

# Newmarket Level Crossing

## Scheme Assessment Report

Prepared by:

**Public Transport Capital Improvements**

**Newmarket Level Crossing Removal**

**Document Information**

Client	Auckland Transport
Title	Newmarket Level Crossing Scheme Assessment Report
Prepared by	Public Transport Capital Improvements
Date	September 2013

**Document Register**

Issue	Description	Prepared by	Reviewed by	Authorised by	Date
001	DRAFT v1	David Wilkie	Adrian Price		April 2013
002	DRAFT v2	Adrian Price	Nick Seymour		August 2013
003	FINAL	Adrian Price	Nick Seymour		September 2013

## Glossary

Auckland Council	(AC)
Auckland Transport	(AT)
Auckland Transport Board	(Board)
Auckland Plan	(AP)
Benefit Cost Ratio	(BCR)
City Rail Link	(CRL)
Do Minimum	(DM)
Electric Multiple Unit	(EMU)
Financial Year	(FYR)
KiwiRail Holdings Limited	(KHL)
Long Term Plan	(LTP)
New Zealand Transport Agency	(NZTA)
Notice of Requirement	(NoR)
Outline Plan of Works	(OPW)
Public Transport	(PT)
Public Transport User Benefits	(PTUB)
Resource Management Act	(RMA)
Road User Benefits	(RUB)
Sarawia Street Crossing Removal	(Project)
Scheme Assessment Report	(SAR)
Waitemata Local Board	(Local Board)

## Executive Summary

This Scheme Assessment Report presents an overview of the work carried out to date on the proposal to remove the rail level crossing located at Sarawia Street, Newmarket, and provide an alternative access option for the residents of Laxon Terrace and Youngs Lane. Information from reports on the removal of this crossing dating back to 2004 have been utilised to provide a summary of the alternative access options and to generate a business case for removal of the rail at-grade level crossing.

Auckland Transport PT Capital Improvements have worked with AT Property, Auckland Council, Waitemata Local Board, KiwiRail and other external consultants to prepare this report.

The Do Minimum option for the purpose of generating a business case is complex. Through consultation with KiwiRail and AT PT Operations it has been established that in order to facilitate planned future improvements to the Auckland metro network following the introduction of Electric Multiple Unit (EMU) train services, the crossing needs to be removed. Retaining the at-grade crossing would result in high risk of significant delays and decreased resiliency to recover from delays for the Auckland rail network.

The preferred option is a road over rail bridge from Cowie Street that links with the northern end of Laxon Terrace and is estimated to cost \$5.72m.

This option provides the following benefits:

- Minimising overall traffic network change
- Provides an improved quality of unimpeded access
- Provides additional access to the northern end of Newmarket Park, including Parnell Tunnel
- Complements the possible Greenway cycle and walking link
- Provides the necessary improved rail network resilience to allow the introduction of the planned higher-frequency timetable
- Removes safety issues that are generated by at-grade level crossings

The BCR for this option is 1.8.

As a result of the information gathered and consultation carried during the preparation of this report and the reports previous, it is recommended that the Cowie Street Bridge option be implemented at an estimated cost of \$5.72m.

# Table of Contents

<b>Glossary.....</b>	<b>3</b>
<b>Executive Summary.....</b>	<b>4</b>
<b>Table of Contents.....</b>	<b>5</b>
<b>Background .....</b>	<b>7</b>
Problem Description .....	7
Site Description – Context .....	7
Previous Investigation / Reports.....	8
Recent Investigation .....	9
Traffic Counts.....	9
Road Network Assessment .....	11
Planning Assessment .....	12
Option 1: Cowie Street Bridge – Planning Assessment.....	12
Option 2: Furneaux Way Connection – Planning Assessment.....	13
Option 3: Newmarket Park through Road – Planning Assessment .....	13
Option 4: Underpass – Planning Assessment .....	14
Stakeholder Relationship Management and Engagement .....	14
Letter Drop.....	14
Stakeholder Meeting (Broadway Park Residents Society).....	15
Public Forum .....	16
Website .....	16
Land Acquisition.....	17
<b>Defining the Options .....</b>	<b>18</b>
Do Minimum .....	18
Overbridges.....	20
Newmarket Park Roads.....	21
Furneaux Way Connections .....	22
Parnell Road Connections (Mobil) .....	23
Developed Options .....	24
Option 1: Cowie Street Bridge .....	24
Option 2: Furneaux Way – Shared Single Lane Road.....	25

**Newmarket Level Crossing Removal**

Option 3: Newmarket Park through Road .....	27
Option 4: Sarawia Street to Laxon Terrace Underpass.....	28
<b>Evaluation .....</b>	<b>30</b>
Assessment .....	30
Rail Patronage.....	30
Time/Distance changes for Vehicles and Pedestrians .....	31
Cost Estimates.....	32
Economic Outcome / Benefits .....	34
Sensitivity Analysis.....	35
Community Impact Evaluation.....	36
Explanation of Criteria and Scoring.....	36
<b>Results of Stakeholder Engagement.....</b>	<b>39</b>
<b>Conclusions and Recommendations.....</b>	<b>40</b>
Recommendation.....	40
<b>Appendix .....</b>	<b>41</b>
1. Traffic Analysis .....	41
2. RMA Scoping Report .....	41
3. Stakeholder Management and Engagement .....	41
4. Legal Advice .....	41
5. Crime Prevention Through Environment Design Report .....	41
6. Developed Option Information.....	41
7. Business Case Report .....	41
1. Traffic Analysis .....	42
2. RMA Scoping Report .....	43
3. Stakeholder Management and Engagement .....	44
4. Legal Advice .....	45
5. Crime Prevention Through Environmental Design Report .....	46
6. Developed Option Information.....	47
7. Business Case Report .....	48

## Background

### Problem Description

The rail level crossing connecting Sarawia Street to Laxon Terrace in Newmarket provides the only vehicle access into and out of Laxon Terrace and Youngs Lane. This crossing has the highest volume of rail movements of any crossing in New Zealand and is the most complex, involving twelve different train approaches and three platform interactions with Newmarket Station.

The crossing has been identified as a significant restriction on rail operational performance and planned 2015 timetable frequency improvements following the introduction of EMU services. These train frequency improvements cannot feasibly proceed while the crossing is in place. This is primarily due to KiwiRail signalling safety restrictions, which do not allow trains travelling from Newmarket to Britomart stations to approach the signals adjacent to the crossing because of the steep grade and subsequent risk that a train may overrun the crossing while the barrier arms are up.

If the crossing is removed this safety restriction could be lifted allowing trains to wait at the Sarawia Street signals, adding the equivalent of an additional platform's capacity to Newmarket Station and removing the current additional headway times required while trains are held at Newmarket Station waiting for the barrier arms to be lowered.

However if the Sarawia Street crossing remains, while the new, higher frequency timetable could be introduced, it would have no resilience to recover from delays and maintaining reliable services would be extremely difficult. The planned development of Parnell Train Station would exacerbate this further.

The faulty operation of the crossing itself also introduces the risk of delay considering its critical location on a busy stretch of the Auckland network. Four delay incidents involving the crossing's operation were recorded since July 2012, the most recent in April 2013 due to vandalism of the barrier arm which resulted in the cancellation of four services.

### Site Description – Context

The Sarawia Street rail level crossing is located less than 1km north of Newmarket Station. Sarawia Street itself is connected to Parnell Road to the north west and services Laxon Terrace and Youngs Lane to the south east. Laxon Terrace and Youngs Lane are each no exit public roads that house a total of 52 dwellings combined.

Newmarket Station accommodates a high frequency of services from all parts of the Auckland metro network. Also adding to the rail complexity and risk of congestion in the Newmarket area are the Newmarket Triangle, Parnell Tunnel and the future Parnell Station.

The crossing not only provides the single means of vehicle access to Laxon Terrace and Youngs Lane, it provides pedestrian and cycle access to the adjacent Newmarket Park from the north.

**Newmarket Level Crossing Removal**

Pedestrian access to Laxon Terrace and Youngs Lane is via the level crossing, through Newmarket Park, and also from the south by way of a public access path that connects Laxon Terrace with Furneaux Way, a private road under the control of the Broadway Park Residents Society.

