Report

Lincoln Road Corridor Improvements: Alternatives Assessment

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Contents

Glossary **3**

Executive Summary **4**

1. Introduction and purpose of this report **6**

1.1 Introduction 6

1.2 Overview of LRCI Project 7

2. Background and history **8**

2.1 Early investigations 8

2.2 Lincoln Road Corridor Preliminary Design 2013 10

2.3 Preliminary Design by MWH 10

3. Alternative Methods, Routes and Sites **11**

3.1 Alternative Methods 11

3.2 Alternative Routes 11

3.3 Alternative Sites 12

4. Alternative Methods: Road Design and Construction Effects **14**

4.1 Road Design 14

4.1.1 Bus lane / T3 Transit Lane 14

4.1.2 Cycleway and footpath 14

4.1.3 Intersections / Transitions 15

4.1.4 Raised median 15

4.2 Construction Activities 16

4.2.1 Temporary works area 17

4.2.2 Construction Yard 17

5. Alternative Methods: Road Design and Construction Effects **18**

5.1 Stormwater Treatment Sites 18

5.2 298-314 Lincoln Road and Daytona Reserve 19

5.3 Te Pai Park & Scheduled Trees 22

5.4 Laidlaw College Frontage 24

Appendix 1 MCA Process **27**

Appendix 2: Multi-criteria analysis - Daytona Service Lane **30**

Appendix 3: Multi-criteria analysis - Te Pai Park & Scheduled Trees **36**

Glossary

AC	Auckland Council
AT	Auckland Transport
CCO	Council Controlled Organisation
LGACA	Local Government (Auckland Council) Act 2009
NoR	Notice(s) of Requirement
NZTA	New Zealand Transport Agency
RA	Requiring Authority
RMA	Resource Management Act 1991
SAR	Scheme Assessment Report
SOI	Auckland Transport Statement of Intent

Executive Summary

Auckland Transport (AT) has served a Notice of Requirement (NoR) to widen and improve Lincoln Road. Lincoln Road is an existing arterial road corridor.

As part of the preparation of the NoR, AT has undertaken an assessment of alternative routes, sites and methods, as required by Section 171 of the RMA.

AT does not own all the land required to implement the project, while the project will result in effects on the environment, although these effects are not anticipated to be significant.

The analysis of alternatives has concentrated on alternative sites and methods. Alternative 'routes' to Lincoln Road such as Edmonton Road / Central Park Drive to the east and Rathgar Road to the west are not considered to be viable alternatives.

Since the mid 2000s investigations have identified the need to increase the people carrying capacity of the corridor through provision of facilities for buses (and high occupancy vehicles). The Lincoln Road Corridor Scheme Assessment Report (SAR) undertaken in April 2008 examined 15 options for Lincoln Road, and compared their merits relative to a 'do-minimum' situation. From these options, four options were selected and developed for further assessment. The preferred option involved construction of a new shared bus/cycle lane from Te Pai Place / Pomaria Road north to State Highway 16 on both sides of the road. The option of taking an existing lane for bus/cycle use was not selected due to the accessibility and congestion issues that would arise. Design refinement since 2008 has seen a dedicated, separated cycle lane proposed.

Implementation of the project requires acquisition of land on both sides of the road, generally in the order of 2 to 3m on the eastern side and lesser areas of land on the western side. North of Daytona Road, AT will purchase some residential properties on the western side to provide for a service lane and to provide space for stormwater treatment. The main feasible alternative to implementing the project would involve widening one side of the road only, not both sides:

- Widening the eastern side of the corridor is not a realistic option as a large number of existing commercial buildings will need to be acquired and demolished. It would generate additional costs to businesses affected and to AT without any corresponding substantial benefits to activities on the western side of the road, or the environment in general. Greater widening on the eastern side would also have a greater impact on Te Pai Park.
- Widening the western side would see a larger number of existing houses and small businesses removed along the corridor, exposing the next row of houses to the west to road traffic noise and related effects. Commercial activities around Universal Drive would see a larger loss of on-site car parking.

Widening both sides limits the extent of acquisition of land from individual properties and avoids the need to acquire land that contains existing industrial or commercial buildings (which would increase project costs and result in disruption to businesses).

In conclusion, there are no design, operational or amenity benefits from widening one side only.

In terms of the width of the road corridor, a range of alternative methods have been considered in relation to:

- Aspects of road design - including use of the transit lane, intersection designs and the raised median;

- Construction effects - in particular temporary construction on private properties and the need for a construction yard;
- Specific amenity and environmental issues relating to:
    - Property access and Daytona Reserve;
    - Scheduled trees and Te Pai Park; and
    - Laidlaw College frontage.
- Stormwater treatment and disposal sites.

A multi-criteria analysis was undertaken for layout options in relation to a new service lane beside Daytona Reserve and in relation to the road alignment adjacent to three scheduled trees near Te Pai Park.

From this analysis, the preliminary design was altered in the Daytona Reserve area and in the Te Pai Place/ Pomaria Road area to retain heritage trees and reduce the amount of land required to be taken from Te Pai Park.

Space for a construction yard is provided for within the designation footprint, while a temporary designation is provided to allow for construction-related works on private property. This temporary designation is the minimum width needed. Sufficient investigations of stormwater collection and treatment options have occurred to determine that the designation can adequately accommodate required stormwater treatment and disposal (with the details of this treatment to be determined through subsequent resource consents).

1. Introduction and purpose of this report

1.1 Introduction

The purpose of this report is to provide a summary of the options that AT has considered in the development of the LRCI Project and how that consideration of alternatives has been carried out.

One of the steps involved in preparing a NoR is the consideration of options for implementing the project. Under section 171 of the Resource Management Act 1991 (RMA), when considering a NoR, Auckland Council must (subject to Part 2 of the RMA) have particular regard to whether:

[A]dequate consideration has been given to alternative sites, routes, or methods of undertaking the work if —

a. *the requiring authority does not have an interest in the land sufficient for undertaking the work; or*
b. *it is likely that the work will have a significant adverse effect on the environment.*

As set out in the NoR and accompanying Assessment of Environmental Effects (AEE), to implement the LRCI Project, AT needs to acquire land from properties that border the road. In general terms, 2 to 3m required from the front yards of the properties on the eastern side of the corridor within the LCRI Project area. On the western side of the corridor, a mix of some front yards and some whole properties are required. AT is in the process of purchasing a number of the residential properties that are substantially affected by the permanent and temporary designation. Further purchases will be required to undertake the project. These purchases are programmed to occur from 2020 onwards.

In undertaking the assessment of alternatives required by Section 171 of the RMA, case law has determined that such an assessment does not need to be exhaustive. The test set by Section 171 is whether adequate consideration has been given to alternatives.

There is a requirement to establish an appropriate range of alternatives and properly consider them. A more fuller and careful consideration of alternatives is expected when there are more significant adverse effects of allowing a requirement.

The assessment of alternatives demonstrates that Auckland Transport, in developing the proposed route alignment, design, and methodology for the LCRI Project has considered:

- Alternative routes (as appropriate);
- Alternative designs, including construction methods and alternative measures to avoid, remedy and mitigate identified adverse effects on the environment; and
- Alternative methods of discharging contaminants.

The assessment process applied was highly iterative, and involved ongoing refinement of the Project on the basis of information derived from desk top studies, field work, community and stakeholder engagement and detailed technical investigations. The process was also informed by the requirements of Part 2 of the RMA, the objectives of the Project and relevant national policy directives. The process satisfies the requirements of section 171.

1.2 Overview of LRCI Project

The LRCI NoR is for a new designation to enable the widening of the Lincoln Road corridor between Pomaria Road / Te Pai Place in the south to the State highway 16 interchange in the north.

The project objectives are set out in Figure 1 below.

Figure 1: LCRI Project Objectives

	Lincoln Road Corridor Improvement - Project Objectives
1	To accommodate more people travelling to and along Lincoln Road by improving corridor efficiency.
2	To improve public transport reliability within the Project area.
3	To improve safety for all road users, including by providing cycling infrastructure.
4	To integrate AT's Lincoln Road improvements with the Western Ring Route upgrade via the Lincoln Road Motorway Interchange.

To achieve these objectives, the LCRI Project involves widening the existing corridor by 2 to 3m (and up to 11m in places) to provide:

- An additional bus and high occupancy vehicle lane on each side of the road (transit lane);
- The construction of a shared/segregated cycleway and footpath on both sides of the road;
- Upgrades at seven intersections;
- The installation of a raised median;
- A new service lane at the rear of 300 to 310 Lincoln Road; and
- Two general vehicle lanes will be maintained in each direction.

The LRCI Project will require the following works:

- Widening the road corridor to provide an additional bus and high occupancy vehicle (transit) lane on each side of the road, including new bus stops;
- Construction of shared/segregated cycleways and footpaths on both sides of the road (with the shared section being approximately 200m long);
- Upgrades and localised widening at 7 intersections;
- Installation of a raised median;
- Installation of a new mid-block, signalised pedestrian crossing between Daytona Road and Paramount Drive;
- Installation of a service lane beside Daytona Reserve to provide alternative access to properties in this area;
- Provision of space for stormwater treatment and associated infrastructure;
- Low retaining walls;

- Removal of some on-street and some off-street car parks; and
- Replacement vehicle crossings and driveways and front yard fencing and landscape strips.

2. Background and history

Lincoln Road is a main arterial route that runs from State Highway 16 (Northwestern motorway) into the centre of Henderson. The road suffers from congestion throughout the day. The current configuration of the road (two lanes in each direction) is inadequate in relation to future demands, and it will become an impediment to the safe and efficient movement of people and goods, and the economic development of the area. Public transport along the corridor is affected by the congestion which contributes to a poor level of service to users. There are safety issues for motorists, while facilities for pedestrians and cyclists are limited.

2.1 Early investigations

Plans to improve the Lincoln Road corridor have been in formulation since MWH was commissioned to undertake the Lincoln Road Corridor Study in 2002. This study commissioned by the former Waitakere City Council (WCC) identified a number of possible upgrade options for Lincoln Road. In 2004 MWH produced the Strategic Corridor Report for Lincoln Road which looked at the strategic transportation capacity of Lincoln Road.

In December 2006, WCC commissioned MWH to undertake a micro-simulation and scheme assessment study that analysed the various options. This work led to the Lincoln Road Corridor Scheme Assessment Report dated April 2008 (SAR) prepared by MWH. That report examined 15 options for Lincoln Road for their merits relative to the 'do-minimum' situation. From these options, four options were developed for further assessment.

The four options were as follows:

- Option 1: Involved bus advanced areas at the intersections of Te Pai Place, Universal Drive and Triangle Road with Lincoln Road (but no widening), duplication of the bridge over SH16 providing two northbound and two southbound lanes and signalisation of the westbound off-ramp from SH16.
- Option 2: Involved the work proposed for Option 1 plus conversion of existing traffic lanes between the Triangle Road and Te Pai Place intersections into bus lanes.
- Option 3: Involved the work proposed as part of Option 1 plus the widening of the carriageway to provide northbound and southbound traffic lanes and bus lanes between the Triangle Road and Te Pai Place intersections with Lincoln Road.
- Option 4: Involved bus advanced areas at the intersections of Te Pai Place, Universal Drive and Triangle Road with Lincoln Road and a northbound bus lane between Te Pai Place and Mega 10, a northbound virtual bus lane[1] between Universal Drive and Triangle Road, southbound bus lane between Triangle Road and Te Pai Place, eastbound bus lane along Triangle Road from Henderson Creek Bridge to Triangle Road (which could be included with any of the four

[1] A separate bus lane is not provided but traffic is held back at a red traffic light, allowing buses to bypass the queues before other vehicles are allowed to continue.

schemes), severance of The Concourse from Lincoln Road removing the intersection at SH16 and provision of a new bridge across SH16 connecting The Concourse with Tony Street.

The SAR 2008 notes that Option 4 was likely to see more extensive land requirements than Option 3 in relation to the new link to the Concourse.

The four options were assessed using a multi-criteria analysis (MCA) with input from various technical experts. Matters assessed included traffic, noise, visual effects, tree removal, effects on private property, effects on pedestrians, tangata whenua, heritage, terrestrial and aquatic ecology, utilities, urban design and consenting requirements.

The MCA identified that Option 2, involving the conversion of existing traffic lanes to bus lanes, would not achieve the objectives of providing bus priority along Lincoln Road and resulted in significant congestion within the network (predominantly on the local road network as queues on Lincoln Road itself impeded access onto Lincoln Road).

Options 1, 3 and 4 were comparable in terms of operation. These options provided priority for buses improving journey times and overall reliability. However, Options 3 and 4 offered additional benefits to Option 1 in that with the provision of bus lanes, buses are protected from variation in traffic flows, queues and traffic growth as they are able to by-pass any congestion. Both these options required the acquisition of third party land along Lincoln Road. In addition, Option 4 with the provision of the new bridge over SH16 would require extensive land take.

Although the options ranked similarly, Options 3 and 4 ensured that as traffic flows grow, buses would continue to receive benefits as they are protected from increases in queuing and congestion by a separate bus lane.

Option 3 was identified as the preferred option. That option is described in the SAR as follows:

> *This option is effectively as Option 2 but instead of conversion of existing traffic lanes to bus lanes, the carriageway would be widened to create bus lanes (Option M8). The option consists of:*
>
> - *A duplicate bridge over SH 16 with two northbound and two southbound lanes;*
> - *Signalisation of the westbound SH 16 off-ramp;*
> - *Bus lane on SH 16 westbound off ramp and between the off ramp and Triangle road southbound;*
> - *Bus advanced signal northbound at new signalised intersection for SH 16 westbound off-ramp;*
> - *Bus advanced areas at intersections of Triangle Road / Central Park Drive; Universal Drive / Universal Drive extension; Te Pay Place / Polaris Road; and*
> - *Widening of Lincoln Road to provide bus lanes north and southbound along Lincoln Road between Te Pay Place and Triangle Road.*
>
> *This configuration provides bus priority facilities along Lincoln Road whilst maintaining capacity for general traffic. The bus lane would be of sufficient width (4.2 metres) to accommodate cyclists within a shared bus/cycle lane.*

In a meeting on 29 and 30 September 2010, WCC agreed that the preferred option for Lincoln Road Corridor Improvements (LCRI) project was Option 3, as outlined in the Lincoln Road Corridor Scheme Assessment Report dated April 2008, and that Option 3 should be the basis for further design work. The LCRI project was recommended to the new Auckland Council to be included for further funding in its draft Annual Plan 2011/2012 and Long Term Community Plan 2012-22.

In October 2010, Auckland Transport (AT) was established as a result of the amalgamation of the region's Councils and the Auckland Regional Transport Authority (ARTA).

AT accepted responsibility for delivery of LCRI Project (as a legacy project, from Waitakere City Council). The AT Board resolved to secure the widening of the route through designations under Section 168 of the RMA.

2.2 Lincoln Road Corridor Preliminary Design 2013

In 2013, GHD produced the Lincoln Road Corridor Preliminary Design, Volume 1: Preliminary Design Report, Addendum to Scheme Assessment Report. The 2013 GHD report considered alternatives for four aspects of the preferred design:

- Special Vehicle Lanes Assessment: three types of special vehicle lane were evaluated – a bus lane (buses, motorcyclists and cyclists), a T2 lane (as per bus lane plus vehicles with two or more occupants) and a T3 lane (as per bus lane plus vehicles with three or more occupants);
- Raised Median Report: the impact of the raised median on intersections was assessed;
- Intersection Operation: evaluation of the signalised intersection layout through to 2026; and
- Integration with the NZTA Interchange: consideration of the interface design including the Central Park Drive intersection.

