioned over an existing stream. It has been assumed this would result in the stream being placed in a culvert to accommodate the turnaround facility.

This option does not include any schedule adherence bays or driver rest stops.

Pedestrian access to the station would be via two elevated overbridges, providing connections to The Hub and Te Irirangi Drive

5.1.6 Bus Station Option 13



Figure 8. Bus Station Option 13

This option is a variant of Option 9, utilising an island platform design. Bus access would be from a new intersection with Te Irirangi Drive at the east end of the station or would connect onto the busway at the west end. Due to the island design, no additional turnaround facilities are required.

Similar to Option 9, this option does not provide any schedule adherence bays or driver rest stops.

Pedestrian access would be via a single elevated overbridge, connecting from the centre of the platform to Te Irirangi Drive/ Botany Town Centre.

5.2 Link Road Options

5.2.1 Link Road Option 1



Figure9. Ti Rakau/Te Irirangi Link Road

This option would position the busway link road in the centre of Ti Rakau Drive and Te Irirangi Drive with the size of the existing intersection between the two roads needing to be increased. Walking and cycling facilities would be provided along both sides of the road. Any widening to accommodate the busway along Ti Rakau Drive would be to the north. The properties impacted are already owned by Auckland Council. This link road option is not compatible with Bus Station Option 8.

5.2.2 Link Road Option 2



Figure 2. Te Koha Drive Link Road

This option would provide the busway link in the centre of Ti Rakau Drive from EB3 to the intersection with Te Koha Drive. The busway would use the alignment of Te Koha Drive to link with Te Irirangi Drive.

Te Koha Drive would include the busway, vehicle lane in each direction, off road cycle facilities and footpaths. The existing buildings would not be impacted. This link road option is not compatible with Bus Station Option 8.

5.2.3 Link Road Option 3



Figure11. Guy's Reserve Link Road

This option would provide the busway link road along the northern edge of Guy's reserve, to the south of the existing retail development. The link road would be placed on a shallow structure to reduce impacts on the reserve. A new intersection on Ti Rakau Drive would be provided to connect with the link road. On Te Irirangi Drive, the link road would use a modified intersection off Te Koha Road. Walking and cycling facilities would be provided along Ti Rakau Drive/ Te Irirangi Drive.

6 Short List Options Evaluation Process

6.1 MCA Overview

The purpose of an MCA is to provide a structured, consistent and systematic process for assessing each option. This tool is aligned to Project objectives and RMA requirements, providing evidence of structured option analysis, and maintaining consistency with other option assessment processes previously undertaken for the Project. The outputs of the MCA assist the decision maker (being the EBA through the ALT and IPAB) to understand relevant considerations when making a decision on the preferred option.

6.2 MCA Framework and Scoring Adopted

The MCA Framework for this assessment was adopted from previous MCAs undertaken for the Project, to ensure consistency in approach. The criteria were carried over from previous assessments. The completed MCA framework (in the form of an excel spreadsheet) identifying criteria, measures and information sources is provided in **Appendix 4**.

The performance of the options against the MCA criteria was scored, without weighting, using an 11-point scale as outlined in Table 8 below. A workshop was held with all Technical Assessors to fully explore the options to ensure that evaluators' assessments were based on consistent and commonly understood information. The scoring was confirmed after the MCA workshop, ensuring scores were based on a common understanding of the options.

The assessments were not comparative to the previous and preferred options (summarised in table 1), rather the effects of the options were considered against the existing environment. The existing environment was considered to include EB1 plus current services and projects currently approved and modelled at the time of the assessment.

Table 8. Scoring criteria

Score	Description/ indicators for assessment
-5 Very High Adverse Effect	National or Greater: Will have adverse effects on a nationally significant resource/ or may be experienced by a national scale audience; <i>and/or</i> May have a substantial/ complete effect (destruction) on the feature/ resource/ community identified; <i>and/or</i> Long Term/ Permanent = 20+ years.
-4 High Adverse Effect	Regional: Will have adverse effects on a regionally significant resource or may be experienced by a regional or wider audience; <i>and/or</i> May have a high extent of impact on features/ resource/ community identified; <i>and/or</i> Long Term/ Permanent = 10 -20+ years.
-3 Moderate Adverse Effect	Local Area Level Impact: Will have adverse effects on a locally significant resource (e.g. significant within an ecological district or within a catchment) or may impact on a local board community/ geographic scale; <i>and/or</i> May have a moderate extent of impact on the feature/ resource/ community identified; <i>and/or</i> Medium term = 5 -10 years
-2	Local Area/ or Individual Level Impact: Will have adverse effects on a locally prevalent resource (e.g. site specific significant within an ecological district but only local effect or within a catchment) or may impact on a local board community/ geographic scale;

Low Adverse Effect	<i>and/or</i> May have some extent of impact on the feature/ resource/ community identified; <i>and/or</i> Short term = 1 -5 years
-1 Very Low Adverse Effect	Individual level impact: Will have adverse effects on resources not otherwise identified for their values or with otherwise innominate value or may impact a limited number of households (i.e. 20 households/ 50 people); <i>and/or</i> May have a low extent of impact on the feature/ resource/ community identified; <i>and/or</i> Very Short Term = <1 year.
0 Neutral Effect	Negligible effects from current situation/ natural
+1 Very Low Positive Effect	Individual level benefit: Benefits will be experienced for resources not otherwise identified for their values or with otherwise innominate value. Benefits may be experienced by a limited number of households (i.e. 20 households/ 50 people); <i>and/or</i> May have a very limited and confined extent of benefits on the feature/ resource/ community identified; <i>and/or</i> Very Short Term = < 1 year.
+2 Low Positive Effect	Local level Benefits (2): Benefits will be experienced by defined local environment or sub-catchment. Benefits may be on Census Area Unit or experienced by a limited number of households (i.e. 20-50 people); <i>and/or</i> May have a low extent of benefits on the feature/ resource/ community identified; <i>and/or</i> Short Term = 1-5 years.
+3 Moderate Positive Effect	Local Level Benefits (1): Benefits will be experienced for values of an ecological district or within a catchment, or at a local board community/ geographic scale; <i>and/or</i> May have some extent of benefits on the feature/ resource/ community identified; <i>and/or</i> Medium Term = 5-10 years.
+4 High Positive Effect	Regional Benefits: Benefits will be experienced for a sub-regionally significant resource/ experienced by a sub-regional audience; <i>and/or</i> May have a high extent of benefits on the feature/ resource/ community identified (and confident of benefits being realised); <i>and/or</i> Long Term Permanent = 10-20+ years
+5 Very High Positive Effect	Regional or Greater Benefit: Benefits will be experienced by a whole region or across regions (including national) or may be to a regionally or nationally significant resource; <i>and/or</i> May have substantial benefits on features/ resources/ community identified. High degree of confidence of benefits being realised; <i>and/or</i> Long Term/ Permanent = 20+ years.

A positive score indicated an opportunity for improvement to the existing environment, and a negative score indicated a worsening of the existing environment. Any 'very high adverse effect' (-5) in relation to key considerations was considered a fatal flaw, in which case the option would not progress as an alternative option.

6.3 MCA Workshop

The workshop was held on 10 March 2021 (via Microsoft Teams). The purpose of the workshop was to:

- Allow specialists to ask questions of the project team about the options;
- Allow each specialist to present their individual assessments and preliminary scores;
- Allow for specialists to be asked questions by the wider team and observers, test assumptions and issues discussed and clarified; and
- Provide an open and transparent discussion for specialists to base their scores on.

A list of workshop attendees and their assessments have been included in **Appendix 4**.

The technical specialists were provided a score sheet ensuring their rationale and assumptions made in the assessment were captured. This was to ensure transparency and consistency of scoring. The scoring sheets from each specialist is provided in **Appendix 4** of this report.

7 Evaluation of Options

Table 9 below provides an overview of the process undertaken to evaluate and analyse the options for EB4 presented at the MCA workshop.

Table 9. Timeline of Activities for Assessment

Date	Activity
19 and 24 February 2021	Technical assessors briefing session held to provide overview of the alternative options and to familiarise themselves with the Project. Session also provided the technical assessors opportunity to ask questions directly to the design team.
1 March 2021	A pre workshop briefing pack was issued to all technical advisors. The briefing pack included information on the options being considered, guidance criteria for assessment and scoring framework based on the 11-point scale. The pack included scoring sheets for the technical assessors.
4 March 2021	An additional option for assessment was provided to the technical assessors. Option 13 is a variation of Option 9. All technical assessors were advised to include this option as part of the assessment for the MCA.
8 March 2021	Technical assessors provided pre-workshop comments and scores (in draft form). The responses provided were based on the information previously provided to the technical specialists, each providing an analysis using their professional knowledge and any appropriate guidance. Each technical assessor provided a score for each option based on 'no mitigation' and 'with mitigation'.
10 March 2021	Online MCA Workshop was held. Each technical assessor provided an overview of their assessment for each option. Each assessor outlined key assumptions used to undertake the assessment and any specific mitigation that was assumed in their assessment.
Post workshop	Following the workshop each assessor was provided with the opportunity to review their preliminary comments and scoring and make any changes they considered appropriate. All updated assessments and scoring were relied on to inform subsequent identification of the technically preferred option.