**Figure 01: Sarawia Street Rail Level Crossing Location**



**Previous Investigation / Reports**

Investigation into the removal of this level crossing dates back to 2004. There have been numerous reports commissioned to outline the various options available if and when the crossing was to be removed. These reports are as follows:

- *Railway Level Crossings Study Final Report 2004* (prepared by Opus for Auckland City Council)

## **Newmarket Level Crossing Removal**

---

- *Realignment of Sarawia Street – Newmarket 2007* (prepared by URS for Auckland City Council)
- *Justification Report for the closure of Sarawia Street Level Crossing and replacement with a new over bridge at Cowie Street 2011* (prepared by Opus/Fulton Hogan for KiwiRail)
- *Laxon Terrace Grade Separation Alternative Access Options Report 2012* (prepared by Opus for Auckland Transport)

### **Recent Investigation**

Auckland Transport have studied the previous reports and have progressed the findings from both the '*Justification Report for the closure of Sarawia Street Level Crossing and replacement with a new over bridge at Cowie Street 2011*' and '*Laxon Terrace Grade Separation Alternative Access Options Report 2012*'.

This progression has involved the refinement of the favoured options, by way of design changes, cost estimates, pedestrian access requirements, resource consent requirements, benefit cost ratio calculations and transportation assessments, each of which are explored in more detail throughout the body of this report and its appendices.

Four options have been subject to detailed analysis and are considered to feasibly allow closure of the crossing whilst providing alternative vehicle, cycling and pedestrian access to Laxon Terrace, Youngs Lane and Newmarket Park:

- **Option 1:** Removal of the Crossing and construction of a two-lane road bridge from Cowie Street to Laxon Terrace.
- **Option 2:** Replacement of the Crossing with a pedestrian/cycle bridge located at Cowie or Sarawia Street and accommodating vehicle traffic to/from Laxon Terrace by expanding an existing walkway to a double (Option 2a) or single (Option 2b) lane road connecting to Furneaux Way, a private road.
- **Option 3:** Replacement of the Crossing with a pedestrian/cycle bridge located at Cowie or Sarawia Street and construction of a two-lane road from Laxon Terrace through Newmarket Park to Ayr Street
- **Option 4:** Replacement of the Crossing with a two-lane underpass running from Sarawia Street to Laxon Terrace.

Option 4 was initially not considered for further developed analysis, but was re-investigated subsequently at the request of the Parnell Community Committee.

### **Traffic Counts**

Vehicle and pedestrian counts were carried out at three points around Laxon Terrace to determine the daily usage of the important streets in the context of this report. The tables below identify daily vehicle rates for Laxon Terrace and Youngs Lane (fig. 02), Furneaux Way (fig. 03), and Cowie Street (fig. 04).

---

**Newmarket Level Crossing Removal**

The results are a snapshot of the vehicle traffic counts taken over a week long period in June 2012. The numbers identify the Laxon Terrace and Youngs Lane traffic volumes as around 400 cars per day, Cowie Street at a similar number and Furneaux Way close to 200.

The District Plan indicates that Local Roads can generally be expected to carry less than 1000 vehicles per day but can support up to 5000 vehicles per day if required. Any combination of these roads will fall well within that limit. All roads involved in the options are considered low use, both currently and after the implementation of any of the short-listed options.

Refer to Appendix section one for a full breakdown of the vehicle and pedestrian counts.

*Figure 02: Vehicle Count Breakdown – Laxon Terrace and Youngs Lane*

Measured at # 16 Sarawia Street							
	Weekday (5 day) Average	Full Week (7 day) Average	Sat Total	Sun Total	0700-0900 Max Hr	1200-1400 Max Hr	1600-1800 Max Hr
Bi-Directional	381	425	320	*697	38	50	39
Northbound	188	209	161	343	21	34	22
Southbound	193	216	159	354	24	19	20

*Figure 03: Vehicle Count Breakdown – Furneaux Way*

Measured at # 38F James Cook Crescent							
	Weekday (5 day) Average	Full Week (7 day) Average	Sat Total	Sun Total	0700-0900 Max Hr	1200-1400 Max Hr	1600-1800 Max Hr
Bi-Directional	220	217	213	205	29	30	26
Northbound	104	102	96	99	9	11	16
Southbound	116	115	117	106	22	19	14

*Figure 04: Vehicle Count Breakdown – Cowie Street*

Measured at # 2 Cowie Street							
	Weekday (5 day) Average	Full Week (7 day) Average	Sat Total	Sun Total	0700-0900 Max Hr	1200-1400 Max Hr	1600-1800 Max Hr
Bi-Directional	370	409	402	*670	37	45	44
Northbound	186	205	199	329	26	24	18
Southbound	184	204	203	341	11	21	26

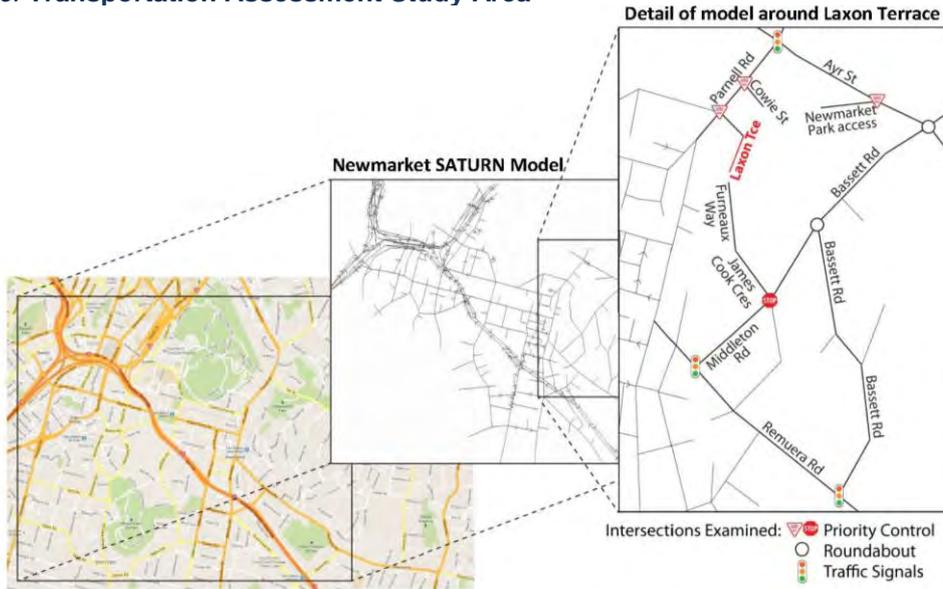
\* These Sunday totals on Sarawia Street and Cowie Street were larger than can be expected and measured again over a 10 hour period to establish more reliable daily limits.

**Newmarket Level Crossing Removal**

**Road Network Assessment**

As well as including the economic impact of increased journey times for road users in the benefit cost analyses for each developed option, Auckland Transport engaged traffic consultants Flow to provide an assessment of the traffic network impact the developed options would have on the local roads. The roads this assessment covered include Parnell Road, Ayr Street, Bassett Road, Middleton Road, Remuera Road and the intersections of these roads (as highlighted in fig 05 below).

*Figure 05: Transportation Assessment Study Area*



The predicted changes to these roads include traffic flows, delays at intersections and travel times on key routes.

The results of the assessment were conclusive in their findings that there are no substantial changes to the traffic movements around the greater area. See below for the assessed changes from each option. Refer to Appendix section one for the full assessment.

Figure 06: Changes to intersection delays as a result of developed options

Option	Changes in Intersection Delays	
	Morning Peak	Evening Peak
<b>Furneaux Way</b> (Middleton Road/James Cook Cres Intersection)	Traffic exiting James Cook Cres increased wait from 15 to 16 secs	Negligible increase
<b>Cowie Street Bridge</b> (Cowie Street / Parnell Road)	Right turning traffic out of Cowie St increased from 47 to 49 seconds	Right turning traffic out of Cowie St increased from 56 to 61 seconds
<b>Newmarket Park Road</b> (Newmarket Park access road / Ayr Street intersection)	Negligible Increase	Right turning traffic out of the park, increased wait from 65 to 73 seconds

The underpass options considered subsequently to Flow’s report do not involve any change in existing traffic movements. All vehicles accessing Laxon Terrace and Youngs Lane still make use of Sarawia Street only.

**Planning Assessment**

Tonkin & Taylor Ltd (T&T) were engaged by AT to identify the resource consent requirements of the initial three short-listed options and did not include Option 4. Refer to Appendix section two for the full RMA Scoping Report.

As identified below, all of the options will have an element of significant stakeholder interest, which has been demonstrated through the engagement that Auckland Transport has undertaken on the project to date. Newmarket Park would be particularly difficult from a consenting perspective due to the complexities of undertaking works on a closed, stabilised landfill.

Provided land ownership matters can be resolved for the Furneaux Way through road and Cowie Street Bridge options in advance (or in parallel) of seeking the RMA approvals, Auckland Transport could reasonably anticipate to progress these options through the RMA process with greater ease than that of Newmarket Park.

