Auckland Transport
An Auckland Council Organisation

Business Case

Point Chevalier to Westmere – cycleway project

J8672

~~19 November 2020~~~~21 December 2020~~9 September 2021 - Version 1.~~6~~7

Change History and Approval

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0.1	6/12/2019	Single Stage Business Case	Working Draft (AECOM)
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DOCUMENT NAME	Point Chevalier to Westmere transport corridor improvements Single Stage Business Case	VERSION	1.7
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1.7	21/12/2020	Single Stage Business Case	Final draft taking into accounts comments made by Auckland Transport
1.8	09/09/2021	Single Stage Business Case	Final following Waka Kotahi comments

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Contents

Executive Summary

This Business Case makes the case for investing in the Point Chevalier to Westmere cycleway project as part of the Urban Cycleways Programme. The proposal seeks to address deficiencies in the existing transport network that will in turn, allow and encourage residents to travel more sustainably. The route is an integral part of the cycle routes in the inner western suburbs of Auckland, which will create a network of safe and segregated cycle lanes. The inner west suburbs will act as an exemplar of the mode share growth that is possible if quality cycling and walking infrastructure is provided. The route connects onto the Northwestern cycleway and will eventually lead to the Northern Pathway to the North Shore. It will also provide links to Ponsonby and the City Centre as well as serving local shops, schools and facilities such as MOTAT.

Figure 1 below shows the proposed route below in pink and the surrounding routes (either built/in development/planned) which will create the inner west network.

Figure 1 Inner West Cycle Network

The problems that the proposal seeks to address relate to the road network i) not meeting the needs of all road users resulting in too many crashes, ii) a lack of integration of public transport and active modes which leads to the perception that these modes are unattractive and iii) a lack of facilities for active modes resulting in poor environmental, place and health outcomes.

According to Urban KiwiRAP, Point Chevalier Road between Gt North Road and Meola Road has a Medium High Collective Risk classification. Congestion and the narrow width of Meola Road create a difficult environment or all road users, but particularly cyclists and pedestrians. This is reflected in crash statistics which indicated that in the last five years, six pedestrians were hit by vehicles when they were crossing the road.

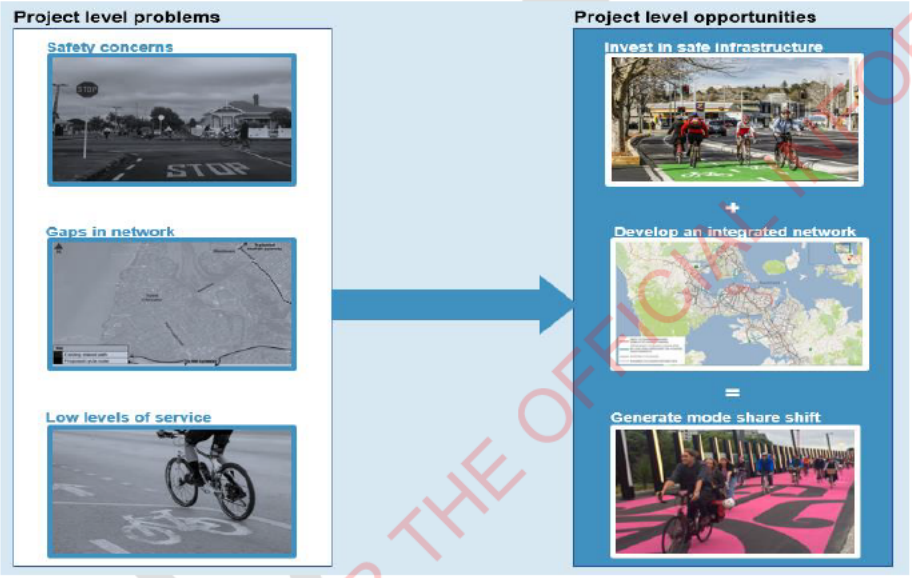
Despite having two Frequent Transit Network (FTN) bus routes on Meola and Point Chevalier Roads, the current congestion along Point Chevalier Road in both the morning and evening peak periods means that the 450m travelled between Meola Road and Great North Road can take anywhere between 1.5 mins (~20kph) and 4 mins on any given day (~7kph or a little faster than walking pace), this is significantly below the level of service that AT requires for FTNs and will not encourage more people to

catch public transport. Further, high levels of idling and slow-moving traffic are detrimental to the environment of this urban area and to the air quality, especially in areas with the highest demand of pedestrian movements and people attending leisure and shopping activities.

Residents have been fully consulted, the four main feedback themes are i) support for improved cycleways, ii) support for improved safety, iii) they like the additional / improved road crossing facilities for pedestrians and iv) like the bus lane on Point Chevalier Road.

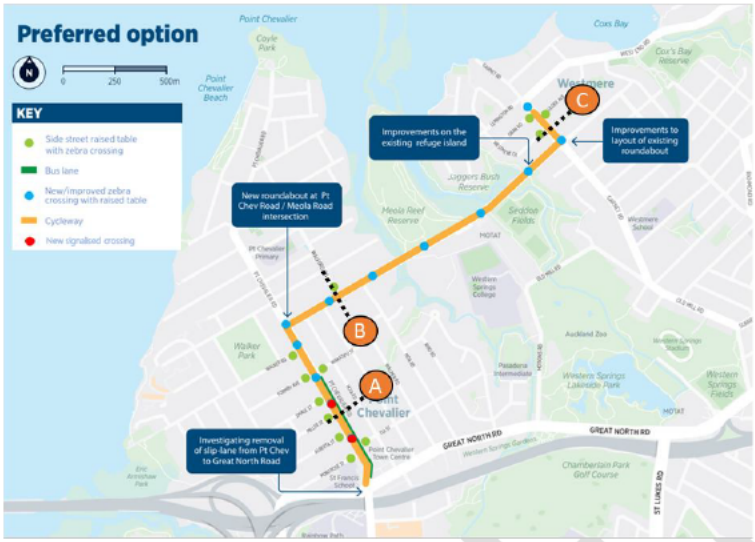
Eight alternatives and options were considered, ranging from Travel Demand Management and traffic calming side streets to shared paths on the preferred route and dedicated facilities on alternate routes. Multi Criteria Analysis (MCA) were used to reduce the number of options to a shortlist which were tested again via an MCA to arrive at a preferred option. As part of this business case, the Early Assessment Sifting Tool (EAST) was used to test the numerous long list options and alternatives against the updated project objectives to ensure previous assessments had captured the best options to proceed to a short list.

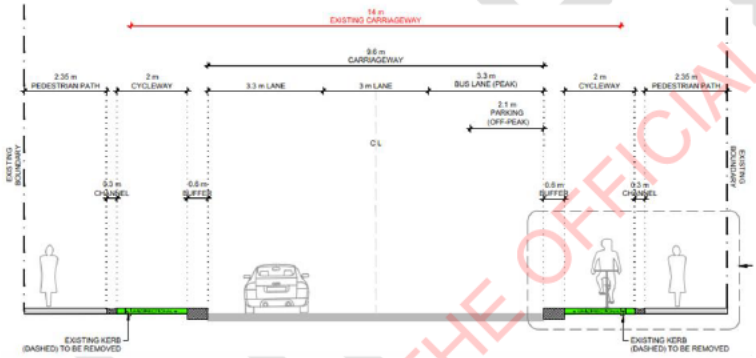
Figure 2: Problems and Opportunities



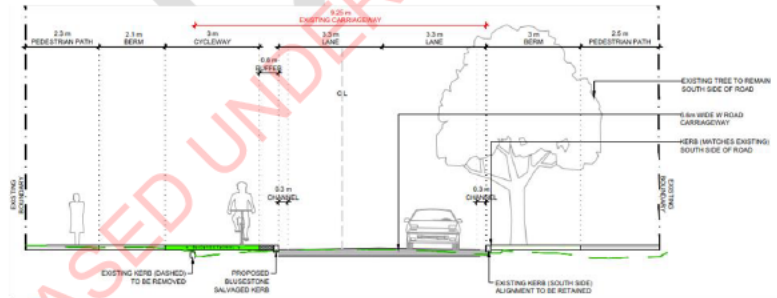
The scope of the preferred option is shown in Figure 3. Key features include a new cycleway, a new segment of bus lane and improved crossing facilities for pedestrians and cyclists (with speed calming measures to reinforce priority and safer speeds at conflict points).

Figure 3: Scope of Preferred Option

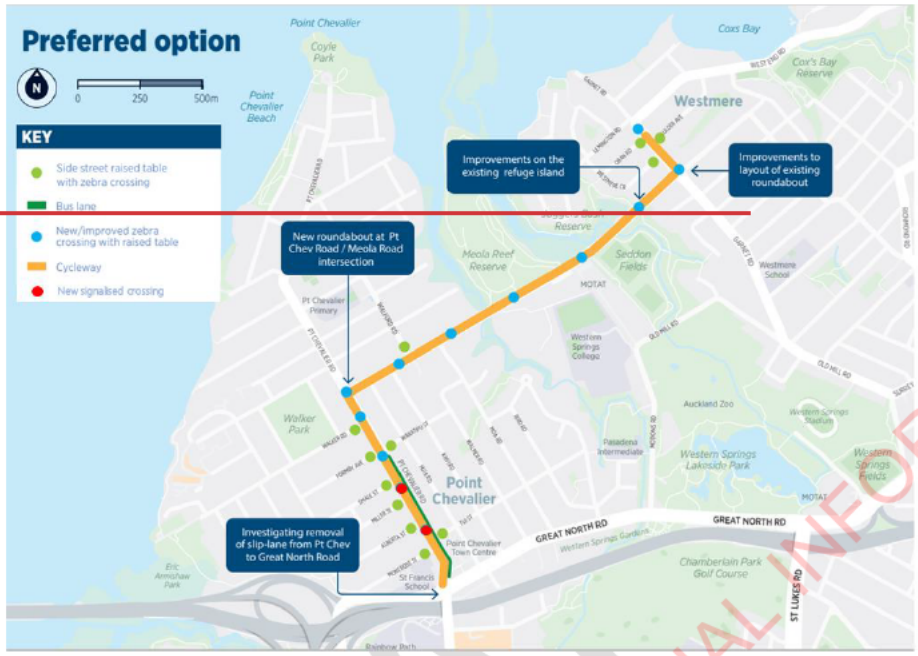


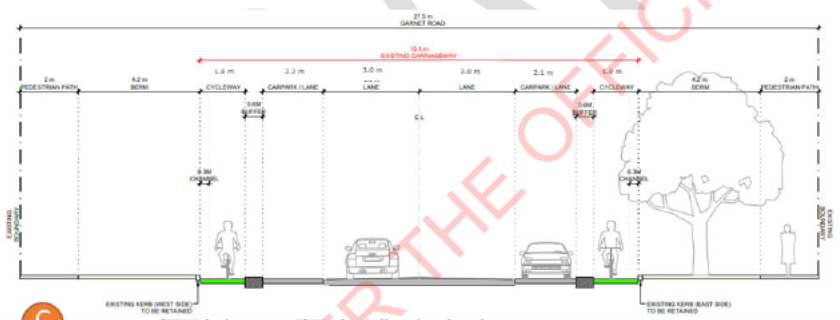


A Pt Chevalier Road – typical cross section of uni-directional cycleway



Meola Road – typical cross section of bi-directional cycleway





C Garnet Road – typical cross section of uni-directional cycleway

The preferred option was developed through a combination of targeted engagement with Mana Whenua and key external stakeholders, design workshop processes with key Auckland Transport subject matter specialists with technical design consultant support, and public engagement (in 2016 to gather initial wider area issues and opportunities, in April 2017 for this specific route and again in November 2019). Following the 2017 consultation and the change in direction for the quality of cycling facilities desired across the Auckland Region, Auckland Transport set up a Community Liaison Group (CLG) for the project. This group made up of local residents and interested stakeholders, helped refine the design to a project that the community would use and support. The result showed the majority of the community and stakeholder respondents broadly in favour of the proposals and identified areas of concern and opportunity which Auckland Transport has addressed. These include:

1. Managing the impact of the loss of parking spaces
2. Further improvements to intersection treatments

The project is estimated to realise an increase in cycling travel to 700 cyclists per day in 2028, and up to 1,100 per day in 2038 with the provision of the quality of service (QoS) level 2 cycleway over the majority of the length of the corridor. This is up from the current estimate of 300 – 400 cyclists per day.

The project aligns with the strategic intent of national, regional and organisation strategies, such as the GPS, Auckland Plan and ATAP outcomes. The investment of appropriate cycling infrastructure provides a safe, coherent and attractive route that improves mobility for all users. The proposal will encourage the uptake of active modes of travel and contribute to reducing the growth of car trips. As higher priority is placed on sustainable forms of travel, the project supports a reduction in transport's negative effects on the local environment and the health and wellbeing of people. These all align with various strategic outcomes from policy directions.

The estimated project cost is $39.1 M which includes allowances for joint working opportunities under the "dig-once" approach to project delivery including:

1. The Meola Road pavement rehabilitation (with financial contribution from the maintenance budgets)
2. The Point Chevalier Road resurfacing (with financial contribution from the maintenance budgets)
3. Integration of Greenway Connections Motions Road to Meola Road – separate project with integrated interfaces and delivery timing
4. Streetscaping and ecological value – replacement of trees in poor condition with native trees and ground cover planting on Meola Road
5. Powerline undergrounding on Meola Road
6. Stormwater treatment – using the opportunity to integrate stormwater treatment in the design even though the impervious area reduces (exploring a financial contribution from Auckland Council)
7. Streelighting upgrades – bringing this forward in the maintenance programme to align with the delivery of the cycleway project.

The investment profile for the project (using NZ Transport Agency's Investment Assessment Framework) is HL, with a high results alignment and a benefit cost ratio of 1.2 using the EEM methodology and 1.8 using the MBCM methodology. Sensitivity testing indicates a BCR range between 0.88 and 2.1 depending on future scenarios. This provides an investment priority of 5. The high results alignment is due to the project meeting the high rating in the follow areas:

"Safety

Addresses a high predicted walking or cycling safety risk"

"Addresses a high perceived safety risk to the use of a mode"

"Access – liveable cities

Targets the completion and promotion of networks in major metros to enable access to social and economic opportunities"

"Supports increasing the uptake of children using walking and cycling especially to and from school"

"Environment

Enables a significan modal shift from private motor vehicles to active modes"

Auckland Transport confirms its local share of the project costs for this activity under the Walking and Cycling Programme. The Walking and Cycling Programme is in the Regional Land Transport Programme (Priority 2) and the National Land Transport Programme (under Western Connections to the city for implementation phase).

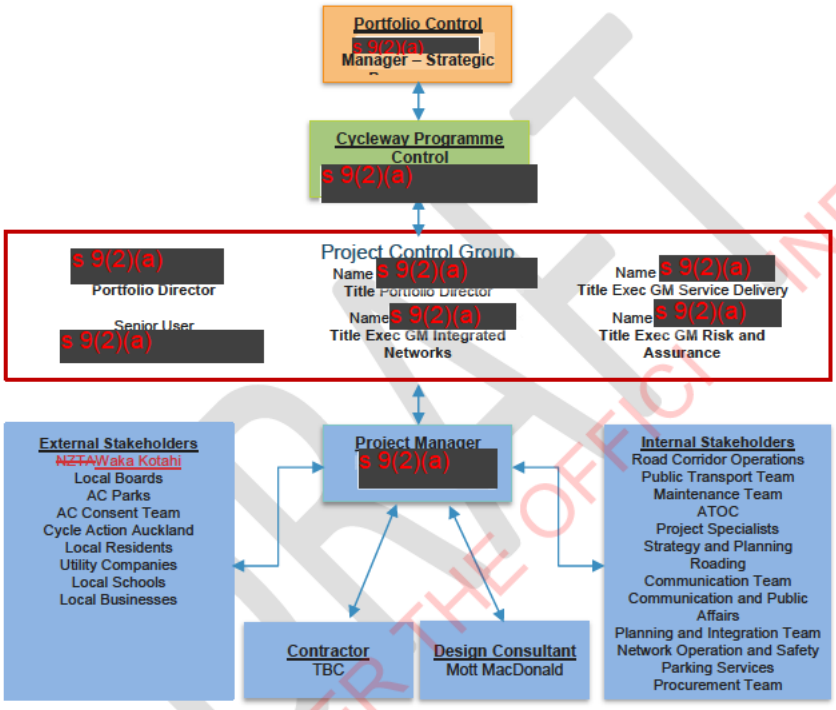
The duration of construction is expected to be 15-18 months with an indicative start date in June 2021. The preferred procurement method is Early Tender Design (with an ECI component) (approved by the Executive Leadership Team) to take advantage of the construction aspects of the detailed design to expedite the programme and reduce the risk of delays to the project. The procurement of the Contract is "Quality Based" as opposed to "lowest price conforming" due to the need for a high quality contractor to assist with the design.

The project will be delivered through:

1. A professional services contract to the preferred Tenderer; and,
2. A Novated (modified) NZS3910 (for the contract between Auckland Transport and the Contractor)

The governance for the project has been established (as outlined in Figure 4) , and the Community Liaison Group that has been established will be a key conduit between Auckland Transport and the local community through the development of the detailed design through to the implementation. The project is ready to proceed through to the implementation, subject to funding, and has secured resource consents.

Figure 4: Project Governance



In conclusion, this project has been considered over many years, it has been consulted on and improved and is now ready to bring forward for pre-implementation and implementation. Design and consultation issues have now been resolved and the project is ready to proceed. The proposal offers the opportunity to create part of a strategically important segregated cycle link between the Northwestern cycleway and the Northern Pathway as well as connecting with local facilities, centres and onwards towards the Wynyard Quarter. All technical issues have now been resolved with the exception of the Meola Road / Pt Chevalier Road roundabout trial which will be undertaken in the next design stage; the project is close to being 'shovel ready' as much of the design is complete. The project is much needed whether the Covid 19 pandemic is an issue in the future (as it offers the opportunity to travel to key destinations in an isolated manner), or not. It will provide active mode infrastructure which will reduce road casualties, reduce congestion and vehicle emissions and improve public transport reliability.

1 Background

1.1 Activity Context

This investment proposal seeks to make the case for improving primarily cycling facilities but also making ancillary changes to public transport facilities and road safety in Point Chevalier / Westmere, suburbs located approximately 5km from Auckland's Central Business District. Its location is prime for improving alternative choices to travelling by car because of its proximity to the CBD, (average cycle trips by adults are approximately 5km in length[1]) and the abundance of social and educational activities located in the area.