The following sections of the report provide a summary of the comments provided by Technical Assessors as well as scores provided against each option.

7.1 Assessment of options – Bus Station

As part of providing a score for each bus station option, the technical assessors provided a high-level assessment, outlining the reasons for the scores provided. A copy of the score sheets, including the written comments can be found in **Appendix 4**.

The following is a summary of the assessments undertaken by the Technical Assessors. Scores were applied without mitigation and with practicable mitigation. For the purposes of this assessment practicable mitigation included standard industry techniques and practices for mitigating effects on the environment, i.e., planting, acoustic treatment, erosion and sediment control, traffic management etc.

7.1.1 Bus way and Bus Station Operational Considerations

Scores: Operational		
Option	Without mitigation	With mitigation
4	+2	+4
5	+4	+5
6	+5	+5
8	+2	+2
9	+3	+3
13	+3	+3

The Technical Assessor for Busway operational considerations along with the assessment criteria identified and noted the following key matters in assessing Projective Objective 6 (to safeguard future transport infrastructure required at (or in the vicinity of) Botany Town Centre to support development of a strategic transport connection to Auckland Airport):

- Supports a strategic public transport connection to Auckland Airport.
- Customer experience when using the bus station.
- Resilience and capacity, including ability to meet forecasted demand for 2048.
- Bus Operations efficiency.
- Flexibility to stage the construction of the station.

All of the options can support a strategic connection to Auckland Airport and would allow for future extension of bus services from the airport to north of Botany. **Option 8** (multi-level station layout) would require changes to the proposed operating pattern to allow buses from the airport to continue to the north. The changes to the operating pattern would result in an increase in bus operating costs.

In terms of customer experience, it is considered that bus stations with an island platform design perform better, as the layout of the station is legible and provides a better interchange experience. Furthermore, stations utilising island platforms avoid the need for any vertical changes for passengers to reach connecting services. In this regard **Options 4, 5, 6 and 13** would perform well. The remaining options utilise opposing platforms, would increase walking distance and require vertical changes to reach some services for interchange passengers.

The location of the station within the wider Botany area is considered to have an impact on the desirability for passengers to use the station to access surrounding services. **Options 5 and 6** are considered to perform best due to being located directly outside of Botany Town Centre. **Options 9 and 13** perform less well due to being located on the opposite side of Te Irirangi Drive.

All of the station options provide a level of operational flexibility and have capacity for increased bus demand beyond 2048. **Option 8** is considered to provide the least flexibility for bus operations due to its layout with specific platforms for specific services. All other options would allow any platforms to be used by any services. **Options 8, 9 and 13** do not provide schedule adherence bays or driver rest stops. This would potentially impact operational reliability and increase operational costs. **Options 4, 5, and 6** all provide schedule adherence bays and/or driver rest stops.

The ability to stage the options has been considered. All of the options are able to be staged apart from Option 5. Option 5 would need to be fully constructed due to its shape.

Based on the assessment and scores provided, the favoured station options based on operational considerations are Options 5 and 6. Both stations provide a similar level of service for passengers and operational needs.

7.1.2 Legislative and Consenting Considerations

The following matters and assumptions were considered when undertaking the assessment of the options in relation to legislative consenting factors:

- All options would result in a positive effect experienced by a sub-regional audience.
- All options require the use of natural resources.
- Potential environmental effects can be managed.
- All options generally use land that has been previously developed.

Scores: Legislative and Consenting		
Option	Without mitigation	With mitigation
4	+3	+4
5	+2	+3
6	+2	+3
8	+1	+3
9	-1	0
13	-1	0

Options 9 and 13 are the least favoured from a legislative and consenting perspective as they would place infrastructure on land that is zoned as conservation/ open space. They would also place the bus station and associated infrastructure on and in proximity to freshwater features including wetlands/stream environment, overland flow paths, flood prone areas and flood plains. The area of open space would also be reduced.

Option 8 would result in the bus station and associated infrastructure being located on both sides of Te Irirangi Drive, occupying part of the car park for Botany Town Centre, the stormwater reserve/ open space area as well as within the road corridor. Although the impacts upon the stormwater reserve/ open space are relatively less than **Options 9 and 13**, it would still result in infrastructure being located in overland flow paths, flood prone areas and flood plains.

Options 4, 5 and 6 all place the bus station within the car park of Botany Town Centre. All of these specific options would result in a reduction of car parks, with **Options 5 and 6** having a greater impact than **Option 4**. All of the infrastructure for the bus station would be on land zoned for commercial use/development, avoiding areas zoned open space. As with all other options, infrastructure will be provided in overland flow paths, flood prone areas and flood plains.

7.1.3 Constructability

The constructability assessment considered a range of factors, including health and safety, environmental impacts, resourcing, access and proximity to residential and community buildings for example. The scores for each option are provided below, based on constructability factors.

Scores: Constructability		
Option	Without mitigation	With mitigation
4	0	0
5	-1	-1
6	-1	0
8	-3	-3
9	-2	0
13	-2	0

Option 8 has the lowest score, even with mitigation applied. **Options 4, 6, 9 and 13** are neutral with mitigation applied.

7.1.4 Transportation effects – temporary

The assessment of temporary transport effects (i.e. during the construction period) considered intersection layouts, level of delay to traffic, property access, pedestrian and cyclist facilities and detours. The scores are provided below.

Scores: Temporary transportation effects		
Option	Without mitigation	With mitigation
4	-3	-2
5	-2	-2
6	-2	-2
8	-4	-3
9	-1	-1
13	-1	-1

Option 4 is considered to have significant effects on Te Irirangi Drive during the construction period, however alternative north-south routes (Chapel Road) are available in the area which may alleviate some of the impacts from construction traffic. **Options 5 and 6** are offline but they will have a significant impact upon parking available in Botany Town Centre during construction. Access during construction will be required from Te Irirangi Drive, which will result in local impacts to the road network.

Option 8 requires major construction on Te Irirangi Drive and in the carpark area of Botany Town Centre. There is the potential for significant adverse effects (more than **Option 4**) to be generated because structures are required to be constructed and will have resultant impacts on programme and therefore the length of time temporary construction traffic impacts are experienced. **Options 9 (and 13)** are off-line and will have minor impacts on the road network, generally relating to construction access.

Mitigation proposed for all options includes travel demand management and communication strategies that includes measures to manage the private vehicle demand during peak periods, by encouraging people to re-route, re-mode or re-time their trips to offset the potential effects of the construction activity.

In terms of temporary transport effects, **Options 9 and 13** perform best as they have the least impact upon the existing transport network during construction.

7.1.5 Transportation effects – permanent

Consideration has been given to Project Objectives 2, 4 and 5, and impacts upon property access, parking and connectivity when assessing permanent transport effects. The scores shown below are overall scores for the Transportation Effects Permanent taking into account the combined scores for: objectives 1, 4, and 5; loss of parking/local circulation; and loss of property access.

Scores: Permanent transportation effects		
Option	Without mitigation	With mitigation
4	+2	n/a
5	+1	n/a
6	+3	n/a
8	+2	n/a
9	+4	n/a
13	+4	n/a

All of the proposed station options provide the same 5-minute walking catchment, with little differentiation between the station location except by proximity to the centre of activity. **Option 4** is the closest to the centre of the Metropolitan Area, with Options 5 and 6 being closer to Botany Town Centre.

For all options property access can be maintained albeit with additional delays. Under **Option 4**, the access to Pak'n Save would need to be signalised. **Options 4, 5, 6 and 8** will have a significant loss of parking on site, with Option 4 potentially affecting deliveries and associated access arrangements. Mitigation has not been considered for permanent effects.

Options 9 and 13 perform best as they do not have direct impacts upon the existing transport network or existing businesses.

7.1.6 Stormwater and Flooding

Scores: Stormwater and Flooding		
Option	Without mitigation	With mitigation
4	-1	0
5	-5	-3
6	-4	-1
8	-4	-2
9	-5	-3
13	-2	-1

Consideration of the station options in relation to stormwater and flooding was undertaken. The following is a summary of the key considerations, mitigation proposed and reasons for the scores.

Bus Station Option 4: Elements of the bus station are sited within existing overland flow paths, with the southern end of the station crossing a large culvert. Proposed mitigation includes the local diversion of overland flow paths or alternatively piping overland flow paths to the stormwater pond in Guy's Reserve.

Bus Station Option 5: The northern section of the station would be inundated by a 1.2m³/s overland flow path during a 100-year event and is likely to be regularly inundated by more frequent stormwater events. The southern bus access to the station is also likely to be inundated by frequent stormwater events. Overland flows along Te Irirangi Drive have the potential to enter the bus station during a storm event. Both pedestrian access points have the potential to be inundated by overland flow paths. At the southern end of the station a large culvert will need to be relocated prior to construction.

Proposed mitigation is considered to be complex and/or expensive. Mitigation includes modifications to the existing car park, provision of new culverts and manholes with large inlet structures formed.