**Option 1: Cowie Street Bridge – Planning Assessment**

The site is not wholly within the railway designation and privately owned land is required on both sides of the rail corridor. It may be possible to reduce the encroachment of the works through the detailed design process, resulting in land acquisition only being required on Cowie Street.

---

**Newmarket Level Crossing Removal**

In terms of RMA consents and approvals, the proposed works will be covered by an OPW and the necessary resource consents, or may be progressed through a NoR process. In this respect, gaining the necessary RMA approvals for the proposed works should be relatively straight forward.

If encroachment into Newmarket Park can be avoided, environmental effects are likely to be minor and generally limited to standard construction works matters.

The site is within close proximity to residential properties, thus requiring effective mitigation measures (landscaping, screening, urban design enhancements) to reduce potential for effects. It is noted that there is likely to be interest from stakeholders on the urban design of the bridge structure.

**Option 2: Furneaux Way Connection – Planning Assessment**

There are land ownership complexities for the vehicular use of the access-way and Furneaux Way as part of the works, and it would be critical to resolve these matters prior to progressing the RMA approvals for both alternatives to this option.

The key constraint to progressing any of the double lane Furneaux Way options is property acquisition.

In terms of RMA consents and approvals, as the proposed works will largely be undertaken across established access-ways, consents will be relatively straight-forward.

Due to the established nature of the access-ways, environmental effects are likely to be limited to access, circulation, noise and urban design.

Given the proximity of the site to residential dwellings, affected party approval from adjacent residents would assist in expediting a consent process.

**Option 3: Newmarket Park through Road – Planning Assessment**

Newmarket Park is managed on behalf of Auckland Council by the Parks, Sport and Recreation Department, who would be required to provide approval for any proposed works within the park.

Furthermore, a portion of Newmarket Park within the footprint of works is a closed landfill, and this is managed by Council's contaminated land and closed landfill team in the Land and Coastal Remediation Group. This team would also be required to provide landowner approval for any works within the park.

The site has been subject to substantial earthworks for rehabilitation and stability, including re-vegetation upon completion. Undertaking further works within this area to progress this option is likely to be unfavourable with surrounding residents, and potentially challenging for some departments within Auckland Council.

## **Newmarket Level Crossing Removal**

---

In terms of RMA consents and approvals, the proposal works will be subject to a number of requirements relating to vegetation clearance and general works that are not consistent with the existing zoning. In this respect, gaining the necessary RMA approvals for the proposed works is likely to be complex.

The site has significant public and stakeholder profile, therefore any works within the Park is likely to require effective mitigation measures (landscaping, screening, urban design enhancements) to reduce potential for effects.

Also noted by T&T is that Local Boards have been provided with delegated authority as landowner of parks and reserves within their region. This is the case with the Waitemata Local Board, so ultimately decision making sits with the Local Board.

### **Option 4: Underpass – Planning Assessment**

No planning assessment has been undertaken to date. If this option were to be progressed, an assessment would need to be completed.

### **Stakeholder Relationship Management and Engagement**

The current phase of investigation into the removal of the Sarawia Street level crossing has seen a high level of public engagement, through the form of closed stakeholder meetings, public forum presentations, information letter distribution and information access through the use of an AT website page.

A survey gauging resident preferences for the three options under consideration ran from December 2012 through to 24<sup>th</sup> April 2013, with comments and feedback received after that date incorporated where possible.

In addition to the public engagement, AT have been in close contact with the Local Board via their transport committee, presented an update to the June 2013 Local Board meeting requesting their formal feedback and has met with members of the Broadway Park Residents Society, Newmarket Community Association and Parnell Community Committee.

Refer to Appendix section three for a full list of the Key Stakeholders related to this project and the presentation provided to the Local Board.

### **Letter Drop**

Communication with key stakeholders that are likely to be directly affected by the removal of the level crossing, and possibly the development of the new access route, has primarily been through the delivery of informative letters and updates to the Auckland Transport website. The letters, as outlined below, have been distributed in the lead up to planned

## **Newmarket Level Crossing Removal**

---

public consultation gatherings, providing details of the events, website information and contact details for any queries and feedback:

- Letter to Broadway Park Residents' Society requesting a meeting with the Body Corporate and members.
- Letter to the wider community affected by the Sarawia Street level crossing removal, informing them of the December 2012 public forum.
- Second letter to the wider community prompting feedback following the public forum in April 2013.

Refer to Appendix section three for copies of the letters that have been distributed.

The catchment area for distribution to the wider community letter was selected on a geographical basis, extending to the roads/properties that would be affected directly by one of the preferred options:

- o Cowie Street
- o Sarawia Street
- o Laxon Terrace
- o Youngs Lane
- o Furneaux Way
- o James Cook Crescent
- o Ayr Street from Parnell Road, inside Newmarket Park, down to the roundabout

### **Stakeholder Meeting (Broadway Park Residents Society)**

In order to gauge the key stakeholder reaction to the implementation of Option 2Furneaux Way, Auckland Transport held a closed group meeting with participants from the Broadway Park Residents Society (BPRS), who are the controlling body of the various subdivisions to the south of Newmarket Park, of which Furneaux Way and parts of Laxon Terrace are included.

This meeting was held on 22<sup>nd</sup> November 2012 at the Broadway Park Recreation Centre and was chaired by David Williams QC with members of Auckland Transport in attendance to present the Laxon Terrace – Furneaux Way connection as a possible option under consideration.

The meeting was well attended by BPRS members, all with an interest in the options being evaluated by Auckland Transport.

The presentation given by Auckland Transport at the meeting is attached in Appendix section three.

## **Public Forum**

Following the Broadway Park Residents Society consultation, Auckland Transport continued to investigate the various options for the removal of the level crossing at Sarawia Street and arranged a public forum to present options to local residents and interested parties.

Through a letter drop Auckland Transport engaged the wider Newmarket Park, Furneaux Way, Laxon Terrace, Youngs Lane, Sarawia Street and Cowie Street community. Members of each area were present at the forum held on the 12<sup>th</sup> December 2012 along with representatives from the Local Board, Newmarket Community Association and Parnell Community Committee. The forum was chaired by Auckland Transport and had approximately 110 people in attendance. A breakdown of the crowd outlined a large presence from people directly affected by the Laxon Terrace – Furneaux Way connection and this was evident throughout proceedings, with a primarily negative response to the Option 2 and the need to decommission the crossing.

It is noted that although feedback during the public forum was overtly against an option involving Furneaux Way, the subsequent response from the compiled survey forms sent in by people both at the forum and unable to attend has seen a more even spread of opinions on the preferred option, or in this case the non-preferred option.

Auckland Transport discussed the level of investigation carried out on the project to date, including the previous studies. Each of the three favoured options (refer Developed Options) were covered in detail. Refer to Appendix section three for the presentation displayed at the forum.

The public forum itself was not intended as a Q&A session, rather an information evening from which all parties present were able to submit feedback through the Auckland Transport communications team and selected personnel. Although discussions were facilitated on the evening, the primary source of feedback remained the survey forms and has since been compiled and responded to through the supply of further documentation on the Auckland Transport website.

## **Website**

As a means of quickly and evenly distributing information, Auckland Transport is making use of a website link from the main Auckland Transport page.

<http://www.aucklandtransport.govt.nz/improving-transport/sarawia-st-crossing/Pages/default.aspx>

This website address has been clearly communicated on all distributed letters and highlighted in all forums and discussions with stakeholders.

The website includes the relevant documentation on each of the preferred options, commentary from KiwiRail describing the main reasons for the closure of the crossing, transportation studies carried out to help assess the best possible outcomes and feedback forms.

---

Refer to Appendix section three for the Auckland Transport webpage.

### **Land Acquisition**

Some of the options explored in the next section of this report require the acquisition of private land. Assumptions have been made in the costing of the short-listed options that will need to be refined during a more detailed consultation process once a preferred option has been selected.

The appropriate consultation with the directly affected parties of the preferred option will take place following Board approval of a preferred option.

Due to the unusual nature of acquisition of a private road, Auckland Transport have engaged Simpson Grierson to provide legal advice [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

## Defining the Options

### Do Minimum

The Do Nothing option has not been considered as a viable option as KiwiRail have advised that at minimum, when rail service frequencies increase through the crossing the current half-arm barriers would be unacceptable from a safety perspective, requiring additional measures such as longer barrier arms and the presence of dedicated personnel to monitor the crossing.

Therefore the Do Minimum has been used as the baseline for this project, which involves the retention of the level crossing with dedicated personnel to ensure safety of rail and road user. However, this is also not seen as a viable option if a higher frequency timetable is introduced as planned, as retaining the crossing in any form would remove all resiliency from the rail network to recover from network delays and therefore maintaining reliable passenger services would become increasingly difficult. However, the Do Minimum option provides a reference point to assess the relative benefit-cost relationship of the short-listed alternative route options outlined in the Developed Options section of this report.