This proposal forms part of the Auckland Urban Cycleways Programme (UCP) and the wider Auckland Cycling PBC. Together with existing cycle infrastructure such as the Northwestern Cycleway, other components of the UCP already under construction such as the Waitemata Safe Routes, the Herne Bay walking and cycling improvements and the Victoria Street Cycleway, the proposal will create a safe cycle network giving residents a real alternative to driving. The proposal also offers the first stage of a direct connection between the popular Northwestern cycleway and the proposed Northern Pathway (across the Auckland Harbour Bridge), and as such the proposal will form part of a cohesive cycle network for Auckland's inner west. Users already of on the Northwestern cycleway will can either remain on there to access thethe Northern Pathway or . Tuse this proposed he project will however, provide anas an alternative route to the Northern Pathway, whilst and athe routeproject provides for those in the Pt Chevalier catchment to access to the Northern Pathway rather than having to back track to the North-western motorway. It will enable cycle access from the inner west to social and economic opportunities within the city centre and beyond.

The public transport component is part of a wider programme to improve the reliability of bus services along the frequent transit network. Services using the route experience very poor reliability in the peak periods. Further, by providing suitable cycling and pedestrian facilities the proposal will offer significant safety benefits to vulnerable road users.

1.2 Geographic Context

The study corridor includes Point Chevalier Road (part), Meola Road and Garnet Road (part), which is approximately five kilometres from the Auckland CBD. The route is approximately 2.8 kilometres in length and is shown in in blue in Figure 5Figure 5Figure 5. The original 2017 Scheme Assessment Report (SAR) identified a 4.3-kilometre-long corridor covering the section of Point Chevalier Road from the Great North Road intersection, along Meola, Garnet and West End Roads ending in Westmere. This was subsequently reduced to a length of 2.8 kilometres as no preferred option was identified for West End Road. However an alternative route comprising of a combination of William Denny Avenue and a route through Cox's Bay Reserve, (both of which are awaiting funding approval) create a good alternative to the West End Road.

The route provides access to support the people living in the area travelling to local destinations and is primary connection between Point Chevalier and Westmere. It also serves as an alternative route to the congested North-West Motorway and Great North Road for travel to/from the CBD, Harbour Bridge and the Ponsonby/Herne Bay area.

Point Chevalier Road and Garnet Road have relatively flat topographies, with a maximum grade of three percent. The maximum gradient on Meola Road is nine percent between Jaggers Bush Reserve and Garnet Road (approximately 200m), which is very steep for someone to cycle but only over a short distance. Point Chevalier Road and Meola Road provide access to recreational and waterfront activities for the people that live in the area.

[1] Cycling New Zealand Household travel Survey 2011-2014 MOT

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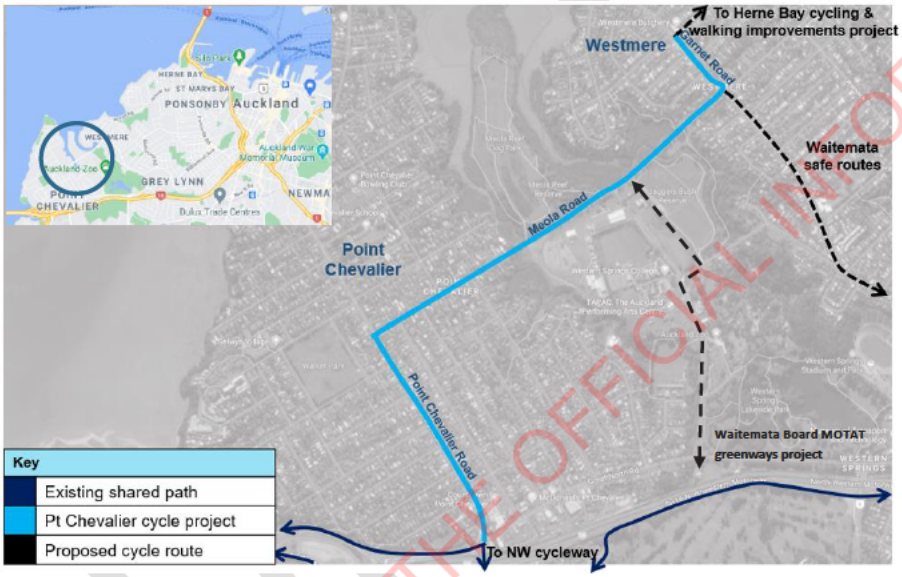
Figure 5: Proposed extent of the Point Chevalier to Westmere Project



1.3 Land Use and Transport Context

There is diverse land use along the route, segmented into sections to accurately reflect the different typologies along the corridor as shown in Figure 6. Local destinations are shown Figure 7.

Figure 6: Network Context (under superseded version of the Roads and Streets Framework)

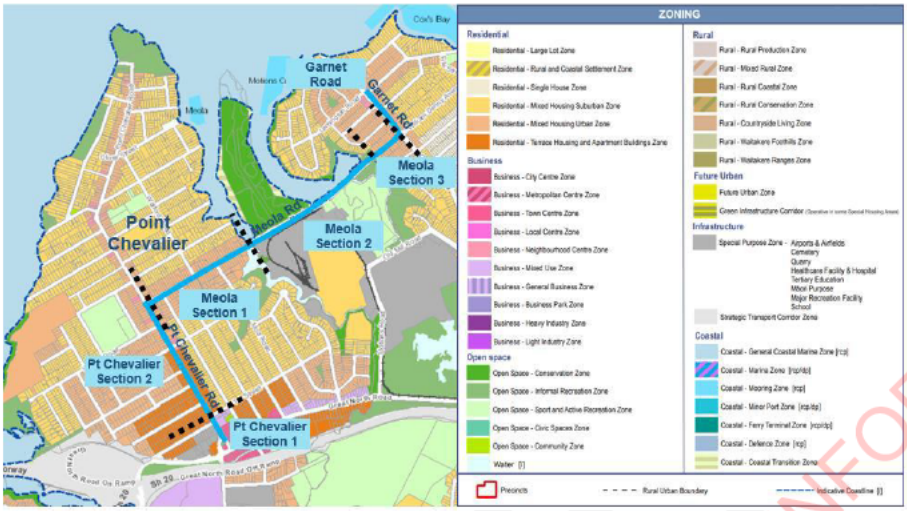
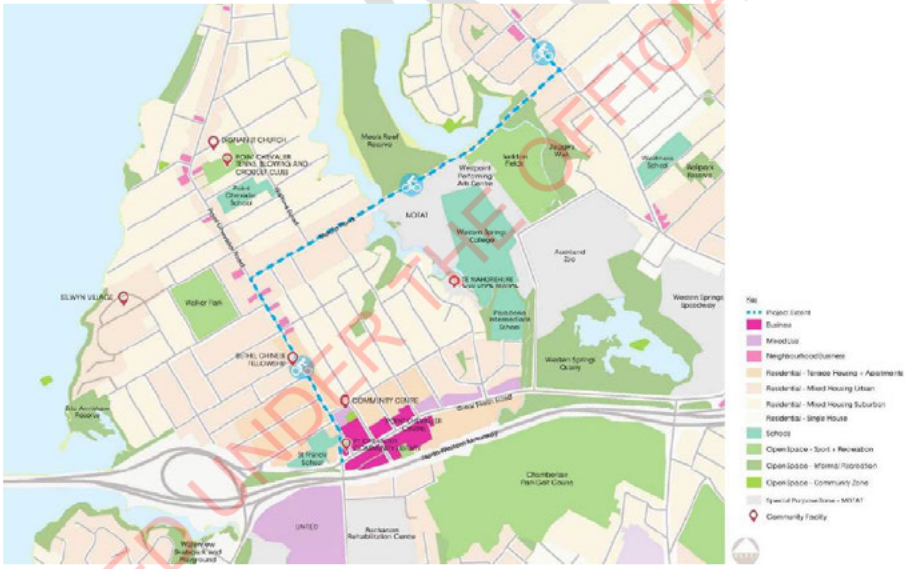


Figure 7: Local Destinations



Traffic Counts

Traffic counts were undertaken in August 2017, after the opening of the Waterview Connection. Point Chevalier Road has the highest five-day Average Annual Daily Traffic (AADT) volume (16,500 vehicles per day) followed by Meola Road (13,200 veh/day) and Garnet Road (8,900 veh/day).

These counts show Point Chevalier Road is busiest in the interpeak hour (11:30am to 12:30pm) with 1,550 vehicles. The morning peak hour (8:00am to 9:00am) has the same number of vehicles (1,400) as the afternoon peak hour (2:30pm to 3:30pm). The afternoon peak hour aligns with after-school pickup times.

Meola Road is busiest in the afternoon peak hour (5:00pm to 6:00pm), followed by the morning peak hour (1,300 vehicles between 7:30am and 8:30am) and the interpeak hour (1,250 vehicles between 12:00pm and 1:00pm).

Garnet Road is busiest in the afternoon peak hour (5:15pm to 6:15pm), followed by the morning peak hour (900 vehicles between 8:00am and 9:00am) and the interpeak hour (800 vehicles between 11:45am and 12:45pm).

Traffic volumes indicate there is little variation in peak volumes throughout the day. The maximum variation in peak volumes is on Meola Road, where the afternoon peak hour has approximately 22 percent more traffic than the interpeak hour. Little variation in peak volumes reinforces the fact that the project route is also an important strategic connection for general traffic.

Table 1: Vehicular Traffic Counts

Location	5 Day AADT	AM peak hour	AM peak volume	Interpeak hour	Interpeak volume	PM peak hour	PM peak volume
Point Chevalier Rd	16,500	8:00am-9:00am	1,400	11:30am-12:30pm	1,550	2:30pm-3:30pm	1,400
Meola Rd	13,900	7:30am-8:30am	1,300	12:00pm-1:00pm	1,250	5:00pm-6:00pm	1,600
Garnet Rd	8,900	8:00am-9:00am	900	11:45am-12:45pm	800	5:15pm-6:15pm	950

Cycle Counts

Annual cycle count data is available for the intersection of Point Chevalier Road, Great North Road and Carrington Road from the annual Auckland Region Manual Cycle Monitor reports (Gravitas, 2015).

Table 2: Cycle Counts– 6:30am to 9:00am and 4:00pm to 7:00pm totals (Estimated ADT in brackets)

Location	2009	2010	2011	2012	2013	2014	2015
Great North Rd/Carrington Rd/Point Chev Rd	193 (281)	314 (455)	232 (335)	206 (301)	228 (331)	227 (327)	266 (387)

Pedestrian Counts

Pedestrian surveys were undertaken by Aleph at the intersection of Garnet Road, Meola Road and William Denny Avenue on Thursday 23 February 2017 and Saturday 25 February 2017.

Table 3: Pedestrian Counts

Intersection arm	Morning peak period (7:00am-9:00am)	Afternoon peak period (4:00pm-7:00pm)	Weekend peak period (10:00am-2:00pm)
Garnet Rd north	133	126	134
William Denny Ave east	24	10	29
Garnet Rd south	23	20	106
Meola Rd west	10	37	27
Total	**190**	**193**	**296**
Average / hour	**95**	**64**	**74**

1.4 Social Context

Point Chevalier is currently home to approximately 8,500 residents and is expected to grow to 11,600 respectively by 2043 (a 38% increase over the next 25 years (2018 model base year))[2]. The areas of Point Chevalier and Westmere have generally low-medium levels of deprivation with some pockets of high social deprivation. This is reflected in commuting patterns with 23 percent of employed residents living in the project area working in the Auckland CBD. When combined with Westmere and Point Chevalier East, almost half of all employed residents living in the project area work in one of five statistical areas; the Auckland CBD (comprising Auckland Central West, Auckland Harbourside and Auckland Central East), Westmere and Point Chevalier East.

There are two primary schools in the study area, Point Chevalier School (approximately 300 metres north of the Point Chevalier Road / Meola Road intersection), and Westmere School (approximately 500 metres south of the Meola Road / Garnet Road intersection) and two close by Pasadena Intermediate and Western Springs College are located to the south of Meola Road (accessed via Motions Road).

The area is home to the Museum of Transport and Technology (MOTAT), Seddon Fields (there is a bike to football project at present based on Seddon Fields which is dramatically increasing the active mode travel to recreational facilities and reducing the demand for casual parking in the area) and smaller parks and reserves.

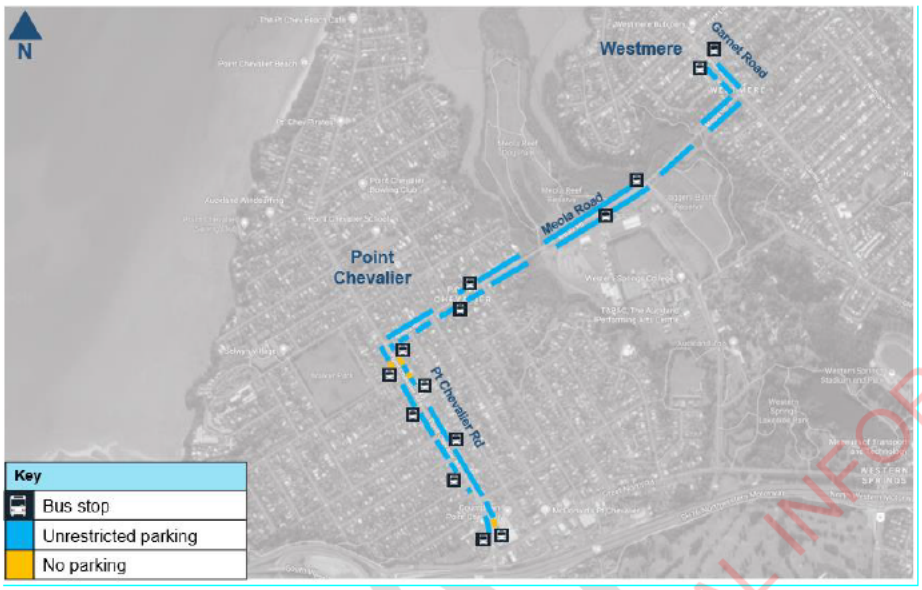
1.5 Existing Transport Infrastructure

Point Chevalier Road, Meola Road and Garnet Road are identified as primary bus routes and are part of the Frequent Transit Network. There is no bus priority are no on-road or off-road cycle facilities within the study area. Along the corridor there are only 5 formal crossing facilities (average spacing of 500 – 600m) and there are no formal crossing facilities at the intersections. The lack of facilities provides barriers for active mode travel.

Kerbside conditions vary across the different road sections. Facilities range from no stopping (broken yellow lines), restricted parking (outside local shops and attractors), unrestricted on street parking and off-street parking around local attractors. Kerbside conditions are shown in Figure 8.

[2] Stats NZ projections

Figure 8: Kerbside conditions along the Point Chevalier cycle project route



Cycling counts indicate approximately 300 cyclists per day use Point Chevalier Road and show year-on-year growth of approximately three percent per annum and thus it is reasonable to expect the number of cyclists to increase within the study area, even without investment in the Point Chevalier cycle project. The morning peak period had the highest number of cyclists, which correlates to the overlap with the school peak period. The weekend peak period had the second highest number of cyclists, suggesting that cycling is a popular recreational activity for residents and the attractiveness of the areas facilities which include Western Springs Stadium and Lakeside Park, MOTAT, Meola Reef Reserve and Jaggers Bush Reserve.

The pedestrian survey demonstrated similar trends to that of cyclists, with the highest average number of pedestrians per hour in the morning peak period and the second highest number on the weekend peak period. As expected, the average on street parking on both the project route and side streets increased during peak periods. The highest total occupancy observed was 45%.

For more details refer to Appendix B.

1.6 Strategic Overview

The hierarchy of the planning documents and the strategic themes for AT is outlined in Figure 8 below. Point Chevalier Cycle and transport improvements proposal has been developed to align with these various strategies by working towards individual objectives relating to cycling, safety, public transport, accessibility, the public realm and land use. Figure 10 shows how The Point Chevalier to Westmere proposal aligns with the wider strategic vision for the city[3].