Consultation with stakeholders on the GHD design occurred between 2013 and 2015, as set out in the consultation report attached to the AEE. An important change from this round of consultation was the shift to a segregated footpath and cycleway configuration.

2.3 Preliminary Design by MWH

MWH was engaged to complete the preliminary design in 2015. A design philosophy statement was prepared in June 2015 setting out the important technical parameters from a transport perspective, based on the preferred option. A copy of the Design Philosophy Statement is attached as **Appendix 7, Volume 2** of the AEE documents.

Further detailed analysis of the available options was undertaken in relation to stormwater treatment options, access to residential properties at the northern end of the project area and in relation to potential effects on three scheduled trees at the southern end of the project area. These considerations resulted in further design refinements, as outlined in Section 5 of this report.

3. Alternative Methods, Routes and Sites

3.1 Alternative Methods

The LCRI NoR for a designation is one method of authorising the land use aspects of the Project. The key alternative method would be to obtain land use consents for the LCRI Project. Obtaining land use consents is not the preferred option because:

- AT does not yet own all the land required for the LCRI Project so may need to exercise its compulsory acquisition powers; and
- Including the designation in the District Plan gives plan users notice of the total extent of the footprint required for the LCRI Project.

Other potential methods include a plan change or a building line restriction or similar be placed along the frontage of properties through the Proposed Auckland Unitary Plan (PAUP) process. Under these options land would need to be acquired on the open market then rezoned as road corridor.

If a plan change was undertaken to “re zone” the land required for the LRCI Project as 'Transport Environment ' or similar, a large number of properties would see split zonings over their sites (prior to purchase of the land by AT). This would create a number of administrative issues for landowners, business operators and the Council.

A NoR is the preferred option because:

- The land required for the LRCI Project is within multiple zones within the Operative Plan and PAUP;
- Building line restrictions and other similar tools do not provide the same level of certainty to landowners and AT as to the form of the corridor, and can only be implemented as sites redevelop;
- A designation provides a comprehensive way to authorise the LCRI Project; and
- A designation assists with supporting the land acquisition required for the Project.

3.2 Alternative Routes

From the outset, MWH’s main was on improving the function and safety of Lincoln Road as a major arterial road. At a conceptual level, possible alternative, parallel routes to Lincoln Road, linking Henderson with the State Highway are Edmonton Road / Central Park Drive to the east and Rathgar Road to the west (see **Figure 2** below).

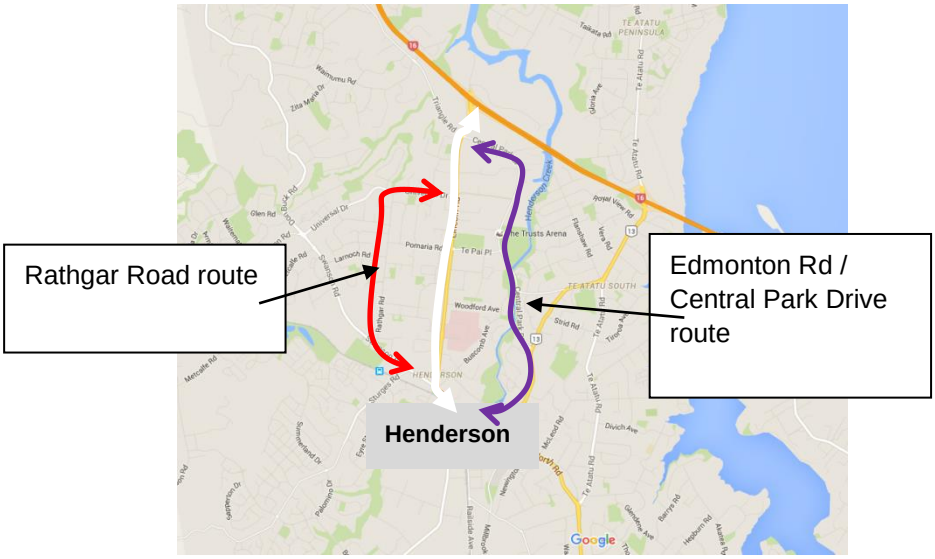


Figure 2: Alternative Routes

Neither of these alignments are suitable or appropriate routes to deliver the project objectives, in full or in part. For example, the public transport function could not be accommodated by one corridor and the private vehicle demand by one of the other routes.

Lincoln Road is identified as a regional arterial. The Edmonton Road / Central Park Drive route is classed as a secondary arterial. Rathgar Road is identified as a collector route.

An eastern route down Edmonton Road / Central Park Drive would generate substantial costs with substantially fewer benefits. The section of Edmonton Road south of Central Park Drive passes through a residential area where widening would create substantial impacts on residential amenity. Central Park Drive provides access to a range of business activities and already helps to provide an alternative route to Lincoln Road. However, this corridor sits to the side of the main commercial and community activities along Lincoln Road, and as a result is significantly less beneficial in terms of public transport accessibility.

To the west, Rathgar Road parallels Lincoln Road up to Universal Drive. North of Universal Drive there is not connection through to Triangle Road and the North-western motorway. Rathgar Road is a two lane, collector-type road that traverses an established residential area, including three schools. Turning this route into a public transport-orientated or general arterial road would generate significant adverse effects on the adjacent residential environment that could not be mitigated. In addition, there are insufficient linkages from these routes to community facilities and businesses that would support public transport.

Accordingly, Rathgar Road and Edmonton Road / Central Park Drive were not considered viable alignments in comparison to Lincoln Road. They would not deliver the project objectives and would result in significant adverse effects, while upgrading either of the alternative corridors will not address the current safety and congestion issues experienced along Lincoln Road.

3.3 Alternative Sites

The SAR 2008 also considered the alternative option of not adding an additional transit lane but instead 'taking a lane' for transit only use (Option 2). This option was not a viable alternative as it would have resulted in the removal of capacity from Lincoln Road by the loss of a lane in each direction. In addition,

it would adversely affect access to a range of services and activities along the length of Lincoln Road. Constricting existing capacity in order to promote public transport use would adversely affect business activities, lessen the arterial road function, and potentially increase pressure on other routes.

To achieve the required width, the Lincoln Road corridor could be widened on the eastern side only, the western side only or a combination of both (as is proposed).

The alternative of widening the road on one side only has not been assessed in any depth due to its impracticality. Due to the 'staggered' nature of buildings and development along the Lincoln Road corridor, there is no clear choice between one side or the other in terms of the level of development. The extent of disruption that would arise if a larger area of land was taken on one side would also be significant.

The eastern side of the corridor is mostly business / commercial in terms of land use activities, while the western side is a mix of residential, small business and commercial. In land use terms, the eastern side may therefore be seen as being less 'sensitive' to change.

As set out in the designation plans attached to the NoR land take is greater on the eastern side of the corridor than the western side. However not all land take can be concentrated on the eastern side. There is Te Pai Park to the south while there is a range of commercial and retail buildings in close proximity to the current road edge. The main 'undeveloped' frontages on the eastern side is in the vicinity of Laidlaw College (near the intersection with Universal Drive) and to the north, close to the State Highway Interchange.

Widening the eastern side of the corridor is not a realistic option as a large number of existing commercial buildings will need to be acquired and demolished. It would generate additional costs to businesses affected and to AT without any corresponding substantial benefits to activities or the environment on the western side of the road. Greater widening on the eastern side would also have a greater impact on Te Pai Park.

Widening the western side would see a larger number of existing houses and small businesses removed along the corridor, exposing the next row of houses to the west to road traffic noise and related effects. Commercial activities around Universal Drive would see a larger loss of on-site car parking.

Particular issues with a 'one-side-only' approach include:

- Engineering/technical – widening one side of the road will mean a significant shift to the road centreline which will lead to a negative impact on the road geometry, especially at the tie-ins at either end of the project area. Also, there would be an increase in the amount of the earth works needed to create the new road crown and potential consequent effects for redirected overland flow during storm events.
- Land take – the total number of properties affected by this approach would be significantly less compared to widening both sides. However, this approach comes with significant land take from the one side affected that is likely to entail full site acquisition in some cases.
- Costs/benefits – taking land on one side does not entail any public benefits that justify the additional public costs.

In summary, the approach of taking land on both sides of the corridor limits the extent of acquisition of land from individual properties and avoids the need to acquire land that contains existing industrial or commercial buildings (which would have increased the costs to AT of the project, but also the disruption effects to businesses so affected). There is no obvious design, operational or amenity benefits from concentrating the widening on one side only. Therefore, this option was not a viable alternative.

4. Alternative Methods: Road Design and Construction Effects

This section sets out the alternatives that have been considered in relation to the physical design of the corridor.

4.1 Road Design

4.1.1 Bus lane / T3 Transit Lane

The main feature of the project is the provision of a 'transit' lane in each direction of travel. Transit lanes accommodate buses and cars with more than one person in them (a T2 transit lane provides for vehicles with two or more people, a T3 lane provides for vehicles with three or more). The provision of dedicated space for buses and high occupancy vehicles strongly links to the objectives of the project to improve the overall people carrying capacity of the corridor.

The growth of the wider Henderson area in terms of more housing, people and businesses, as well as the completion of SH 20 as the 'Western Ring Route' will significantly increase travel demands along the corridor, into the future. A transit lane provides much greater people carrying capacity than a lane occupied by a majority of vehicles carrying only one person. As a result, the overall efficiency of the corridor is improved, even if fewer additional cars are accommodated by the widening.

The option of providing an additional lane for general traffic (three lanes in each direction) and not a dedicated transit lane was considered in the SAR 2008. Such an option provides additional short term capacity for all road users, but over time, the extra capacity becomes depleted. Public transport services experience the resulting congestion, as does commercial and business traffic. As a result, once levels of congestion begin to rise, there is much less ability to provide additional capacity through increasing passenger transport services. Dedicated transit lanes retain capacity for the longer term, with the overall capacity of the corridor greater than if all three lanes are used by general traffic.

Section 6.4 of the Transportation Assessment describes the assessment of the options of providing a T2, T3 or a bus only lane. A T2 lane would carry volumes of traffic similar to a general traffic lane and not result in any benefits for high occupancy vehicles. In contrast, a T3 lane in both directions would provide significant benefits to travel time per person along the corridor. If a bus lane was to be implemented rather than a T3 lane, then the performance of the other general traffic lanes would deteriorate to LOS F at an earlier stage.

Accordingly, it is proposed that a T3/bus lane is introduced first, with the ability for the lane to become a dedicated bus lane in the future on the basis that the frequency of buses will increase as the Frequent Service Network is implemented.

4.1.2 Cycleway and footpath

The 2013 GHD design included a 2.5m wide shared path for pedestrians and cyclists on either side of the road. During consultation on this design, segregated cycleways were sought, and AT agreed to consider providing a segregated cycleway.

As set out in section 6.5 of the Transportation Assessment Report, three different forms of segregated cycleway were considered at a workshop in April 2015. These were:

- Protected cycleway with a raised island;
- Painted island separation; and

- Raised cycleway (Copenhagen style).

The preferred option is a 'Copenhagen style' separated cycleway and footpath on either side of the road. The project extent/width was subsequently revised to accommodate the separated cycleway, with the combined footpath/cycleway width of over 4m.

The reduction of conflicts between cyclists and pedestrians and greater sense of safety for cyclists provided by a segregated cycleway helps to meet the project objective of improving safety for all road users. While the number of cyclists using Lincoln Road is currently low, experience elsewhere in the Auckland region is that once a safe cycle facility is provided, usage quickly grows. The flat topography of the Lincoln Road area and the numerous side-street connections with surrounding residential and business areas should further assist in stimulating demand. State Highway 16 also has a dedicated cycleway along the North-western Motorway into which the Lincoln Road cycling and walking facilities will connect.

As explained further below, the need to retain two scheduled trees near Pomaria Road and to minimise reserve land take impacts on Te Pai Park has resulted in the design reverting to a shared cycleway/footpath along a 200m section at the southern portions of the project area.

4.1.3 Intersections / Transitions

Alternative layouts for the following three key intersections were considered, as set out in section 6.1 of the Transportation Assessment Report:

- Lincoln Road / Central Park Drive / Triangle Road intersection;
- Lincoln Road / Universal Drive intersection; and
- Lincoln Road / Te Pai Place / Pomaria Road.

All alternative layouts were assessed in terms of operational efficiency and performance using micro-simulation models in order to arrive at the preferred intersection layouts.

Three options were also considered for the transition from Lincoln Road to the SH16 interchange, as set out in section 6.2 of the Transportation Assessment Report. The preferred option provides for four lanes of traffic northbound approaching the motorway without a T3 lane, providing 250m length of road corridor for drivers to select the correct lane for their destination. Southbound traffic has three lanes of traffic turning left off the motorway widening to four lanes and the addition of the T3 lane, avoiding a ‘transit lane trap’ scenario for traffic turning left off the motorway.

4.1.4 Raised median

The construction of a raised median is an important component of the LRCI Project, but by itself does not require authorisation by the NoR. It could be installed by AT as a permitted activity, subject to normal safety and traffic management considerations. Nevertheless, it is accepted that the widening of the road to three lanes, one of which is a transit lane, prompts the need for a raised median, and therefore it is appropriate for AT to consider alternatives to the raised median as part of this NoR process.

One of the objectives of the project is to improve safety. The corridor already experiences a relatively high crash rate and without further intervention in the road design, safety is likely to deteriorate. The raised median avoids mid-block U turns. The alternative to a raised median is a flush median or no median at all.

In-depth consideration has been given to assessing the requirement for a raised median in Section 8 of the Transportation Assessment Report. Further assessment is set out in an earlier report by GHD: 314/11/44/PA Lincoln Road, Corridor Preliminary Design, and Impact of Raised Median in April 2013.

Positive effects identified in the various reports arising from the raised median include:

- Reduction in right angle and other turning collisions along mid-block sections, estimated at 20-30%;
- Reduction in delays and queuing from side roads results in less driver frustration which otherwise may result in drivers taking unacceptable gaps to merge with Lincoln Road traffic;
- Elimination of mid-block U-turn manoeuvres; and
- Prevention of collisions that would otherwise be caused by traffic crossing the centreline / flush median.

Negative effects identified include:

- Increased travel distance resulting from right-turn restriction on movements in and out of driveways and minor side roads - vehicles will be required to perform U turns or take side roads instead. From selected destinations along the corridor the additional distance is up to 690m representing a maximum additional travel time of 2.8 minutes;
- Increased number of vehicles passing through intersections as a result of changes in movements. A relatively minor impact on intersection performance is expected, ranging from 0.2% - 5.0% during peak periods;
- Concentration of right turning movements at signalised intersections; and
- Pedestrians may be encouraged to cross away from the formalised crossings.

The Transportation Assessment concludes that the safety benefits of installing a median will outweigh the negative effects, and the implementation of a raised median will meet the project objective of improving road safety while having a minimal impact upon the objective that corridor efficiency be improved. The raised median also offers opportunities for landscape treatment, such as street trees.