Earlier surveys carried out by KiwiRail in 2011 indicated that if the level crossing remains in place, train travel times through this area will be increased by 30 seconds. This is a significant dis-benefit to each of the train passengers using this section of track.

**Newmarket Level Crossing Removal**

**Underpass**

The possibility of lowering the road carriage way was explored in the original 2004 level crossings report and quickly dismissed due to the significant civil works that would be required. The underpass options explored in these early reports linked Sarawia Street to Laxon Terrace directly and would cause severe short and long term disruption to residents of both roads.

High level discussions have taken place around the possibility of an underpass from Railway Street to Laxon Terrace, the thought process being that this route would be easier to achieve than the underpass from Sarawia Street to Laxon Terrace due to the much lower grade entry point at Laxon Terrace. However the logistics of entering from Railway Street are still extremely complex and expensive, ultimately removing this as a feasible option.

As a result of these early findings an underpass option was initially dismissed by AT during this current stage of investigation, however input from an affected residents group led to the reopening of underpass investigation explored in Developed Options as Option 4.

*Figure 07: Indicative Underpass Routes Explored*



**Newmarket Level Crossing Removal**

**Overbridges**

Grade separation of the Sarawia Street level crossing has also been explored in the form of road over rail bridges. Options from Sarawia Street and Cowie Street have been investigated.

A road over rail bridge from Sarawia Street to Laxon Terrace was considered and discounted as a non-viable option due to topological and geographic constraints associated with rail clearance, road gradient and property access issues.

Cowie Street offers a more feasible solution, as outlined in both the URS study 2007 and Fulton Hogan/Opus study 2011. (See Developed Options, Option 1).

*Figure 08: Indicative Road over Rail Bridges Explored*



**Newmarket Level Crossing Removal**

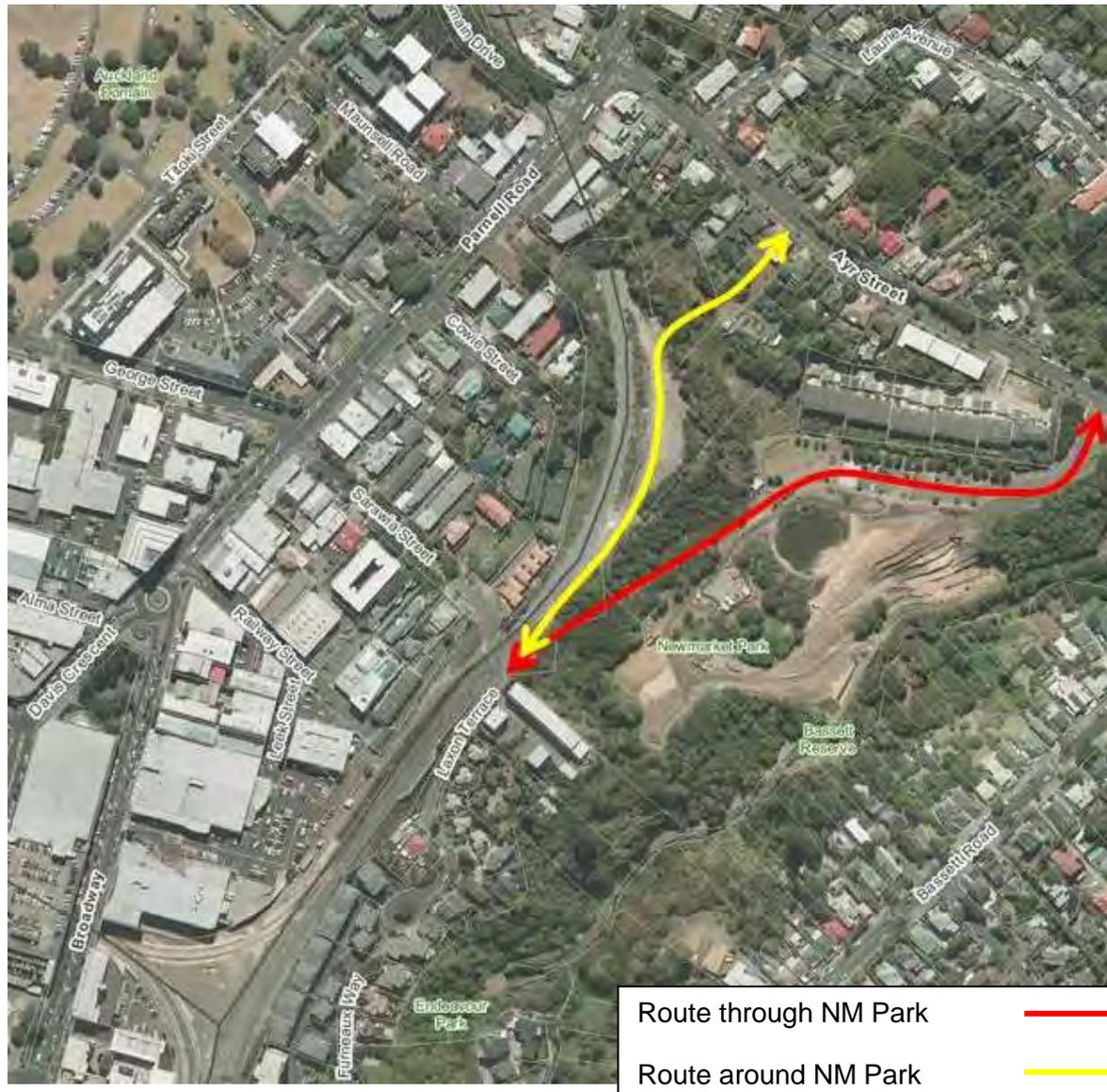
**Newmarket Park Roads**

Two options for a road through Newmarket Park have been investigated, both linking Laxon Terrace with Ayr Street. Each road arrangement carries with it significant risk requiring extensive structural and geotechnical work, road geometry, land acquisition and consenting elements.

The two roads both run north east from the current level crossing, with one road following the rail corridor around to the north before turning back east adjoining Ayr Street through a private property (17 Ayr Street). The second road follows the alignment of the existing pedestrian path through the park before tying into the carpark entrance off Ayr Street.

The road around the park was discounted due to numerous unknown factors around the ground stability for this route, steep gradient and additional land acquisition requirements. The road through the part was developed as Option 3 (See Developed Options).

*Figure 09: Indicative Newmarket Park Roads Explored*



**Furneaux Way Connections**

Furneaux Way is a 65m private road situated between two public street cul-de-sacs (Laxon Terrace and James Cook Crescent). It is a higher density street than Laxon Terrace, with a mix of small and medium sized apartment buildings. Currently there is a 20 metre long pedestrian paved footpath connecting Furneaux Way to Laxon Terrace controlled by Auckland Transport.

Opening up connections between Laxon Terrace and Furneaux Way through the use of this access way have been considered throughout each of the various reports. Options ranging from double lane roads with pedestrian footpaths to a single lane shared space are included in the latest investigations carried out by Opus.

All of the options for connections to Furneaux Way are feasible from a construction and implementation perspective, although the land acquisition costs and potential building demolition associated with the double lane options makes these comparatively expensive and disruptive sub-options. These were explored further as Option 2a and 2b (See Developed Options)

*Figure 10: Furneaux Way Connection*



**Newmarket Level Crossing Removal**

**Parnell Road Connections (Mobil)**

The public forum held in December 2012 prompted feedback suggesting exploration of the possibility of a road from the northern end of Laxon Terrace running along the rail corridor to join Parnell Road by the Mobil Station (506-522 Parnell Road).

Discussions with design consultants led to further consideration of two similar routes connecting with Parnell Road at 524 and 526. Each of these routes were discounted through high level discussions due to the geotechnical issues for the road, similar to the Newmarket Park options, inflated costs due to the extended road geometry in addition to the structural requirements over the rail corridor, and finally the traffic constraints of adding another intersection close to the complex Ayr Street / Domain / Parnell Road intersection.

*Figure 11: Indicative Parnell Road Connections*



## **Developed Options**

The investigation carried out to date by the various parties involved with this project saw the emergence of three short-listed options that have since been developed and discussed on a more detailed level. In addition to these three options a fourth option was developed at a later stage as a result of the public consultation process.

The four options have been included in the benefit cost ratio (BCR) analysis explored in the following section of the report.

Options that have not been investigated past a high level include: vehicle underpasses from Railway Street and directly between Sarawia Street and Laxon Terrace, a road over rail bridge at Sarawia Street, connections to Parnell Road through or near the Mobil Station and a road around Newmarket Park.