[3] Reworked visual original sourced from Auckland Transport (2018) *Asset Management Plan Summary*

Figure 9: Auckland Transport – Strategic Alignment

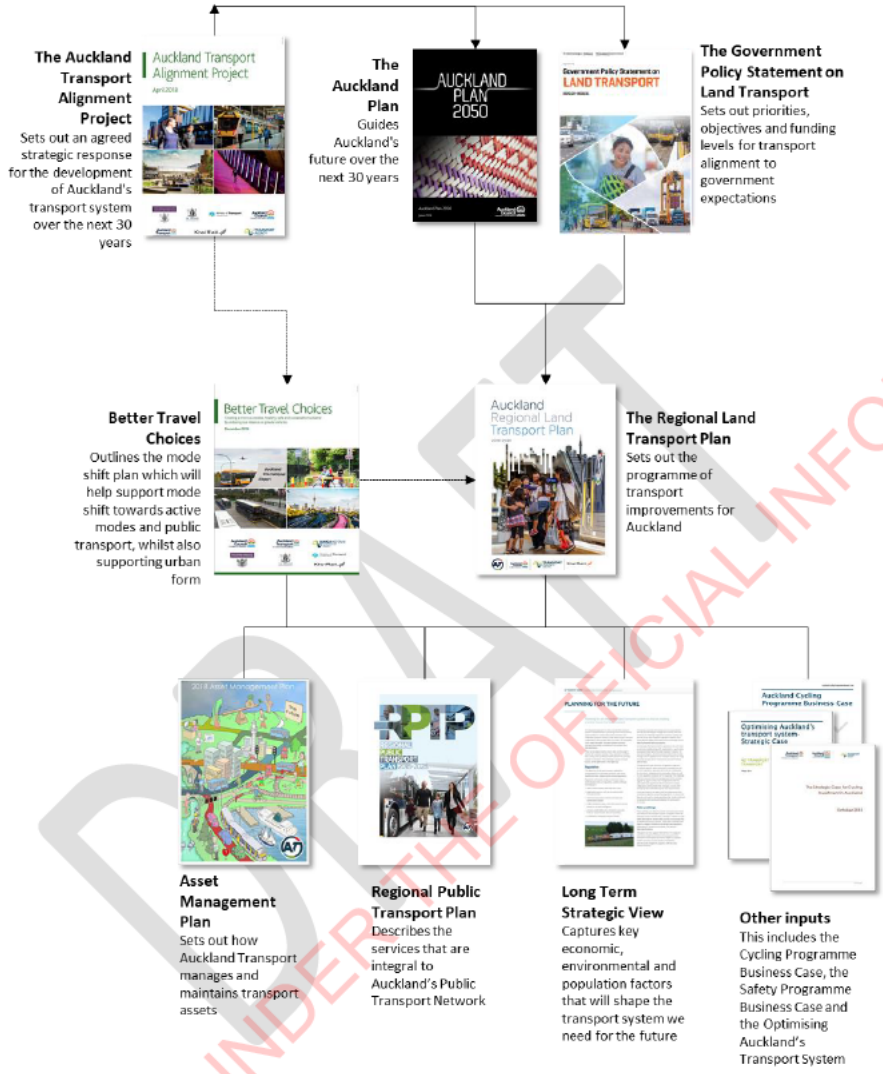
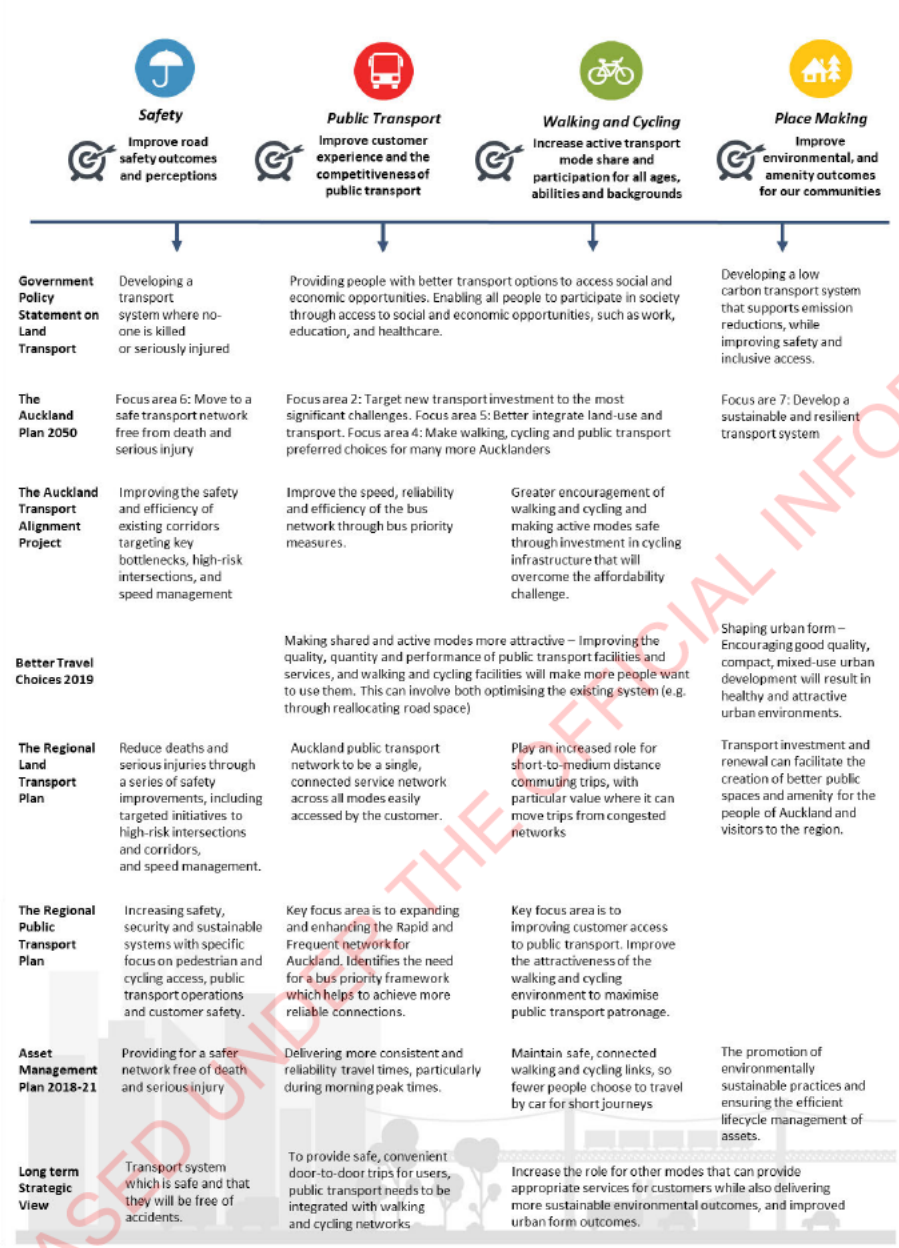


Figure 10: Point Chevalier Cycling and transport improvements - strategic alignment



	Safety Improve road safety outcomes and perceptions	Public Transport Improve customer experience and the competitiveness of public transport	Walking and Cycling Increase active transport mode share and participation for all ages, abilities and backgrounds	Place Making Improve environmental, and amenity outcomes for our communities
Government Policy Statement on Land Transport	Developing a transport system where no-one is killed or seriously injured	Providing people with better transport options to access social and economic opportunities. Enabling all people to participate in society through access to social and economic opportunities, such as work, education, and healthcare.		Developing a low carbon transport system that supports emission reductions, while improving safety and inclusive access.
The Auckland Plan 2050	Focus area 6: Move to a safe transport network free from death and serious injury	Focus area 2: Target new transport investment to the most significant challenges. Focus area 5: Better integrate land-use and transport. Focus area 4: Make walking, cycling and public transport preferred choices for many more Aucklanders		Focus are 7: Develop a sustainable and resilient transport system
The Auckland Transport Alignment Project	Improving the safety and efficiency of existing corridors targeting key bottlenecks, high-risk intersections, and speed management	Improve the speed, reliability and efficiency of the bus network through bus priority measures.	Greater encouragement of walking and cycling and making active modes safe through investment in cycling infrastructure that will overcome the affordability challenge.	
Better Travel Choices 2019		Making shared and active modes more attractive – Improving the quality, quantity and performance of public transport facilities and services, and walking and cycling facilities will make more people want to use them. This can involve both optimising the existing system (e.g. through reallocating road space)		Shaping urban form – Encouraging good quality, compact, mixed-use urban development will result in healthy and attractive urban environments.
The Regional Land Transport Plan	Reduce deaths and serious injuries through a series of safety improvements, including targeted initiatives to high-risk intersections and corridors, and speed management.	Auckland public transport network to be a single, connected service network across all modes easily accessed by the customer.	Play an increased role for short-to-medium distance commuting trips, with particular value where it can move trips from congested networks	Transport investment and renewal can facilitate the creation of better public spaces and amenity for the people of Auckland and visitors to the region.
The Regional Public Transport Plan	Increasing safety, security and sustainable systems with specific focus on pedestrian and cycling access, public transport operations and customer safety.	Key focus area is to expanding and enhancing the Rapid and Frequent network for Auckland. Identifies the need for a bus priority framework which helps to achieve more reliable connections.	Key focus area is to improving customer access to public transport. Improve the attractiveness of the walking and cycling environment to maximise public transport patronage.	
Asset Management Plan 2018-21	Providing for a safer network free of death and serious injury	Delivering more consistent and reliability travel times, particularly during morning peak times.	Maintain safe, connected walking and cycling links, so fewer people choose to travel by car for short journeys	The promotion of environmentally sustainable practices and ensuring the efficient lifecycle management of assets.
Long term Strategic View	Transport system which is safe and that they will be free of accidents.	To provide safe, convenient door-to-door trips for users, public transport needs to be integrated with walking and cycling networks	Increase the role for other modes that can provide appropriate services for customers while also delivering more sustainable environmental outcomes, and improved urban form outcomes.	

The Government Policy Statement in the above table relates to the 2021 document, however the current 2018 document should also be acknowledged. The 2018 GPS's key strategic priorities are Safety, Access and Environment, which remain in the 2021 document. The main differences are that in the

2018 document these priorities are supported by Value for Money, whereas in the 2021 document Improving Freight Connections for economic development takes a higher priority.

The Point Chevalier Cycle Project aligns with the strategic intent of national, regional and organisation strategies. The project meets the strategies by delivering a critical missing link in an urban cycle network of high demand, to increase access to economic and social opportunities and make an inclusive and integrated network. Further information strategic alignment can be found in Appendix B Strategic Context Review Report.

The project prioritises a safe system to create a space that is attractive and feels safe for all users, especially vulnerable users. Along with the project's investment into infrastructure that supports walking and cycling, this will encourage the uptake of active modes of travel and contribute to reducing the growth of car trips. As higher priority is placed on sustainable forms of travel, the project supports a reduction in transport's negative effects on the local environment and the health and wellbeing of people.

The project also meets the desired outcomes and objectives of the:

- Auckland Cycling Programme Business Case
- Auckland Road Safety Programme Business Case
- Auckland Cycle Network (ACN)

By completing an important link in the cycle network, the project will improve safety for current users and promote cycling as a viable, sustainable alternative to motorised transport.

Refer to Appendix B for details on the strategic fit of the project.

1.7 Stakeholder Agreement

No formal agreements were set up for the project. However, stakeholders such as Auckland Council, MOTAT, the local board, the local schools and asset owners in the area are aware of the projects with general agreement to collaborate where appropriate. Refer to Appendix C Stakeholder Engagement for details

1.8 Current State

The current state of the project is to seek Waka Kotahi funding for implementation. This business case and its contents would support the case for investment.

1.9 History of Project / Work Completed to Date

Change History

The project was initiated in 2015 wi h most of the investigation work being undertaken by AECOM with the support of an AT project manager. The different stages of work are outlined in Table 4 below.

Table 4: Work to date

Stage	Year	Org.	Description	Outcomes
Project Mandate	2015-Sept	AT	Draft project mandate that outlined the strategic context and the expectation for the project going forward.	Confirmed the project mandate for the design investigation

Stage	Year	Org.	Description	Outcomes
Early Investigation Study	2015-Oct	AECOM	Initial feasibility study for the project based on the project mandate. Data collection was completed with two options developed and adopted to take forward into scheme design.	Confirmed the route selection Adopted two options for the next stage of investigation. Tree removal/relocation along Point Chevalier Road require further consideration On-street car parking removal requires further consideration for Meola Road and West End Road
Scheme Assessment	2016-Jul	AECOM	The designs were developed further based on technical assessments from the early investigations. Cost estimates and BCRs were developed for the option Public consultation was carried out in 2017 and feedback in incorporated into further design development	Confirming the preferred design and develop the option with engineering checks Cost estimate was completed for the two options, approximately $10.3mil or $14.7mil respectively BCR was assessed to be 1.8 and 1.2 respectively West End Road was removed from the project scope due to budget constrains
Options Refinement and Assessment	2018 - 2019	AT / AECOM	Further optioneering was undertaken in alignment with the latest design guidance Options assessment was completed which confirmed the preferred option for detailed design Public consultation in late 2019	A range of concept options were developed and assessed through Multi-Criteria Analysis (MCA) Engineering checks on the MCA recommendation was carried out before detailed design Early tender design drawings issued
Detailed Design	2020 May	Mott MacDonald	Design and developed the details and the road layout for all routes within the project area	Completed engineering checks on the options refinement provided by AT Early tender design drawings issued Completing business case for funding approval

During the project period, from 2015 to mid-2020, three policy changes occurred:

- Government Policy Statement on Land Transport (2018-2028 and 2021-2031)
- Auckland Transport Alignment Project 2018

- Road to Zero – New Zealand Road Safety Strategy 2020-2030

These policies are described in Appendix B.

Local guidance was also released by AT during the project period:

- Auckland Cycle Programme Business Case (PBC) 2017
- Local Streets Design Guide 2017 (Greenways Design Guide previously)
- Auckland Transport Roads and Streets Framework, DRAFT 2018
- Auckland Transport Roads and Streets Framework, FINAL 2020
- Auckland Transport Design Manual, 2020
- Auckland Transport Cycle Quality of Service Tool, 2016

The Early Investigation Study is included in Appendix D and the Scheme Design Report is included in Appendix M.

1.10 Next Steps

This business case supports the move to pre implementation and implementation for the preferred option. The business case has been prepared to support this option and includes an appropriate level of evidence to support the option in favour over the alternatives assessed.

2 Problems, Opportunities and Constraints

2.1 Problems and opportunities

It is considered good practice during the development of the business case to reconsider whether problems and opportunities stated at the beginning of the project are still relevant and fully captured. In October 2020 AT reconsidered the problem statements with the assistance of Waka Kotahi. The Investment Logic Map (ILM) which summarises the issues found on the corridor and the benefits of resolving these issues can be found in Appendix A and is shown in Figure 11~~Figure 11~~Figure 11 ~~Figure 11~~ below.

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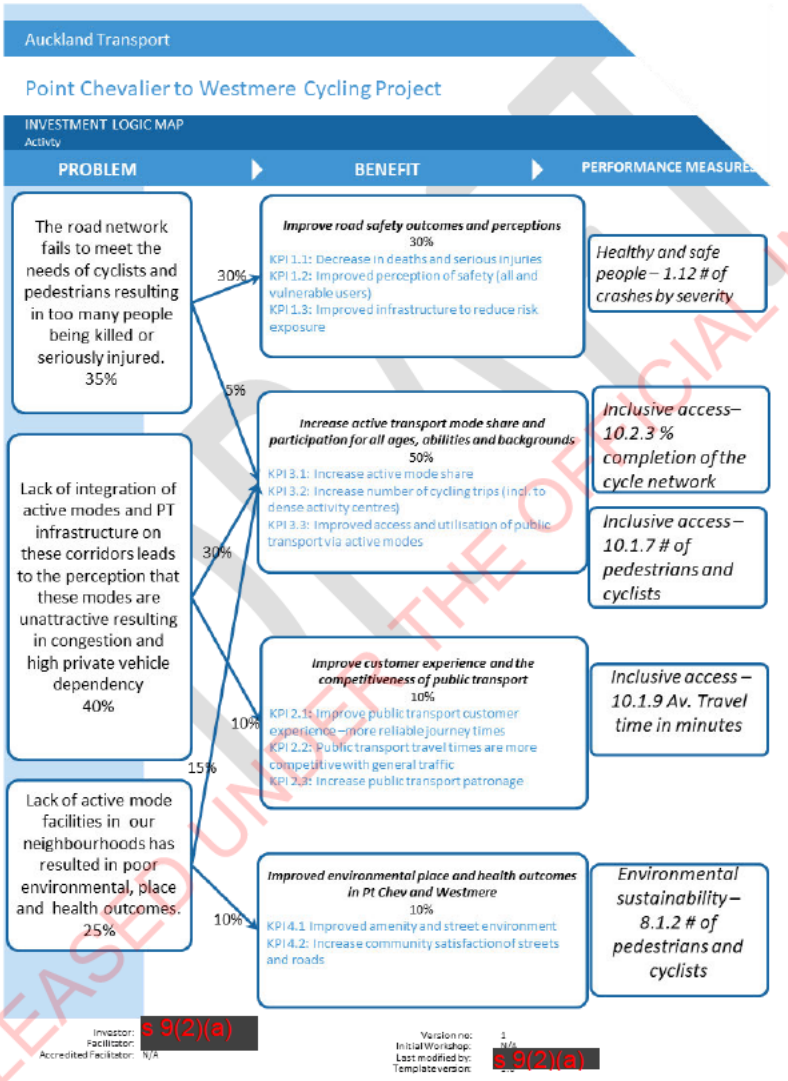
Figure 11: Investment Logic Map Point Chevalier to Westmere – Cycle, Bus and Safety Improvements



Notes relating to the ILM:

(i) The problem statements in the ILM closely align to the problem statements in the ~~Regional~~ Auckland Cycling PBC.

(ii) The ILM relates to a) Point Chevalier Road between the junction of Great North Road and Meola Road, b) Meola Road and c) Garnet Road between junction with Meola Road and Oban Road

(iii) Problem Statement 1 - Considers all crashes which result in serious or fatal injuries within the road corridor but has a special emphasis towards the most vulnerable road user – cyclists and pedestrians.

(iv) Problem Statement 2 - Lack of integration of active modes and PT infrastructure means considering all modes of transport equally. That people are able to walk and cycle to PT facilities safely and that all facilities are of an appropriate quality. It is not sufficient to just reduce road injuries. Road users must perceive that walking and cycling is safe on the corridor to increase the number of people using active modes. Unattractive means perceived as unsafe, inferior to motor vehicle use and therefore given less priority. Facilities must be safe and attractive to all potential users not to just the confident users.

(v) Problem Statement 3 - Relates to the project corridor of Point Chevalier, Meola and Garnet Road which directly serves shops and cafes etc.

The following amended problem statements were agreed:

Problem One: The road network fails to meet the needs of cyclists and pedestrians resulting in too many people being killed or seriously injured.

Problem Two: Lack of integration of active modes and PT infrastructure on these corridors leads to the perception that these modes are unattractive resulting in congestion and high private vehicle dependency.

Problem Three: Lack of active mode facilities in our neighbourhoods has resulted in poor environmental, place and health outcomes.

A summary of the evidence to support the problem statements is provided below:

Problem One: The road network fails to meet the needs of cyclists and pedestrians resulting in too many people being killed or seriously injured.

According to Urban KiwiRAP, Point Chevalier Road between Gt North Road and Meola Road has a Medium High Collective Risk classification. Collective Risk is a measure of the total number of fatal and serious injury crashes per kilometre over a section of road. Collective Risk can also be described as the crash density. Congestion and the narrow width of Meola Road create a difficult environment for all road users, but particularly cyclists. This is reflected in crash statistics which indicated that between 2015 and 2019, 5 of the 6 active mode crashes occurred midblock. The narrow width of Meola Road also gives cyclists the perception of a high crash risk as vehicles tend to overtake cyclists without providing sufficient gap between the vehicle and the rider, making the cycling experience uncomfortable even for experienced cyclists and would actively discourage unexperienced cyclists.

Community consultation w thin the study area indicates that local residents are concerned with the safety of all road users, particularly along Meola Road.

Point Chevalier Road and Meola Road both experience speeds in excess of the posted limits. Recent data shows that on Meola Road over 40% of vehicles travel above the posted speed limit of 50km/hr. Part of Point Chevalier Road has 27% of vehicles travelling over the posted speed limit. These high speeds in an urban context contribute to the hostile cycling environment, not only along the corridor

(where there are no dedicated cycling facilities – Quality of Service 4[4]), but at intersections and crossings where there are conflicts between users.

The current configuration of Point Chevalier Road and Meola Road are a barrier for people to consider walking and cycling for trips to local destinations and social activities (as outlined in Figure 12, and for commuting trips, where they are the key roads into and out of the area.

Analysis has been carried out of the crashes along the route from July 2015 to June 2020, inclusive. There were 52 crashes recorded, 3 serious crashes, 14 minor injury and 17 non-injury. There were 5 cyclist crashes within the boundaries of the project, 4 of the 5 reported cyclist crashes would be very unlikely if segregated cycle lanes were in place. The fifth, involving a car manoeuvring out of a driveway, may have been less likely to occur if the project makes cyclists more conspicuous.