Bus Station Option 6: The northern part of the bus station would be inundated during a 100-year storm event and is likely to be regularly inundated by more frequent storm events. The southern bus access crosses an overland flow path and is likely to be regularly inundated by frequent events. Flows along Te Irirangi Drive have the potential to enter the bus station during a storm event. The western pedestrian entrance is within an overland flowpath and will be subject to inundation during a storm event. At the southern end of the station a large culvert will need to be relocated prior to construction.

Proposed mitigation is considered to be complex and/or expensive, but to the same level as required for Option 5. Mitigation includes modifications to the existing car park, provision of new culverts and manholes with large inlet structures formed.

Bus Station Option 8: The station configuration makes it very complicated to avoid impacts upon private property. All sets of platforms, apart from the ones above Te Irirangi Drive, will be subject to inundation, either during a 100-year event or more frequent events. Works within Te Irirangi Drive Have the potential to impact multiple overland flow paths.

Proposed mitigation is considered to be complex and/or expensive, but not to the same level as required for Option 5. Mitigation includes modifications to the existing car park, provision of new culverts and manholes with large inlet structures.

Bus Station Option 9: This option will require a culvert for a 100-year event to manage flood risk, and it is likely to consist of a twin barred box embedded by 0.5m for fish passage and containing waterway bed material in the base. Each box culvert will need to be designed as a bridge. In the Te Irirangi Drive turnaround facility, a new overland flowpath into the stormwater pond will be formed.

Proposed mitigation includes formation of a stormwater pipe network, however this will be required to be located in part of Te Koha Road and/or VTNZ site. New inlet and outlet structures for the stormwater pond will need to be provided.

Bus Station Option 13: This option may result in a small reduction in pond volume due to the placement of piers. The bus entrance to the station may be impacted by an overland flowpath along Te Irirangi Drive, along with similar impacts for the pedestrian access. Proposed mitigation includes coordinating the location of piers with the modelled overland flow paths to retain the existing volume of the pond.

All options required the mitigation of stormwater and flooding. Options 6 and 13 were scored on the basis that relatively less complicated mitigation to reduce effects on overland flow would be required compared to the other options.

7.1.7 Freshwater and Terrestrial Ecology

Scores: Ecology		
Option	Without mitigation	With mitigation
4	-1	0
5	-1	0
6	-1	0
8	-3	-2
9	-3	-2
13	-2	-1

An assessment was undertaken of all of the options in relation to freshwater and terrestrial ecology effects. The following is an overview of the assessment and scores provided for each option.

For **options 4, 5 and 6**, vegetation at the parking area will be removed but this is amenity planting and is likely to have low ecological value. Some vegetation present may provide some roosting and/or nesting habitat for birds, although most bird species identified as potentially present are either introduced or naturalised or native but not threatened. Effects on terrestrial avifauna are therefore considered to be low.

Proposed mitigation includes landscape planting with ecological enhancements, avoiding bird nesting season for vegetation removal and the provision of appropriate erosion and sediment control measures during construction.

The following matters were identified for **Option 8, 9 and 13** being the options located within Guys Reserve:

- Options 8, 9 and 13 all have elements that are either adjacent to or located above a part of the stormwater detention pond. For consistency of assessment, it was assumed that none of the options will have a significant impact on the stormwater pond and its operational capacity.
- Options 8 and 9 both encroach into the stream at Guy's Reserve with a moderate to high impact. There is potential for NPS-FM natural wetlands to be present alongside the stream,

however on-site investigations will need to be undertaken to determine this. Due to its design, Option 13 has a lower level of impact upon the stream and adjacent environment. The existing terrestrial vegetation that is impacted by options 8, 9 and 13 is considered to have low ecological value, however some of the vegetation may provide roosting and/or nesting habitats for birds.

- The stormwater pond may provide foraging habitat for 'at risk-recovering' Pied Shag (*Phalacrocorax varius*) and New Zealand Dabchick (*Poliiocephalus rufopectus*), 'At-risk declining' Red-billed Gull (*Larus novaehollandiae scopulinus*) and 'At risk - naturally uncommon' Little Black Shag (*Phalacrocorax sulcirostris*). Effects to terrestrial avifauna are considered to be moderate to high (assuming vegetation removal is timed to be completed outside of the nesting season).
- There is the potential for one lizard species (copper skink) to be present within the existing habitat, however the species is not threatened. The effects to fish habitat are considered to be moderate to high as a result of the structure within the stream.
- Proposed mitigation includes landscape planting with ecological enhancements, avoiding bird nesting season during vegetation removal and the provision of appropriate erosion and sediment controls measures during construction. Consideration should be given to moving the bus turnaround area as far out of the stream as possible. Design of the structure within the stream should be hydrologically sensitive and allow natural flow of the stream and fish passage.
- Proposed mitigation includes provision of landscape planting with ecological enhancement, avoiding bird nesting season during vegetation removal and the provision of appropriate erosion and sediment controls measures during construction. Consideration should be given to moving the bus turnaround area as far out of the stream as possible. Design of the structure within the stream should be hydrologically sensitive and allow the natural flow of the stream and fish passage.

Options 4, 5 and 6 are located within the Botany Town Centre and therefore perform better as they avoid impacts upon ecological areas associated with Guys Reserve.

7.1.8 Urban Design effects

The assessment of urban design effects assumed that all proposed options improve public transport and have not considered this as part of the assessment, as whilst this can be seen as being part of an Urban Design Assessment it has been assessed by other Technical Specialists – notably Busway operations and permanent Transport effects. The assessment is focused on the relevant project objectives and the matters outlined for consideration in the guidance provided to the technical assessor.

Scores: Urban Design – Bus Station		
Option	Without mitigation	With mitigation
4	-2	-2
5	-3	-3
6	-2	1
8	-4	-4
9	-4	-4
13	-4	-3

All of the station options are provided with a negative score, with only **Option 6** receiving a positive score once mitigation has been applied. It was noted that **Option 6** had the opportunity for better integration with the Botany Town Centre such as opportunities to build on top of the bus station,

making the station more legible to Te Irirangi Drive and more opportunities for planting given the potential space available.

Options 9 and 13 would become dominant features within Guy’s Reserve and contribute to the loss of open space, with **Option 9** having a greater impact than **Option 13** in this regard. **Options 9 and 13** do not provide direct access to/from Botany Town Centre and are not of a compact form. Neither option has frontage onto Te Irirangi Drive with passenger access arrangements creating a potential Crime Prevention Through Environmental Design (CPTED) issue. Mitigation could be applied to reduce visual impacts of both station options.

Option 8 is the least compact of all of the bus station layouts. The station would be a dominant feature above Te Irirangi Drive, having a large viewing audience, including from residential properties, due to its position. This option also has impacts upon Guy’s Reserve. Due to the multi-level layout, passenger access is via a range of stairs, lifts and over bridges. This layout increases the likelihood of CPTED issues.

Options 4, 5 and 6 avoid impacts upon Guy’s Reserve, being located on the Town Centre side of Te Irirangi Drive. **Option 4** was assessed as being reasonably compact however the scale of the bus station and its juxtaposition, dominates existing buildings. Furthermore, due to the circulation of buses, the bus station is disconnected from adjacent buildings. **Option 5** has a large footprint, and due to its shape may potentially impede access for other uses in the centre of the bus station. Compared to other options, **Option 5** has the largest impact upon loss of carparking. **Option 6**, is reasonably compact however it would still result in car parking being reduced, but not to the same extent as **Option 5**.

In terms of passenger access, **Options 4, 5 and 6** all require over bridges to connect the station to the surrounding environment. **Option 5 and 6** provide the more direct access to Botany Town Centre than Option 4. Due to the offset position of **Option 4**, being further from the frontage of Botany Town Centre, there is potential for CPTED issues.

Option 5 is set back from Te Irirangi Drive, which reduces the opportunity for the station to have a strong presence with the street. A benefit of the station being setback is that the impact upon trees and vegetation is reduced. Both **Options 4 and 6** would result in the loss of trees and vegetation along the frontage of the Town Centre site however the bus stations would have a strong street presence when compared to **Option 5**.

Overall **Options 4 and 6** scored the best given their potential to integrate with the existing town centre and when mitigation was applied, as described above, option 6 scored marginally better than **Option 4**.

7.1.9 Landscape effects

Scores: Landscape – Bus Station		
Option	Without mitigation	With mitigation
4	-1	-1
5	-1	-1
6	-1	1
8	-2	-1
9	-4	-3
13	-4	-3

All options would result in the loss and reduction of trees and vegetation. In terms of **Options 4, 5 and 6** the impact is mainly limited to street trees along Te Irirangi Drive and trees and vegetation within the car park area of Botany Town Centre.

Option 8, due to its layout impacting both sides of Te Irirangi Drive, would result in trees along Te Irirangi Drive and the Botany Town Centre being lost as well as having an impact upon vegetation within Guy’s Reserve.

Options 9 and 13 would have an impact upon Guy’s Reserve, including the occupation of public open space and through the loss of trees and vegetation.

Option 6 scored more favourably given the opportunity to replant the edges of Te Irirangi Drive as mitigation for the works.