The developed options are as follows; (for more information on the developed options refer to Appendix section six).

### **Option 1: Cowie Street Bridge**

A road over rail bridge from Cowie Street to Laxon Terrace was first investigated in the 2007 report by URS. Further detailed investigation on the possibility of a bridge was carried out by Opus and Fulton Hogan in 2011 and by Opus in 2012 as part of their report to Auckland Transport, including alternative alignment options and the possible structural assembly of the bridge and surrounding roads. This phase of work also looked at the arrangements for the termination of Sarawia Street and effects on the property at 9 Cowie Street.

A bridge from Cowie Street will directly impact a limited number of residents, with only one property at the end of Cowie Street (Number 9) requiring a small degree of land acquisition. The remaining dwellings on Cowie Street would be informed of any plans to move ahead with the option and their feedback on a design sought. Support from KiwiRail would also be required, especially as this solution includes construction over an electrified rail line. There are additional risks involved with any development taking place on or near Newmarket Park land as detailed in the discussion of that option.

Moving the point of access to Laxon Terrace from Sarawia Street to Cowie Street is the option that involves minimal change for members of Laxon Terrace and also frequent users of the Laxon Terrace entrance to Newmarket Park. It has little or no effect on the current traffic congestion of the wider area, as the vehicles from Laxon Terrace and Youngs Lane are still exiting onto Parnell Road, 400 metres further north.

There are opportunities for a Cowie Street bridge to complement the Greenway cycle and walking link supported by the Waitemata Local Board.

Public feedback has been mixed on this option, as it is the preference of residents surveyed who live in the Broadway Park area, and has approximately even support with

**Newmarket Level Crossing Removal**

Option 2 from residents in Sarawia Street, Laxon Terrace and Youngs Lane. However, the road bridge would have a notable physical presence and this option is opposed by Cowie Street residents and has limited support from Ayr Street residents.

The economic case for this option is Low, with a BCR of 1.8.

**Figure 12: Proposed Cowie Street Bridge Design**



**Option 2: Furneaux Way – Shared Single Lane Road**

Connection to Furneaux Way has been highlighted as an option throughout each of the reports dating back to 2004, with each report differing from the previous in terms of the obstacles this option raises. The main differences are centred on the extent of land acquisition and the legal right for the use of Furneaux Way, a private road. The double lane option (Option 2a) is high cost and would involve land acquisition and building demolition to some degree, and provide Low benefits when the benefit-cost ratios are assessed. However, as investigations have progressed and the range of vehicular access quality has been explored in more detail, the most efficient and least disruptive option for a connection has been identified as the single lane shared zone road (Option 2b). This option does not involve the purchase of any adjacent property land and can be implemented in a very short period of time with minimal disruption to nearby residents.

A traffic safety review was carried out by Traffic Planning Consultants Ltd to assess the safety risks involved with the single lane solution. This highlighted some areas of concern, mainly around the identification of the connection as a ‘shared zone’ and ensuring that the public were aware of the hierarchy of vehicles and pedestrians within the zone, both of which are able to be dealt with through signage and road markings. The one-lane connection would be wide enough for emergency and large vehicles.

**Newmarket Level Crossing Removal**

This connection would have a large effect on the residents of Furneaux Way, with a significant but lesser effect on nearby streets including James Cook Crescent and Middleton Road. Auckland Transport would require Furneaux Way to be converted into a public road, therefore taking ownership of this land and maintenance responsibility. AT received a formal response from Broadway Park Residents Society on 28 March 2013 advising that they are not supportive of the option, preferring a bridge from Cowie Street to Laxon Terrace (Option 1). If no agreement can be reached, there are provisions under the Local Government or Public Works Act that could affect changing the status of the road from private to public.

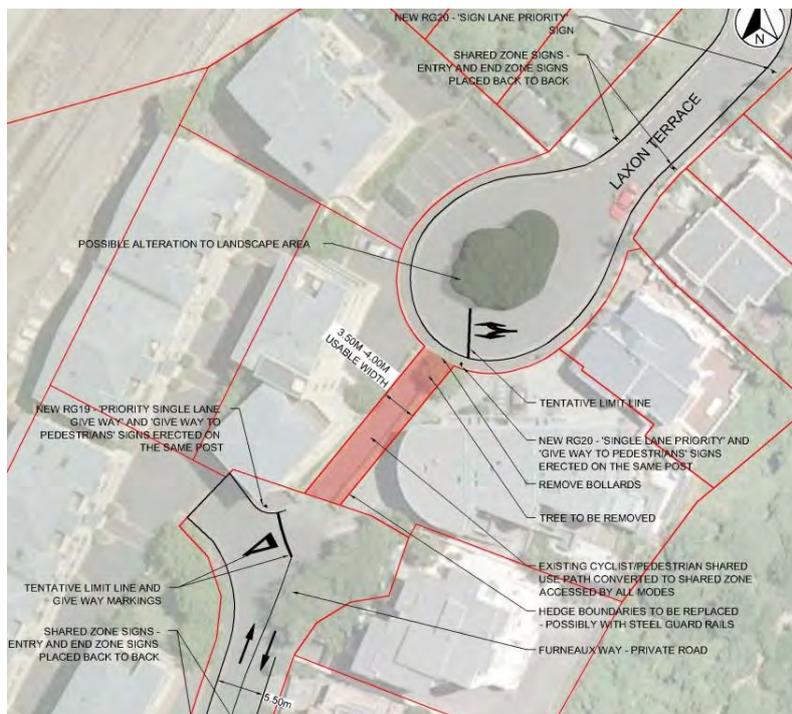
A single-lane shared space road connection would provide a lesser level of amenity compared to the two-lane options being considered for a Cowie Street bridge or Newmarket Park Road, albeit only over the 20m length of the existing walkway.

Resident survey feedback on this option has been strongly negative from Broadway Park residents, mixed from Sarawia Street, Laxon Terrace and Youngs Lane residents and supportive from Cowie Street and Ayr Street residents.

As with the Newmarket Park alternative access, a connection to Furneaux Way will also require the construction of a pedestrian bridge between Newmarket Park and Sarawia or Cowie Streets.

The economic case for the single-lane option is Medium, with a BCR of 3.2. The economic case for the double-lane option is Low, with a BCR of 1.3.

**Figure 14: Proposed Connection to Furneaux Way**



### **Option 3: Newmarket Park through Road**

Conceptual exploration of the two Newmarket Park through road options by Opus in 2012 found a range of technical obstacles associated with each option. These issues were largely connected to the historic use of Newmarket Park as a land fill site, and resulting geological and civil challenges this creates. As a result of discussions with Opus, the 'through' road was identified as the more viable option, due to less area of road being located over unstable land, no requirement for the acquisition of private land and the possibility to tie in with an existing entry/egress point on Ayr Street, rather than creating another intersection in an already congested area.

A road through Newmarket Park expands the existing walkway bisecting the reserve and ties into the current car parking area. More defined design work has been carried out by Opus during the latest stage of investigation to determine the possibilities for road alignments, car parking spaces and the safety of the option.

The entrance to Newmarket Park is currently closed at night to reduce loitering and associated crime. If access to Laxon Terrace was to proceed via the park this gate would need to remain open at all times, and would be likely to increase the incidence of night time loitering by people who do not live in the area. Advice from AT Property is that if AT compensated AC Parks for the land used by the road, AT would likely be able to proceed. However further investigation by T&T into the authority over the park has identified the important role that the Local Board have with respect to any decisions to use park land for an alternative access option.