There were 6 crashes that involved pedestrians, all of which involved being hit by vehicles. Both a serious injury and a minor injury crash involved pedestrians being hit by vehicles as they were crossing Garnet Road. A crash occurred on Meola Road where a pedestrian was hit by a van as they were crossing the road. Three crashes involved pedestrians on Pt Chevalier Road, in which two pedestrians were hit by a car as they were crossing Pt Chevalier Road.

Furthermore, consultation responses often bring up the issue of Meola Road and Point Chevalier Road being a hostile environment for pedestrians, especially when they need to cross the road.

Figure 12: Local destinations which could be accessed by walking and cycling

Problem Two: Lack of integration of active modes and PT infrastructure on these corridors leads to the perception that these modes are unattractive resulting in congestion and high private vehicle dependency.

[4] AT Quality of Service considers the quality of infrastructure where Quality 1 is the highest and Quality 4 is the lowest.

The following section explains how the Point Chevalier and Westmere road network has developed and why it has been operated primarily for the convenience of private vehicle use, prodominantly car, over many years, to the detrement of other users of the road network.

The road network in Point Chevalier was not designed to be mixed use arterial roads carrying 17,000 vehicles a day. Point Chevalier Road was designed for trams as trams were the primary transportation mode in Auckland before 1950 . Consequently the road network was not originally designed for extensive private vehicular use, instead it has evolved into its current usage.

Figure 13: Auckland's electric tram network including Point Chevalier Road

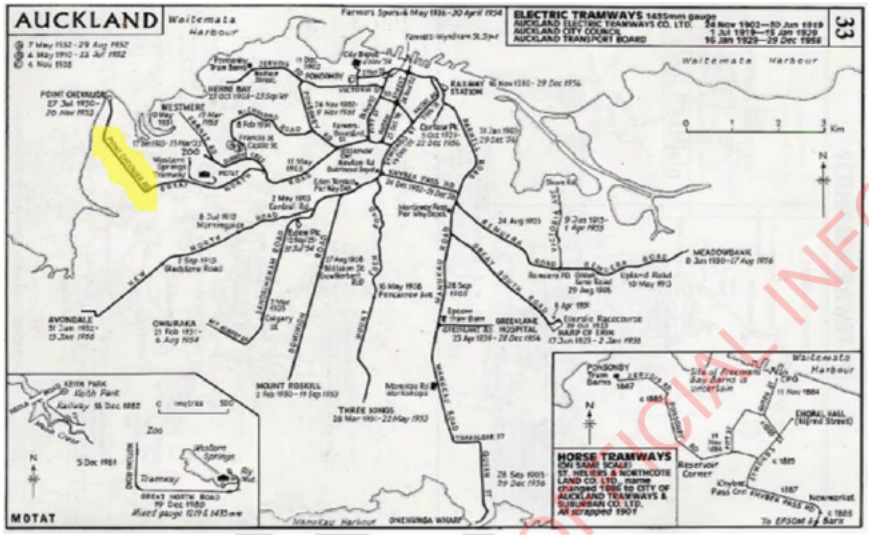
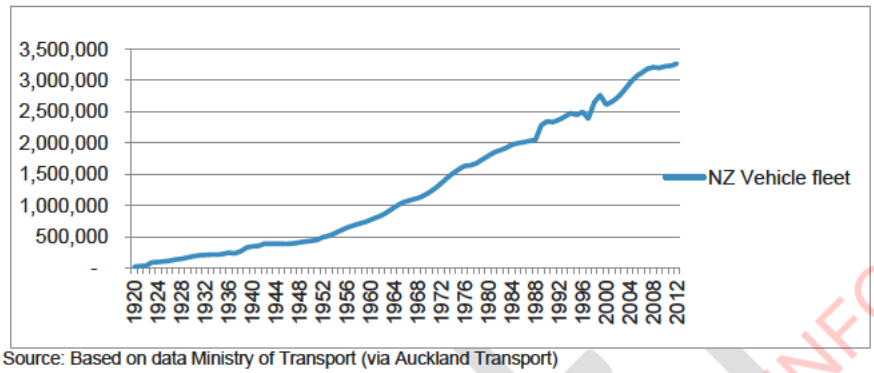


Figure 14: Historical Auckland roadspace dominated by public transport

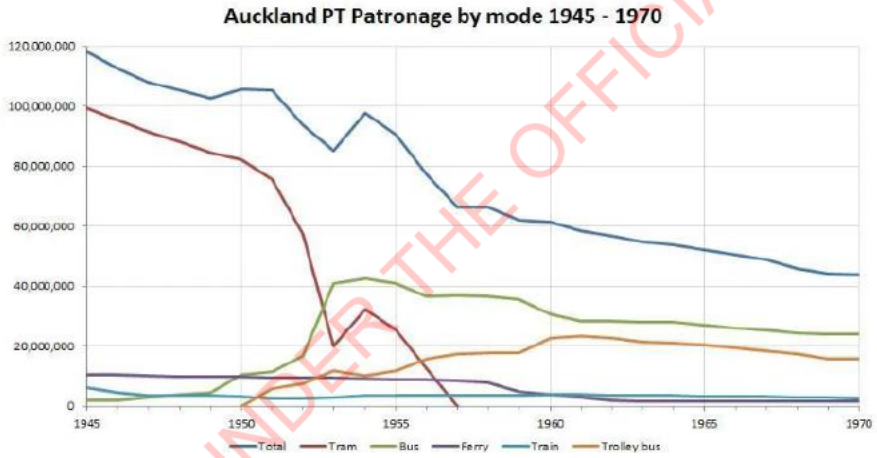
The trams in Auckland were dismantled in 1956. The tram lines were removed and roadspace previously used by the trams was not reallocated to buses which had replaced the trams but to all motorised vehicles. In the 1950s, car ownership per capita was low and so buses and cyclists shared the roadspace without too many issues. However, over time car ownership increased. In 1952 there were 500,000 vehicles in New Zealand, currently there are over 3.5 million vehicles.

Figure 15: New Zealand Vehicle Fleet



Source: Based on data Ministry of Transport (via Auckland Transport)

Figure 16: Public Transport Patronage in Auckland



During the second half of the twentieth century in Auckland, as car ownership increased, tram and then bus use decreased, consequently there was little incentive to improve the road network to prioritise public transport. A similar reduction in use of bikes occurred at a similar time.

As more people drove cars as opposed to walked, cycled or caught public transport in Auckland, the road network was increasingly prioritised for the efficient use of vehicles in both a physical sense by the allocation of roadspace and an operational sense by allowing traffic speeds which are appropriate for vehicles but less appropriate for pedestrians and cycles. As congestion increased the number of traffic lanes also increased to facilitate easier and quicker car trips as opposed to more reliable bus

trips. Traffic signals were designed primarily for the ease of movement and safety of car drivers as opposed to the convenience of pedestrians or the reliability of buses. Underutilised roadspace was used to park motor vehicles, especially around local shops, parks and schools, to the detriment of pedestrian, cyclists, bus reliability and the attractiveness of the road corridor as a public space.

Since the 1990s significant increases in population and car ownership in central-west Auckland has led to increased congestion particularly on Point Chevalier Road but also on Meola Road. Operational and physical improvements to the roads were no longer able to accommodate such large demand for roadspace. This has led to high levels of congestion and poor journey reliability. Gradually, over the last twenty years public sentiment has to some extent, changed from demanding more roadspace to reduce congestion, to accepting that there is a greater demand for car use than can reasonably be accommodated in densely populated areas and that priority should be given to other forms of transport which can transport people more efficiently.

Point Chevalier Road is the primary arterial connecting the western suburbs of Point Chevalier and Westmere area and having efficient bus connectivity is key to equitable accessibility. Point Chevalier Road services routes between Point Chevalier Beach and Point Chevalier shops as part of their routes. Meola Road services the Outer Link, connecting Point Chevalier shops, Herne Bay and the City Centre as part of its route. It has two Frequent Transit Network (FTN) routes, - the highest frequency and quality bus routes, No.66 and the Outer Link and a future FTN in the form of the No.650. The number of high frequency buses on the corridor makes Point Chevalier Road and Meola Road one of the most serviced corridors in Auckland by public transport, hence, it is critical to provide priority for the buses, increase their reliability and attractiveness. Currently, the Level of Service is relatively poor, as shown in Figure 17 below, the AT network strategy is to have at least LoS of D and above for our bus services, especially on FTN routes.

The current congestion along Point Chevalier Road in both the morning and evening peak periods means that the 450m travelled between Meola Road and Great North Road can take anywhere between 1.5 mins (~20kph) and 4 mins on any given day (~7kph or a little fas er than walking pace). In the afternoon, the peak period coincides with the end of the school day and does not subside until after the commuter peak period.

This has a significant impact on the ability services to arrive within their timetabled schedule.

Figure 17: Level of Service for buses on Point Chevalier Road and Meola Rd

	AM Peak Travel Time LoS	AM Peak Reliability LoS	PM Peak Travel Time LoS	PM Peak Reliability LoS
March – September 2019	D	F	E	F

The knock-on effect of this is to reduce the attractiveness of public transport, particularly for commuting. With a large proportion of people working in the City Centre and City Fringe, the public transport patronage for journeys to work is still relatively low but consistent with the national average at around 8%.

Poor perceptions of safety of the corridor, as illustrated in recent data that shows on Meola Road over 40% of vehicles travel above the posted speed limit of 50km/hr off-peak and part of Point Chevalier Road has 27% of vehicles travelling over the posted speed limit off-peak which is restricting residents willingness to walk or cycle to public transport. The lack of integration between modes, - safe road crossing facilities and cycle parking at bus stops is further restricting public transport use.

Along the corridor there are only 5 formal crossing facilities (average spacing of 500 – 600m) and there a e no formal crossing facilities at the intersections. The lack of facilities provides barriers for active mode travel

Mode Share

Bicycle mode share is consistently low for employed residents, despite the high proportion of people working in the CBD, the average commuting distance for people living in the area ranging from 6 – 9km, and approximately 75% of commuting trips are less than 10km (as the crow flies). Despite this, the cycling mode share from the 2018 Census was approximately 5% (substantially higher than the regional average), up from approximately 4% from the 2013 Census but has more than doubled since 2001 where the mode share was ~1.8%. This suggests that the demand for cycling is high due to the number of attractions within an easily cyclable distance. It also suggests the potential for cycle growth would be substantial if facilities were suitable and safe.

More details on the method of travel to work for employed residents living in the study area can be found in the Strategy and Context Review document in Appendix B.

Perception of poor safety for active modes

The latest public consultation period (November 2019) indicated that respondents currently perceive the route as unsafe, with a top theme across all roads along the corridor being "like improved safety". There was not unfortunately a specific question posed to respondents regarding existing perceived safety, however the feedback in relation to safety included that respondents:

- like the safety of separated cycleway
- like the safety of additional pedestrian crossings and raised intersections
- likes reduced vehicle speeds; and
- generally think the project improves safety in the area.

This infers there is a general perception of poor safety for active modes along the corridor.

Gap in the network

Figure 1 – the Inner West cycle network clearly shows that there is a gap in the cycle network where the project is proposed. If resolved the future network has the ability to link the Northwestern cycleway with the proposed Northern Pathway which will create a link to the North Shore creating a link between two high quality strategic cycleways.

Problem Three: Lack of active mode facilities in our neighbourhoods has resulted in poor environmental, place and health outcomes.

This problem relates to the overall space and capacity dominance of private vehicles, with high volumes of cars and trucks affecting human context and environment of the town centres and urban areas. This prioritisation of cars and trucks rather than people in our urban centres[5] is causing:

- poor liveability, as our urban centres are too dominated by vehicles and have become less desirable places to meet and connect with other people in the community.
- poor environmental outcomes such as increasing pollutants and CO^2 in the air contributing to health problems and cl mate change.

High traffic volumes through urban centres

The *one netwo k performance scorecards* identifies areas within the wider Auckland network where private vehicle dominance is a significant problem. Figure 18~~Figure 18~~~~Figure 18~~ provides the October 2019 network performance which clearly shows the city centre being the most impacted by congestion during the AM peak period; which coincides with the commuting peak for the predominance of public transport users and pedestrians. However, the scorecards also identify the top ten 'pain points' within the network for the month. Pain points refer to areas which have a LOS F and travel speeds lower than 10km/hr; hence a 'saturated' network that may be close to failure and will have no opportunity to support

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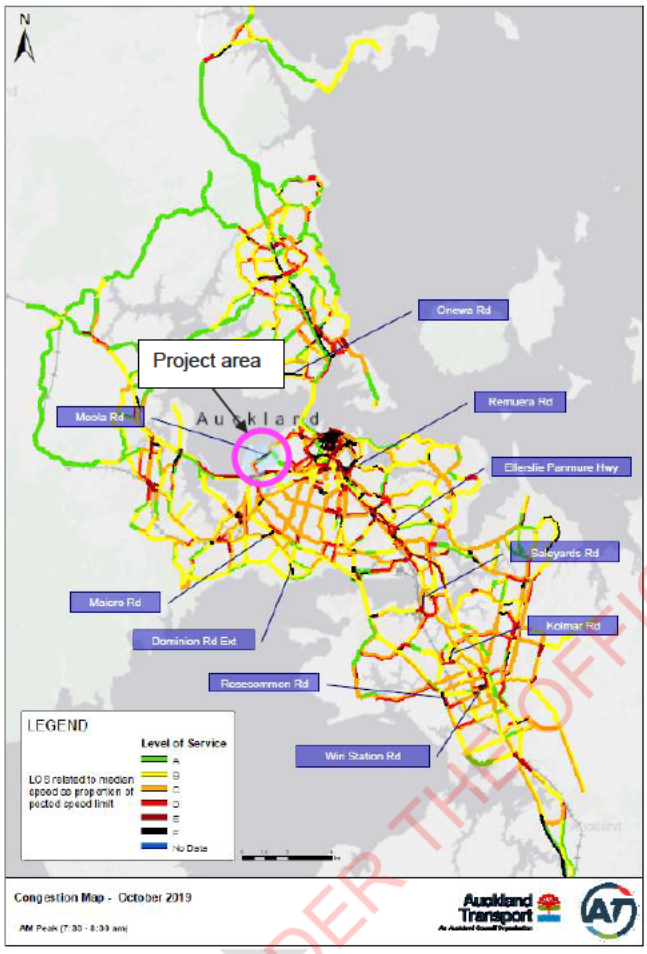
[5] Urban centres refer to all town centres within or adjacent to the boundaries of the proposed project.

future land use change and growth. In October 2019 Meola Road between Walford Road and Garnet Road was identified as pain point.

Figure 18: AM peak congestion map – One network performance October 2019 scorecard



Liveability and environmental impacts of vehicles

High levels of idling and slow moving traffic are detrimental to the environment of the urban area or town centre and on air quality in areas with the highest demand of pedestrian movements and people attending leisure activities. This has both environmental and health impacts. A long queue of buses within a town centre has similar impacts to safety and access.

Vehicles emit multiple air pollutants including carbon monoxide (CO), oxides of nitrogen (NOX) and other particulate matter (PM). However, carbon dioxide (CO2) makes up the majority of the air pollutants caused by road transport. When measuring air pollutants, a CO2 equivalent is often used. High traffic volumes, congested traffic, will have significantly higher level of pollution concentrations and therefore become a major contributing factor to the overall local air quality of the urban area in which these areas

of congestion are continuously recorded. Road transportation emissions in 2018 made up 43%[6] of all carbon dioxide emissions. One of the key issues with regard to high volumes of air pollutants is the impact on climate change.

One of central government's primary objectives is to reduce the adverse effects on the climate, local environment and public health[7]. The heavy reliance on private vehicles contributes to the negative impacts on climate and the local environment, with congestion within town and urban centres having an even greater impact.

In terms of public health, NOX causes inflammation of airways particularly for young children, asthmatics and those with respiratory issues. PM is also inhalable, which over time and in high concentrations can increase lung irritation and decrease lung function. Health implications of poor air quality can range from breathing problems to premature death. A study undertaken in 2012, showed that 22% of all social costs associated with human induced air pollution are attributed to motor vehicles and more than 256 people in New Zealand are estimated to die prematurely every year due to emissions from motor vehicles[8].

Figure 19~~Figure 19~~~~Figure 19~~ highlights where on the Auckland road network currently sees the greatest concentrations of CO[9]. The map shows emissions are concentrated to the major highways and major arterials which correspond to those areas which have the greatest amount of traffic. Meola Road and Point Chevalier Road experience between 30 and 50 kg/km/day of CO. Whilst this is not the h ghest reading for the Auckland region it is still significant considering Meola and Point Chevalier Roads are not classified as Regional Arterials.

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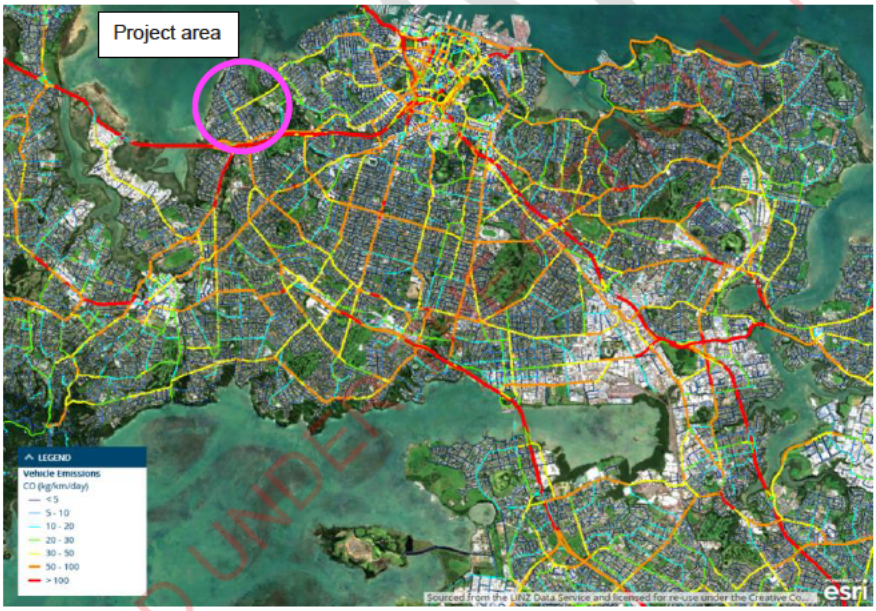
Figure 19: Auckland CO vehicle emissions[10]



[6] https://www.stats.govt.nz/indicators/new-zealands-greenhouse-gas-emissions

[7] Source New Zealand Government, Government Policy Statement on Land Transport, 2018, New Zealand Government

[8] Source: Emission Impossible Ltd et al. 2012, Health Effects of Air Pollution in New Zealand (HAPINZ), Health Research Council of New Zealand, Ministry of Transport, Ministry for the Environment and Waka Kotahi

[9] CO2 and CO2 equivalence measures are not currently publicly available, however CO gives an indication of where there is the greatest concentration of all vehicle emissions.