It is recognised by AT that the raised median will alter the way that customers will be able to access businesses along the corridor. Pedestrian crossings have been provided. If the raised median was not included in the design, traffic safety will become an increasing problem, and as a result some customers may be deterred from using the corridor and accessing businesses along it. Steps have also been taken in the design to enable U turns at key intersections.

4.2 Construction Activities

Construction of the LCRI Project is likely to take two to three years. A project specific construction methodology for the LCRI Project will be prepared once detailed design is complete and implementation is programmed. This construction methodology will consider how to minimise impacts on businesses and activities, as well as the road users, while not prolonging the time that it takes to complete the works. In addition, as detailed in the AEE, a range of management plans will be prepared, including a Construction Environmental Management Plan, that will set out how effects like noise and dust will be managed.

4.2.1 Temporary works area

The designation plans show an area where construction-related activities are likely to need to be undertaken on private property. This is the land between the red and blue dotted lines. The land affected by this area will not form part of the widened permanent road corridor and does not need to be acquired by AT. However AT and its contractor may need to undertake works in this area to form the road and replace existing driveways, landscape strips and the like. Along the corridor, there will be some level changes between the widened road surface and on-site car parking areas that will have to be addressed through works on private land, such as reformed driveways.

Once the works are complete, the intention is that this part of the designation be uplifted.

The designation plans attached to the AEE generally show a 2m wide temporary works area, but in some cases a narrower area has been identified so as to avoid existing buildings, or where it is expected that works can occur within the current road corridor. The objective has been to keep the temporary works area as narrow as possible whilst recognising that the proposed Lincoln Road corridor will see, in most cases, transport related infrastructure extend from one side of the road corridor to the other, with no grass berm.

Prior to the project commencing, the temporary works area designation does have implications for any proposed development in the temporary works area, including new buildings and installing new or upgraded utility connections. This is because AT's approval is needed for any works in the affected area. Conditions are proposed that would prevent AT from withholding its consent to any minor utility works in the temporary works area.

4.2.2 Construction Yard

A construction yard will be required to store plant, machinery and materials during the construction phase. One of the key considerations when deciding how and where to store plant, machinery and materials during the construction phase was minimising the amount of construction traffic on the road network.

A site in excess of 2,000m^2 is likely to be needed for a project of this size.

The preferred site for a construction yard is at the corner of Triangle Road and Lincoln Road where AT has acquired a number of properties (322 and 324 Lincoln Road). This site is close to the motorway, but is opposite residential uses.

Alternative sites or methods could include sites elsewhere along the corridor, or greater reliance upon material and machinery being brought to the construction site on a 'just-in-time' basis. Both of these options have significant potential adverse effects relating to increased vehicle movements along the road network. In addition, any other sites along the road corridor would require additional land purchases.

AT is acquiring land near Daytona Reserve, and one option considered was whether to use some of that land in the interim as a construction yard. However, this land is immediately adjacent to residential activities and therefore much closer to its nearest residential neighbours than the Triangle Road site. Trucking in machinery and material on a regular basis will result in a greater number of heavy vehicle movements on other roads, including on the motorway.

5. Alternative Methods: Road Design and Construction Effects

As part of the NoR preliminary design process, an initial scan of environmental effects was conducted by technical experts on the LRCI project team. This scan identified locations where the adverse effects of the project were potentially more significant. These were called 'hot spots'. The four hot spots were:

- Daytona Reserve area;
- Scheduled heritage trees near Pomaria Road, opposite Te Pai Park;
- Lincoln Centre / Laidlaw College frontage; and
- Stormwater treatment and disposal method and site.

Alternative designs and options were considered for these 'hot spot' locations, with subsequent technical expert analysis and MCAs carried out. A comprehensive set of criteria was developed and used as the basis for undertaking the MCA. These criteria form each of the below sub-headings below and cover Project Objectives, consenting factors, and temporary and permanent effects. The methodology used for the MCA is set out in **Appendix 1**.

The key alternatives considered for these 'hot spots' are summarised in the sections below.

5.1 Stormwater Treatment Sites

As the NoR seeks to designate land that will be used for the treatment of stormwater from the LRCI Project, an assessment of alternative sites and methods for stormwater treatment has been undertaken. Currently, stormwater from Lincoln Road is discharged untreated at 10 different locations.

MWH prepared the 'Lincoln Road Corridor Improvements Option Report' in May 2015 (MWH 2015 report) to assess feasible options for the treatment and disposal of additional stormwater generated from the LCRI Project, as well as the existing road corridor if that was required. This work was undertaken so that AT could be satisfied that there was a viable stormwater management approach available. The investigations were not to the level that would be needed to support a resource consent application. Resource consents will be applied for at a later date.

Water sensitive urban design options (described as Low Impact Design (LID) in the MWH 2015 report) were not considered to be feasible options for the treatment of stormwater from the LRCI Project. The Lincoln Road corridor is constrained on both sides and the additional width required to implement LID devices would substantially increase land acquisition and the impact of the road widening works on property owners and businesses would be substantial. Therefore, LID devices are not considered to be a feasible solution for full stormwater management of the widened Lincoln Road corridor.

The stormwater options discussed in the Stormwater Report are:

- **Option 1 - Separate discharges for northern and southern catchments:** Consolidate stormwater discharges from the northern part of the road and discharge to the Coastal Marine Area (CMA) at Triangle Road or Daytona Strand, to be treated using structural filtration or wetland close to the discharge point. Consolidate discharges from the southern part of the road and discharge to Henderson Creek via upgrading existing drain through Laidlaw College, to be treated using structural filtration on Laidlaw College land or on Trusts Stadium land.

- **Option 2 - Single discharge to triangle road:** Consolidate stormwater discharges from entire road to discharge to the CMA at Triangle Road. Treatment to be provided by a wetland (option 2A) or structural filtration device (option 2B) close to the discharge point.
- **Option 3 - Single discharge to Daytona Strand:** Consolidate stormwater discharges from entire road to discharge to the CMA at Daytona Strand. Treatment to be provided by a wetland in the CMA at Daytona Strand (option 3A) or a structural filtration device located at 312 Lincoln Road (low point of the road) (option 3B).

All of these options were considered technically feasible at a high level. Option 1 was not favoured due to the additional costs and environmental impacts of two separate treatment and discharge locations. Option 3 had the benefits of a shorter pipe route and more defined land acquisition route than Option 2. Consolidation of existing discharges to one point would benefit those parts of the receiving environment that would no longer receive road run off.

Providing treatment via structural filtration was considered to be easier to construct, maintain and consent, and have a lower whole life cost than a wetland. The preferred option was therefore Option 3.

Under Option 3B, a structural filtration device at 312 Lincoln Road has the ability to treat various amounts of stormwater runoff; that is, run off equivalent to the new impervious areas up to the full impervious area of the new and existing road.

As noted above, stormwater discharge consents are not being applied for at this stage. For the purpose of the NoR, AT is satisfied that a feasible and constentable stormwater discharge option is available using the land at 312 Lincoln Road. At this stage the proposal is to treat the stormwater discharges from an area equivalent to the new surface installed as part of the road widening (but not the existing surface).

Disposal of stormwater will require a new pipe to be laid from 312 Lincoln Road to a discharge point at Daytona Strand. The preferred route for this new pipe is to follow an existing walkway that links Lincoln Road with Preston Avenue. The new pipe will then be laid under Preston Road before crossing one property to reach Daytona Strand. The first section of this pipe route is included in the temporary works designation to allow for the works to place the pipe under the pedestrian walkway. These works are likely to affect adjacent vegetation and fencing.

Given that 312 Lincoln Road is the natural low point along the corridor, the new stormwater pipe has to follow the walkway. There is an existing stormwater easement shown crossing Daytona Reserve, but this easement would not provide a feasible route.

The temporary designation will follow the path of the walkway. Land on either side of the walkway is likely to be affected by construction works and as a result a temporary designation is proposed to be placed on land either side of the walkway. Once constructed, the temporary designation will be withdrawn.

5.2 298-314 Lincoln Road and Daytona Reserve

The residential properties at 298 to 314 Lincoln Road, on the western side of Lincoln Road towards its northern end, are located well below the level of the surface of the road. The gradients of the driveways to these properties are currently very steep. With a widened road, retaining structures will be required and the gradient of new driveways would be too steep to enable safe access to these properties directly from Lincoln Road. The need for an alternative route for vehicle access to these properties was identified early in the design process.

At the same time, the stormwater management options discussed above identified the need for land at 312 Lincoln Road to accommodate an in-ground stormwater treatment device (this being the low point along the corridor). There is a need to provide vehicle access to this area for maintenance purposes.

To address these issues, in 2013 GHD proposed a two way service lane connecting Lincoln Road to Preston Avenue (a cul-de-sac to the rear of the properties), as a concept. Subsequent consultation with landowners in Preston Avenue identified that they did not want a through route to be provided because of traffic noise and safety issues.

In 2014, a workshop was undertaken with AT and Auckland Council technical experts (project management, property acquisition, planning, parks, stormwater, urban design, walking and cycling, traffic systems and traffic operations) to assess various further conceptual options for the location of the service lane. The options that were assessed are shown on Figure 3 below and included the 'Back Lane' (red), 'Lincoln Road Edge' (purple), 'Half Park Edge' (blue) and 'Park Edge' (green). These options do not join with Preston Avenue, with the intention that the service lane terminate at 312 Lincoln Road where it would provide access to the stormwater treatment device. Access to 314 Lincoln Road could also be obtained at this point. All of the options involved the purchase of 298 and 1 / 298 Lincoln Road.

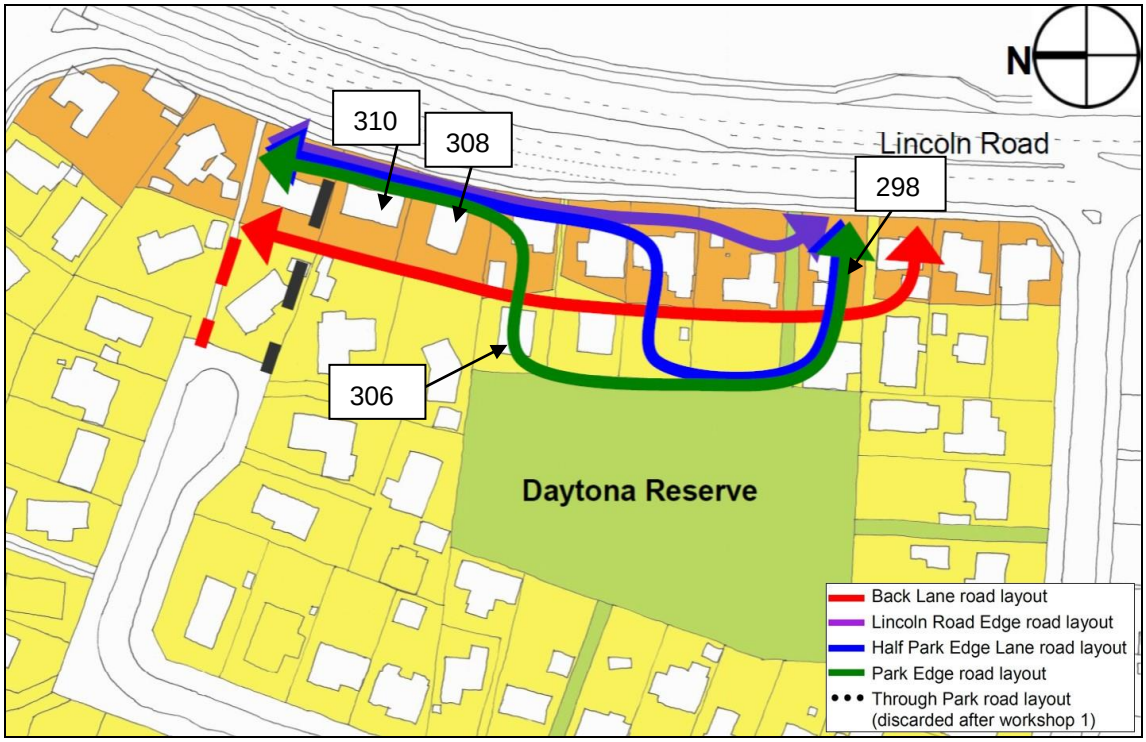


Figure 3: New Service Lane Options (MWH Transportation Assessment)

The Park Edge Road layout (green line) was identified as the preferred option at this workshop because it largely retains a contiguous area of land (numbers 300 to 304A Lincoln Road) that could be redeveloped in a comprehensive manner. The other options severed these lots.

The Park Edge option also provides good sightlines from Lincoln Road into the park which should assist in raising awareness of this public amenity. It was also considered the best option to improve public access to and passive surveillance of the park.

The alignment of the service lane within Daytona Reserve was subsequently discussed with the Henderson-Massey Local Board and it was agreed that some land could be taken from the reserve for roading purposes due to the public benefit of opening up the reserve to easier public access. Some

trees would need to be removed and replacement planting provided. As set out in the Arboricultural Report, the tree removal was discussed with Council Parks' Arborist Chris Loughborough, and removal of the trees was supported by Council Parks provided suitable mitigation planting was provided.

Consideration was then given to how to access 312 Lincoln Road. Three further alternative, preliminary design drawings were then prepared based on the Park Edge Road layout. All three options involved the lane passing through 306A and requiring the removal of the existing dwelling on that site. The options were:

- **Option 1:** The service lane would pass to the rear of 308 and 310 Lincoln Road. The existing dwelling at 306 Lincoln Road is not required to be removed. 308 and 310 Lincoln Road would be required to be acquired in full, with residual land sold once the lane is constructed. A cul-de-sac turning area would be located on 312 Lincoln Road requiring the removal of the building on that site.
- **Option 2:** The service lane would pass to the front of 308 and 310 Lincoln Road adjacent to Lincoln Road edge (but at a lower level, beneath retaining walls). This would require the existing dwelling at 306 Lincoln Road to be removed. 308 and 310 Lincoln Road would be required to be acquired in full, with the potential for sale of residual land. A cul-de-sac turning area would be located on 312 Lincoln Road requiring the removal of the building on that site.
- **Option 3:** The service lane passes through the middle of 308 and 310 Lincoln Road, most likely requiring the existing dwelling at 306 Lincoln Road to be removed. 308 and 310 Lincoln Road would be required to be acquired in full. A hammerhead turning area would be located on 312 Lincoln Road requiring the removal of the existing building.

Sketch plans showing the different options are included in **Appendix 2** to this report.

These options were assessed using a MCA evaluation exercise involving AT staff and members of the LRCI Project team having different technical expertise. A fourth option was identified through this process. This option (**Option 4**) involved the same alignment as Option 1 above. However, the land acquired at 308 and 310 Lincoln Road would be retained in Auckland Council's control in order to provide space for replacement street tree planting mitigation and possibly(if feasible) some level of stormwater treatment such as bio retention or similar.

The MCA considered criteria relating to achievement of the project objectives, effects on the environment, social effects, economic effects and RMA / consenting issues. The matrix and results are in **Appendix 2** to this report. These results gave an understanding of the different effects generated by the options.

The options were all similar in terms of ability to achieve the project objectives. The highest scoring option overall was Option 4 due to the amenity benefits, including the ability to provide some space for street trees, landscape treatment and possibly stormwater management.