7.1.10 Visual effects

Scores: Visual Effects – Bus Station		
Option	Without mitigation	With mitigation
4	-2	-2
5	-1	-1
6	-2	-1
8	-4	-4
9	-4	-3
13	-4	-2

All options are considered to have an adverse visual effect, even with mitigation being applied. **Option 8** would have the greatest visual impact due to the elevated structures across Te Irirangi Drive, with the viewing audiences including the retirement village/housing estate off Oneroa Road and Waihi Way. Furthermore, the loss of trees along the Botany Town Centre edge with Te Irirangi Drive would also result in adverse visual effects.

For **Option 9** the main affected viewing audiences are the retirement village/ housing estate off Oneroa Road/ Waihi Way, as they look out over the reserve. As the bus station would be placed within the reserve, the impact upon this viewing audience will potentially be significant.

Option 13 has a potential visual amenity impact on housing to the north of Te Rakau Drive. Due to the position of the bus station, the road corridor becomes very wide resulting in adverse visual effects for road users. Potential mitigation may involve visually breaking the carriageway into sections to reduce its apparent width.

Option 4, similar to **Option 13** would create a very wide transport corridor, creating adverse visual effects on people travelling through and visiting the adjacent retail centres. **Option 5** will have impacts on visitors to Botany Town Centre.

Option 6 would have an effect on viewing audiences from the retirement village north of Haven Drive, and visitors to Botany Town Centre. Potential mitigation may include relocation bus layby areas and tree planting.

7.1.11 Social effects

For social effects, each option was considered in relation to:

- Impacts upon community facilities/ open space;
- Impacts upon viability/ productivity of business land areas; and
- Impacts upon social connectivity.

For each option, consideration was given to temporary and permanent effects.

Scores: Social Impact – Bus Station		
Option	Without mitigation	With mitigation
4	1	2
5	2	3
6	2	3
8	-1	0
9	-2	0
13	-2	0

Options 4, 5 and 6 are all located to the east of Te Irirangi Drive and do not impact existing open space within the area. They will, however, have some level of impact upon the existing retail businesses/ Botany Town Centre. Option 4 has the greatest impact in this respect as it likely requires physical changes to Pak'n Save, as well as a reduction in car parking for the site. Options 5 and 6 do not require physical changes to existing buildings, however they would result in a reduction in car parking, with Option 5 having the biggest impact on car parking.

Option 8 has a range of social impacts, due to its size and spread across Te Irirangi Drive. The station would have direct impacts upon open spaces (Guy's Reserve) and would occupy an area of car parking that currently services Botany Town Centre.

Options 9 and 13 are both located within Guy's Reserve and would have an impact (loss of) upon the existing open space/reserve.

For all options, a range of social effects would be experienced during construction. Mitigation can be implemented to manage adverse effects. The Technical Assessor identified the following as potential mitigation for all of the options:

- Communication with affected community facilities and business owners.
- Detailed Management Plans to limit construction and traffic impacts and to identify Development Response Initiatives
- Restrictions to construction hours
- Additional landscaping to offset vegetation loss.

7.1.12 Acoustic considerations

Scores: Acoustic		
Option	Without mitigation	With mitigation
4	0	0
5	0	0
6	0	0
8	-1	0
9	-1	0
13	-2	-1

The noise and vibration assessment assumed that the existing acoustic environment is dominated by road traffic noise. It has also been assumed that any new surfaces would be quieter than existing road surfaces within the area.

For **Options 4, 5 and 6** the scores for without mitigation and with mitigation are the same. For these options, there are no residential receptors immediately impacted and the noise environment for nearby residential properties is unlikely to change. Proposed mitigation includes quieter road surfaces and localised screening around areas of buses parking and pulling away.

Option 8 is considered to change the perceptibly of noise due to the layout of the station, providing noise sources closer to residential receptors. Proposed mitigation includes quieter road surface, localised screening around areas of buses parking and pulling away and noise barriers located to the west of new traffic lanes on Te Irirangi Drive.

Options 9 and 13 are both located in Guy's Reserve and would likely change the perceptibly of noise for adjacent and nearby residential receptors, with Option 13 having a greater impact given its closer proximity to residential receptors (primarily those on Cottesmore Place and Kirikiri Lane). Mitigation proposed includes quieter road surface, localised screening around areas of buses parking and pulling away and noise barriers.

7.1.13 Property impacts

The assessment of property impacts has considered the number of properties that would be fully or partially acquired and the cost/value of the properties impacted. No mitigation score has been provided as the impacts cannot be mitigated. The scores are presented in the table below.

Scores: Property impacts – acquisitions and cost			
Option	Score	Property acquisitions	Cost
4	-5	2 partials	\$54M
5	-5	1 partial	\$117M
6	-3	1 partial	\$48M
8	-4	5 partials, 2 reserves	\$58M
9	-2	1 partial, 2 reserves	\$1.83M
13	-1	1 partial, 1 reserve	\$1.7M

Based on the above, the options of providing the bus station in Guy's Reserve (**Options 9 and 13**) have an overall lower cost compared to options that require land within the car park of Botany Town Centre

(Options 4, 5 and 6). Option 5 has a higher cost compared to all other options due to the large footprint of the station design.

7.1.14 Civil design and utilities

Scores: Civil design and utilities		
Option	Without mitigation	With mitigation
4	-2	-2
5	-3	-2
6	-1	NA
8	-4	-3
9	-4	-3
13	-4	-3

The assessment considers civil design and the impact upon utilities. The impact upon stormwater and associated assets was not considered as this was assessed separately.

Bus Station Option 4: This option will require modifications to the structure of the Pak'n Save building and will impact upon its loading bay arrangements. Utilities located within the verge of Te Irirangi Drive will require relocation. Impacted services include WaterCare Howick water main, water distribution network, sewer system, electrical network, gas main and telecommunication network.

Mitigation proposed includes realignment of the bus station to avoid impacts upon Pak'n Save, however this would result in impacts on the service station (Z Energy) on the western side of Te Irirangi Drive.

Bus Station Option 5: This option will require significant excavation of material (earthworks) to provide the bus station to the same level as Te Irirangi Drive. This will result in the need for material to be hauled off site to a suitable landfill location. This option results in the loss of car parking for Botany Town Centre during construction. This option would allow for the provision of car parking above the station post construction. Utilities within the bus station location are minimal, however there are some that will require relocation. They principally provide a local connection to the Botany Town Centre.

Mitigation proposed includes provision of car parking above the bus station to offset the loss of existing car parking.

Bus Station Option 6: This option will occupy an area currently used as car parking for Botany Town Centre, however not to the same extent as Option 5. Due to the design of the station, it is not possible to mitigate the reduction of car parking with overhead parking above the structure. Utilities that service the Botany Town Centre are located in the area of this option. These services would need to be relocated away from the site prior to construction commencing on the bus station.

No mitigation is proposed with this option.

Bus Station Option 8: This option will result in the loss of car parking, however this is significantly less than Option 5. Due to the station design, replacement car parking above or below the station is not a feasible option. Utilities along both verges of Te Irirangi Drive will need to be relocated. Key impacted services include TransPower 22kV lines x2, and WaterCare Howick water main.

Proposed mitigation includes controls around trunk utilities to avoid unplanned disruption to services.

Bus Station Option 9: This option has no impact on existing car parking, as the bus station location is in an existing reserve. Consideration is given to the potential risk of constructing the station within the flood zone of a stormwater pond. The level of the station would need to be set such that operations are not impacted by stormwater flood events.

Utilities along both verges of Te Irirangi Drive will need to be relocated. Key impacted services include TransPower 22kV lines x2, and WaterCare Howick water main. There is a high risk of construction around the water main and TransPower assets which is significantly higher than other options, due to the fact that the station buildings are located along the alignment of the services.

Proposed mitigation includes controls around trunk utilities to avoid unplanned disruption to services.

Bus Station Option 13: The assessment provided is consistent with the assessment provided for Option 9, with similar impacts experienced in relation to civil design and utilities.

Proposed mitigation includes controls around trunk utilities to avoid unplanned disruption to services.

Based on the above, the preferred option for civil design and utilities is **Option 6**.

7.2 Assessment of Options – Link Road

As noted above, three link road options (connecting the bus station and the EB3 busway on Ti Rakau Drive at Huntington Drive/ Guys Reserve) were assessed as part of the MCA. The following is a summary of the assessment provided for each option by the technical assessors. The options considered are:

- LR1: Ti Rakau Drive/ Te Irirangi Drive.
- LR2: Te Koha Road.
- LR3: Guy's Reserve.

These options are described in section 4.4 and 5.2 of this report. Scores were applied without mitigation and with practicable mitigation applied. For example, if an acoustic impact was identified what would it score without mitigation and what would it score if mitigation (such as a barrier) was considered. Mitigation is described in the Technical Assessors score sheets at Appendix 4.