[10] Source: https://maphub.nzta.govt.nz/storymapjournal/index.html?appid=f1e08892b2264ca0a800f024d02041a4#

Another significant impact resulting from the high numbers of vehicles within the urban and town centres is the liveability implications around creating severance, impeding access, producing unnecessary noise and creating an unpleasant atmosphere.

Too many vehicles within town centres impact the street functionality. On-street parking narrows the available corridor and creates additional safety hazards for pedestrians, cyclists and buses (both on and off bus priority lanes) travelling through or to town centres. Boarding and alighting of public transport can be hazardous as conflict points exist in the streetscape between high volumes of vehicles and pedestrians. Vehicles accessing on-street parking or vehicles accessing off-street parking or driveways creates additional conflict points for pedestrians and cyclists, as these off street manoeuvres will require the footpaths and cycle lanes to be traversed. As a destination, these town centres become less attractive as traffic volumes become more of an issue.

Whilst the majority of the 'high street' activity in Point Chevalier town is on Gt North Road, there are a significant number of shops on Point Chevalier Road and also the Westmere shops are on Garnet Road towards the junction with West End Road. One of the conflicts to be addressed is the need for these areas to cater for numerous functions and purposes. Issue with the current road layout include:

- insufficient road lanes (and space) for both general traffic and buses (including bus stops)
- inability to cater for high volumes of pedestrian traffic
- poor connections onto the cycling network
- sufficient local car parking opportunities
- unsuitable access points (to and from shops and services and to and from bus stops and train stations)
- insufficiently inviting environment and atmosphere.

2.2 Urgency

There is an urgency to complete the project from both a safety and a cycle connections perspective.~~compl~~

The DSI (Deaths and Serious injury crashes) equivalent for the ~~re are~~corridor is 3.8 DSIs for the last five year period. Over the five year period, six crashes involved pedestrians being hit by vehicles and five crashes involved cyclists. The project is expected to ~~save approximately 1.6 DSIs~~reduce DSIs through provided safe crossing and cycling infrastructure.

Furthermore, the project will complete a ~~missing link~~ gap in the cycle network between the Waterview / Great North Road / Pt Chevalier area and the City Centre. The corridor is listed as *a High First Decade Priority Investigation Areas (Cycle PBC or UCP)* in Auckland Transport's Future Connect.

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~~su~~Figure 20 shows the cycling routes that are either existing/under construction or in design or awaiting funding approval, which adjoin the Point Chevalier to Westmere route.

Figure 20: Connections to the Point Chevalier to Westmere project

This figure illustrates that considerable progress is being made in the Inner West suburbs to create a quality network of cycle infrastructure. When complete, the Inner West will act as an exemplar to other areas of the City. As previously discussed, due to the success of the Northwestern Cycle route, this suburb has higher than average number of cycle trips and by increasing the number of destinations that can be safely reached by cycle, even higher cycle mode share is expected.

Covid 19 has dramatically altered the Auckland region s travel patterns. In the short term, during outbreaks of the disease (Alert Levels 3 and 2), people tend not to travel in close confinement to each other, consequently more people have been working from home and bus patronage has been lower than previously, whereas of those that do travel, are travelling by car, cycle or walking. In these circumstances it is vital to give travellers real travel choices, in addition to car travel; and cycling infrastructure that meets customers' requi ements. Auckland CBD is approximately 5km from the project and therefore within easy reach on a cycle. Cycle journeys to the CBD aligns with the intent of the Cycling PBC that more short journeys for both employment and social opportunities (5-8km) can be undertaken by cycling as a way of increasing active mode share uptake and reducing congestion. Whether travel patterns will change over the long term has yet to established, however many workers have proven their ability to work remotely. If this trend is maintained then there will more people in the suburbs for longer periods and therefore carrying out more local trips, for which suburban cycle infrastructure is suitable along with safety improvements that benefit pedestrians. Recent research into the impacts of Covid 19 on the Land Transport system in Auckland[11] indicates "there will be an-going need to focus on network optimisation, mode shift and climate change mitigation (emissions reductions)" and effectively integrating land-use and transport remains critical to sequence development, ensure growth areas are serviced with active mode and PT infrastructure and services,

[1] https://www.nzta.govt.nz/assets/planning-and-investment/arataki/docs/regional-summary-2-auckland-potential-impacts-of-covid-19.pdf

and linking housing to employment and essential services." Considering the above, there does appear to be urgency to completing this local cycle network.

2.3 Issues and Constraints

This section identifies key constraints that could have implications for project delivery. Some of these constraints have already shaped the evolution of this project to this point.

Corridor Widths

Point Chevalier Road and Meola Road are typical of urban corridors in Auckland. Point Chevalier Road is approximately 20m wide (boundary to boundary), with Meola Road reflecting an upgraded urban street to connect with Westmere, as it is only 16.5m wide (boundary to boundary) in the eastern section. In the western section, Meloa Road is tree-lined on both sides with a narrow carriageway.

Table 5: Typical road widths

Road	Boundary-boundary width (m)	Kerb-kerb width (m)
Point Chevalier Road	20.1	14
Meola Road East	16.5	9.25
Meola Road Central	24.75	9.25
Meola Road West	20.1	9.25
Garnet Road	27.5	15.1

Impact on existing street trees

The loss of 12 prominent Pōhutukawa trees on Point Chevalier Road was raised as a concern by a smaller proportion of submitters in the 2017 consultation, overall tree loss was raised as a key concern by stakeholders and interest groups at that time. The tree constraints extend to the street trees along the western end of Meola Road where the civil works would impact the health of the trees. While it can be managed through new planning provisions, there is a sense of loss of amenity from the community feedback.

Loss of parking

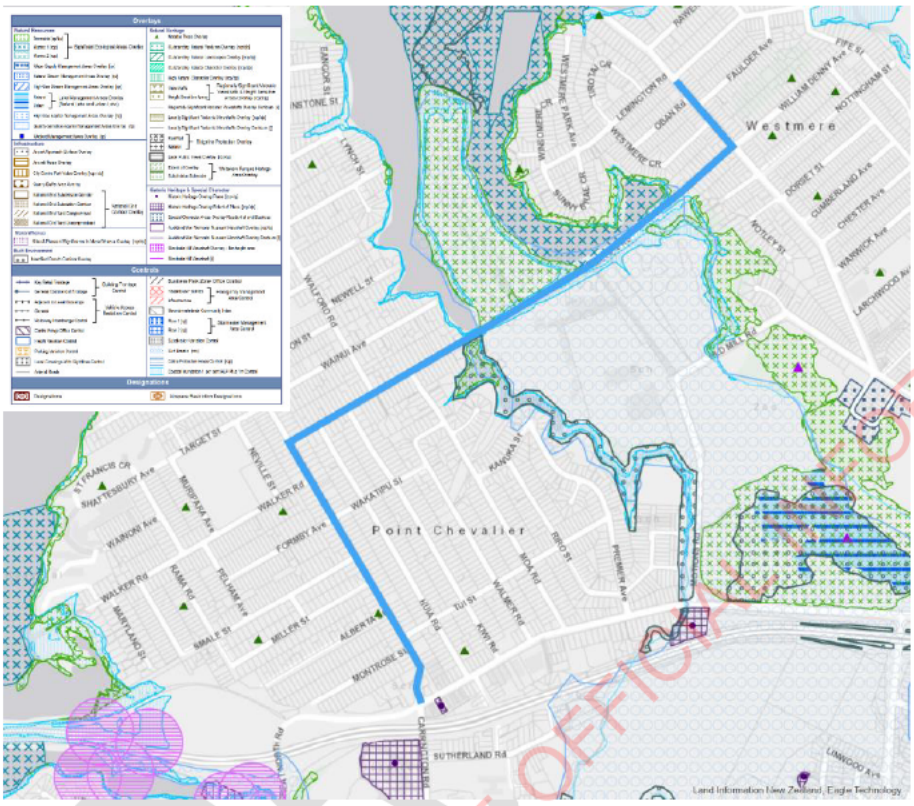
The loss of parking on Meola Road was of most concern to the local community, particularly how it affects access to the Museum of Transport and Technology (MOTAT) and recreational facilities at Meola Reef Reserve and Seddon Fields. Other parking issues identified by the local community include:

- The loss of parking outside local businesses.
- The use of side streets to offset the loss of parking along the route, and the impact of future development is expected to further restrict parking opportunities for local residents.

Environmental

The section of Meola Road runs alongside the Coastal Marine Area (constraint), and parts of Meola Road (and the reserve) are built over the top of a landfill giving rise to potential contaminated land. Site investigations found the soil materials likely to be disturbed as part of the development are unlikely to present a significant risk to human health or the environment through the implementation of a Contaminated Land Management Plan.

Figure 21 : Environmental Constraints



Uncertainties

An uncertainty log has also been compiled that will need to be considered in project delivery.

Table 6: Uncertainty Log

Factor	Time	Uncertainty[12]	Impact on programme
Factors affecting demand			
Progress towards ATAP Recommended Strategic Approach, including road pricing	2018-2028 period	Reasonably foreseeable	Road pricing is likely to increase demands for alternatives to driving, including cycling
Population growth (or change)	Long term	More than likely	Places increased pressure on the transport system and road safety making it more challenging to reduce poor safety outcomes.
Changes in societal travel pattern due to Covid 19	2020 - ongoing	Hypothetical	Less commuting more working from home. Increase in local trips More walking and cycling
Mode choice changes	Ongoing	Reasonably foreseeable	The degree to which change occurs is unknown, so investment should not be statically focussed on one mode.
Changes to bicycle technology that may increase the attractiveness of cycling, e.g. reductions in prices for batteries and e-bikes	Ongoing	Reasonably foreseeable	Cheaper batteries and e-bikes may increase the attractiveness of cycling for mo e people
Changes to road safety technologies that may increase road and cycling safety – e.g. vehicle, traffic signal, information systems technologies	Ongoing	'Hypothetical to 'Reasonably foreseeable'	Earlier availability of new road safety technologies may improve road safety in general and increase cycling demand.
Factors affecting supply			
Availability of funding from NLTP and AT relative to other transpor priorities	2018-2028	Reasonably foreseeable	Shifts in funding priorities will impact on the supply of new infrastructure and speed of implementation. A legacy project of UCP, now required to fit into changed

12 'Near certain' refers to cases that have policy or funding approval, tenders let, or which are under construction. 'More than likely' refers to factors where planning consent application is imminent or where there are adopted plans. 'Reasonably foreseeable' refers to cases where there are adopted/draft plans or development conditional upon other interventions. 'Hypothetical' refers to policy aspirations that are still labouring under considerable uncertainty.

Factor	Time	Uncertainty[12]	Impact on programme
			funding priorities has already impacted the programme.
Trade-offs with other modes	2018-2028	More than likely	Implementation of cycling facilities on constrained road space likely to be impacted by decisions on road space allocation with other modes (parking and general traffic lanes for example).
Timing of road renewals / resurfacing	2018-2028	More than likely	Road renewals may provide opportunities to develop new cycle facilities at a lower cost; however, renewals are difficult to forecast far in advance
Cycle facility investments made by local boards and AC parks team (greenways / local paths)	Ongoing	Reasonably foreseeable	These investments have the potential to make minor contributions to investment objectives
Factors affecting cost			
General cost inflation for civil construction	Ongoing	Reasonably foreseeable	Cost inflation will drive up the cost of delivering cycle facilities, thus limiting the amount of network that can be delivered under an allocated budget
Age of lighting in area	Ongoing	More than likely	Existing lighting may need to be upgraded across the whole suburb to comply with new standards.
Capacity constraints in the industry leading to timeframe / cost risk, availability of consultants and contractors to design and build facilities	Ongoing	Reasonably foreseeable	Capacity constraints may limit the quantity of cycle facilities that can be delivered within the timeframe; they can be overcome in the medium term by recruiting and training
Consultation and engagement processes and impact on cost and rate of delivery	Ongoing	Reasonably foreseeable	Politically sensitive and engaged community. Delivery of project will require substantial consultation resources and management of engagement process.
Cost escalation due to changes in design guidance and standards	Ongoing	More than likely	During the project period between 2015 to 2019, additional design guidance was released by AT. These documents proposed higher quality cycle infrastructure that was previously discounted. The result is the latest design requires additional civil works compared with the 2016-2018 designs.

3 Outcomes

3.1 Strategic Outcomes

The project aligns with the strategic intent of national, regional and organisation strategies, such as the GPS, Auckland Plan and ATAP outcomes. The investment of appropriate cycling, safety and public transport infrastructure provides a safe, coherent and attractive route that improves mobility for all users. The project area has no existing on-road cycle facilities; addressing this gap will encourage the uptake of active modes of travel and contribute to reducing the growth of car trips. As higher priority is placed on sustainable forms of travel, the project supports a reduction in transport's negative effects on the local environment and the health and wellbeing of people. These all align with various strategic outcomes from policy directions.

For more information refer to Appendix B.

3.2 Programme Outcomes

Auckland cycling programme investment objectives are directly applicable to this project and are listed as:

- Triple cycling mode share from 1% to 3% of total journey to work/education trips by 2028.
- Triple jobs and education opportunities accessible by short cycle trips for people with low levels of transport choice by 2028
- Triple cycle volumes in dense activity centres by 2028
- Increase rate of participation in regular cycling activity from 13% to 25% by 2028
- Reduce deaths or serious injuries involving people using bikes by 20% by 2028

AT road safety programme draft investment objectives that are directly relevant to this project are:

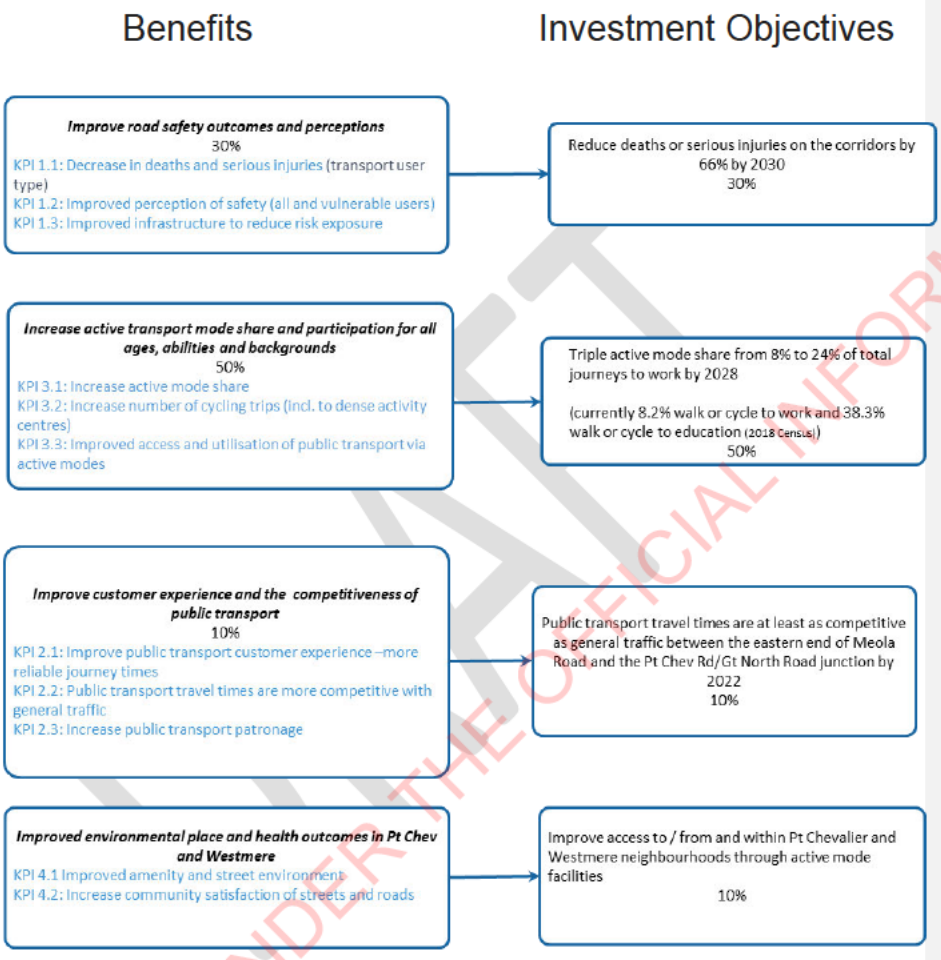
- Reduce the number of DSI's involving pedestrians, cyclist and powered two wheelers
- Contribute to improved public health through a shift to active modes, by improving safety for users
- Improve the safety of access to public transport services
- Reduce the gap between safe speeds and 85^{t} percentile operational speeds towards zero on the Auckland arterial and local roads network

The outcomes sought on this project are very similar to the outcomes sought from the Connected Communities programme, such as enhancing road safety, and increasing the uptake of sustainable modes and improving public transport reliability. Further, the issues and constraints are also similar. Consequently, the project has used the experienced gained on Connected Communities to align the problems, benefits and outcomes of the two projects.

3.3 Benefits and KPIs of investment

Benefits were refined through workshops with the project team and Waka Kotahi in October 2020. The following four benefits were identified as the most critical to the project and weighted according to importance. Investment objectives related to each benefit sought, indicate what the project is trying to achieve, so that progress can be measured against these targets:

Figure 22: Benefits and Investment Objectives



These benefits have been further detailed below.

3.3.1 Benefit statement 1: Improved road safety outcomes and perceptions

There are various strategic catalysts, driving this prioritisation of road safety. One of the biggest influences is the Vision Zero philosophy adopted by the government as part of the 'Road to Zero' National Road Safety Strategy. This philosophy states that DSIs are not acceptable on NZ roads and embraces a transformative mind set in making all roads safe. The strategy outlines how the transport system needs to be designed to be more forgiving and protect road users when human error inevitably occurs. Infrastructure improvements and speed management are just parts of the solution. Unsafe road user behaviour, vehicle safety and system management also play a significant role when improving

road safety (see Figure 23), however the Point Chevalier to Westmere project will predominately focus on infrastructure and speed related issues.