The second highest scoring option was Option 2, which had the best layout in terms of urban design criteria because:

- It does not pass to the rear of existing properties at 31 and 33 Preston Avenue;
- The properties at 308 and 310 Lincoln Road continue to front towards Lincoln Road; and
- The lane has good visibility from Lincoln Road.

Based on the outcome of the MCA, AT elected to proceed with Option 4 for the designation (see **Figure 4** below).

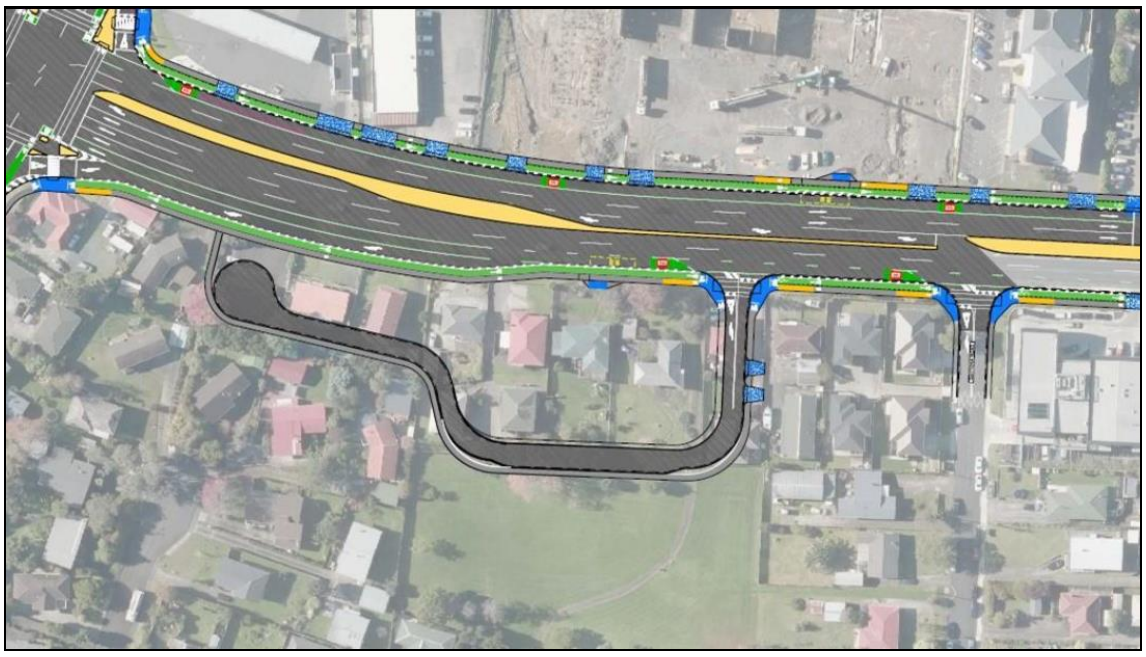


Figure 4: Service Lane selected design (MWH Transportation Assessment)

5.3 Te Pai Park & Scheduled Trees

There are three scheduled trees located at the southern extent of the project area, opposite Te Pai Park (a Himalayan Cedar within the road reserve outside 158 Lincoln Road, a Rimu within the road reserve outside 172 Lincoln Road, and a Rimu on private property at 170 Lincoln Road).

The preliminary design for the road (involving the three lanes in each direction, raised median and segregated pedestrian/cycle facility) required the removal of the Himalayan Cedar and the Rimu outside 158 Lincoln Road. The Rimu at 170 Lincoln Road is set back from the road and would not need to be removed.

Due to the particular significance of these two trees, this area of the project was identified as a 'hot spot' where alternative designs needed to undergo a thorough a MCA in order to understand their positive and negative effects and whether removal of the trees could be justified.

Building on the preliminary design, seven feasible options were sketched by MWH for possible road layouts in this area, some of which avoided the removal of one or both trees, and some of which did not. The options were then assessed in a MCA workshop involving AT and members of the LRCI project team having different technical expertise. The options were:

- **Option 1:** shift the alignment of this section of Lincoln Road towards the east, into Te Pai Park. This avoids the removal of all scheduled trees; however it has an increased impact on Te Pai Park through further land take. As part of this option, the footpath is separated from the cycleway and passes around the western side of the Rimu outside 172 Lincoln Road.
- **Option 2A:** the alignment of the road remains as per the preliminary design. The northbound cycle and pedestrian paths are moved towards the west to pass around the western side of the Himalayan Cedar outside 158 Lincoln Road. This avoids the removal of the Himalayan Cedar, but has an increased impact on the site at 158 Lincoln Road. It does not avoid the removal of the Rimu outside 172 Lincoln Road.

- **Option 2B:** the alignment of the road remains as per option 2A, but the northbound T3 lane only commences north of the Cedar. The northbound cycle and pedestrian paths pass around the eastern side of the Himalayan Cedar outside 158 Lincoln Road. This avoids the removal of the Himalayan Cedar but means there is no T3 lane outside 158 Lincoln Road. Northbound buses cannot therefore enter the T3 lane directly from the southern side of the intersection with Pomaria Road and Te Pai Place. The option does not avoid the removal of the Rimu outside 172 Lincoln Road.
- **Option 2C:** the cycle and pedestrian paths are split around the Himalayan Cedar outside 158 Lincoln Road, with the northbound cycle path passing to the east and the pedestrian path passing to the west, requiring some land to be taken from the site at 158 Lincoln Road. This avoids the removal of the Himalayan Cedar but requires there to be no northbound T3 lane outside 158 Lincoln Road. Northbound buses can therefore not enter a T3 directly from the southern side of the intersection with Pomaria Road and Te Pai Place. The option does not avoid the removal of the Rimu outside 172 Lincoln Road.
- **Option 3B: t**he northbound cycle and pedestrian paths pass around the eastern side of the Himalayan Cedar outside 158 Lincoln Road and the Rimu outside 172 Lincoln Road. This avoids the removal of all scheduled trees but requires there to be no northbound T3 lane for about 100m (from the Pomaria Road intersection to 174 Lincoln Road). Northbound buses cannot therefore enter a T3 lane directly from the other side of the intersection with Pomaria Road and Te Pai Place. The bus stop is located further towards the north than other options due to the need to position it within the T3 lane.
- **Option 4A:** As per the preliminary design**,** the Himalayan Cedar outside 158 Lincoln Road and the Rimu outside 170 Lincoln Road are both required to be relocated. These trees would be relocated to an appropriate location as close by as possible, such as Te Pai Park.
- **Option 4B:** the same as Option 4A except that the scheduled trees will not be relocated.

Sketch plans of the different options are included in **Appendix 3** to this report.

The MCA considered criteria relating to achievement of the project objectives, effects on the environment, social effects, economic effects and RMA / consenting costs. The matrix and results are in **Appendix 3** to this report. These results gave an understanding of what the different effects of the options would be and were used to inform the proposed design.

The highest overall score was given to Option 3B. This option was the worst at achieving the project objectives, but scored the best for environmental effects.

The second highest overall score was given to Option 1. The option was top equal at achieving the project objectives, and scored well for environmental effects.

From a design engineering perspective, Options 4A and 4B were most favoured by AT. Of these two options, Option 4A had the better score for environmental effects. It was the fourth highest scoring option overall (Option 2B was third).

Following this exercise, AT decided to present Options 1 and 4A to the Auckland Council Parks and Arborist teams for feedback. Option 3B, despite avoiding effects on the trees and properties, was considered too unfavourable for meeting the Project's strategic objectives to progress because of the impact on bus services from the reduced transit lane.

The Parks team advised that Option 1 required an excessive amount of land from Te Pai Park and that the extent of land take should be minimised. The arborist did not support the relocation of the scheduled trees required by Option 4A, due to the risks involved in trying to transplant these established trees. Neither option presented was considered ideal.

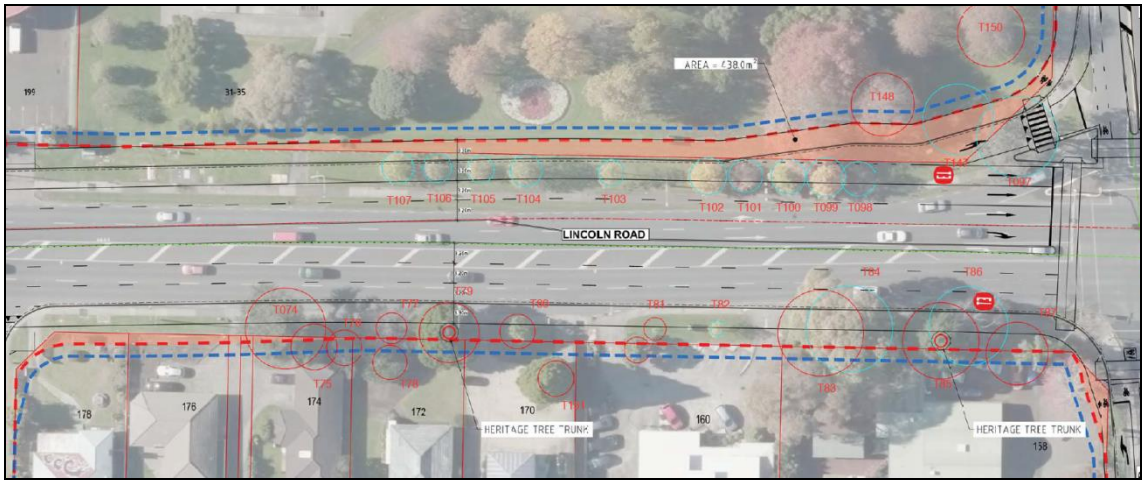


Figure 5: 'Hybrid' option selected for Te Pai Park & scheduled trees

The feedback from Council resulted in a hybrid option being developed which minimised land take from Te Pai Park while avoiding the removal of the scheduled trees (see **Figure 5** above). This was achieved by narrowing the cross section of the road as much as possible, including the raised median width being reduced and the segregated cycleway being changed to a shared cycle and footpath for this section of the road (3.3m wide). This option was presented to the AT Walking and Cycling team for feedback. It was recognised that the hybrid option is not as favourable for walking and cycling as the Copenhagen segregated cycleway provided in the other options, although is still an improvement upon the existing situation. The shared path provides a safe environment for cyclists and their use of the path will need to be moderated when pedestrians are present. AT elected to proceed with the hybrid option for the designation.

The detailed design of the shared footpath / cycle way will need to ensure that the scheduled trees are not harmed by the works in the drip line. This is to be covered in the conditions of the NoR. The other trees in this location on the western side of the road may also be able to be retained, depending upon detailed design, while the retained berm space offers opportunities for new street trees.

5.4 Laidlaw College Frontage

An issue considered during the preliminary design phase was whether the road design should be amended to retain more existing trees or to provide additional space for replacement planting. A focus of this assessment was the Laidlaw College frontage, given that this frontage contains a concentration of larger trees on private property.

Laidlaw College is a large site at 211-221 Lincoln Road. The frontage to the site from Lincoln Road was identified in the Urban Design, Landscape and Visual Assessment attached to the AEE as providing an area of moderate to high amenity. It has a low brick wall and entrance alcove combined with a line of large, established trees (see **Figure 6** below). The trees are a highly visible landmark within the context of the rest of the Lincoln Road environment.

The preliminary design for LRCI Project requires the removal of the wall and the trees within approximately five metres of the road boundary. Section 8.23 of the Arborist report lists the trees present and makes a broad judgment as to whether the trees may need removal. This judgement is not

based on an accurate survey of the final road boundary and therefore takes a very conservative approach. Not all of the trees along the site's frontage are likely to be removed as some of the taller trees are more than 5m back from the frontage. The Arborist's assessment identifies that the gum, walnut, oak and pin oak may be able to be retained. However the hedge and lower vegetation beside the road will be removed.

Figure 6: Laidlaw College Lincoln Road entrance (Urban Design, Landscape and Visual Assessment Report)

The larger trees on the site are subject to the tree rules of the Operative District Plan by virtue of the size of the property that they are located on, which is in excess of 4,000m^2. A resource consent for a limited discretionary activity would normally be required for their removal.

However, given the subdivision and development potential of the site, there is no certainty that these trees will remain subject to the tree rules, in the future. Once smaller sites are created (less than 4,000m^2 in area), then the tree rules will no longer apply, although in granting any subdivision consent, retention of some of the trees may be considered.

In addition, the frontage to a depth of 4.88m is also the subject of an existing designation in the Operative District Plan. This designation is for 'road widening purposes' and is not subject to any conditions that would prevent the removal of the wall and some of the trees when undertaking road widening.

Nevertheless, AT has thoroughly assessed all alternatives available for potentially retaining these trees. The Urban Design Assessment reviewed alternative options including a slight re-alignment of the carriageway at 211 - 221 Lincoln Road towards the western side of Lincoln Road, or replacement ‘like-for-like’ of the features to be removed within a new berm / planting area on the eastern side of the new road alignment, within the College site.

A realignment of the carriageway would see a majority of the trees able to be retained. This would be beneficial from a landscape and urban design perspective. However, the assessment found that it would have significant implications for the design of the road corridor. A stagger in the alignment of traffic lanes and median strip in a short section of the corridor would create a range of serious issues for traffic flow and safety, as well as continuity of utility services. Accordingly, this option was not considered to be a viable alternative.

Another alternative option was the removal and reinstatement of the brick wall and the replacement of the hedge and trees to be removed in a new berm area to the east of the new footpath/cycle. This

option would require compulsorily acquiring or negotiating the purchase of additional land from the College site for the replacement planting and wall. This land would include any of the larger trees that are retained, such as the oak and walnut.

The costs of this option are not likely to be outweighed by the benefits. It is considered the landscaping proposed within the median, adjacent to the lane beside Daytona Reserve and 308 and 310 Lincoln Road and on the street outside 322 and 324 Lincoln Road would appropriately mitigate the loss of these trees.

Negotiations with landowners over compensation for land take will involve tree planting and landscape treatment of new frontages, if agreed to by those owners. As a result, as part of the acquisition of the Laidlaw College frontage required for the LRCI Project, whether or not the low wall will be replaced and the new front yard planted will be a matter that is negotiated with the landowner.

Appendix 1 MCA Process

In order to assess the performance of options, a set of performance criteria were identified. These metrics are provided in Table 2 below.

The performance of each of the options against the criteria was assessed in terms of a five-point scale. The assessment was not comparative across the options; rather each effect was considered option by option, against the existing environment that currently exists in the project area.

A positive score indicates an opportunity for improvement to the existing environment and a negative score indicates a worsening of the existing environment.

The MCA score may not exactly transfer to the same level of effect on the environment once detailed technical assessments are undertaken for a preferred option. This is due to the difference in the level of investigation involved between preliminary and detailed design. However any differences are likely to be small.

Differences between the MCA scoring and detailed technical assessments will also occur due to differences in technical methodologies and the measures in the MCA. The MCA relies upon a coarse grained analysis of effects and involves a judgement of their average scale and effect. There may be particular areas where effects are significant or there are particular receivers not considered at the coarse MCA level that experience significant effects.

For the project objectives the scoring was slightly different. A positive score means that the option contributes to the achievement of the project objective while a negative score indicates that the option did not.