Link Road Options: Summary of technical assessments and scoring				
Area of assessment	Scores without mitigation and (with mitigation)			Summary of assessment
	LR1	LR2	LR3	
Busway Operations	+2 (+2)	+2 (+2)	+4 (+5)	For LR1 bus operations are likely to have unreliable travel times due to the number of intersections that would be traversed. For LR2 bus operations are likely to have unreliable travel times due to the number of intersections that would be traversed. For LR3 bus operations are likely to be more reliable due to the reduced number of intersections that need to be traversed. To further improve performance schedule adherence bays can be placed along link road.
Legislative and consenting	+3 (+4)	+1 (+2)	-3 (0)	The assessment of the options has considered how they would perform in relation to legislative and consenting matters. All options, with mitigation provided, are either positive or neutral. LR1 and 2 score better as they utilise existing transport corridors or areas already developed. LR3 would place infrastructure within an open space/ reserve area and would require mitigation if it were to be progressed.
Constructability	-2(-2)	-1(-1)	-1(-1)	The assessment of constructability shows that LR1 is more complex than the other two options. A key reason for this is the large-scale traffic management that will be required along Ti Rakau Drive and Te Irirangi Drive. LR2 and 3 are largely offline and will require less traffic management.
Transport effects – Temporary	-4 (-3)	-3 (-2)	-1 (-1)	The assessment has considered intersection layouts, acceptable level of delay, property access, pedestrian and cyclist facilities and detours. For all options during construction, alternative travel options are available for people to use. LR1 will have a significant impact on the network, due to the high volume of traffic using Ti Rakau Drive/ Te Irirangi Drive. Staging of works and intersection arrangements will be complex. LR2 will have significant impact on parking supply and operation of The Hub retail park. LR3 will have localised impacts associated with the access points. Mitigation that can be applied to all options is the use of demand management and communication strategy.

Transport effects – Permanent	+1 (+1)	-1 (-1)	+3 (+3)	In terms of journey time reliability, LR3 is the best performing, providing a faster conflict free link with little interface or impact with the road network. LR2 is unlikely to be significantly better than do-minimum ¹ . LR1 will likely result in loss of parking along the corridor (due to widened corridor).
Stormwater and flooding	-1 (0)	-1 (0)	-1 (0)	For LR1 there are opportunities to provide green infrastructure solutions. Two small overland flow paths will be impacted. Mitigation proposed is upgraded drainage at the overland flow paths. For LR2 there are limited opportunities to provide green infrastructure. Two small overland flow paths will be impacted. Mitigation proposed is similar to LR1. For LR3 there are limited opportunities to provide green infrastructure solutions. Two small overland flow paths will be impacted. Bridge piers are to be located within the stormwater pond. Mitigation proposed includes upgraded drainage at the overland flow paths and minor reshaping of the stormwater pond to re-establish storage volume.
Freshwater and Terrestrial Ecology	-1 (0)	-1 (0)	-3 (-2)	For LR1 and LR2 vegetation within the road corridor will be removed, however it has low ecological value. Any removal should be undertaken outside of bird nesting season. Proposed mitigation includes landscape planting with ecological enhancements, and provision of appropriate erosion and sediment control measures during construction. For LR3 there is a greater impact as the alignment travels via the Guys Reserve. This will result in greater effects upon vegetation and terrestrial ecology. Mitigation proposed includes the same measures as LR1 and LR2 above but also consideration of moving bus lanes out of the stream area and design of the structure within the stream to be hydrologically sensitive and allow natural stream flow and fish passage.
Urban design effects	-1(1)	-3(-3)	-4(-4)	For LR1 the existing road corridor will become very wide with the provision of additional lanes for the busway. The road widening would also result in the loss of existing street trees and affect the visual amenity for adjacent residential properties. For LR2 the provision of the busway through The Hub could have an impact upon pedestrian access and connectivity. For LR3 the proposed busway would have an impact upon Guy's Reserve, restricting pedestrian access between the reserve and The Hub retail park. The busway would also have amenity effects upon the reserve.
Landscape effects	-2(-2)	-2(-1)	-3(-2)	For LR1 there may be a loss of street trees however there is the potential to replace them. LR2 will impact on the footpath widths and streetscape of Te Koha Road. For LR3 there are amenity effects on the Guys Reserve and a potential loss on vegetation.
Visual effects	-3(-2)	-2(-2)	-3(-2)	For LR1 and 2 there is a potential visual amenity impact on housing to the north of Ti Rakau Drive and the increase in the width of the road corridor will have adverse visual effects for road users. For LR3 there are potential visual effects on residents to the west of the Reserve.
Social impact	1 (2)	1 (2)	0 (1)	LR1 will avoid direct impacts upon Guy's Reserve however during construction significant impacts will be experienced on Te Irirangi Drive and Ti Rakau Drive. Once construction is

¹ The Do Minimum scenario is EB1 plus current services and projects currently approved and modelled.

				<p>finished, the route will provide multi-modal transport options for the area.</p> <p>LR2 will result in significant disruption to business within The Hub during construction. The proposed connection will avoid the intersection of Ti Rakau Drive/ Te Irirangi Drive which is considered positive for active mode users. Around 10+ residential properties will be impacted, along with minor impacts upon Guy's Reserve.</p> <p>LR3 provides an efficient PT network, however the options lack pedestrian/ cycling improvements. There is a direct impact upon Guy's Reserve, reducing the usability of the open space. This option has minimum impact upon businesses.</p>
Acoustic considerations	-2 (-1)	-2 (-1)	-2 (-1)	<p>LR1 would result in the road corridor being located closer to existing residential properties. Residential properties will likely notice a perceptible change in acoustic environment. Noise barriers were considered in the with mitigation option and lowered the score from a -2 to a -1. .</p> <p>LR2 will have similar effects as per LR1 above.</p> <p>LR3 will introduce a noise source into a reserve, changing the noise environment for surrounding uses. Suggest provision of noise barriers as required.</p>
Property impacts	-4(-4)	-4(-4)	-2(-2)	<p>LR1 and 2 have a higher property cost compared to LR3. For LR1 the forecast property cost is \$10.15m. For LR2 it is \$37M.</p> <p>LR1 identified 8 Partial acquisitions and impact on 3 reserves.</p> <p>LR2 identified 3 partial acquisitions and 5 reserves impacted.</p> <p>LR2 was assessed as having significant property impacts on the parking and common areas of 451 Ti Rakau Drive.</p> <p>LR3 has a property cost of \$1.3M, with 1 partial acquisition and 3 reserves identified. Mitigation was identified as potentially being required offset the loss of open space.</p>
Civil design and utilities	-4 (-3)	-3 (-2)	-3 (-1)	<p>LR1 would result in the widening of the intersection of Ti Ruaku/ Te Irirangi Drive, resulting in the need for existing services to be relocated. Utilities located in the verge of Ti Rakau/ Te Irirangi Drive would also need to be relocated as part of the carriageway widening. A major trunk watermain runs along the alignment for a portion of the alignment, with construction activity undertake along and on top of the utility.</p> <p>LR2 would result in the provision of two new signalised intersections within The Hub retail park. Carriageway widening would be required along a section of Ti Rakau Drive. Te Koha Road is a private road and it is assumed it would need to be fully reconstructed to bring it up to any acceptable standard for busway operations.</p> <p>For LR3 adjacent utilities in Te Koha Road would need to be relocated. Construction works are generally offline from the existing road network and will not require complex traffic management arrangements.</p> <p>For all options mitigation includes the provision of controls to avoid adverse impacts (such as striking) during construction.</p>

7.3 Scoring of Options

7.3.1 Bus Station

The following table provides an overview of the scores provided by technical assessors in relation to the shortlisted bus station options.

Table 10 Bus Station scores - non weighted

	EB4 Bus Station Scores - non weighted												
	No mitigation						With mitigation						
	Option 4	Option 5	Option 6	Option 8	Option 9	Option 13	Option 4	Option 5	Option 6	Option 8	Option 9	Option 13	
	A2B	Hash Brown	Central Platform	Grade Separated	Guy's Reserve	Alt Guy's Reserve	A2B	Hash Brown	Central Platform	Grade Separated	Guy's Reserve	Alt Guy's Reserve	
Busway & bus station ops	2	4	5	2	3	3	4	5	5	2	3	3	
Traffic & transport - temp	-3	-2	-2	-4	-1	-1	-2	-2	-2	-3	-1	-1	
Traffic & transport - permanent	2	1	3	2	4	4	2	1	3	2	4	4	
Legislative & consenting	3	2	2	1	-1	-1	4	3	3	3	0	0	
Constructability	0	-1	-1	-3	-2	-2	0	-1	0	-3	0	0	
Civil design & utility impacts	-2	-3	-1	-4	-4	-4	-2	-2	n/a	-3	-3	-3	
Urban design	-2	-3	-2	-4	-4	-4	-2	-3	1	-4	-4	-3	
Landscape	-1	-1	-1	-2	-4	-4	-1	-1	1	-1	-3	-3	
Visual	-2	-1	-2	-4	-4	-4	-2	-1	-1	-4	-3	-2	
Ecology	-1	-1	-1	-3	-3	-2	0	0	0	-2	0	-1	
Acoustics & vibration	0	0	0	-1	-1	-2	0	0	0	0	0	-1	
Stormwater & flooding	-1	3	-4	-4	-5	-2	0	-3	-1	-2	-3	-1	
Social impact	1	2	2	-1	-2	-2	2	3	3	0	0	0	
Property	-5	-5	-3	-4	-2	-1	-5	-5	-3	-4	-2	-1	

7.3.2 Link Road

The following table provides an overview of the scores provided by technical assessors in relation to the link road options

Table 11 Link Road scores - non weighted

EB4 Link Road Scores - non weighted						
No mitigation			With mitigation			
	Ti Rakau Drive	Te Koha Road	Guy's Reserve	Ti Rakau Drive	Te Koha Road	Guy's Reserve
Busway & bus station ops	2	2	4	2	2	5
Traffic & transport - temp	-4	-3	-1	-3	-2	-1
Traffic & transport - permanent	1	-1	3	1	-1	3
Legislative & consenting	3	1	-3	4	2	0
Constructability	-2	-1	-1	-2	-1	-1
Civil design & utility impacts	-4	-3	-3	-3	-2	-1
Urban design	-1	-3	-4	1	-3	-4
Landscape	-2	-2	-3	-2	-1	-2
Visual	-3	-2	-3	-2	-2	-2
Ecology	-1	-1	-3	0	0	-2
Acoustics & vibration	-2	-2	-2	-1	-1	-1
Stormwater & flooding	-1	-1	-1	0	0	0
Social impact	1	1	0	2	2	1
Property	-4	-4	-2	-4	-4	-2

7.4 Sensitivity analysis of MCA outcomes

Following the MCA workshop, a weightings and sensitivity analysis were undertaken by the EBA and SMEs from AT.