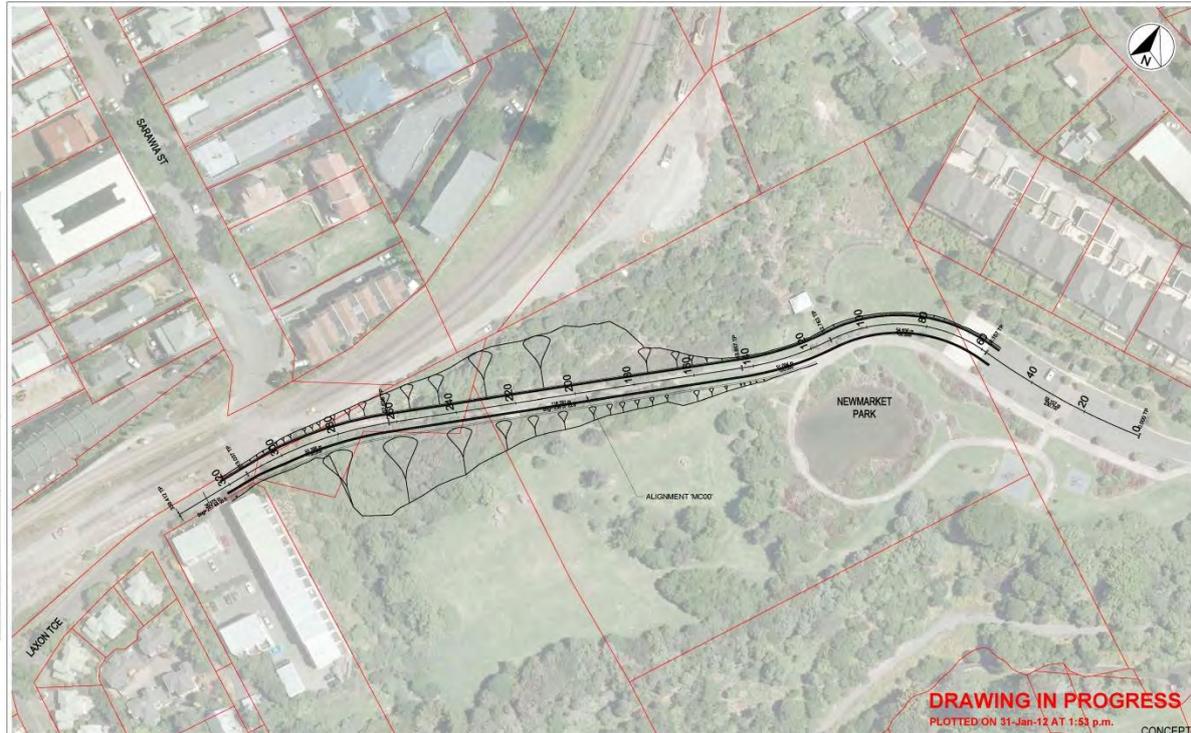
Resident survey feedback on this option has generally been negative. The Auckland Council Parks, Sport and Recreation Department, the Local Board and Parnell Community Committee all oppose this option.

The requirement for all forms of level crossing to be removed at Sarawia Street, not just vehicular as first thought, means that the Newmarket Park through Road option will also require a pedestrian and cycling bridge to / from either Sarawia Street or Cowie Street to satisfy the public needs for a northern point of access between Broadway and Newmarket Park.

As a result of the negative feedback from numerous parties, especially the formal response from the Local Board rejecting the option, Newmarket Park is no longer seen as a viable solution.

The economic case for this option is Medium, with a BCR of 3.0.

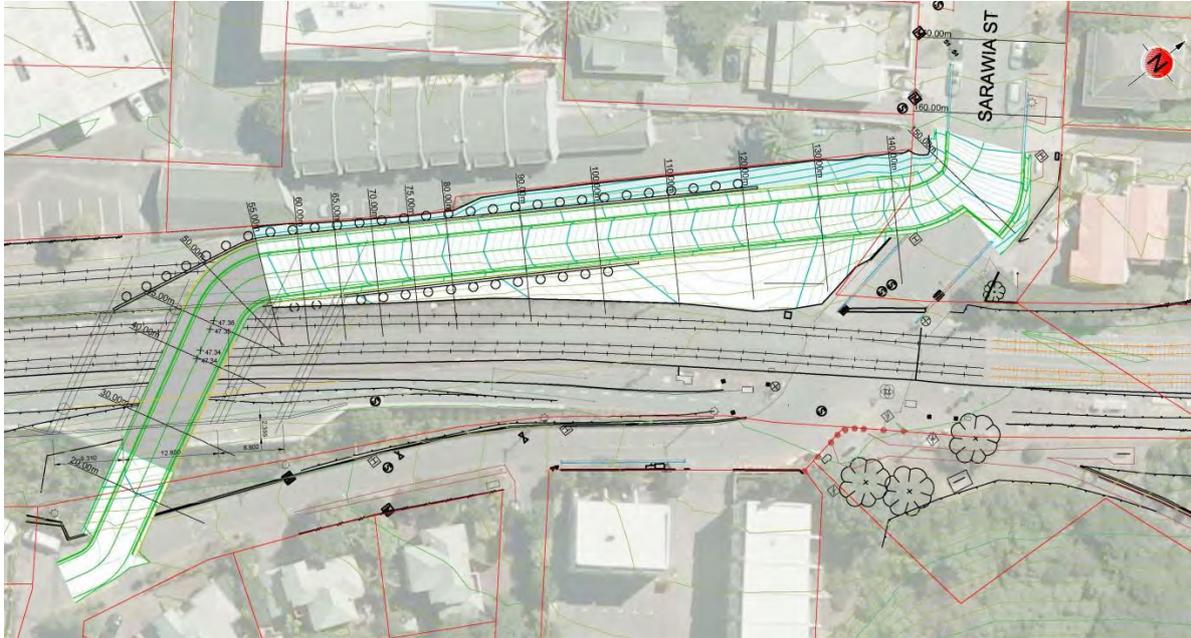
**Figure 13: Proposed Newmarket Park Road Layout**



**Newmarket Level Crossing Removal**

and \$7.5m (Alignment 2). Assuming progression of the lower cost Alignment 2, this provides a Low BCR of 1.3.

**Figure 15 and 16: Proposed Underpass Alignment 1 (top) and Alignment 2 (bottom)**



## Evaluation

### Assessment

The evaluation carried out for in this report for the purpose of generating BCR values was fully consistent with the NZTA Economic Evaluation Manual (EEM). Cost and benefit streams were calculated over a 30 year period and discounted at 8% p.a., with the first year of the evaluation period being 2013/14. Refer to Appendix section seven for the full business case report.

The evaluation took into account the following benefits and dis-benefits which would result from removing the level crossing:

- Time savings for rail passengers
- Possible extra journey time for vehicles
- Possible extra journey time for pedestrians

### Rail Patronage

AT Operations have not completed modelling needed to precisely determine the volume of rail patronage passing through the Sarawia Street crossing at this point in time. However, AT Operations have provided interim data used in the design and development of Parnell Station. The indicative modelling used for the planning of Parnell Station outlines approximate 2016 patronage values of 7,500 passengers on this section of track in the morning 2 hour peak period which, using standard scaling factors equates to 25,000 passengers per day (weekday).

As of August 2012 these numbers are estimated at circa 3,700 in the morning peak and 14,000 across an entire day.

The number of passengers through this track has a direct effect on the BCR calculations, as the time constraints that the crossing places on trains is measured by the number of train users. Therefore the 30 second delay caused by the level crossing (as outlined in the 2011 KiwiRail report on the closure of the crossing), is attributed to each of the 25,000 passengers going through this section of track each day.

*Figure 15: Rail Patronage through Sarawia Street Level Crossing*

	<b>Morning Peak (2 hours)</b>	<b>Daily Total</b>
Current Rail PAX (2012)	3700	14000
Future Rail PAX (2016)	7500	25000

**Newmarket Level Crossing Removal**

**Time/Distance changes for Vehicles and Pedestrians**

In order to quantify the time/cost changes for each of the developed options in terms of distance travelled by car, the analysis has measured the distances by road to Laxon Terrace from two locations:

- *South*: the junction Broadway /Remuera Rd
- *North*: the junction Ayr St /Parnell Rd

It has been assumed that of traffic entering or leaving Laxon Terrace, 60% would be to /from the north (CBD) and the remainder, the south (Newmarket and beyond).

The road distances are shown in fig. 16, which also shows the extra distance involved for each option relative to the Do Minimum. These have been used in the evaluation of car user impacts.

*Figure 16: Distances by road to Laxon Terrace (metres)*

	Do Minimum	Furneaux Way Link	Newmarket Park Road	Cowie St Bridge
From South	2750	2250	4250	3000
From North	1500	4750	1500	1500
<b><i>Distances (m) relative to Opt 1</i></b>				
From South		-500	1500	250
From North		3250	0	0

The distances outlined above have been converted into times using an average car speed of 30kph and the extra times have then been monetised and included in the benefit calculation, refer fig. 20.

For pedestrians, the situation is different. Pedestrians to/from the south (Broadway /Remuera Rd) are likely to be already using Furneaux Way so any changes at the crossing will be immaterial. For pedestrians to / from the north (Parnell Rd – e.g. to catch a bus into town) the new Cowie or Sarawia Street bridge would allow pedestrians to avoid the delays at the crossing. In light of this it has been assumed that with all the options there would be no dis-benefit to pedestrians.

In order to convert the patronage and road user benefits into dollar values all calculations used a suitable value of time (per hour), taken from EEM, as shown in fig. 17.