A negative project objective score was considered a fundamental flaw, as the option did not contribute to the project objectives. For an option to be taken forward it must contribute to the requiring authority's project objectives.

The scale used to score options against criteria is described as follows:

Each criteria score can be used for either (1) the degree to which the option being considered supports that criteria or (2) the scale of effect resulting from the option being considered.

The evaluation system is as follows:

Table 1: Scoring

Evaluation	Rating
1. Strongly supports criteria or 2. Significant Potential Positive Effect	5
1. Supports criteria or 2. Potential Positive Effect	4
1. Limited support of criteria or neutral to this criteria or 2. No more than Minor Potential Adverse Effect (with limited or no consideration of mitigation)	3
1. Not supportive of criteria or 2. Potential Adverse Environmental Effect (with opportunities to remedy or mitigate)	2
1. Strongly not supportive of criteria or	1

Evaluation	Rating
2. Significant Potential Adverse Effect (with limited opportunities to mitigate)	

AT considered the benefits of using weighting in the evaluation process and on balance decided to give all criteria equal weighting in the mathematical scoring process further described below. The reason for this is that AT pre-selected the evaluation criteria that would allow for effective differentiation of the options being considered. Once the options had been scored (i.e. following evaluation) AT then considered the relative merits of each criteria in relation to the overarching LRCI objectives.

For project objectives, the higher the score the greater the extent to which the option supports the project objectives. For the other groups, a higher score indicates that an option has a lower overall effects profile (i.e. its effects impact will be smaller either in extent or due to the mitigation available).

Table 2: Criteria

Outcome	Criteria	Anticipated Result
Project Objectives (transport-related)	Corridor efficiency	The option will satisfactorily accommodate general traffic, including buses, heavy vehicles, pedestrians and cyclists with a view to minimising delay and associated congestion
	Public transport reliability	The option will provide for increased reliability for public transport using Lincoln Road
	Transport safety	The option will provide a safe environment for all travellers along Lincoln Road and in the project area (pedestrian, cycle and vehicles)
		The design can comply with AT's Code of Practice (AT CoP)
	Integration with the NZTA Western Ring Route upgrade	The option will enable the Lincoln Road project to integrate with the NZTA Western Ring Route upgrade
Environmental	Vegetation	The design should avoid/limit impacts on the three scheduled trees, both during construction and in its final form
		The design minimises or can fully mitigate loss of vegetation that is generally protected (open space areas and in road reserve)
		The design minimises or mitigates loss of vegetation on private property
	Health and safety	Operational noise, vibration experienced by sensitive receivers is within limits, or can be mitigated
		Hazards from overland (stormwater) flow paths affecting private properties are not increased
	Coastal (receiving) environment	Earthworks volumes are minimised
		Sufficient stormwater management / treatment can be achieved and facilities accommodated
	Visual amenity	The option contributes positively to the environment within public open spaces
		The option contributes to a visually coherent road corridor
		The option supports a quality built interface with the road corridor
		The option provides room for street trees
Economic	AT affordability	The option will be the most efficient (highest Benefit/Cost Ratio), considering: - property acquisition - construction cost - relocation of buildings - renewal/operating costs - asset management and serviceability
	Development potential	The option will not decrease the redevelopment potential of sites,

Outcome	Criteria	Anticipated Result
		given operative and proposed zoning
		The option will not affect the ongoing viability of legally established businesses
		The option will not decrease on-site car parking to an unacceptable degree
Social	On-site amenity	The option will not decrease amenity for occupants of dwellings, and will maintain private outdoor living and utility areas
		The option enables or maintains easy and safe (vehicle and pedestrian) access to and from private properties
	Pedestrian connectivity	There is an improved level of service for pedestrians - including the quality of connection for pedestrians, acceptable gradients.
	Cycling connectivity	There is an improved level of service for cyclists
	Sense of safety	The design applies CPTED principles to public areas and supports safety on private lots
	Disruption	The option disrupts a minimum of people and those that wish to stay in the location can. Daytona Road will not become a through route.
Transaction / compliance costs	Risk	Consent risk is low in terms of likelihood of obtaining NoR and time taken to gain authorisation
	Implementation	Conditions of NoR do not impose significant burden on Auckland Transport

Appendix 2: Multi-criteria analysis - Daytona Service Lane

Options assessed

See plans attached following the matrix for illustrations of Options 1, 2, 3 and 4.

Option 1: After passing through 306A and requiring the removal of the existing dwelling, the service lane passes to the rear of 308 and 310 Lincoln Road. The existing dwelling at 306 Lincoln Road is not required to be removed. 308 and 310 Lincoln Road are required to be acquired in full. A cul-de-sac turning area is located on 312 Lincoln Road requiring the removal of the building on the site.

Option 2: After passing through 306A and requiring the removal of the existing dwelling, the service lane passes to the front of 308 and 310 Lincoln Road adjacent to Lincoln Road edge (but at a lower level, beneath retaining walls). The existing dwelling at 306 Lincoln Road is to be removed. 308 and 310 Lincoln Road are required to be acquired in full. A cul-de-sac turning area is located on 312 Lincoln Road requiring the removal of the building on the site.

Option 3: After passing through 306A and requiring the removal of the existing dwelling, the service lane passes through the middle of 308 and 310 Lincoln Road, most likely requiring the existing dwelling at 306 Lincoln Road to be removed. 308 and 310 Lincoln Road are required to be acquired in full. A hammerhead turning area is located on 312 Lincoln Road requiring the removal of the building on the site.

Option 4: Same alignment as Option 1 above, however the land acquired at 308 and 310 Lincoln Road will be retained in Auckland Transport control in order to provide mitigation for the landscape, and possibly stormwater (subject to feasibility), effects of the project.

Multi-criteria scoring matrix

The following scoring system was used:

Evaluation	
1. Strongly supports criteria or 2. Significant potential positive effect	5
1. Supports criteria or 2. Potential positive effect	4
1. Limited support of criteria or neutral to this criteria or 2. No more than minor potential adverse effect (with opportunities to remedy or mitigate)	3
1. Not supportive of criteria or 2. Potential adverse environmental effect (with limited opportunities to remedy or mitigate)	2
1. Strongly not supportive of criteria or 2. Significant potential adverse effect (with little or no opportunities to mitigate)	1

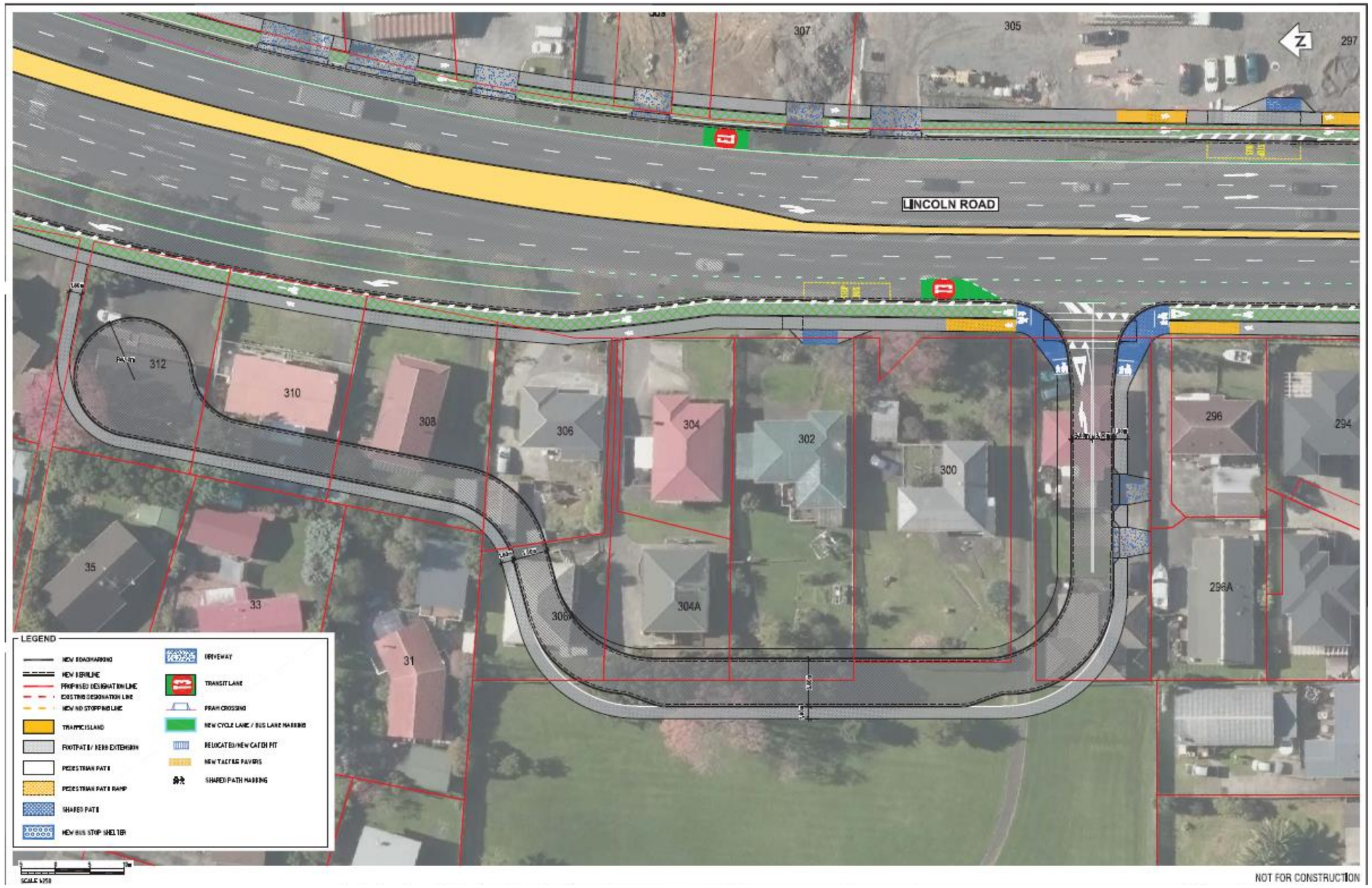
The options were all scored against the criteria and anticipated results in the second and third columns. Reasons for the scores given are summarised in the final column.

Well Being	Criteria	Anticipated Result	Option 1	Option 2	Option 3	Option 4	Reasons
Project Objectives (transport-related)	Corridor efficiency	The option will satisfactorily accommodate general traffic, including buses, heavy vehicles, pedestrians and cyclists with a view to minimising delay and associated congestion	3	3	3	3	All options have a neutral effect on the efficiency of the main Lincoln Road corridor.
	Public transport reliability	The option will provide for increased reliability for public transport using Lincoln Road	3	3	3	3	All options have a neutral effect on the public transport reliability of the main Lincoln Road corridor.
	Transport safety	The option will provide a safe environment for all travellers along Lincoln Road and in the project area (pedestrian, cycle and vehicles)	3	2	2	3	All options have various issues with potential conflicts that can be addressed through detailed design stage. Option 1 and 4 show a limited cul de sac size which could result in vehicles mounting the kerb. Options 2 and 3 have a footpath only on one side. Options 2 & 3 seem to be slightly longer for pedestrians to walk along footpath. Pedestrians may walk along eastern side of service road (with no footpath) as it is shorter in walking distance, that puts them on the inside, which is not safe
		The design can comply with AT's Code of Practice (AT CoP)	3	3	3	3	All options can comply with AT's Code of Practice.
	Integration with the NZTA Western Ring Route upgrade	The option will enable the Lincoln Road project to integrate with the NZTA Western Ring Route upgrade					N/A - no influence on NZTA integration
Environmental	Vegetation	The design should avoid/limit impacts on the three scheduled trees, both during construction and in its final form					N/A - scheduled trees not in this location
		The design minimises or can fully mitigate loss of vegetation that is generally protected (open space areas and in road reserve)	1	1	1	3	Option 4 provides space able to be used for tree planting which can mitigate removal of generally protected vegetation from Lincoln Road and Daytona Reserve
		The design minimises or mitigates loss of vegetation on private property	2.5	3	3.5	4	A higher score is given where trees could remain, especially at 310. Higher score for Option 4 which provides space able to be used for tree planting which can mitigate loss of vegetation on private property.
	Health and safety	Operational noise, vibration experienced by sensitive receivers is within limits, or can be mitigated	3	3	3	3	All options similar
		Hazards from overland (stormwater) flow paths affecting private properties are not increased					3D road design is required in order to complete detailed assessment of impact on overland flow paths. However expect the variances between the cul-de-sac options will have no real effect on flooding hazards to private properties.
	Coastal (receiving) environment	Earthworks volumes are minimised					All options similar
		Sufficient stormwater management / treatment can be achieved and facilities accommodated	4	4	4	5	Given the SW360 maintenance access and laydown requirements, all of the cul-de-sac options presented are expected to have sufficient space to allow construction and maintenance of the proposed treatment device. Option 4 has potential to accommodate additional treatment area.
	Visual amenity	The option contributes positively to the environment within public open spaces	1	2	1.5	3	A higher score is given for option 2 where the lane fronts onto Lincoln Road, as it will provide better visual interest both for pedestrians on the footpath (regarded as public open space) on Lincoln Road and the footpath along the lane. Option 4 provides space for vegetation visible from Lincoln Road and new lane
		The option contributes to a visually coherent road corridor	1	1.5	1.5	2	A higher score is given for option 2 where the lane aligns with Lincoln Road as it will create greater visual coherence. For option 4, lane will not align with the road corridor; tree planting may provide some vertical edges to the road corridor