Improving road safety along these corridors will lead to a greater perception of safety within our communities, encouraging more people to walk and cycle. It would encourage parents to let their children walk or cycle to school and improve accessibility for elderly and disabled people. There is a big focus in improving safety around town centres, schools and other services, to create a more positive environment and to encourage people to choose walking, cycling and public transport for both local and commuter trips. Safety therefore takes an important role when designing for walking and cycling, public transport and the urban environment.

To implement Vision Zero, Auckland Transport has developed the Transport Design Manual which requires Quality of Service standards for cycling infrastructure, which in turn requires greater separation between vehicles and cyclist as a way of reducing harm.

Figure 23: Road to Zero Vision and Strategy for New Zealand Roads[13]

The related KPIs to this benefit statement are:

- KPI 1.1: Decrease in deaths and serious injuries
- KPI 1.2: Improved perception of safety (all and vulnerable users)
- KPI 1.3: Improved infrastructure to reduce risk exposure

Investment Objective - Reduce deaths or serious injuries on the corridors by 66% by 2030

3.3.2 Benefit statement 2: Increased active transport mode share and participation for all ages, abilities and backgrounds

Implementing safe and connected walking and cycling facilities along the project corridors will have a positive impact on active transport uptake, with one of the main barriers to cycling uptake being safety[14]. This is particularly true for more vulnerable users such as children, elderly people and disabled people, for whom safety and access have considerably more weight when making transport choices. These users have lower levels of transport choice, and the over-arching objective of the intervention is to increase levels of access for people of all ages and abilities through provision of active modes.

[13] New Zealand Government, *Road to Zero – New Zealand's Road Safety Strategy 2020-2030*, 2019, New Zealand Government, New Zealand

[14] s 9(2)(a) *Facilitating customer behaviour change on key roads*, February 2019, Auckland Transport, Auckland.

The provision of safer and connected walking and cycling routes will impact the number of people choosing active modes for their daily commute, the number of people choosing to walk and cycle recreationally and the number of people choosing to use active modes for short trips, or multimodal trips. The Point Chevalier to Westmere project aims to increase the cycling uptake for all trip types and trip purposes. As part of this, the project will also seek to improve active mode access and connections to public transport, allowing for smoother and safer interchanges between modes. This will influence positive active travel behaviours and consequently resulting in healthier communities.

Like improvements to public transport, the provision of active transport infrastructure provides people with a lower cost travel option; with the increase in petrol and parking prices making private vehicle travel increasingly more unaffordable. Better public transport and active mode facilities can increase access to jobs and educational opportunities for people with fewer transport choices.

The related KPIs to this benefit statement are:

- KPI 3.1: Increase active mode share
- KPI 3.2: Increase number of cycling trips (incl. to dense activity centres)
- KPI 3.3: Improved access and utilisation of public transport via active modes

Investment Objective - Triple active mode share from 8% to 24% of total journeys to work by 2028

3.3.3 Benefit statement 3: Improved customer experience and the competitiveness of public transport

The lack of prioritisation and integration of Auckland's public transport network was identified as a significant problem. This was evidenced by examining the poor reliability and travel time performance of the buses which use Garnet, Meola and Point Chevalier corridors, particularly in comparison with private vehicles. Improving both public transport reliability and travel time will improve overall customer experience and provide a more competitive bus service when compared with private vehicles. It is expected that these improvements will drive a shift towards greater public transport mode share and therefore greater bus patronage. It is also expected to improve overall customer satisfaction with the public transport network and services.

Some of the flow-on benefits created through the improvement of the public transport network along these corridors is the reduction of private vehicle traffic on the roads, meaning less congestion and a reduction in emissions. Additionally, individuals will likely be spending less on their commute, with public transport fares being less than the cost of ope ating a private vehicle and parking. This provides greater opportunities and benefits for people from lower socio-economic areas, reducing social inequalities and increasing access to jobs, services and education.

The related KPIs to this benefit statement are:

- KPI 2.1: Improve public transport customer experience –more reliable journey times
- KPI 2.2: Public transport travel times are more competitive with general traffic
- KPI 2.3: Increase public transport patronage

Investment Objective - Public transport travel times are at least as competitive as general traffic between the eastern end of Meola Road and the Point Chev Rd/Gt North Road junction by 2022.

3.3.4 Benefit Statement 4: Improved environmental place and health outcomes in Point Chevalier and Westmere

One of the driving transport outcomes identified within the GPS is the need for transport activities to become more environmentally sustainable. Furthermore, Better Transport Choices[15] identifies healthy and attractive urban environments as a key strategic driver for improving transport choices. Both policy documents aim to reduce traffic, pollution and noise and create more attractive, accessible and people-friendly streets to promote physical activity and ultimately improve people's health. Motorised transport within Auckland's urban areas can have multiple impacts on people's health; with fewer people choosing active modes, greater number of injuries from road crashes, poorer air quality, noise and vibration impacts and severance of communities.

Improved environmental outcomes predominately focus on the reduction in car emissions as a result of modal shift away from private vehicle use towards public transport and active mode use.

The related KPIs to this benefit statement are:

- KPI 4.1 Improved amenity and street environment
- KPI 4.2: Increase community satisfaction of streets and roads

Investment Objective - Improve access to/from and within Point Chevalier and Westmere neighbourhoods through active mode facilities

3.4 Performance Measures

Performance measures for this activity including the methodology, the baseline data, the target and the frequency for measuring this target are provided in the Appraisal Summary Table in Appendix E.

[15] https://www.transport.govt.nz/assets/Import/Uploads/Land/Documents/19-422-ATAP-Better-Travel-Choices-mode-shift-plan-Dec-2019-FINAL.pdf

4 Stakeholders

A Consultation and Engagement Plan was developed to provide the project team with a framework for project consultation and general communication. The Plan provided a way for Auckland Transport to clearly and effectively communicate the project objectives and goals to key stakeholders including mana whenua, the NZ Transport Agency, people who will be directly impacted by the proposed changes and the community at large. It also provided Auckland Transport with strategies to communicate and engage with stakeholders through the project. Refer to Appendix C Stakeholder Engagement.

4.1 Key Stakeholder List

The stakeholders broadly fall into 3 categories:

- Internal stakeholders (technical and senior management)
- External stakeholders that will use the facility
- External stakeholders that are affect by the project in another way.

The key stakeholder list is outlined in Table ~~Table~~ ~~Table~~ 7.

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Table 7: Key Stakeholders

Stakeholder	Type of Organisation	Area of interest or influence
Mana whenua	Partner	Project details and its impact on community (Refer to Section 5.0)
Albert Eden Local Board	Local Government	Impact on community and funding, detail of project
Waitemata Local Board	Local Government	Benefits and impact on community, integration with other active mode schemes
Auckland Council Design Office	Local Government	Impact on council facilities
Transport Agency	Central Government	Project impact and funding implications
Watercare	Utilities	Project timing and impact
Vector	Utilities	Project timing and impact
Local businesses	Local Business	Project details and impact on business
Chorus	Utilities	Project timing and impact on asset
Auckland Council Arborist	Local Government	Project timing, details regarding treatment of trees along the routes and any mitigation strategies
AT Walking & Cycling	Local Government	Project details regarding the walking and cycling connectivity, design, street treatments and finishing detailing

Stakeholder	Type of Organisation	Area of interest or influence
AT Road Corridor Operations	Local Government	Details of the project, particularly proposed changes that will impact the operational performance of the route
AT Maintenance and Renewals	Local Government	Details regarding project timing, the plans for pavement renewal along Meola Road and ongoing maintenance impact post-improvement
AT Planning	Local Government	Project details and its compliance with the associated regulations, also liaison with Auckland council
AT Road Safety	Local Government	Project details and its impact on multi-modal safety
AT Parking	Local Government	Project details on parking impact along the route
AT Stormwater	Local Government	Project details on stormwater impact due to the improvements
AT Urban Design	Local Government	Project details around the treatments around the shops and town centre areas
AT Metro	Local Government	Project details on the improvements for the bus services. These include the bus lane arrangement, bus stop locations and bus stop treatments with cycleway
Bike Auckland	Advocacy	Overall project direction and outcome.
General public	-	Project details and its impact on community

Throughout the project investigation phases there were also several interest groups with visibility of the project including the Tree Council, Cycling Without Age, Bike Point Chevalier and Generation Zero.

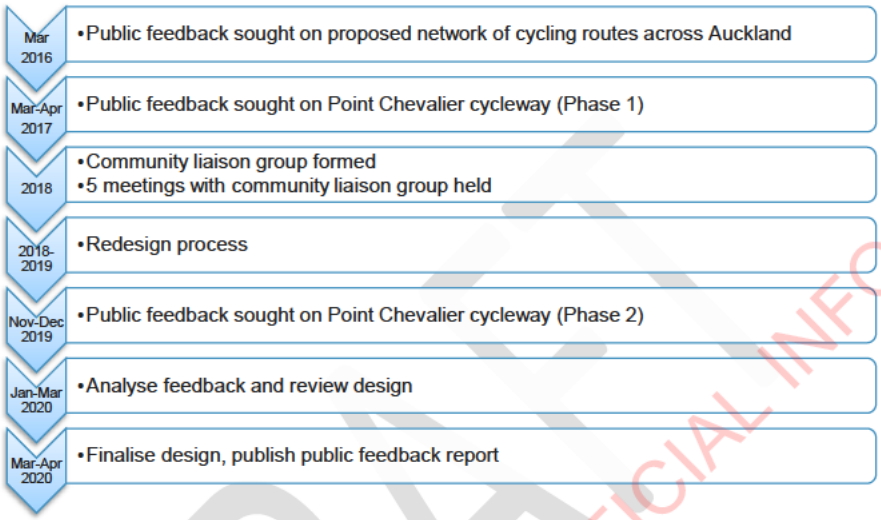
In addition, there has been consultation with the local businesses along Point Chevalier Road.

4.2 Communication and Consultation Approach

4.2.1 External Stakeholder Engagement

This project has been in the pipeline for several years and has been through several consultation cycles involving the public as summarised in Figure 24.

Figure 24: Consultation timeline



In March 2016, public feedback was sought on the potential cycle routes between Point Chevalier and the city fringe (bounded by the Northwestern motorway and the sea). The outcomes of this helped Auckland Transport decide on the preferred route and create the design that was consequently consulted on in 2017.

The feedback period for public consultation on the Phase 1 proposal was open from 27 March to 23 April 2017. The feedback received was mostly supportive of the proposed cycle network and identified a wide range of issues and concerns that put people off cycling this corridor. As a result of this feedback and the change in direction for the quality of cycling facilities desired across the Auckland Region, Auckland Transport set up a Community Liaison Group (CLG) for the project. The purpose of this group, made up of local residents and interested stakeholders, was to help deliver a project that the community would use and support.

During 2018-2019, further work was undertaken on the design and another public consultation period was held between 22 November and 20 December 2019 on the revised design. This recent consultation period involved the following:

- Distribution of 5 700 brochures
- Letters, meetings, emails, phone calls to local businesses
- Erected on-street signage
- Media release (Stuff and Our Auckland also published articles)
- Advertisements in Central Leader
- Social media posts and geo-targeted advertising campaigns

- Three public drop-in sessions
- Project webpage and online feedback form.

4.2.2 Internal Stakeholder Engagement

The project has several complexities around the planning, design and delivery that have required the careful management of stakeholders. The project team arranged internal workshops through the design process in order to capture requirements and key issues. In particular:

- Updated technical guidance and standards with the release of the Design Manual (including the identification of departures from standards);
- Reconciliation of competing desires and an agreement on the allocation of road space, particularly the balance between parking, turning, footpath, cycleway and public transport priority (on Point Chevalier Road); and
- Update on the CLG and community feedback on previous proposals to be incorporated into the development of design options. Updated standards or policy were communicated at these discussions.

Refer to Appendix H Design Philosophy Statement for a summary of the internal feedback received on the Scheme Design. This feedback was incorporated into the next design stage (Detailed Design)

4.3 External Stakeholder Views

Stakeholder views were integral to the development of the recommended option. Collaborative input from stakeholders was a formative part of the assessment process and was collected during multiple touchpoints during the project.

It is important to note that as a ~~consequence~~result ~~-~~of the extensive consultation that has taken place over a number of years, ~~that~~ there is ~~probably~~ a high public expectation that this project will be delivered.

The public feedback report is contained in Appendix C Stakeholder Engagement.

The key themes identified are:

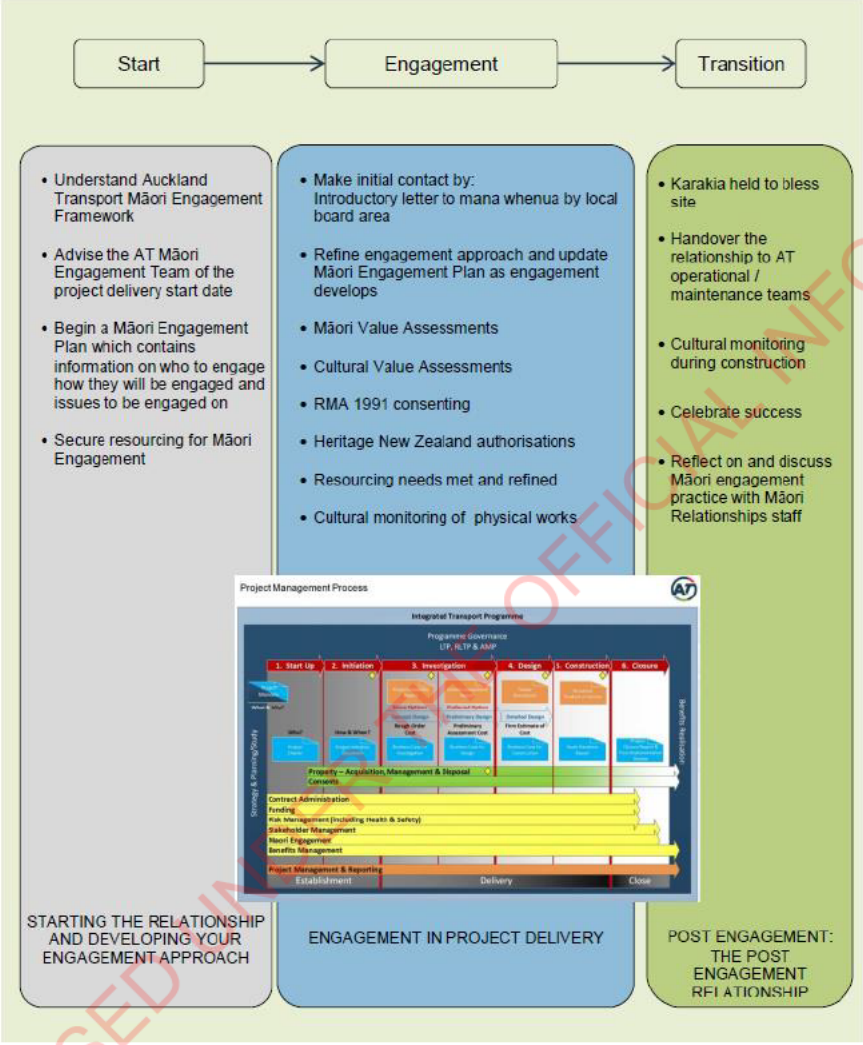
- Like improved cycleways
- Like improved safety
- Like additional / improved crossing points
- Like bus lane
- Like the removal of on-street parking on Meola Road
- Request for raised crossings across all side streets
- Like the new raised crossings on Garnet Road
- Opposition to parking removal on Point Chevalier Road (affecting local businesses)
- Request for roundabout at Point Chevalier Road / Meola Road instead of signals.

Refer to Appendix H Design Philosophy Statement for details of how Auckland Transport has incorpo ated the feedback into the design and proposed a way forward for the key areas of concern.

5 Māori Engagement

The Figure 25 below is from the Auckland Transport Project Management Framework and illustrates the Auckland Transport Māori Engagement process.

Figure 25: Auckland Transport Māori Engagement process



Engagement with Mana Whenua began as early as 2016 and has continued through the various iterations of the project.

The project team presented the scheme design at the scheduled Hui in late 2016 before releasing the project designs for public consultation. Mana whenua were in support of the project however

particular interest around stormwater treatment was raised. The project team has taken this into consideration through further design development.

A second Hui was held in 2017 after the public consultation period where the feedback from the community and the resulting design changes were presented. Acknowledgements of the community feedback was received and no major changes to the design were expected therefore the mana whenua position remained the same as previously (in support of the project with interest in stormwater management).

Following the re-design process, two further hui were held. The following iwi partners were present:

- Ngaati Whanaunga
- Ngati Maru Runanga
- Te Patukirikiri Iwi Incorporation
- Te Akitai Waiohua
- Ngati Akitai Waiohua
- Ngati Whatua Orakei
- Ngati Tamaoho
- Ngati Paoa Trust Board
- Ngati Paoa Iwi Trust

On 11 September 2019, prior to Phase 2 public consultation, the first draft of the scheme design was presented at a hui. The key issues discussed were safety, stormwater treatment and project naming.

On 13 November 2019, immediately prior to public consultation going live, a further developed design was presented at a hui. This design offered the opportunity for increased safety by improving the width of the cycleway to current standards and presenting opportunities, at concept level, for water treatment. A necessary consequence of these changes was the replacement of aged and damaged (because of power line trimming) exotic trees on Meola Road to create space in the corridor.

Response from the group has been positive, particularly around providing sustainable forms of transport, improved safety, retaining Pohutukawa trees along Point Chevalier Road and replacing the removed trees and planting with native species along Meola Road.

Iwi engagement will continue to be a pivotal part of the project through the detailed design process and is expected to continue through to the construction stage.

6 Alternative and Option Assessment

As noted previously, in 2020, problem statements, benefit statements and investment objectives have been developed and refined specifically for this project, in consultation with Waka Kotahi. These have been developed with consideration of the investment objectives of the AT Regional Cycle Programme Business Case and the Connected Communities Programme Business Case.

The following problems were identified:

- Lack of integration of active modes and PT infrastructure on these corridors leads to the perception that these modes are unattractive resulting in congestion and high private vehicle dependency.
- The road network fails to meet the needs of cyclists and pedestrians resulting in too many people being killed or seriously injured.
- Lack of active mode facilities in our neighbourhoods has resulted in poor environmental, place and health outcomes.