Figure 17: NZTA Economic Evaluation Manual Values

User Type	peak	off-peak	
Update factor	1.37	1.37	From NZTA: updates from the 2002 values in EEM to a 2013 value
Rail passenger (same as car occupant)	\$10.14	\$9.18	Including update, from EEM various tables giving value of time and traffic breakdown per hour by purpose
Car (urban arterial)	\$17.02	\$21.43	
Pedestrian	\$10.14	\$9.18	Same as rail passenger

The assumptions about annual transport growth in future years of the evaluation are given in fig. 18. The relatively low rate for traffic reflects the fact that further development in Laxon Terrace is unlikely, so any growth would only arise from increased car use by approximately the same number of residents. The rail passenger growth rate is typical of historic Public Transport growth in Auckland but below that of rail alone; in addition any increase in rail patronage as a result of the improved rail journey time has not been taken into account, meaning that the reported benefits will be conservative.

Figure 18: Annual Transport Growth

User type	Annual growth
Pedestrians and cars	1.0%
Rail passengers	3.0%

### Cost Estimates

The cost estimates have been prepared through a combination of the construction costs outlined by Opus for the various options along with assistance from the AT Property Team to determine approximate land acquisition costs for the numerous parcels of land that are required to be purchased. Additional cost estimating assistance has been gained from Cuesko Cost Consultants to provide high level pricing of the recent underpass access options compared with the already developed options (Cowie Street Bridge, Furneaux Way). Both the Cowie Street bridge and Furneaux Way option costs were re-evaluated to bring them in line with assumptions used by Cuesko in evaluating the underpass costs.

The table below highlights the base capital cost of each option, which includes a 10% contingency. This includes the design, construction and land acquisition costs associated with the implementation of a selected design.

Each base cost is accompanied by two outlying figures in the form of a minimum and maximum cost. These have been generated through discussions within AT and with external consultants involved in the investigations, and these variations on the base costs are utilised for the sensitivity testing later in the report.

**Newmarket Level Crossing Removal**

Refer to appendix section six for a more detailed breakdown of the option costs.

Figure 19: Project Capital Cost Estimates

Option	Min Cost	Base Cost	Max Cost
<b>Option 1: Cowie Street Bridge</b>	\$5.2m (base -10%)	\$5.72m	\$6.86m (base +20%)
<b>Option 2a: Furneaux Way – Double Lane + Ped/Cycle Bridge</b>	\$5.44m (double lane shared, Cowie pedestrian bridge, 50% land acquisition)	\$6.53m (double lane separated, Cowie pedestrian bridge, 50% land acquisition)	\$10.89m (double lane separated, all properties purchased, Sarawia bridge)
<b>Option 2b: Furneaux Way – Single Lane + Ped/Cycle Bridge</b>	\$2.47m (single lane shared, Cowie pedestrian bridge)	\$3.24m (single lane shared, Cowie pedestrian bridge)	\$4.05m (single lane separated, Sarawia pedestrian bridge)
<b>Option 3: Newmarket Park through Road + Ped/Cycle Bridge</b>	\$3.42m (basic parking, Cowie pedestrian bridge)	\$3.70m (enhanced parking, Cowie pedestrian bridge)	\$4.43m (enhanced parking, Sarawia pedestrian bridge)
<b>Option 4: Underpass Alignment 2</b>	\$6.82m (base -10%)	\$7.51m	\$9.01m (base +20%)

Cost estimates used in the BCR calculation are based on the costs above and additional maintenance and renewal cost estimates over a 30 year period using the following estimates:

Item	Cost Estimate
Road Carriageway	\$5,500 per km per year
Underpass	\$2,200 per year
Footpath	\$850 per km per year
Street Lighting	\$4,200 per km per year
Signs and Road Markings	\$130 per km per year

**Newmarket Level Crossing Removal**

Drainage	\$2,700 per km per year
Road resurfacing: chipseal	\$7 per sq. m per 10 years
Road resurfacing: AC	\$25 per sq. m per 10 years

**Economic Outcome / Benefits**

The results of the economic evaluation are presented in fig. 20.

Figure 20: Economic Evaluation Results

Item	Option 1: Cowie St Bridge	Option 2a: Furneaux Way Double Lane	Option 2b: Furneaux Way Single Lane	Option 3: Newmarket Park through Road	Option 4: Underpass Alignment 2
Benefits 2016: Reduced delays to rail passengers and	\$612,620	\$612,620	\$612,620	612,620	\$612,620
Benefits 2016: Remove delays to level crossing users	\$6,040	\$6,040	\$6,040	\$6,040	\$6,040
Dis-benefits 2016: Delays to road traffic	\$6,460	\$113,040	\$113,040	\$38,760	\$0
Present value of benefits, \$m	\$7.74	\$7.74	\$7.74	\$7.74	\$7.74
Present value of dis-benefits, \$m	\$0.07	\$1.22	\$1.22	\$0.42	\$0
<b>Present value of net benefits, \$m</b>	<b>\$7.67</b>	<b>\$6.52</b>	<b>\$6.52</b>	<b>\$7.32</b>	<b>\$7.74</b>
<b>Present value of net costs, \$m</b>	<b>\$4.21</b>	<b>\$4.87</b>	<b>\$2.05</b>	<b>\$2.46</b>	<b>\$5.74</b>
<b>Total BCR</b>	<b>1.8</b>	<b>1.3</b>	<b>3.2</b>	<b>3.0</b>	<b>1.3</b>

The benefits for all options are dominated by the benefits to rail passengers so the BCR depends largely, but not entirely, on costs, with lower cost meaning a higher BCR. The dis-benefits from additional vehicle journey times to and from Laxon Terrace / Youngs Lane users are minimal in comparison to the rail passenger benefits, and the differential pedestrian walking distances are smaller again if anything at all due the requirement to keep pedestrian access to Laxon Terrace and Newmarket Park from the north, whether this be from Cowie Street or Sarawia Street.

The Present Value (PV) Costs do not align with the option costs outlined in fig. 19 due mainly to the following;

**Newmarket Level Crossing Removal**

- The PV Costs are relative to the Do Minimum costs, in this case the \$75k per year to man the crossing.
- These costs are also based over an extended period of time, with any costs being spent after the first year being subject to the discount rate outlined by the EEM.
- Costs include maintenance and renewals estimates calculated over a 30 year period, as per the EEM.

In terms of the NZTA assessment profile, benefits from all options are Low with the exception of the single lane shared Furneaux Way option, which delivers Medium benefits.

**Sensitivity Analysis**

A series of sensitivities have been tested as outlined below. The results indicate a good level of robustness with adjustments to the key variables of capital and patronage growth.

Also included is a variation to the time savings per rail passenger and benefits outside of the peak hours.

*Figure 21: Sensitivity Analysis Breakdown*

Case	BCR Opt 1	BCR Opt2a	BCR Opt2b	BCR Opt 3	BCR Opt 4	Comment
Base	1.8	1.3	3.2	3.0	1.3	
No need to have crossing manned, just full width barrier	1.5	1.2	2.3	2.3	1.2	No opex in the DM effectively increases the costs of the other options
Maximum expected cost	1.5	0.8	2.4	2.4	1.1	
Patronage 10% higher	2.0	1.5	3.6	3.3	1.5	
Patronage 10% lower	1.6	1.2	2.8	2.7	1.2	
Rail benefit is "reliability" and so is weighted	2.4	1.8	4.4	4.0	1.8	Higher value of rail passenger time – see Do Minimum
Lower benefit per rail passenger	1.2	0.8	1.9	1.9	0.9	Taken as 20 seconds, not 30

**Newmarket Level Crossing Removal**

Half benefits outside peaks	1.4	1.0	2.3	2.2	1.0	
High rail passenger growth	2.1	1.6	3.7	3.4	1.5	5% p.a., not 3%
Evaluated over 40 years at 6%	2.7	2.0	5.1	4.6	2.0	NZTA requirement from July 1 <sup>st</sup> 2013

**Community Impact Evaluation**

As a result of the stakeholder engagement process and as a product of the investigation process the following non-cost factors have been identified and assessed. These factors are not included within the BCR calculation and are detailed in Figure 22. This evaluation is necessarily subjective and Auckland Transport has endeavoured to balance the considerations of each stakeholder group when conducting the non-cost evaluation.

In order to evaluate the non-cost benefits of the shortlisted options the table below has been created, comparing the associated level of non-cost benefits from each option which has not otherwise been captured in the BCR evaluation. For this reason, rail operational benefits and extra vehicle journey time dis-benefits have not been included in the non-cost evaluation.

Each option has been ranked in comparison to the other options shortlisted for consideration, between 1 (worst) and 3 (best) to provide a comparative assessment of non-cost aspects. Where options are ranked equally highly, a score of 3 has been applied to reflect that the criterion has been fully met.