Well Being	Criteria	Anticipated Result	Option 1	Option 2	Option 3	Option 4	Reasons
		The option supports a quality built interface with the road corridor	1	2.5	1.5	1	A higher score is given where properties front onto Lincoln Road and the new lane; a lower score is given where Lincoln Road and the lane have properties backing onto them, e.g. options 1 and 4 have 31-35 Preston backing onto the lane.
		The option provides room for street trees	2	1	4	4	A higher score is given where room is available for street trees and where the trees will be visible from Lincoln Road. Option 4 will provide for a localised area for planting
Economic	AT affordability	The option will be the most efficient (highest Benefit/Cost Ratio), considering: - property acquisition - construction cost - relocation of buildings - renewal/operating costs - asset management and serviceability	3	3	3	3	All options require the acquisition of full sites, so no real difference. The differences come when the residual land (not needed for road) is divested.
	Development potential	The option will not decrease the redevelopment potential of sites, given operative and proposed zoning	2.5	3	1.5	2.5	A higher score is given when there is a greater ability to redevelop and a higher quality outcome could be achieved, with option 2 being best. For options 1 and 4, lane on the edge of 31-35 Preston Ave may provide access to redevelopment on these sites in the future.
		The option will not affect the ongoing viability of legally established businesses	2.25	2.5	1.5	2	While existing buildings will need to be removed at 308, 310 and 312 for all options, a slightly higher score is given for options 1 and 2 as it is possible to reinstate businesses; access to sites will be more visible for option 2.
		The option will not decrease on-site car parking to an unacceptable degree	2.5	2	1.5	2	A higher score is given where parking can be reinstated on properties after reconfiguration.
Social	On-site amenity	The option will not decrease amenity for occupants of dwellings, and will maintain private outdoor living and utility areas	1	2.5	1	2	A lower score is given if the building at 306 is retained as the amenity of occupants will be reduced (compared with a new building on the property), if buildings at 308 and 310 are replaced with fronts facing the backs of other properties or backing onto Lincoln Road, and if 31 and 33 Preston have a new lane located adjacent to their backyards.
		The option enables or maintains easy and safe (vehicle and pedestrian) access to and from private properties	2.75	4	3	3.5	A higher score is given when the footpath is on the same side as the properties at 308 and 310 so that pedestrians do not need to cross the lane. For option 4 there will be no development on 308 and 310, so no access issues.
	Pedestrian connectivity	There is an improved level of service for pedestrians - including the quality of connection for pedestrians, acceptable gradients.	3.25	3.5	3.75	4.25	Pedestrian level of service is improved with all options with a new link to Daytona Reserve. A higher score is given if the route is more direct and has a greater level of amenity.
	Cycling connectivity	There is an improved level of service for cyclists	4	4	4	4	The condition for cyclists will be improved along Lincoln Road for all options. Options also provide access to the park from Lincoln Road.
	Sense of safety	The design applies CPTED principles to public areas and supports safety on private lots	3	5	4	3	A lower score is given if the new lane has buildings backing onto it and less visibility from Lincoln Road, and if the backs of properties are exposed to open spaces.
	Disruption	The option disrupts a minimum of people and those that wish to stay in the location can. Daytona Road will not become a through route.	3	2	1.5	2	A lower score is given if the building at 306 is removed and if the new lane is located adjacent to the backyard of properties at 31 and 33 Preston. Options 1 & 4: dwelling at 306 can be retained; but 31-35 Preston will have new lane along their rear fence. Options 3 & 4: cannot rebuild houses at 310 & 308.
Transaction / compliance	Risk	Consent risk is low in terms of likelihood of obtaining NoR and time taken to gain authorisation	3	3	3	4	Option 4 is better due to the additional space available to mitigate the vegetation removal effects of the project

Well Being	Criteria	Anticipated Result	Option 1	Option 2	Option 3	Option 4	Reasons
costs	Implementation	Conditions of NoR do not impose significant burden on Auckland Transport	3	3	3	4	Additional mitigation potential for option 4 means that NoR conditions are likely to be less burdensome
Totals			**60.75**	**66.5**	**61.75**	**73.25**	

Plan C116 - Option 1 (service lane western alignment). Option 4 is same alignment, but 308 and 310 Lincoln Road are retained as mitigation land



Plan SK.400 - Black lines show Option 2 (service lane eastern alignment), Red lines show Option 3 (Hammer Head terminal)

Appendix 3: Multi-criteria analysis - Te Pai Park & Scheduled Trees

Options assessed

See plans attached following the matrix for illustrations of the Options:

- **Option 1:** shift the alignment of this section of Lincoln Road towards the east, into Te Pai Park. This avoids the removal of all scheduled trees; however it has an increased impact on Te Pai Park through further land take. As part of this option, the footpath is separated from the cycleway and passes around the western side of the Rimu outside 172 Lincoln Road.

- **Option 2A:** the alignment of the road remains as per the preliminary design. The northbound cycle and pedestrian paths are moved towards the west to pass around the western side of the Himalayan Cedar outside 158 Lincoln Road. This avoids the removal of the Himalayan Cedar, but has an increased impact on the site at 158 Lincoln Road. It does not avoid the removal of the Rimu outside 172 Lincoln Road.

- **Option 2B:** the alignment of the road remains as per option 2A, but the northbound T3 lane only commences north of the Cedar. The northbound cycle and pedestrian paths pass around the eastern side of the Himalayan Cedar outside 158 Lincoln Road. This avoids the removal of the Himalayan Cedar but means there is no T3 lane outside 158 Lincoln Road. Northbound buses cannot therefore enter the T3 lane directly from the southern side of the intersection with Pomaria Road and Te Pai Place. The option does not avoid the removal of the Rimu outside 172 Lincoln Road.

- **Option 2C:** the cycle and pedestrian paths are split around the Himalayan Cedar outside 158 Lincoln Road, with the northbound cycle path passing to the east and the pedestrian path passing to the west, requiring some land to be taken from the site at 158 Lincoln Road. This avoids the removal of the Himalayan Cedar but requires there to be no northbound T3 lane outside 158 Lincoln Road. Northbound buses can therefore not enter a T3 directly from the southern side of the intersection with Pomaria Road and Te Pai Place. The option does not avoid the removal of the Rimu outside 172 Lincoln Road.

- **Option 3B: t**he northbound cycle and pedestrian paths pass around the eastern side of the Himalayan Cedar outside 158 Lincoln Road and the Rimu outside 172 Lincoln Road. This avoids the removal of all scheduled trees but requires there to be no northbound T3 lane for about 100m (from the Pomaria Road intersection to 174 Lincoln Road). Northbound buses cannot therefore enter a T3 lane directly from the other side of the intersection with Pomaria Road and Te Pai Place. The bus stop is located further towards the north than other options due to the need to position it within the T3 lane.

- **Option 4A:** as per the preliminary design**.** The Himalayan Cedar outside 158 Lincoln Road and the Rimu outside 170 Lincoln Road are both required to be relocated. These trees would be relocated to an appropriate location as close by as possible, such as Te Pai Park.

- **Option 4B:** the same as Option 4A except that the scheduled trees will not be relocated.

Multi-criteria scoring matrix

The following scoring system was used:

Evaluation	
1. Strongly supports criteria or 2. Significant potential positive effect	5
1. Supports criteria or 2. Potential positive effect	4
1. Limited support of criteria or neutral to this criteria or 2. No more than minor potential adverse effect (with opportunities to remedy or mitigate)	3
1. Not supportive of criteria or 2. Potential adverse environmental effect (with limited opportunities to remedy or mitigate)	2
1. Strongly not supportive of criteria or 2. Significant potential adverse effect (with little or no opportunities to mitigate)	1

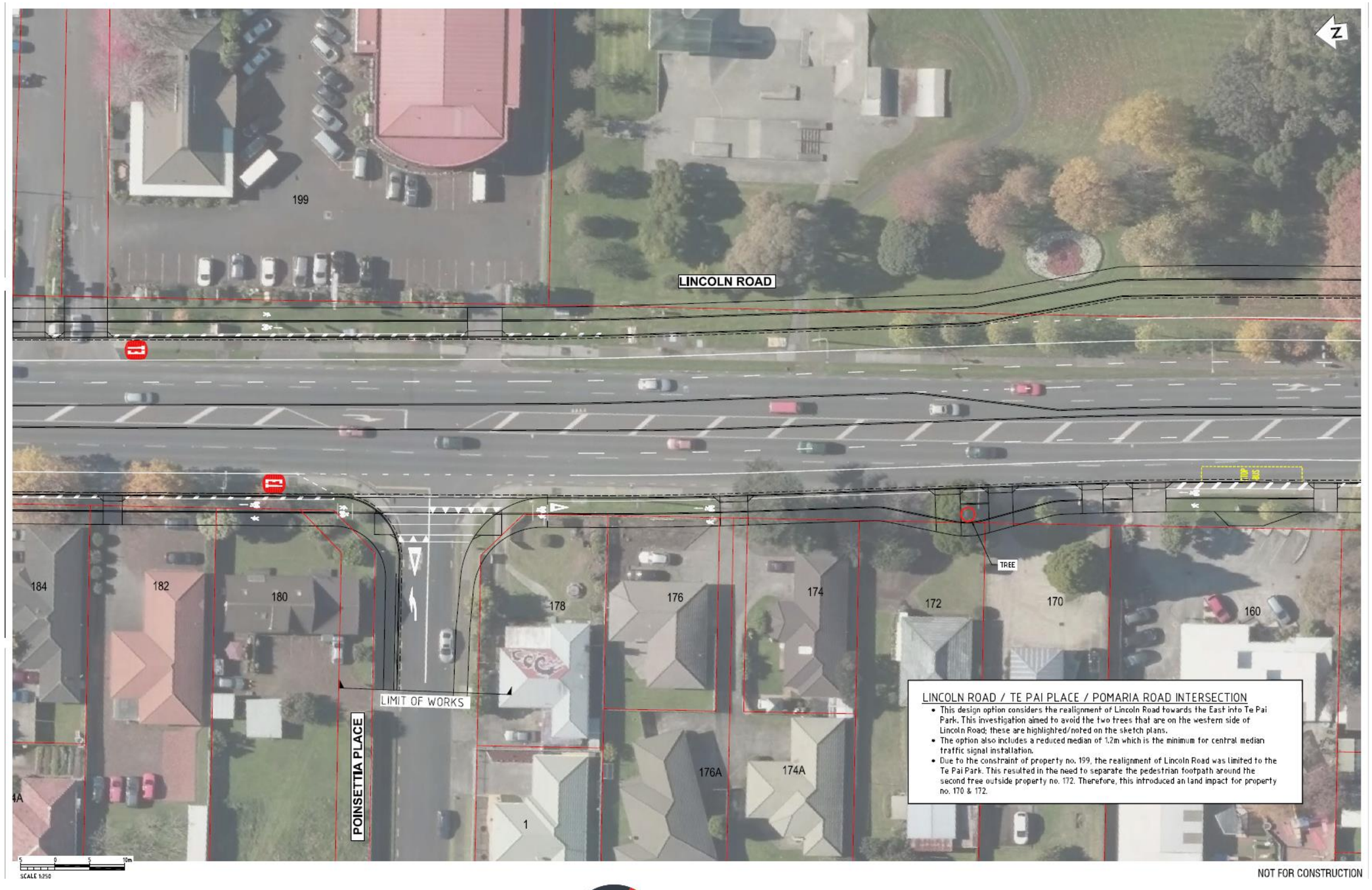
The options were all scored against the criteria and anticipated results in the second and third columns. Reasons for the scores given are summarised in the final column.

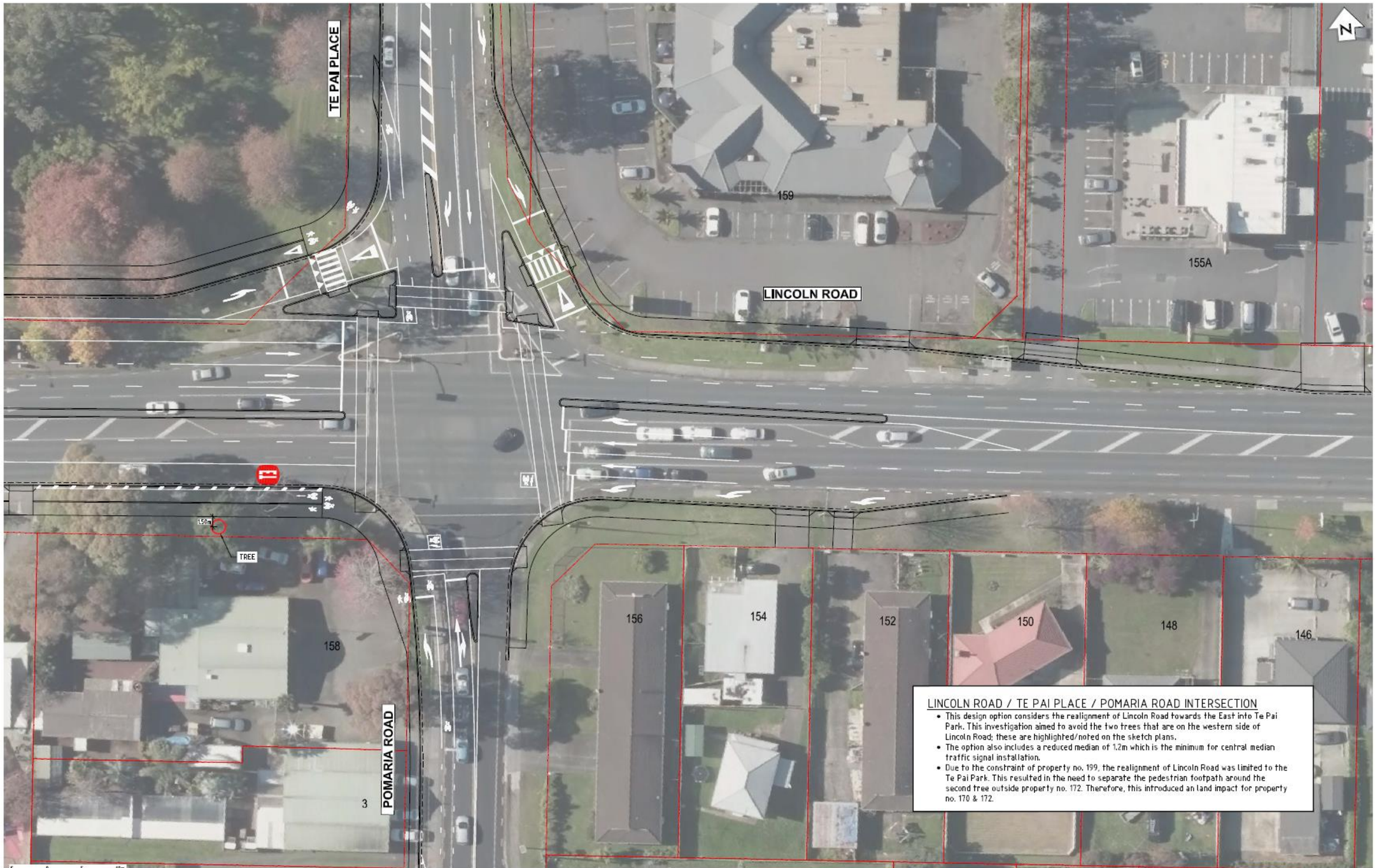
			Option							
Well Being	**Criteria**	**Anticipated Result**	**1**	**2A**	**2B**	**2C**	**3B**	**4A**	**4B**	**Reasons**
	Strategic fit	A measure of how an identified problem, issue or opportunity that is addressed by a proposed activity or combination of activities, aligns with the NZTA's strategic investment direction	4.5	4	3	3	3	4.5	4.5	A continuous T3 is preferred to facilitate future T3 extension along Lincoln Road south of Te Pai Place. Options 2B, 2C, 3B do not provide continuous T3 and will create bottleneck and adversely affect future expected operation of the Te Pai Place intersection. 2A has a larger footprint than Options 1, 4A and 4B.
Project Objectives (transport-related)	Corridor efficiency	The option will satisfactorily accommodate general traffic, including buses, heavy vehicles, pedestrians and cyclists with a view to minimising delay and associated congestion	4	4	3	3	3	4	4	For Options 2B, 2C and 3B, limitation on widening reduces effectiveness of T3 lane, and makes future extension of widening south of Pomaria Road much harder. All options provide for pedestrians and people on bikes. Intersection treatment for pedestrians and people on bikes is the same in all options and does not minimise delay for pedestrians and cyclists due to the fact that cyclists have to use shared path to cross each signalised intersection.
	Public transport reliability	The option will provide for increased reliability for public transport using Lincoln Road	4.25	4.25	2.75	2.75	2.5	4.25	4.25	Options 2B, 2C, 3B do not provide continuous T3. 3B starts T3 later than 2B and 2C.
	Transport safety	The option will provide a safe environment for all travellers along Lincoln Road and in the project area (pedestrian, cycle and vehicles)	3.5	3.5	4	4	3.5	3.5	3.5	Unclear how cyclists will enter the cycle lane (travelling north) without conflicting with pedestrians waiting at the signalised crossing (travelling north). A vehicle conflict can occur when vehicles enter the T3 lane from either the through lane or the left turn lane. Options 2B & 2C have reduced vehicle conflict for vehicles using the left turn lane going straight (compared with other options).
		The design can comply with AT's Code of Practice (AT CoP)	4	4	4	4	3	4	4	For option 3B, kerb profile on approach to bus stop at no. 174 is incapable of meeting ATCOP for approach path. All options provide similar width for footpath and cycle path.
	Integration with the NZTA Western Ring Route upgrade	The option will enable the Lincoln Road project to integrate with the NZTA Western Ring Route upgrade								n/a
Environmental	Vegetation	The design should avoid/limit impacts on the three scheduled trees, both during construction and in its final form	5	3	3	3	5	2	1	A higher score is given if the scheduled trees are retained in their current position. Assumes proximity of tree to the footpath / cycleway does not impact health of tree due to construction of boardwalk/ bridge over root zone
		The design minimises or can fully mitigate loss of vegetation that is generally protected (open space areas and in road reserve)	2	3.25	3.25	3.25	4	2.75	2.75	Option 1 affects more generally protected trees in Te Pai Park (at least 2 more) than each of the other options. Options 2A, 2B and 2C may provide some space within the road reserve for mitigation planting, while option 3B provides even more space for mitigation planting and may be able to avoid the removal of a further generally protected tree T80.