Weighting and sensitivity analysis considered whether a different outcome would be achieved if different emphasis was applied to the MCA criteria. The MCA Criteria are set out in **Appendix 4**. The following categories were applied to the weighting of the options:

- Equal Weighting.
- Safety.
- Transport.
- Environmental.
- Effects.
- Cost.

When undertaking the weighting analysis, 50% weighting was applied to the specific criteria grouping, apart from the equal weighted scenario where all groupings were given equal weighting. To undertake the sensitivity analysis, the assessment criteria from the MCA has been grouped for the application of weighting. Table 13 below shows how the assessment criteria have been grouped.

Table 12 Grouping of assessment criteria.

Grouping of assessment criteria for weighted analysis	
Grouping	MCA Criteria
Safety	Provide transport infrastructure that is safe for everyone
Transport Benefits	Provide a multimodal transport corridor that connects Pakuranga and Botany to the wider network and increases choice of transport options
	Provide transport infrastructure that integrates with existing land use and supports a quality, compact urban form
	Contribute to accessibility and place shaping by providing better transport connections between, within and the town centres
	Provide transport infrastructure that improves linkages, journey time and reliability of the public transport network
	Safeguard future transport infrastructure required at (or in vicinity of) Botany Town Centre to support development of a strategic public transport connection to Auckland Airport
Environmental	Legislative and Consenting Considerations
	Natural environment/ ecological effects
	Social effects
Effects	Constructability
	Transportation Effects
	Built Environment
Costs	Cost (Property and construction)

Of note **Bus Station Option 6** ranked best across all weighting categories with Option 13 ranking second. Of the Link Road options, the weighting identified **Option 3 and 1** as the best and second best performing options respectively across all of the categories except cost weighting where Link Road Option 1 was the lowest performing option.

The following table provides an overview of the outcome of weighting and sensitivity analysis based on the identified categories above.

Table 13. EB4 Weighting and Sensitivity Analysis

Scoring results – Equal weighting applied		
Ranking	Bus Station Option	Link Road Option
1	Option 6 – Central platform in AMP site	Option 3 – Guy’s Reserve
2	Option 13 – Alternative Guy’s Reserve	Option 1 – Ti Rakau/ Te Irirangi Drive
3	Option 4 – Variant of A2B offline preferred	Option 2 – Te Koha Road
4	Option 5 – Offline ‘Hash Brown’ in AMP site	
5	Option 9 – Offline Guy’s Reserve	
6	Option 8 – Grade separated	
Scoring results – Safety weighting applied		
Ranking	Bus Station Option	Link Road Option
1	Option 6 – Central platform in AMP site	Option 3 – Guy’s Reserve
2	Option 4 – Variant of A2B offline preferred	Option 1 – Ti Rakau/ Te Irirangi Drive
3	Option 13 – Alternative Guy’s Reserve	Option 2 – Te Koha Road
4	Option 9 – Offline Guy’s Reserve	
5	Option 5 – Offline ‘Hash Brown’ in AMP site	
6	Option 8 – Grade separated	
Scoring results – Transport weighting applied		
Ranking	Bus Station Option	Link Road Option
1	Option 6 – Central platform in AMP site	Option 3 – Guy’s Reserve
2	Option 4 – Variant of A2B offline preferred	Option 1 – Ti Rakau/ Te Irirangi Drive
3	Option 13 – Alternative Guy’s Reserve	Option 2 – Te Koha Road
4	Option 9 – Offline Guy’s Reserve	
5	Option 5 – Offline ‘Hash Brown’ in AMP site	
6	Option 8 – Grade separated	
Scoring results – Environmental weighting applied		
Ranking	Bus Station Option	Link Road Option
1	Option 6 – Central platform in AMP site	Option 3 – Guy’s Reserve
2	Option 13 – Alternative Guy’s Reserve	Option 1 – Ti Rakau/ Te Irirangi Drive
3	Option 4 – Variant of A2B offline preferred	Option 2 – Te Koha Road
4	Option 5 – Offline ‘Hash Brown’ in AMP site	
5	Option 9 – Offline Guy’s Reserve	
6	Option 8 – Grade separated	
Scoring results – Effects weighting applied		
Ranking	Bus Station Option	Link Road Option
1	Option 6 – Central platform in AMP site	Option 3 – Guy’s Reserve
2	Option 13 – Alternative Guy’s Reserve	Option 1 – Ti Rakau/ Te Irirangi Drive
3	Option 4 – Variant of A2B offline preferred	Option 2 – Te Koha Road
4	Option 5 – Offline ‘Hash Brown’ in AMP site	
5	Option 9 – Offline Guy’s Reserve	
6	Option 8 – Grade separated	
Scoring results – Cost weighting applied		
Ranking	Bus Station Option	Link Road Option
1	Option 6 – Central platform in AMP site	Option 3 – Guy’s Reserve
2	Option 13 – Alternative Guy’s Reserve	Option 2 – Te Koha Road
3	Option 4 – Variant of A2B offline preferred	Option 1 – Ti Rakau/ Te Irirangi Drive

4	Option 9 – Offline Guy’s Reserve	
5	Option 5 – Offline ‘Hash Brown’ in AMP site	
6	Option 8 – Grade separated	

The emerging technically preferred option for the bus station is Option 6 and for the Link Road it is Option 3. The second-best performing options are Option 13 for the bus station and Option 1 for the link road.

To provide further sensitivity testing an analysis of the two best performing options from the station options and the link road options was undertaken so that a combined EB4 Scheme could be assessed to ensure there were no perverse outcomes when combined that could not be identified when assessed as independent components.

8 Combined Options Assessment (post workshop)

Technical assessors were asked to undertake further assessment of four combined options for EB4. The combined options are noted in Table 15 below.

Table 14. EB4 Combined Options for Assessment

Combined Options		
Option	Bus Station	Link Road
A	Option 6 – Central platform in AMP site	Option 3 – Guy’s Reserve
B	Option 6 – Central platform in AMP site	Option 1 – Ti Rakau Drive/ Te Irirangi Drive
C	Option 13 – Alternative Guy’s Reserve	Option 3 – Guy’s Reserve
D	Option 13 – Alternative Guy’s Reserve	Option 1 – Ti Rakau Drive/ Te Irirangi Drive

Drawings of the combined options are provided in **Appendix 3**. The drawings have been extracted and are provided below.

8.1 Combined Options

8.1.1 Option A (Bus Station Option 6 and Link Road Option 3)



Figure 3. Bus Station Option 6 and Link Road Option 3

8.1.2 Option B (Bus Station Option 6 and Link Road Option 1)



Figure 4. Bus Station Option 6 and Link Road Option 1

8.1.3 Option C (Bus Station Option 13 and Link Road Option 3)



Figure 5. Bus Station Option 13 and Link Road Option 3

8.1.4 Option D (Bus Station Option 13 and Link Road Option 1)



Figure 6. Bus Station Option 13 and Link Road Option 1

8.2 Combined Options Scores and Assessment

An additional assessment of the combined options was undertaken based on a limited range of factors compared to the original MCA. The specific assessment factors were selected by EBA based on their likelihood to generate cumulative effects and related considerations. The purpose of this assessment was to consider how the Bus Station Options and Link Road options would perform when considered together. To this end the mitigated options were selected to take forward in this stage of the options assessment.

Error! Reference source not found. Table 16 shows the scores provided for the combined options.

Table 15. Combined Option Scores

EB4 Bus Station Scores - non weighted				
With mitigation				
	Option A	Option B	Option C	Option D
	BS6 + Guy's Reserve	BS6 + Ti Rakau Dr	BS13 + Guy's Reserve	BS13 + Ti Rakau Dr
Busway & bus station ops	5	3	3	2
Traffic & transport - temp	-2	-3	-1	-2
Traffic & transport - permanent	3	2	4	3
Legislative & consenting	0	4	2	0
Construction	-2	-2	-2	-3
Urban design	-2	1	-4	-3
Landscape	-1	0	-2	-2
Visual	-2	-2	-3	-2
Ecology	-2	0	-2	-1
Acoustics & vibration	-1	-1	-1	-1
Social impact	3	3	1	1

The following table provides the assessment of the combined options, along with the scores provided.