These values have then been weighted according to three prioritisation categories reflecting the importance of the criterion both from Auckland Transport priorities (e.g. traffic safety) and from stakeholder feedback (e.g. low priority on vehicle queuing times).

- **Priority 1: Critical importance** – criterion represents an essential component for successful delivery of Project outcomes. Weighting factor 3.
- **Priority 2: High importance** – criterion represents a highly desirable component for successful delivery of Project outcomes. Weighting factor 2.
- **Priority 3: Moderate importance** – criterion represents either a ‘nice to have’ or transitional component for successful delivery of Project outcomes, whose impact will be temporary only. Weighting factor 1.

**Explanation of Criteria and Scoring**

**Priority 1 Criteria**

- **Rail Safety:** Likelihood of a road/rail or pedestrian/rail collision. All options provide for complete segregation of the Crossing.

## Newmarket Level Crossing Removal

- **Traffic Safety:** Visibility and sight lines, likelihood of a vehicle/pedestrian collision. Option 1 is the most successful in this regard, with Option 2b next due to the need to improve visibility and safely managed use of the shared space. Option 4 is least successful due to visibility limitations, space and road alignment constraints and a steeper than ideal gradient.
- **Crime Prevention:** As assessed against CPTED principles. Options 1 and 2b both comply with CPTED principles, Option 4 demonstrates some significant failings (refer to Appendix 5 for the CPTED report).

### Priority 2 Criteria

- **Environmental/Aesthetic Impact:** How noticeable the option will be to local residents and stakeholders, for example visually or in terms of noise. Option 1 is the most visually intrusive; Option 2b will negatively impact residents in Furneaux Way with higher noise levels and traffic movements. Option 4 is strongest in this regard, only impacting residents living near the underpass openings.
- **Impact for Wider Community:** Impact of the option on residents and stakeholders outside of the immediate area around the Crossing (Sarawia Street, Laxon Terrace, Youngs Lane). Option 4 is strongest, restricting the impact to those already affected. Option 1 impacts residents in Cowie Street, turning the no-exit road into access to Laxon Terrace and Youngs Lane and Option 2b has the greatest negative impact, changing traffic flows from existing and affecting a greater number of residents outside of the immediate Crossing area.
- **Vehicle Amenity/Queuing:** The quality of the connection for road and cycle users, including adequate road widths, acceptable gradients and removal of queuing. Option 1 provides the greatest level of amenity with a two-lane access and separated pedestrian and cycle area and no queuing is expected at either Cowie Street or Laxon Terrace. Option 4 has good two-lane access, a narrower pedestrian separated area not suitable to share with cyclists and some vehicle queuing is possible at peak periods as a means to manage visibility issues for traffic entering the underpass. Gradient is acceptable for road vehicles but could present difficulties for disabled users due to the 1:10 gradient. Option 2b will have no or minimal pedestrian and cyclist separation and the rise of the connection will restrict visibility to a degree. Some queuing is likely at peak travel periods and one-way traffic flow will need to be managed through right of way signage or traffic signals.

### Priority 3 Criteria

- **Construction Disruption:** The impact of the option's construction on traffic flows and affected stakeholders. Option 2b could be constructed quickly and with minimal disruption to road users and residents. Measures would be needed to maintain pedestrian and cycle access throughout the construction period, although an alternative through Sarawia Street is possible. Option 1 will involve construction vehicles and noise for approximately 6 months, mostly affecting residents at the end of Cowie Street and top of Laxon Terrace. Option 4 will involve construction vehicles and noise for approximately 6 months and could disrupt efficient use of the Crossing at critical phases of construction. Residents at the bottom of Sarawia Street and top half of Laxon Terrace and Youngs Lane would be affected.

**Newmarket Level Crossing Removal**

Figure 22: Community Impact Scoring

	<b>Option 1: Cowie Street Bridge</b>	<b>Option 2b: Furneaux Way Access</b>	<b>Option 4: Underpass Alignment 2</b>
<b>Priority 1 Component (weighting factor of 3)</b>			
Rail Safety	9	9	9
Traffic Safety	9	6	3
Crime Prevention (CPTED)	9	6	3
<b>Priority 2 Component (weighting factor of 2)</b>			
Environmental/Aesthetic Impact	2	4	6
Impact for Wider Community	4	2	6
Vehicle Amenity/Queuing	6	2	4
<b>Priority 3 Component (weighting factor of 1)</b>			
Construction Disruption	2	3	1
<b>TOTAL</b>	<b>41</b>	<b>32</b>	<b>32</b>

## Results of Stakeholder Engagement

Options 1 – 3 have been surveyed with the groups below. Option 4 was re-investigated at the request of the Parnell Community Committee. However, due to a combination of low BCR, associated construction risks and CPTED and traffic safety concerns and the Project has not circulated the option to other stakeholder groups. The following groups provided feedback:

**Broadway Park Residents Society:** Recommend Option 1 and opposed to Option 2a and 2b. Option 4 has not been presented to this group.

**Green Group representing some members of Cowie Street and Parnell Road:** Preference for Option 2b, with opposition to Option 1. Option 4 has not been presented to this group.

**Cycle Action Auckland:** Cycling and walking access should be preserved, either through a pedestrian/cycle bridge or pedestrian-only level crossing.

**Laxon Terrace and Youngs Lane Resident Group:** The level crossing should remain open and the safety measures there be upgraded.

**Newmarket Community Association:** Initially questioned the need to remove the crossing. Option 4 has not been presented to this group.

**Parnell Community Committee:** Supportive of Option 4 and not supportive of Options 1 or 3.

**Waitemata Local Board:** Opposed to Option 3. Option 4 has not been presented to this group.

Residents and other interested parties were encouraged to submit survey forms providing comments and ranked preferences on the three options under consideration. The results of these surveys indicate a divided response dependent upon the respondent's location.

Option 3 generally received limited support, and very little from residents outside of the Broadway Park area. Cowie Street residents oppose Option 1 and Furneaux Way/Broadway Park residents oppose options 2a or 2b, although survey results from residents living adjacent to the crossing indicate a roughly even preference between Option 2b and Option 1.

The full results from the survey forms received can be found in Appendix section three.

## Conclusions and Recommendations

Although a Do Minimum has been developed for the purpose of the BCR calculations, the reality is that keeping any form of rail level crossing in place at Sarawia Street will not viably allow the planned improvements to rail service frequency through the area following introduction of EMUs.

The preferred option for alternative access to Laxon Terrace and Youngs Lane is the development of a road over rail bridge from Cowie Street to the northern end of Laxon Terrace. While this option does not produce the most efficient BCR value, it has the highest non-cost evaluation score and provides a comprehensive solution to Laxon Terrace/Youngs Lane access, being a two lane road and providing pedestrian and cycle access without the need for a separate structure and complements planned Greenway link cycling/walking improvements without affecting the integrity of Newmarket Park.

Feedback received during the stakeholder engagement process indicates that the Newmarket Park road option has little support and will be opposed by the majority of stakeholders and following formal feedback from the Local Board it is not recommended that this option be progressed further.

Although there is support for the Furneaux Way shared space option outside of Furneaux Way and Broadway Park, the outcome delivers a lower level of amenity due to the limited space allowing only a single lane and faces significant potential legal and consenting challenges, which even if overcome risk delaying completion of the project for a lengthy period and jeopardise removal of the crossing by early 2015.

The Cowie Street Bridge has a BCR of 1.8 and has an estimated capital cost of \$5.72m. The developed design phase would begin in the first half of FYR 2013/14, with construction commencing next year and carrying on through to late FYR 2014/15.

Funding has been allocated in the LTP at uninflated values of \$2.87m in FYR 2013/14 and \$2.85m in FYR 2014/15.

This option provides the following benefits for an alternative access route to/from Laxon Terrace and Youngs Lane;

- Minimises overall traffic network change
- Provides an improved quality of unimpeded access
- Provides additional access to the northern end of Newmarket Park, including Parnell Tunnel
- Complements the possible Greenway cycle and walking link
- Allows more resilience in the train network timetables (as do all developed options)
- Removes safety issues that are generated by at-grade crossings (as do all developed options), and provides a positive outcome from a CPTED perspective.

### Recommendation

Based on the conclusions drawn above, it is recommended that the Cowie Street Road over Rail Bridge be selected as the preferred option to progress to design phase.

---

## **Appendix**

- 1. Traffic Analysis**
- 2. RMA Scoping Report**
- 3. Stakeholder Management and Engagement**
- 4. Legal Advice**
- 5. Crime Prevention Through Environment Design Report**
- 6. Developed Option Information**
- 7. Business Case Report**