			Option							
Well Being	**Criteria**	**Anticipated Result**	**1**	**2A**	**2B**	**2C**	**3B**	**4A**	**4B**	**Reasons**
		The design minimises or mitigates loss of vegetation on private property	4	2	3.5	2.5	4	3	3	Difference in effect on vegetation on private property at 158 Lincoln Road - options 1 & 3B may be able to avoid tree removal compared to other options. The less land required from private property, the more space available for potential mitigation. Option 2A requires the most land from 158 Lincoln Road.
	Health and safety	Operational noise, vibration experienced by sensitive receivers is within limits, or can be mitigated	2	2	2	2	3	2	2	The road corridor is further from sensitive receivers for Option 3B
		Hazards from overland (stormwater) flow paths affecting private properties are not increased								n/a
	Coastal (receiving) environment	Earthworks volumes are minimised								n/a
		Sufficient stormwater management / treatment can be achieved and facilities accommodated								n/a
	Visual amenity	The option contributes positively to the environment within public open spaces	3	3	4	3	4	4	2	A lower score is given where more land is taken from Te Pai Park or where trees are removed as this will impact on the visual amenity of the park and streetscape
		The option contributes to a visually coherent road corridor	3	2	3	2	5	1	1	A higher score is given when the two trees remain in the current position as this will create a vertical element and edge on the street and where there is no bend in the footpath around the trees which reduces visual coherence
		The option supports a quality built interface with the road corridor	3	2	3	2	3	3	3	A lower score is given when the front of the property is impacted by a bend in the footpath or the bus stop position which may result in a bend in the property boundary or reduction in the front setback
		The option provides room for street trees	4	3	4	3	5	1.5	1.5	A higher score is given where the length of berm is longer or there is a greater width of central median
Economic	AT affordability	The option will be the most efficient (highest Benefit/Cost Ratio), considering: - property acquisition - construction cost - relocation of buildings - renewal/operating costs - asset management and serviceability	4	2	3	3	3	3	3	Option 2A requires extra land take from 158 Lincoln Road. For option 1, taking land from Te Pai Park and not the opposite properties will mean only one negotiation instead of several. However, it will likely require a statutory process to revoke the reserve status that will be made more difficult by the extra land take.
	Development potential	The option will not decrease the redevelopment potential of sites, given operative and proposed zoning	3.25	3	3.25	3	3.25	3.25	3.25	The impact of all options on redevelopment potential is reasonably insignificant
		The option will not affect the ongoing viability of legally established businesses	4	3	4	3	4	4	4	Options 2A and 2C have greater potential effect on the viability of Bird Barn
		The option will not decrease on-site car parking to an unacceptable degree	4	2.5	2.75	2.75	4	3.5	3.5	A lower score is given where there is a greater land take from properties with carparking to the front
Social	On-site amenity	The option will not decrease amenity for occupants of dwellings, and will maintain private outdoor living and utility areas	2	3	3	3	2	3	3	A lower score is given where there is greater encroachment onto private residential property. 172-178 Lincoln Road are residential uses. Option 1 encroaches more on 172 Lincoln through bend in footpath around tree. Option 3B encroaches more on 174 Lincoln Road for bus stop.

			Option							
Well Being	**Criteria**	**Anticipated Result**	**1**	**2A**	**2B**	**2C**	**3B**	**4A**	**4B**	**Reasons**
		The option enables or maintains easy and safe (vehicle and pedestrian) access to and from private properties	3.5	4	4	4	3.5	4	4	Small variance in ease of access to certain properties depending on where the bus stop is located. The path around the Rime for option 1 reduces ease of access for 170 and 172 Lincoln Road.
	Pedestrian connectivity	There is an improved level of service for pedestrians - including the quality of connection for pedestrians, acceptable gradients.	2	2	3	2	3	3	3	Lower scores are given as none of the options improve the pedestrian condition. A lower score is given where the footpath bends and lengthens the route for pedestrians
	Cycling connectivity	There is an improved level of service for cyclists	4	4	4	4	4	4	4	All options improve cycling service. A bend in the route is not regarded to impact on cyclists.
	Sense of safety	The design applies CPTED principles to public areas and supports safety on private lots	3	2	4	2	4	4	4	A lower score is given where the footpath is located behind a tree and where a bus stop is located on private property, potentially resulting in staggering front boundaries (entrapment potential), however this is easier to mitigate
	Disruption	The option disrupts a minimum of people and those that wish to stay in the location can. Daytona Road will not become a through route.	3	2.5	3	2.5	3	3	3	A lower score is given where there is greater private land take
Transaction / compliance costs	Risk	Consent risk is low in terms of likelihood of obtaining NoR and time taken to gain authorisation	4	3	3	3	5	2	1	A higher score is given for options avoiding scheduled tree removal, having lesser impact on Te Pai Park and the trees there, and having lesser impact on private properties (although this is not as big a factor as scheduled trees and Te Pai Park).
	Implementation	Conditions of NoR do not impose significant burden on Auckland Transport	4	2	3	3	5	2	1	If heritage trees are removed, mitigation is likely to be required and could be of significant expense. Effects on private property / Te Pai Park - the less impact the better.
Totals			**82.5**	**69**	**79.5**	**69.75**	**88.75**	**73.75**	**68.75**	

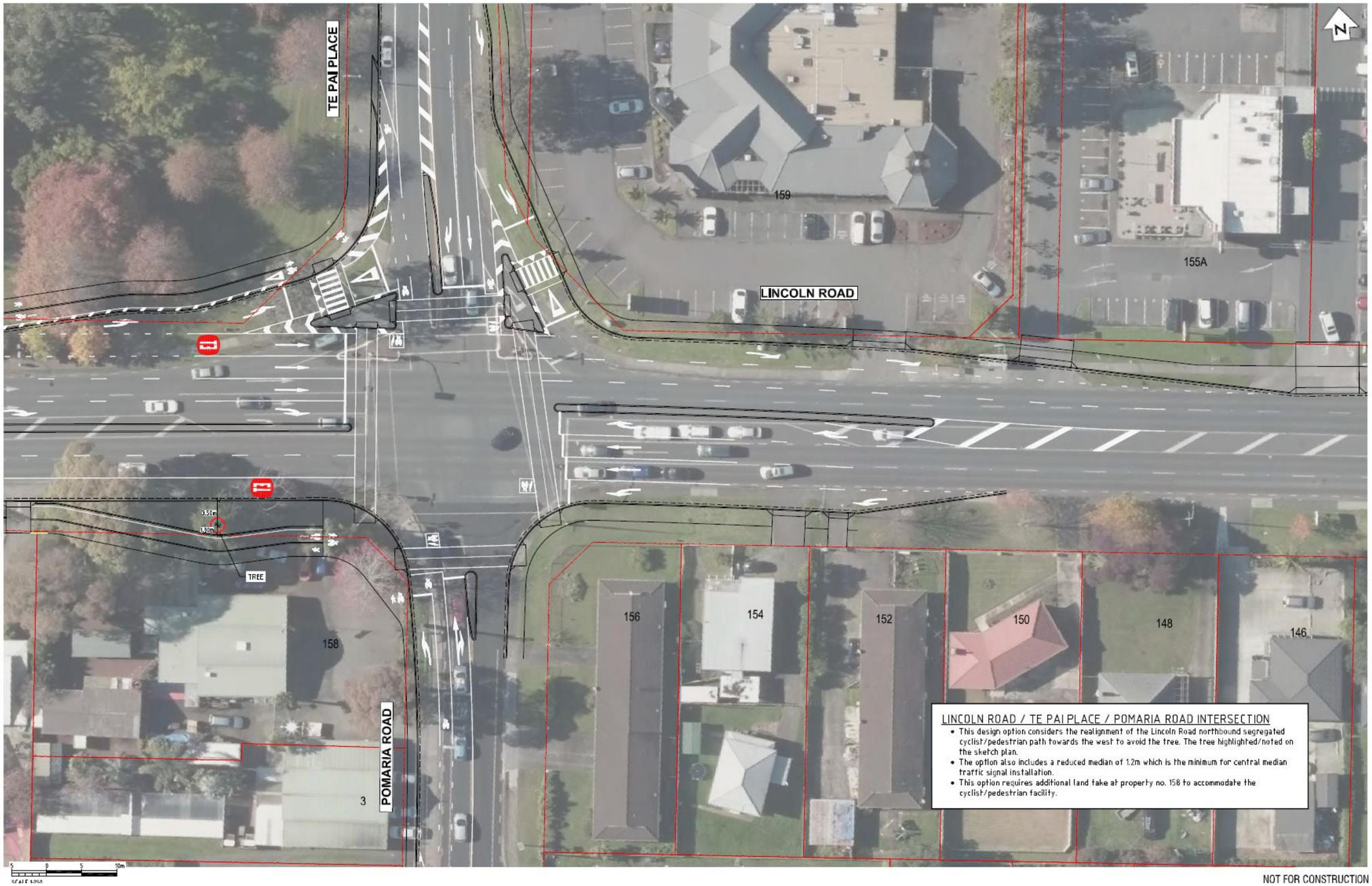
Option 1 (2 plans) - alignment moved eastwards towards Te Pai Park to avoid Rimu and Himalayan Cedar