Table 16. EB4 Combined Options Scores and Assessment

EB4 Combined Options Assessment					
Area of assessment	Scores (mitigated)				Summary of assessment
	A	B	C	D	
Bus Operations	5	3	3	2	<p>Option A is considered to provide the best operational performance against the matters considered. The station is legible, providing easy same level interchange between connecting bus services.</p> <p>The link road with this option provides a congestion free dedicated link for buses offering high reliability and fast travel times. This combined option has the lowest operational costs in terms of bus kilometres travelled.</p> <p>Option B provides a station that is legible and provides easy same level interchange between connecting bus services. The link road with this option would likely result in unreliable travel times due to the need for buses to pass through four intersections including Ti Rakau Drive/ Te Irirangi Drive intersection. This combined option has the second lowest operational costs in terms of bus kilometres travelled.</p> <p>Option C provides a station that is legible and provides easy same level interchange between connecting bus services. The station is located to the west of Te Irirangi Drive, which could diminish customer experience and generate potential CPTED issues due to its location away from the main centre of activity. This station option does not provide schedule adherence bays or drive rest stops which will result in increased operational costs and</p>

					<p>reduced resilience². The link road with this option provides a congestion free dedicated link for buses offering high reliability and fast travel times. This combined option has the second highest operational costs in terms of bus kilometres travelled.</p> <p>Option D provides a station that is legible and provides easy same level interchange between connecting bus services. The station is located to the west of Te Irirangi Drive, which could diminish customer experience and generate potential CPTED issues due to its location away from the main centre of activity. This station option does not provide schedule adherence bays or drive rest stops which will result in increased operational costs and reduced resilience. The link road with this option would likely result in unreliable travel times due to the need for buses to pass through four intersections including Ti Rakau Drive/ Te Irirangi Drive intersection. This combined option has the highest operational costs in terms of bus kilometres travelled.</p>
Transport Effects (permanent)	3	2	4	3	<p>For all options, it is noted that property access can be maintained, albeit with additional delays. It is also noted that the options that provide a bus station in Botany Town Centre (Options A and B) will result in a permanent loss of car parking.</p> <p>In terms of reliability, it is considered that Options A and C perform better as the link road to the bus station travels offline via Guy's Reserve. Options B and D would have the link road running along the centre of Ti Rakau Drive/ Te Irirangi Drive, requiring buses to interact with numerous intersections.</p>
Transport Effects (temporary)	-2	-3	-1	-2	<p>Option A will have temporary transport effects for the car park at Botany Town Centre. During construction a large area of the car park will not be available for use. Access during construction will be required from Te Irirangi Drive which will likely result in localised impacts to the road network. Impacts associated with the link road construction will be less than other Link Road Options, and likely localised to Ti Rakau Drive and Te Koha Road intersections.</p> <p>Option B will have significant impacts to Ti Rakau Drive and Te Irirangi Drive during construction due to the high number of vehicles that use these roads. Complex traffic management arrangements will be required, with difficulties in maintaining suitable pedestrian and cycling facilities during construction. The impact upon the car park at Botany Town Centre are consistent with Option A.</p> <p>Option C has the least impactful temporary transport effects as the majority of construction is offline. Any effects upon the transport network would be localised and generally relate to access to and from construction areas.</p> <p>Option D will have significant impacts to Ti Rakau Drive and Te Irirangi Drive during construction due to the high number of vehicles that use these roads. Complex traffic management arrangements will be required, with difficulties in maintaining suitable pedestrian and cycling facilities during construction. Construction impacts for the bus station in Guy's Reserve would be localised.</p>
Construction	-2	-2	-2	-3	<p>The constructability assessment considered a range of factors, including health and safety, environmental impacts, resourcing, access and proximity to residential and community buildings for example.</p> <p>Option A does perform the best when the scores are not rounded out, with Option D performing the worst. Options B and C score similarly.</p>
Urban Design	-2	1	-4	-3	<p>Option A provides a bus station which has a reasonably compact form with pedestrian overbridge that aligns with main entrance to Botany Town Centre. The link road will have an impact upon Guy's Reserve, with loss of open space. This also results in reduced connectivity between The Hub and Guy's Reserve.</p>

² Resilience - being the ability to meet forecast public transport service demand and to provide operational flexibility that supports alternative bus operating strategies and growth beyond 2048

					<p>Option B bus station is the same as Option A. The link road for this option utilises the existing road corridor, avoiding impacts upon Guy's Reserve.</p> <p>Option C provides a bus station within Guy's Reserve, with it becoming a dominating factor within the existing open space. This option also provides the link road within the reserve, further reducing available open space.</p> <p>Option D provides a bus station within Guy's Reserve, with it becoming a dominating factor within the existing open space. The link road is located within the existing road corridor, avoid additional impacts upon Guy's Reserve.</p>
Landscape	-1	0	-2	-2	<p>Options A, C and D have an impact on vegetation in Guy's Reserve and on wetlands/stormwater pond.</p> <p>Option B has impacts upon vegetation within the road corridor. Given Option B's location within the road corridor this option was considered to have less impact on Landscape Criteria than the other options which have impacts on Guys Reserve.</p>
Visual	-2	-2	-3	-2	<p>Option A will have a visual impact on the residential properties to the south of Guy's Reserve.</p> <p>Option B will result in the road corridor being widened, potentially having adverse visual effects. Additionally, there will be visual impact on the retirement village north of Haven Drive and a potential visual amenity impact on housing to the North of Ti Rakau Drive.</p> <p>Option C will have impacts upon Guy's Reserve from a visual and landscape perspective. The residential properties to the south will have their existing views modified. The bus station will have a potentially significant adverse visual effect on the retirement village.</p> <p>Option D will have impacts upon Guy's Reserve from a visual and landscape perspective. The residential properties to the south will have their existing views modified. The bus station will have a potentially significant adverse visual effect on the retirement village.</p>
Ecological	-2	0	-2	-1	<p>Option A and Option C have a similar level of effect in relation to ecology due to the provision of infrastructure within Guy's Reserve. Option A provides the link road in the reverse, whilst Option C provides the link road and bus station in the reserve.</p> <p>Option B does not interact with Guy's Reserve, having a low impact upon ecology.</p> <p>Option D provides a bus station adjacent to the existing stormwater pond within Guy's Reserve. It is assumed that the bus station will be on a structure just above the pond, with the operational capacity not impacted.</p>
Acoustics	-1	-1	-1	-1	<p>Option A will result in the provision of new noise sources within Guy's Reserve (link road). This may change the acoustic perceptibly for adjacent residential properties.</p> <p>Option B will result in the widening of Ti Rakau Drive, resulting in noise sources moving closer to residential receivers. This may result in a perceptibly change to the acoustic environment for impacted residential receivers along the road corridor.</p> <p>Option C will result in both the link road and bus station being placed within Guy's Reserve. This could result in a perceptibly change to the acoustic environment for adjacent residential receivers, especially to the south.</p> <p>Option D requires the widening of the existing road corridor and the placement of the bus station in Guy's Reserve. This will result in noise sources being brought closer to residential receivers, potentially resulting in a perceptibly change to the acoustic environment.</p>

<p>Social Impact</p>	<p>3</p>	<p>3</p>	<p>1</p>	<p>1</p>	<p>Option A will result in a permanent impact upon Guy’s Reserve, altering the amenity and usability of the space. The existing walking connecting within the reserve will be permanently severed unless mitigation is provided to maintain the connection (whether detailed design could consider design solutions to maintain pedestrian connectivity around the pond area). The link road with this option does not include a walking/cycling connection along the alignment. The location of the bus station is considered to have minimal impact on existing business during construction and once operational. It is noted that the bus station would reduce available car parking at the Town Centre, however this is offset by new Public Transport provision.</p> <p>Option B does not have an impact upon Guy’s Reserve. Improved walking and cycling connections are provided along Te Irirangi Drive/ Ti Ruaku Drive to Botany Town Centre. During construction this option will have major impacts along Te Irirangi Drive/ Ti Rakau Drive, potentially affecting the efficient operation of businesses. The location of the bus station is considered to have minimal impact on existing business during construction and once operational. It is noted that the bus station would reduce available car parking at the Town Centre, however this is offset by new Public Transport provision.</p> <p>Option C will have a significant impact upon Guy’s Reserve, with the link road and bus station occupying land currently used as open space. Business land and/or operations are generally unaffected by this option. This option does not provide a walking and cycling connection along the alignment of the link road. Furthermore, this option will sever the existing north-south walkway within Guy’s Reserve.</p> <p>Option D will result in a reduction in open space due to the placement of the bus station in Guy’s Reserve. The link road for this option travels via Te Irirangi Drive/ Ti Rakau Drive, resulting in an impact upon existing businesses during construction. This option does provide enhanced walking and cycling connection to Botany Town Centre.</p>
<p>Legislative and consenting</p>	<p>0</p>	<p>4</p>	<p>2</p>	<p>0</p>	<p>Option A has the potential to interact with an existing stream, resulting in works within or adjacent to the stream/ wetlands. This option also has impacts upon the car park of Botany Town Centre.</p> <p>Option B avoids area of ecological value, including streams/wetlands within Guy’s Reserve. The alignment of the link road is contained within the existing transport corridor with the bus station placed on land used for car parking. This option is considered easier to consent as it avoids areas of ecological value.</p> <p>Option C has the highest ecological impacts, placing both the link road and bus station within Guy’s Reserve, adjacent to the stream/ wetland and stormwater pond. This option also has the greatest impact upon open space.</p> <p>Option D generally avoids impacts upon the stream/ wetlands within Guy’s Reserve but will result in a reduction in open space due to the placement of the bus station. The link road would be located within the existing transport corridors, reducing the spread of effects outside of these corridors.</p>

The combined assessments did not identify any cumulative effects with Options A, B, C or D.