The proposed solution will meet the following investment objectives:

- Reduce deaths or serious injuries on the corridors by 66% by 2030
- Triple active mode share from ~~8~~4% to 24~~3~~% of total journeys to work / education by 2028
- Public transport travel times are at least as competitive as general traffic between the eastern end of Meola Road and the Point Chevalier Road/Great North Road junction by 2022
- Improve access to / from and within Point Chevalier and Westmere neighbourhoods through active mode facilities

Earlier alternatives and options assessments have used previously developed project objectives and criteria. The following sections provide an assessment of alternatives and options against the recently agreed investment objectives and benefits framework. However there will be reference to previous objectives throughout the supporting documentation in the appendices.

6.1 Alternatives and Long List Assessment

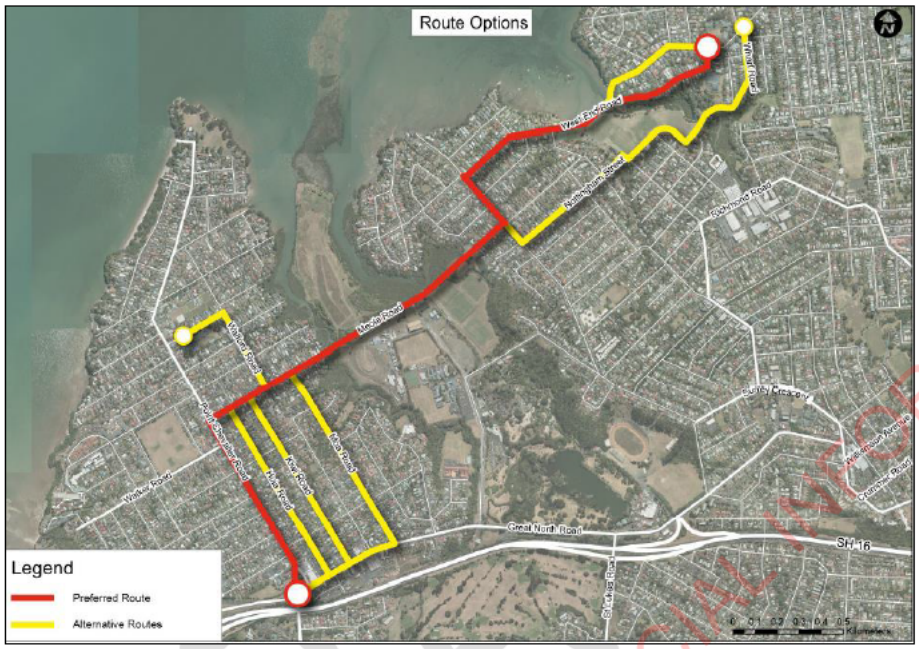
Throughout the project's history, there have been several alternatives and options considered.

Section 1.8.1 provides an overview of the change history and demonstrates that investigations for cycle facilities for the project corridor commenced in 2015. Between 2015-2020, there have been multiple phases of investigations and these have considered many different options and designs for cycle facilities.

In 2015, a project mandate confirmed that there was a need for cycle facilities in Point Chevalier. The *Point Chevalier to Herne Bay Cycle Facilities Early Investigation Report*[16] included an assessment of alternative route corridors and alternative types of cycle facilities. The alternative routes that were investigated are shown in Figure 26~~Figure 26~~Figure 26.

[16] Point Chevalier to Herne Bay Cycle Facilities Early Investigation Report, dated May 2016, completed by AECOM

Figure 26: Alternative routes assessed in 2015



Source: Point Chevalier to Herne Bay Cycle Facilities Early Investigation Report

In 2015, project objectives were developed and used to assess the preferred route and the alternative routes. The key objective was to *deliver a safe cycle facility for local and utility trips that provides for existing riders and encourage new confident people on bikes on Pt Chevalier Road, Meola Road and West End Road.*

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The assessment confirmed that the preferred route had the greatest likelihood of achieving the project objectives and assessment of alternative routes were discontinued. Refer to Appendix D for the Early Investigations Report and the assessment of alternative routes.

The *Point Chevalier to Herne Bay Cycle Facilities Scheme Assessment Report*[17] details and assesses the different options for the preferred route. Following the completion of the scheme design, further assessment of the options was completed ~~as a result of changing~~by Auckland Transport ~~as strategic priorities evolved~~following a public consultation period in 2017/2018~~.~~ where feedback identified a wide range of issues and concerns that put people ~~o~~off cycling this corridor and a Community Liaison Group was set up to help deliver a project that the community would use and support. ~~.~~This later assessment is ~~, and this is~~ detailed in the *Point Chevalier to Westmere Cycle Facilities Options Assessment Report*[18].

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As part of preparing the SSBC, revised investment objectives have been developed, in agreement with AT and Waka Kotahi. These investment objectives are intended to **replace** the previous project objectives from 2015 and reflect the changes as a result of the approved Cycling Programme Business

[17] Point Chevalier to Herne Bay Cycle Facilities Scheme Assessment Report dated April 2017, completed by AECOM

[18] Point Chevalier to Westmere Cycle Facilities Options Assessment Report dated August 2019, completed by AECOM

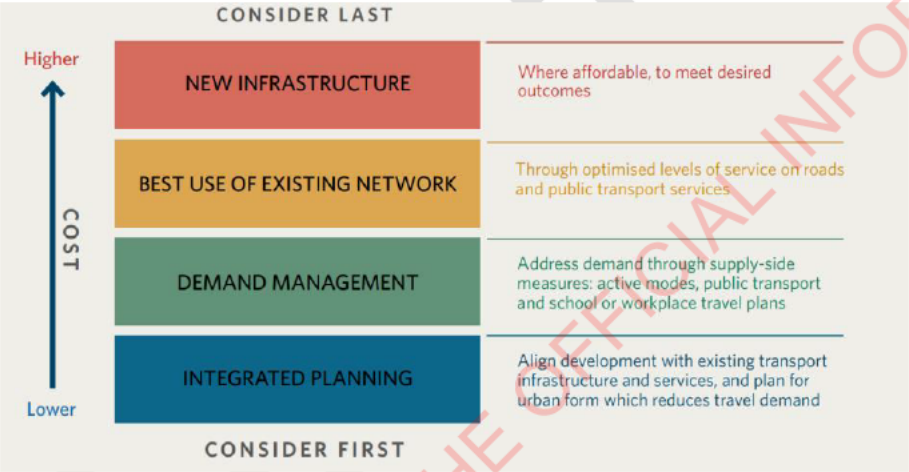
Case (PBC) for Auckland, changes in the strategic priorities of national and regional organisations since 2015 and the incorporation of objectives relating to public transport improvements.

In 2020, Waka Kotahi released the Early Assessment Sifting Tool (EAST) as a new tool to use as part of business case development. The EAST is used to confirm the longlist of options, at an early stage of the business case process, particularly when there are many alternatives and options to consider.

Due to the long history of option development and assessment and the evolving project objectives, it was considered prudent to undertake an EAST assessment on the alternatives and long list options with the revised investment objectives for this project. The EAST should confirm that the short listed options will best achieve the investment objectives and that these will not be meet through alternatives or other long list options.

Selection of alternatives for an EAST assessment should include a range of different means of achieving the investment objectives, according to Waka Kotahi's *Intervention hierarchy for National Land Transport Fund (NLTF) investments* (Figure 27).

Figure 27: Intervention hierarchy for NLTF investments



The alternatives and options that have been considered throughout the investigations and included in the EAST are described below. Alternatives have been selected that meet different levels of the intervention hierarchy.

- **Travel behaviour change (TBCh) programme**. The TBCh programme consists of initiatives such as a bike training and education campaign, a road safety awareness campaign, workplace travel plans (for local businesses) and school travel plans (for local schools). No new infrastructure is proposed as part of this alternative.
- **Traffic calming on alternative routes.** This involves the installation of kerb build-outs, raised tables / speed bumps and use of different coloured/textured paving to reduce vehicle speeds on alternative routes, that are parallel to the preferred route. Cycle wayfinding would accompany the alternative routes.
- **Shared-use paths on the preferred route.** This involves increasing the width of the existing footpaths on Point Chevalier Road and Meola Road and converting these to shared-use paths.
- **Un-protected cycle lanes on the preferred route.** This option uses the existing carriageway to provide uni-directional cycle lanes on both sides of the route.

- **Dedicated cycle facilities on an alternative route.** This provides separated cycle facilities on an alternative route.
- **Dedicated uni-directional, separated cycle facilities for the uphill direction on the preferred route.** No cycle facilities would be provided for the downhill direction on the preferred route.
- **Dedicated bi-directional, separated cycle facilities for the preferred route.**
- **Dedicated uni-directional, separated cycle facilities for the preferred route.**

The strengths and weaknesses of each of the alternatives and options is documented in Table 7~~Table 7~~Table 7. Bus priority improvements on Point Chevalier Road could be incorporated within some of the options, as indicated within the table.

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Table 7: Summary of strengths and weaknesses of the alternatives and options

Description	Strengths	Weaknesses
Travel behaviour change programme	Helps optimise the existing network No new infrastructure is required No construction related impacts	Requires community buy-in and participation in the TBCh programme Many people work and study outside of Point Chevalier and may be difficult to include in the programme Many people will not feel confident enough to cycle without dedicated cycle facilities Unlikely to deliver significant long-term behaviour change without supporting infrastructure
Traffic calming on alternative routes	Limited new infrastructure is required Reduced construction related impac s relative to other options Improves safety and reduces risk of death and serious injury to people walking and cycling	No bus priority / bus improvement measures included as this option, meaning bus travel times will not improve and likely increase with traffic calming measures. Many people will not feel confident enough to cycle without dedicated cycle facilities Design issues associated with traffic calming devices creating pinch points for people cycling Alternative routes are not as well-aligned with surrounding cycle facilities and will not provide as great an improvement to cycling access
Shared path facilities on preferred route	No changes to the existing kerb-lines are required Reduces the incidence of conflict between people cycling and people driving Bus priority improvements can be delivered, improving bus travel times	Shared paths provide a low quality of service that might not attract many people to cycle Shared paths introduce conflict people walking and people cycling Tree removal is required to accommodate the shared path

Description	Strengths	Weaknesses
	Minimises on-street parking removal on the preferred route	
Un-protected cycle lanes on preferred route	No changes to the existing kerb-lines are required Provides greater certainty to all road users about where people cycling will be on the road	No separation between general traffic / parked vehicles and people cycling Un-protected cycle lanes will not improve safety outcomes as they do not prevent conflict between people driving and people cycling Unlikely to attract new people to cycle because poor safety perceptions are likely to remain Bus priority improvements cannot be delivered No protection through the intersections Unprotected cycle lanes do not meet the Transport Design Manual guidelines (2020)
Separated cycle facilities on alternative route	Provides a high cycling facility appropriate for new and unconfident cyclists	Alternative routes are not as well-aligned with surrounding cycle facilities and will not provide as great an improvement to cycling access Cycle facilities on streets with lower vehicle volumes does not align with AT s design standards No opportunity to provide bus priority improvements with this alternative (ie separate construction would be required on Point Chevalier Road) Requires removal of on-street parking on local streets where parking is more important for providing access to residential activity More intersections would need to be incorporated into design
Bi-directional cycle facilities on Point Chevalier Road and Meola Road	Provides a high cycling facility appropriate for new and unconfident cyclists Well-connected to surrounding cycle facilities and will improve cycling access around Point Chevalier Opportunity for bus priority improvements will reduce travel times for bus users Minimises street-tree removal on Point Chevalier Road	Requires changes to kerb-lines and new infrastructure to be delivered Requires street tree removal on Meola Road Requires removal of some on-street parking on the preferred route

Description	Strengths	Weaknesses
Uni-directional cycle facilities on Point Chevalier Road and Meola Road	Provides a high cycling facility appropriate for new and unconfident cyclists Well-connected to surrounding cycle facilities and will improve cycling access around Point Chevalier Opportunity for bus priority improvements will reduce travel times for bus users Minimises street-tree removal on Point Chevalier Road	Requires changes to kerb-lines and new infrastructure to be delivered Requires street tree removal on Meola Road Requires removal of some on-street parking on the preferred route

The EAST assesses the alternatives and options against the investment objectives, practical feasibility and cost, climate change and Te Ao Māori, environmental and social impacts and identifies if there are any fatal flaws. The strengths and weaknesses of each option were carefully considered as part of the EAST assessment. Refer to Appendix D for the full EAST tables.

Table 8 summarises the EAST assessment and how the alternatives and options align with the investment objectives:

1. Reduce deaths or serious injuries on the corridors by 66% by 2030
2. Triple active mode share from 1% to 3% of total journeys to work / education by 2028
3. Public transport travel times are at least as competitive as general traffic between the eastern end of Meola Road and the Point Chevalier Road / Great North Road junction by 2022
4. Improve access to / from and within Point Chevalier and Westmere neighbourhoods through active mode facilities

Table 8: Assessment of alternatives and options against the investment objectives

Identifier	Name of alternative / option	Investment objective 1	Investment objective 2	Investment objective 3	Investment objective 4
1	Travel behaviour change programme	2	2	2	2
2	Traffic calming on alternative routes	3	2	4	3
3	Shared path facilities on preferred route	3	2	4	2
4	Un-protected cycle lanes on preferred route	2	2	1. Low	1. Low
5	Separate cycle facilities on alternative route	3	3	4	3
6	Dedicated uni-directional, separated Cycle facilities for the uphill direction on the preferred route.	3	3	4	2

Identifier	Name of alternative / option	Investment objective 1	Investment objective 2	Investment objective 3	Investment objective 4
7	Bi-directional cycle facilities on preferred route	4	4	4	5. High
8	Uni-directional cycle facilities on preferred route	4	4	4	5. High

To achieve the investment objectives, it is important that the solution delivers a cycle facility that is safe and comfortable for all ages and abilities in order to attract new users for more cycle trips. The AT Design Manual recommends that people cycling are physically separated from vehicles (including parked vehicles) and walkers to provide for all ages and abilities. The facility also needs to be well-connected to existing and proposed future cycle facilities to improve local access.

Un-protected cycle lanes and shared paths do not provide a good quality of service for cyclists Un-protected cycle lanes are generally unsuccessful in overcoming the perception that cycling is unsafe and there is the risk that side-swipe crashes between people cycling and people driving can occur. Shared paths can, depending on the design and the number and types of path users, improve perceptions of safety for people cycling. A large number of side roads and vehicle crossings can reduce safety for people cycling due to conflict with people driving. In addition, if there are high volumes of people cycling on the shared path, perceptions of safety can be impacted for people walking.

The Waka Kotahi Research Report 660 *Factors affecting cycling levels of service*[19] (Research Report 660) presents a discussion of research on what surveys have indicated people prefer in terms of the cycle facility and confirms that generally, dedicated infrastructure, physically separated from vehicles and walkers, provides the greatest quality of service for cyclists and is more likely to attract less confident cyclists.

In summary, the majority of alternatives either do not provide a good quality of service (in terms of the cycle facility proposed) or are not as well connected to the existing cycle network, as documented in the above assessment. This means that they are less likely to attract new or unconfident cyclists and therefore are less likely to increase the cycling mode share. Most of the alternatives do not provide an opportunity for bus priority improvements and therefore, these alternatives are unlikely to achieve reduced bus travel times.

The options progressed for further consideration include the provision of dedicated, separated cycle facilities on the preferred route and the removal of on-street parking to provide for bus priority improvement measures. The provision of safe infrastructure is proposed, to improve road safety outcomes and improve people's perception that the corridor is unsafe or unattractive to cycle.

The above assessment confirms that the investment objectives for the project are best met with the options that were progressed to a short list for further assessment and refinement for the various sections of the route:

- Bi-directional cycle facilities on Point Chevalier Road and Meola Road
- Uni-directional cycle facilities on Point Chevalier Road and Meola Road.

In addition to the two shortlisted options, the Do Minimum was carried through as a baseline comparator.

[19] Research Report 660 Factors affecting cycling levels of service, Waka Kotahi, 2019

6.2 Shortlisted options

6.2.1 Types of Cycle Facilities Considered

Since 2015, there have been several changes to the scope of the project and changes to design standards within the industry. The long project history for the project means there are:

- Many iterations of similar design options that have been investigated.
- Different combinations of design options that have been assessed for different sections of the preferred route (i.e. there's been a 'mix-and-match' assessment).
- Some inconsistencies in the naming conventions of the options.

Therefore, for clarity, a summary of the issues considered for the different categories of cycling facilities considered for the short list is presented in Table 9.

Table 9: Discussion of type of cycle facilities

Description	Comments
Separated bi-directional cycle lane	Options have generally considered a separated bi-directional cycle lane on the northern side of the preferred route. Early investigations identified that overhead Vector power lines on the southern side of Meola Road meant that it would not be feasible to construct a bi-directional cycle facility on the southern side. This option would provide a separated cycle facility and would improve perceptions of safety for cycling on the preferred route. This option will require a significant amount of street tree removal, including 16 pohutukawa trees on Point Chevalier Road.
Separated uni-directional cycle lane on both sides of the road	Options generally consisted of a uni-directional cycle lane on both sides of the preferred route. Horizontal and/or vertical separation between people cycling and people walking is provided. This option would provide a separated cycle facility and would improve perceptions of safety for cycling on the preferred route. This option will require a significant amount of street tree removal, although no native trees would need to be removed.
Separated uni-directional cycle lane in uphill direction only on Meola Road	Options considered a uni-directional cycle lane on both sides of Point Chevalier Road however, consideration was given again to providing a uni-directional cycle lane in the uphill direction on Meola Road. Horizontal and/or vertical separation between cyclists and walkers is provided where there are cycle facilities proposed for the route. This option would provide a separated cycle facility and would improve perceptions of safety for cycling on the preferred route. However, there are many cyclists who will still not be confident to cycle in the downhill direction on Meola Road, without a separate facility. This also creates a gap in the cycle network, therefore reducing the connectivity benefits of implementing cycle facilities on the preferred route.

The Scheme Assessment Report in Appendix M provides detailed descriptions and assessment of various design options. The report outlines why a design option was discontinued for different sections of the preferred route, based on whether the design meet the project objectives and the feasibility of constructing/consenting the design option.

6.2.2 Short list of options for cycle facilities

Table 10 provides a summary of the short-listed options that were assessed using a Multi Criteria Analysis (MCA) during the 2018-2019 investigation stage. The options consist of either uni-directional cycle facilities on both sides of the road or a bi-directional cycle facility on one side of the road for the various sections of the route. See Appendix E for the short-list drawings.