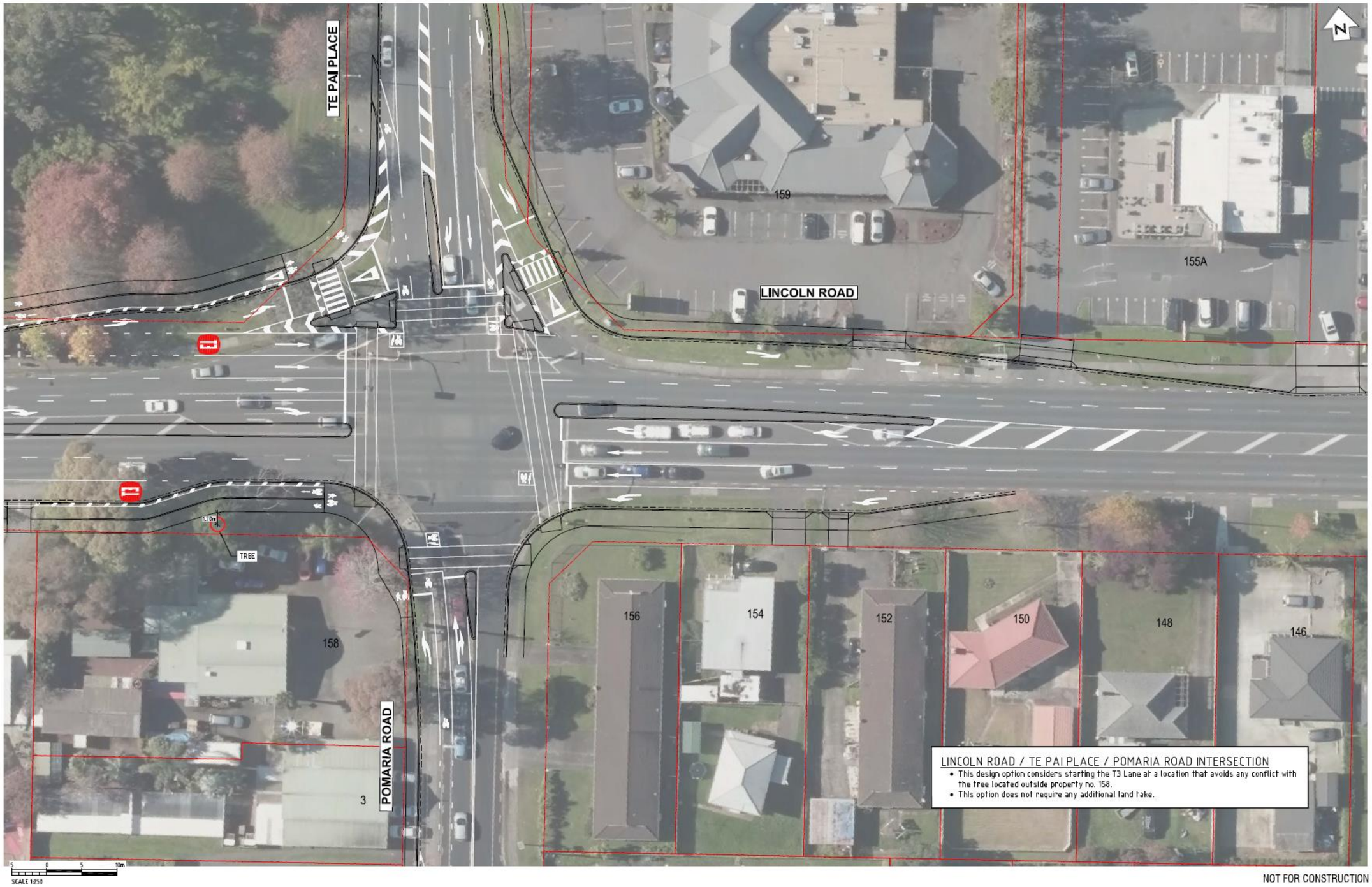


NOT FOR CONSTRUCTION

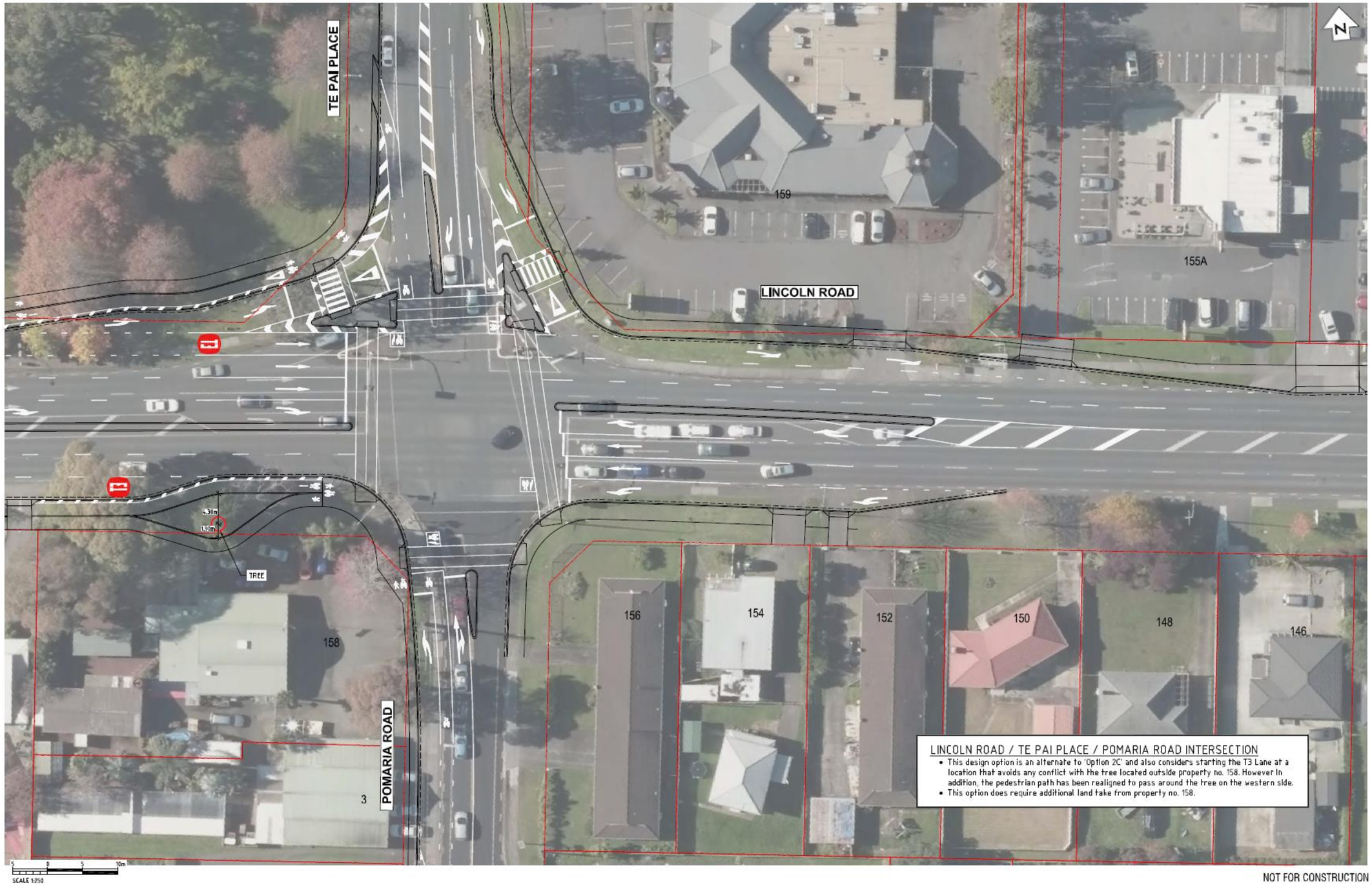
Option 2A - additional land used taken 158 Lincoln Road for footpath and cycleway in order to avoid Himalayan Cedar



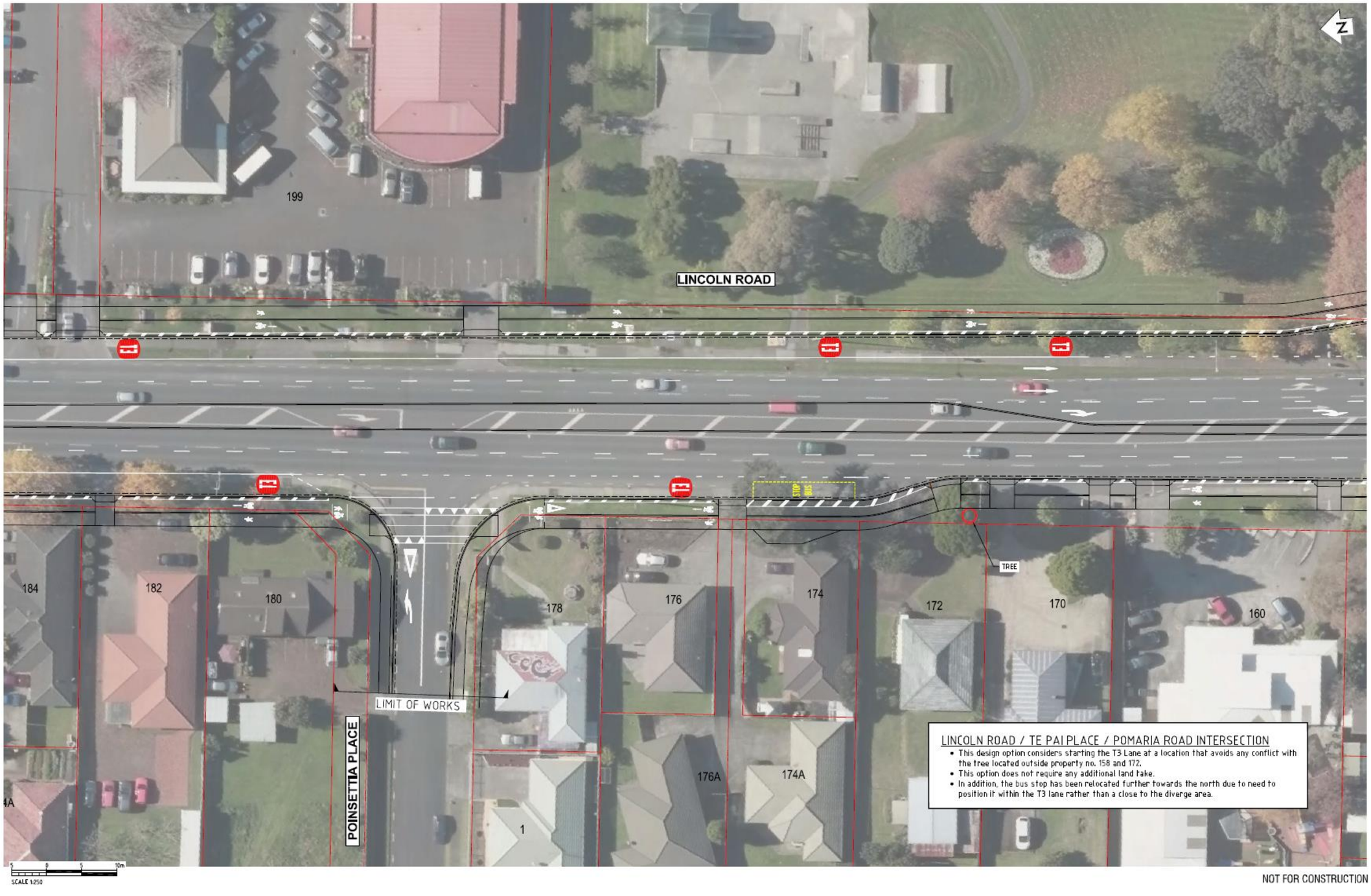
Option 2B - No T3 outside 158 Lincoln Road; footpath and cycleway on eastern side of Himalayan Cedar

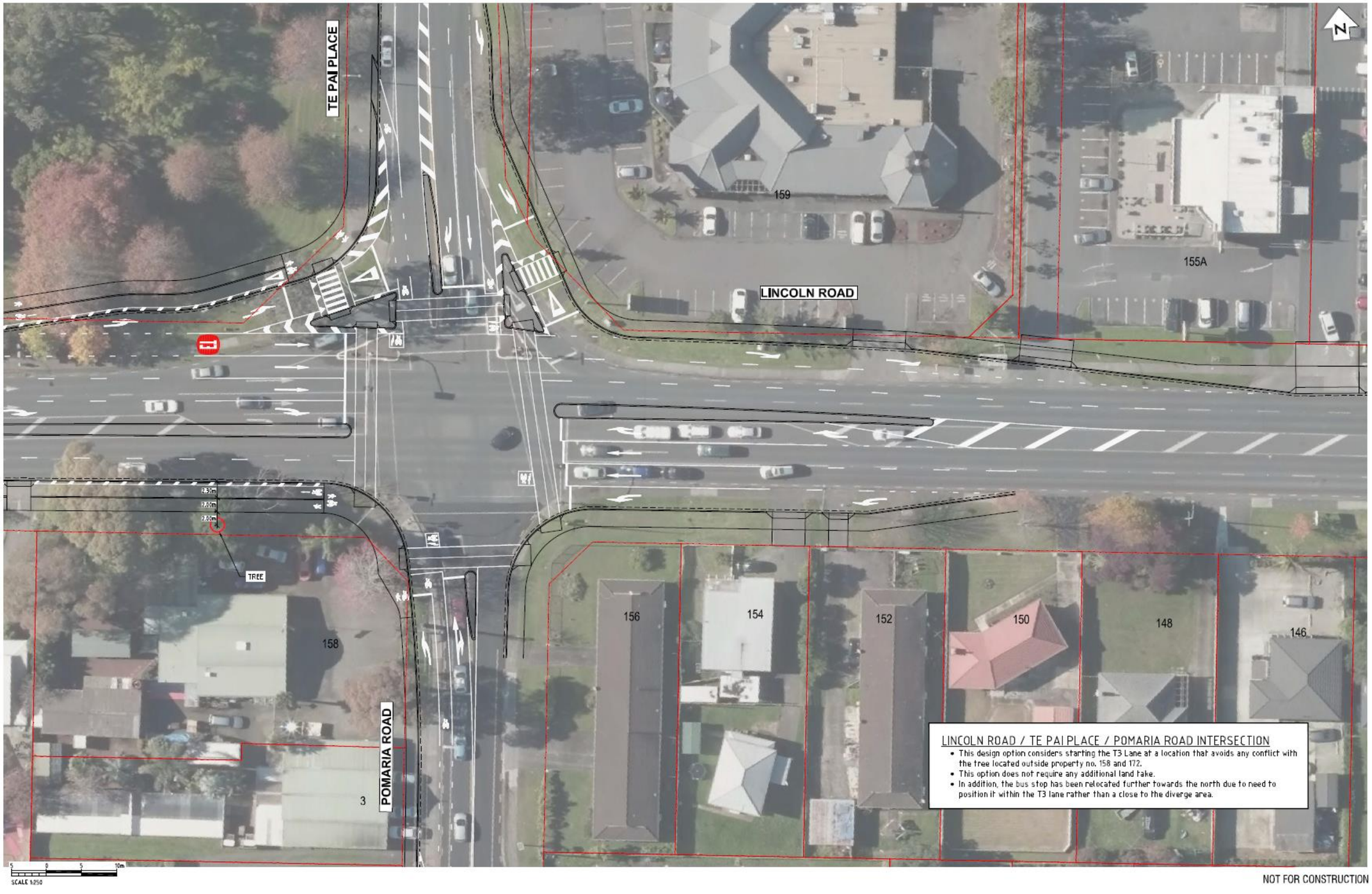


Option 2C - No T3 outside 158 Lincoln Road; footpath and cycleway split around Himalayan cedar



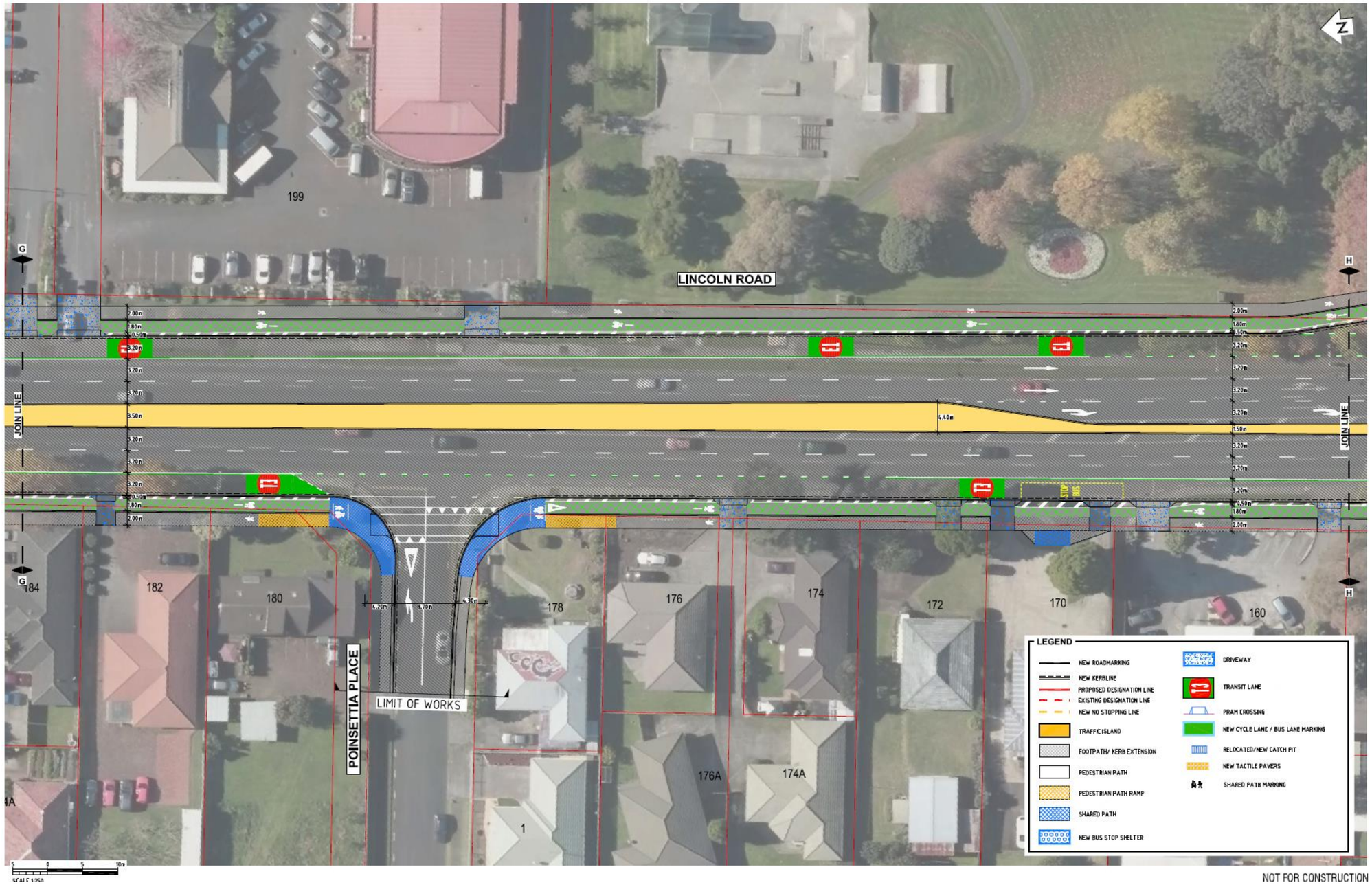
Option 3B (2 plans) - No T3 on western side until 174 Lincoln Road; Himalayan Cedar and Rimu avoided





NOT FOR CONSTRUCTION

Option 4A and 4B (2 plans) - continue alignment of northern section, requiring removal of Rimu and Himalayan Cedar. 4A includes relocation of these trees



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