8.2.1 Combined Options weighting and sensitivity analysis

As with the individual assessment of options, weighting and sensitivity analysis was also undertaken for the combined options to see if a different outcome would be achieved if different emphasis was applied to the MCA criteria. The following categories were applied to the weighting of the options:

- Equal Weighting.
- Safety.
- Transport.
- Environmental.
- Effects.
- Cost.

The following table provide an overview of the outcome of weighting and sensitivity analysis based on the identified categories above.

Table 17. Combined Options Weighting Outcome

Scoring results – Equal weighting applied	
Ranking	Combined Option
1	Option A (Bus Station Option 6, Link Road Option 3)
2	Option B (Bus Station Option 6, Link Road Option 1)
3	Option C (Bus Station Option 13, Link Road Option 3)
4	Option D (Bus Station Option 13, Link Road Option 1)
Scoring results – Safety weighting applied	
Ranking	Combined Option
1	Option C (Bus Station Option 13, Link Road Option 3)
2	Option A (Bus Station Option 6, Link Road Option 3)
3	Option B (Bus Station Option 6, Link Road Option 1)
4	Option D (Bus Station Option 13, Link Road Option 1)
Scoring results – Transport weighting applied	
Ranking	Combined Option
1	Option A (Bus Station Option 6, Link Road Option 3)
2	Option B (Bus Station Option 6, Link Road Option 1)
3	Option C (Bus Station Option 13, Link Road Option 3)
4	Option D (Bus Station Option 13, Link Road Option 1)
Scoring results – Environment weighting applied	
Ranking	Combined Option
1	Option B (Bus Station Option 6, Link Road Option 1)
2	Option A (Bus Station Option 6, Link Road Option 3)
3	Option D (Bus Station Option 13, Link Road Option 1)
4	Option C (Bus Station Option 13, Link Road Option 3)
Scoring results – Effects weighting applied	
Ranking	Combined Option
1	Option A (Bus Station Option 6, Link Road Option 3)
2	Option C (Bus Station Option 13, Link Road Option 3)
3	Option B (Bus Station Option 6, Link Road Option 1)
4	Option D (Bus Station Option 13, Link Road Option 1)
Scoring results – Cost weighting applied	

Ranking	Combined Option
1	Option A (Bus Station Option 6, Link Road Option 3)
2	Option C (Bus Station Option 13, Link Road Option 3)
3	Option B (Bus Station Option 6, Link Road Option 1)
4	Option D (Bus Station Option 13, Link Road Option 1)

Other than safety or environmental weighted scores, Option A (combination of bus station Option 6, with link road Option 3) performs best. For safety, Option C performs best due to the reduced level of interaction this option has with the road network. Option B scores best for environmental weighting as it avoids impacts upon Guy’s Reserve.

Overall, the preferred option identified by the Technical Assessors in the Combined Options Assessment is **Option A**. This is because although it did not perform best on the safety or environmental weighted scores, this option performed best on the transport effects and cost weighted scores and when an equal weighting is applied. In addition, the MCA showed that the options considered did not present adverse impacts that could not be addressed or managed under the RMA. Mitigation could also be incorporated into the design in most cases to reduce the adverse effects of the options being considered.

9 Mana Whenua

The EBA presented the options for EB4 to mana whenua on 25 February 2021 (via Microsoft Teams). This presentation included a description of the geographic and system context for the area and described the possible station location with the town centre and the possible busway locations.

Mana whenua requested that an additional workshop be held to further understand the details presented on EB4. This additional workshop was held on 9 March 2021, the day prior to the MCA workshop.

The options for EB4 were discussed in further detailed at this workshop.

Comments and discussions of note from this workshop included:

- EBA and Mana Whenua will need to develop appropriate processes and systems including a robust Cultural Monitoring Plan which will outline steps for who / what / when / why / where / how things will be managed during construction.
- Mana Whenua identified that the project should utilise existing infrastructure wherever possible.
- Mana Whenua identified that they want to be involved in stormwater design for the project which are to be the focus of future workshops.
- Mana Whenua requested that at the next hui that Environmental Specialists from the EBA present to Mana Whenua to discuss how they have assessed options and how they have considered mana whenua values.

The EBA presented the findings from the EB4 MCA workshop to the Mana Whenua forum on 25 March 2021. At this hui the EBA also presented an overview of the Urban Design, Transport and Ecological considerations for the EB4 area and were supported by EBA specialists from the Design, RMA Planning and Busway Operation Teams. The combined Option A consisting of Bus Station Option 6 and the Guys Reserve Link Option 3 was presented to mana whenua as the emerging technically preferred option.

The Mana Whenua Forum identified that the key issue for all options considered is the management of stormwater and the potential impact on water quality in the catchment. The workshop noted that further design work is to be undertaken in respect of stormwater management and that this will be a future topic for engagement with the forum.

The presentations to mana whenua are attached at **Appendix 6**.

10 Assessment Outcomes and Recommendations

10.1 Summary of Options Analysis

A robust and replicable process has been adopted in the consideration of the EB4 options for the bus station and link road. The options assessment has been undertaken as part of the detailed Business Case for the Project and also meets the requirements for the consideration of alternatives prescribed by the RMA.

All options scored positively against the Project Objectives and positive impacts of the options were also presented in terms of Busway performance and permanent transport effects.

The options located within private property (the AMP site, the Hub) scored negatively against property considerations. Station options 8, 9 and 13 and link road option 3 also scored negatively against the ecological and legislative criteria recognising that environmental mitigation will be required if these options are to be progressed.

Four combined bus station and link road options were assessed, with no cumulative issues identified.

Overall, the MCA showed that the options considered did not present adverse impacts that could not be addressed or managed under the RMA. Mitigation could also be incorporated into the design in most cases to reduce the adverse effects of the options being considered.

Following the MCA workshop and sensitivity analysis station **Option 6** and link road **Option 3** emerged as the technically preferred options for EB4.

10.2 Recommendations

Following the MCA Workshop, the Alliance Leadership Team (ALT) met on 12 March 2021 to discuss the findings, review the options against the Project's KRA's, identify risk and to select a technically preferred option for endorsement by the Interim Project Alliance Board (IPAB).

10.2.1 ALT consideration and recommendation

In addition to the outcome of the MCA, the ALT also considered the following matters in the process of selecting a preferred option. The below factors have been applied to the decision-making process by the ALT to provide additional points of differentiation between the proposed options:

- Assessments and scoring undertaken by the technical assessors.
- KRA's³.
- Cost (further consideration of the Property, Construction and Operations costs as detailed in the MCA scoring sheets attached at Appendix 4).

The outcome of this meeting was that the ALT selected station **Option 6** and link road **Option 3** as the technically preferred scheme to be recommended to the IPAB.

The legal team requested that to close a potential gap in our analysis, the options that were the top two performing for both the station and the link road should be assessed as combined options (being a total

³ The Eastern Busway Key Result Areas (KRA's) are: Safe and Well; Collaborative Culture; Customer experience; Sustainability; Community and Partners; Commercial and Project Controls and Legacy. The purpose of the Key Result Areas (KRA's) is to drive outstanding performance within the Alliance to achieve the broader project objectives, benefits and outcomes.

of four options). This was to ensure that the combined EB4 schemes (link road and stations) do not generate any cumulative adverse effects that are not evident when assessing them individually.

10.2.2 Consideration of combined schemes

The four combined options have been considered by technical assessors, using the same range of assessment considerations as before. The assessment of the combined options has not shown any unexpected outcomes or cumulative impacts. The preferred option from the combined scheme assessment is consistent with the outcomes from the separate options assessments as detailed at section 7.2.1 of this report being the selection of Bus Station 6 and Link Road Option 3. The combination of Bus Station Option 6 and Link Road Option 3 was assessed in the combined option assessment as **Option A** and as a result of the assessment was considered to be the preferred option,

10.2.3 IPAB recommendation

The IPAB considered the recommendation made by the ALT on 25 March 2021. The IPAB agreed with the recommendation presented.

The IPAB's agreement with the ALT recommendation for Link Road Option 3 included in depth discussion relating to design, mitigation of effects and consentability of the option in relation to potential impacts on wetlands within Guy's Reserve.

Based on the above, the IPAB endorsed **Station Option 6 and Link Road Option 3 (Combined Option A)** as the technically preferred scheme to be taken forward for design development.

Appendix 1: Long List Options Assessment

Screening assessment for EB4 long list options.