Table 10: Short list of options

Option	Description
Point Chevalier Road	
Option 0	Do-minimum (maintenance)
Option 1A	Uni-directional cycle lane (all trees require removal)
Option 1B	Uni-directional cycle lane (narrowing around existing trees)
Option 2A	Bi-directional cycle lane (all trees require removal)
Option 2B	Bi-directional cycle lane (splitting around existing trees)
Meola Road (residential section)	
Option 0	Do-minimum (maintenance)
Option 1	Uni-directional cycle lane
Option 2	Bi-directional cycle lane
Meola Road (reserve section)	
Option 0	Do-minimum
Option 1A	Uni-directional cycle lane (convert footpath to cycleway, build new footpath, retain parking on the southern side)
Option 1B	Uni-directional cycle lane (replace footpath with footpath and cycleway, retain parking on the southern side)
Option 2	Bi-directional cycle lane on the northern side (retain existing footpath on the northern side and retain parking on the southern side)
Meola Road (Garnet section)	
Option 0	Do-minimum
Option 1	Uni-directional cycle lane
Option 2	Bi-directional cycle lane

The Do-Minimum option includes pavement resurfacing on Point Chevalier Road and pavement rehabilitation on Meola Road. No changes to the corridor are proposed as part of the Do-Minimum (i.e. the allocation of road space will remain as per existing).

Two MCA workshops were held on 3 May 2018 and 14 May 2018 to assess the short-list of options. The options were assessed against the topics and criteria shown in Table 11.

Table 11: MCA Criteria used for short-list assessment

Topic	Criteria #	Grouping	Criteria
Transport	1.1	Accessibility	Suitable for all ages and abilities of cyclist. High quality facility
	1.2		Maintains private vehicle movements
	1.3		Traffic movement/operation
	1.4		LOS for bus movements.
	1.5		Quality of pedestrian environment
	1.6		Connectivity for pedestrians and cyclists (crossing opportunities)
	1.7		Improved transport/modal choices.
	1.8	Safety	Provides a safer transport network for all modes, based on hierarchy of vulnerable users first
Urban Design	2.1	Urban Design	Enhances the character of Point Chevalier/sense of place.
Environment and Planning	3.1	Heritage	Effects on historic heritage and character.
	3.2	Natural Environment	Effects on the natural environment (ecology etc.)
	3.3	Trees	Effects on trees
	3.4	Visual Amenity/Landscape	Visual Amenity/ landscape effects on the environment
Social and Economic	4.1	Social	Provides convenient access to key community services
	4.2	Economic	Supports economic viability of business within the project area. Includes provision for loading/parking

The four topics (transport, urban design, environmental/planning and social/economic) were each given equal weighting. The scoring criteria are shown in Table 12.

Table 12: Outline of evaluation scoring

Evaluation scoring	
Strongly supports criteria or significant potential positive effect	3
Supports criteria potential positive effect	2
Limited support of criteria or no more than minor potential adverse effect (limited or no consideration of mitigation necessary)	1
Same effect and outcome as the existing environment	0
Somewhat not supportive of criteria; or some adverse effects (opportunities to remedy or mitigate)	-1

Evaluation scoring	
Not supportive of criteria; or potential adverse environmental effect (limited opportunities to remedy or mitigate)	-2
Strongly not supportive of criteria; or significant potential adverse effect (no opportunities to mitigate)	-3

As described earlier, investment objectives have been revisited throughout the project's lifecycle and were agreed with Waka Kotahi in 2020. Whilst the MCA undertaken in 2019 encompasses the objectives to an extent, Table 13 below uses the scoring criteria from the MCA to score the specific investment objectives to ensure the progressed option identified from the MCA scoring is also the preferred way forward in terms of the specific investment objectives.

The weighted scores from the MCA and the scoring against the investment objectives for the short-listed options are shown in Table 13.

Table 13: MCA and Investment Objectives results

Option	Description	MCA Weighted score (refer Appendix E1)	Investment Objective				Status
			Reduce deaths or serious injuries on the corridors by 66% by 2030	Triple active mode share from 1% to 3% of total journeys to work / education by 2028	Travel times are at least as competitive as general traffic between the eastern end of Meola Road and the Point Chev Rd/Gt North Road junction by 2022	Improve access to / from and within Point Chevalier and Westmere neighbourhoods through active mode facilities	
Point Chevalier Road							
Option 0	Do minimum	0	0	0	0	0	Discounted
Option 1A	Uni-directional cycle lane (all trees require removal)	-0.75	2	3	2	2	Discounted
Option 1B	Uni-directional cycle lane (narrowing around existing trees)	1.85	2	2	2	2	Progressed
Option 2A	Bi-directional cycle lane (all trees require removal)	-2.5	1	3	2	1	Discounted
Option 2B	Bi-directional cycle lane (splitting around existing trees)	-0.125	1	2	2	1	Discounted
Meola Road (residential section)							
Option 0	Do minimum	0	0	0	0	0	Discounted
Option 1	Uni-directional cycle lane	-1.25	2	1	0	2	Discounted

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Option	Description	MCA Weighted score (refer Appendix E1)	Investment Objective				Status
			Reduce deaths or serious injuries on the corridors by 66% by 2030	Triple active mode share from 1% to 3% of total journeys to work / education by 2028	Travel times are at least as competitive as general traffic between the eastern end of Meola Road and the Point Chev Rd/Gt North Road junction by 2022	Improve access to / from and within Point Chevalier and Westmere neighbourhoods through active mode facilities	
Option 2	Bi-directional cycle lane	0.75	2	2	0	2	Progressed
Meola Road (reserve section)							
Option 0	Do minimum	0	0	0	0	0	Discounted
Option 1A	Uni-directional cycle lane (convert footpath to cycleway, build new footpath, Parking retained on south side)	3	2	3	2	2	Discounted
Option 1B	Uni-directional cycle lane (replace footpath with footpath and cycleway, parking retained on south side)	1.375	2	3	2	2	Discounted
Option 1C	Uni-directional cycle lane (replace footpath with footpath and cycleway, parking retained on south side)	2.625	2	3	2	2	Discounted
Option 2	Bi-directional cycle lane on northern side (no change to the footpath on the northern side, parking retained on the southern side)	2.25	3	3	2	2	Progressed
Meola Road (Garnet section)							

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Option	Description	MCA Weighted score (refer Appendix E1)	Investment Objective				Status
			Reduce deaths or serious injuries on the corridors by 66% by 2030	Triple active mode share from 1% to 3% of total journeys to work / education by 2028	Travel times are at least as competitive as general traffic between the eastern end of Meola Road and the Point Chev Rd/Gt North Road junction by 2022	Improve access to / from and within Point Chevalier and Westmere neighbourhoods through active mode facilities	
Option 0	Do minimum	0	0	0	0	0	Discounted
Option 1	Uni-directional cycle lane	1	2	1	0	2	Discounted
Option 2	Bi-directional cycle lane	1.5	2	3	0	2	Progressed

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The key considerations from the MCA assessment, in selecting the options to progress, are noted below.

- All options that were assessed had an overall positive weighted score for the 'transport' criteria set out in Table 13. Of note, all options received a positive score against the criteria '*suitable for all ages and abilities of cyclists*'. For the Point Chevalier Road section of the route, the removal of street trees would allow for the highest quality of cycle facility to be provided, although retention of street trees would still allow for a good quality cycle facility.
- During community consultation, local residents expressed a strong desire to retain the existing Pōhutukawa trees on Point Chevalier Road and this was considered as part of scoring for effects on visual amenity/landscape effects.
- Existing tree roots are very close to the kerb line on Meola Road and therefore, removal of street trees is required to deliver cycle facilities. The type of cycle facility provided will affect whether mitigation planting can be carried out and this was part of scoring for effects on visual amenity/landscape effects and for effects on ecology and the natural environment.
- The treatment for Garnet Road needs to tie into the proposed facility as part of the Waitematā Safe Routes work. This means the design team will adopt the treatment that is proposed for the Waitematā Safe Routes project and accept that as the preferred option unless significant design issues occur.
- An MCA was not completed considering a uniform treatment along ~~its~~the ~~length of Meola Road because considering the full route of Meola Road~~ because of the different attributes of each section. However, to provide a consistent and legible facility on Meola Road there was a preference to adopt the same option across all three sections of Meola Road. A mixture of cycle facilities would result in design challenges and may not achieve the transport criteria set out in the MCA.
- For Meola Road (reserve section), the option that had the highest weighted score (Option 1A) was not progressed. Option 2, which was progressed, had the ~~3rd~~ highest weighted score. In addition to the MCA, AT have undertaken an assessment of the cycling Quality of Service (QoS) of the various options for this route using the AT Quality of Service (QoS) evaluation tool. This assessment is provided in Appendix E Options Assessment (within Appendix E - Appendix X3 QoS option assessment). Both options for Meola Road achieve a QoS 2. This is the second highest level of quality in the evaluation tool (i.e. only a QoS 1 is higher) and confirms both options will provide an improvement in cycling facilities for the route. Considering the bi-directional options at the Meola Road - Residential and Meola Road - Garnet Road section have a higher MCA score; it is practical to continue a bi-directional design through this middle section. In addition, land acquisition is required for Option 1A which will increase costs and timeframes for implementation ~~, therefore there were additional factors above~~beyond the MCA in this instance in determining the design for this section to provide a continuous and legible facility~~.~~

In assessing the options against the investment objectives, the following is noted.

- Uni-directional cycle facilities (with the TDM recommended widths) were considered to provide the safest form of cycle facility in residential sections however this is balanced against the ability to provide a buffer between vehicles (parked and moving) and pedestrians.
- Bi-directional cycle facilities that did not meet the recommended design standards in the TDM were considered to provide a lower quality and less safe cycle facility (relative to the other options). Likewise, options which required narrowing around trees provide a lower quality of service. This impacted on the ability to score well on the mode share objective.
- Options for Point Chevalier Road contributed well to the travel time objective with the addition of the bus lane. There is no notable improvement with the residential sections on Meola Road, however the reserve section contributes to the objective through the removal of parking to provide continuous 3.2m wide lanes.

- In terms of access, bi-directional facilities on Point Chevalier Road score lower due to the facilities being located on one side in relation to the land use.

6.3 Other Impacts

In addition to the MCA criteria and scoring, the following impacts were considered for the options:

- Consenting risk.
- Property acquisition risk.
- Constructability risk (e.g. requiring undergrounding of powerlines).

As a result of the assessment, the following short-listed options were progressed for further development as the preferred option:

- Uni-directional cycle lanes on both sides of Point Chevalier Road, narrowing around street trees.
- Bi-directional cycle lane on the northern side of Meola Road.
- Cycle facilities on Garnet Road between Meola Road and Oban Road to tie into the Waitemata Safe Routes project.

Refer to Appendix D for the Early Assessment Sifting Tool (EAST) assessment carried out in October 2020 and a full MCA assessment ~~which was carried out in 2015 within the Early Investigation Report~~undertaken in 2019. Both of the above documents explain the scoring process and the rationale for selecting the above options to progress to further design.

6.4 Refinement of the design for the preferred cycle facilities

As has been noted, cycling design standards have evolved throughout the history of the project. In 2019, the Draft Transport Design Manual was released. In 2019, t~~T~~he preferred option was assessed according to the guidance provided in the Draft Transport Design Manual in terms of the width of facility. This is set out in Table 14 below and further detailed in Appendix E1 (Short list MCA summary).

Table 14: Refinement of the design for the preferred option

Option	Description	Comments	Status
Point Chevalier Road			
Short-list Option 1B	Uni-direction Cycleway (2.0m width)	Design is in accordance with the draft AT TDM guidance. The facility width should yield high attractiveness to the users, while the safety component of localised narrowing around the existing trees can be managed through design.	Adopted as Preferred
	Uni-direction Cycleway (1.6m width)	Design is a 1.6m wide protected cycle lane with localised narrowing at the existing street trees. While the proposal is a notable improvement over the existing condition, it is considered an interim facility under the guidance of the draft AT TDM.	This was discounted as it was not in accordance with the TDM.
Meola Road (residential section)			
Shortlist Option 2	Bi-direction cycleway (2.5m	This design would retain all existing street trees and the carriageway would remain as wide as possible. This would be done by bridging or	This was discounted, as it

Option	Description	Comments	Status
	width). Retain all existing street trees	raising the cycle facilities over the tree roots. The width limitation between the trees meant a bi-directional facility of 2.5m was possible in addition to the traffic lanes.	compromised the cycle facility quality and tree conditions.
	Bi-direction cycleway (2.05m width). Retain all existing street trees	This design would retain all existing street trees. The width of the cycleway is reduced to accommodate growth and improving condition of the street trees.	Discounted as the width does not meet the Draft AT TDM requirements and will not meet the objective of providing high quality cycle facilities
	Bi-direction cycleway (3.0m width). Remove and replant trees on north side	To accommodate a 3.0m wide path which meets TDM guidelines, all street trees on the northern side of the road would need to be removed. However, with this design there is space to replant trees, mitigating effects from the tree removal.	Adopted as Preferred
Meola Road (reserve section)			
Shortlist Option 2	Bi-direction cycleway (3.0m width)	Option refined to ensure legibility with and continuity with Meola Road residential section.	Adopted as Preferred
Meola Road (Garnet section)			
Shortlist Option 2	Bi-direction cycleway (2.6m width)	Option refined to ensure legibility with and continuity with Meola Road residential section.	Adopted as Preferred

6.5 Options for bus improvements

On the section of Point Chevalier Road between Meola Road and Great North Road, there are currently 12 buses per hour during peak periods, including two frequent routes, with capacity to carry around 900 people. There is evidence that the buses have been experiencing significant delays on the section between Wakatipu Street and Tui Street.

AT have completed several investigations into bus travel time reliability as part of developing the New Network for bus services. A project feasibility report for bus priority improvements for the Route 66 bus route identified Point Chevalier Road as needing improvements and AT further commissioned a study into bus travel times on Point Chevalier Road which took account of GPS travel time data, Google traffic data and AT's traffic performance data. The Monday-Friday data was reviewed month-by-month between March and August 2019. The data shows that public transport journey times would improve if a southbound bus lane was implemented on Point Chevalier Road (between Wakatipu Street and Tui Street). It will also ensure that bus travel times will be more reliable.

~~All of the options considered from the Scheme Assessment Report included an assessment of whether bus lanes could be included as part of that option~~As a result of investigations, options were assessed as to whether bus lanes could be incorporated into the option. If an option did not allow for bus lanes to be included, it was not progressed for further consideration. This is in line with the agreed objectives and consistent with the assessment within this business case.

6.6 Options for intersection improvements

The MCA detailed above assumed that all upgrade options would include some form of intersection improvement at the three major intersections to improve safety for active mode users and enable a continuous cycle facility. The intersections include:

- Point Chevalier Road / Great North Road;
- Point Chevalier Road / Meola Road; and
- Meola Road / Garnet Road.

Refer to the Intersection Modelling Report dated April 2020 in Appendix E for detailed assessments of the intersections.

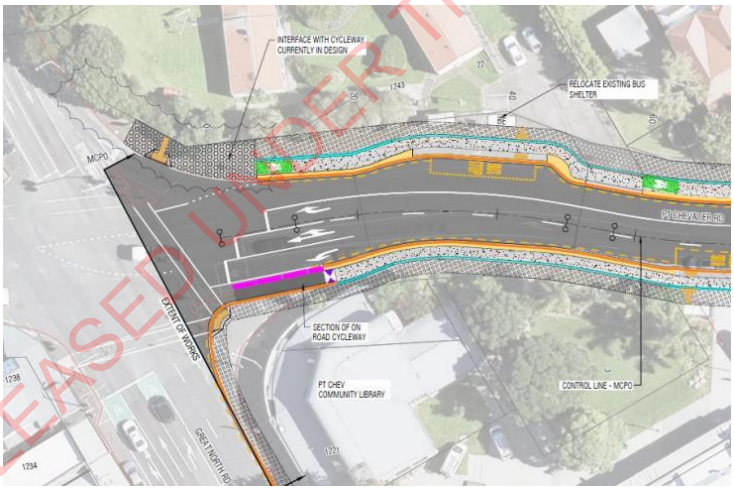
6.6.1 Great North Road / Point Chevalier Road

This major four arm traffic signal-controlled intersection contains a priority controlled free flow left turn lane from Point Chevalier Road onto Great North Road. Whilst providing capacity for motorised users this movement does not allow pedestrians to cross safely and there is the risk of cyclists being struck by the free-flowing left turning motor vehicles.

Options to ~~r~~Remove~~ing~~ the priority controlled left turn lane were developed. The removal has implications on the ~~revised~~ traffic signal phasing resulting in a less efficient ~~traffic signal~~ phasing but providing increased safety benefits to pedestrians and cyclists~~e users. A number of~~O ~~options~~ were developed to identify a layout and traffic signal phasing sequence that would give an equal or better level of service or delay to motorists than the existing operation of the intersection. Refer to Appendix E Options Assessment Report Aug 2019 for the assessment.

The left turn slip lane is proposed to be removed as shown in Figure 28.

Figure 28: Great North Road / Point Chevalier Road Intersection



~~Removing the priority controlled left turn lane has implications on the revised traffic signal phasing resulting in a less efficient traffic signal phasing but providing increased safety benefits to pedestrians and cycle users. A number of options were developed to identify a layout and traffic signal phasing sequence that would give an equal or better level of service or delay to motorists than the existing operation of the intersection. Refer to Appendix E Options Assessment Report Aug 2019 for the assessment.~~

6.6.2 Point Chevalier Road / Meola Road

The existing intersection at this location is a give way priority controlled intersection. The following options have been considered for incorporation into the short listed route options:

- Change the priority of the intersection. This would mean that the give-way control on Meola Road would be removed and would be installed on the Point Chevalier Road northern approach instead. Therefore, Point Chevalier Road northern approach would become the side road. This would mean that a dedicated facility could be provided for the full route (without terminating) through the intersection.
- Upgrade the intersection to a signalised intersection. This would allow for signalised pedestrian and cycle crossings to be installed so that active mode users can safely cross the road.
- Upgrade the intersection to a roundabout. Cycle facilities could be provided through the roundabout, likely using shared paths as there are space constraints for a fully protected roundabout design.

The change in intersection priority was discounted. An assessment of the option using SIDRA intersection modelling software confirmed that the option would result in a significantly poorer operation of the intersection compared to the current layout. As no bus facilities are provided at this intersection, any impact to general traffic would have the same impact to bus users. There is also limited opportunity with this option to provide for people transitioning from the Point Chevalier Road northern approach to the facilities on the preferred route and limited opportunity to provide improved facilities for walkers. Furthermore, there are challenges in providing a safe design given Point Chevalier Road is the expected priority with a T-intersection layout such as this. Therefore, this option was discounted as it did not fully address safety issues for people cycling and people walking and would result in considerable delay to bus passengers and general traffic.

The upgrade to a signalised intersection would create some delay to traffic but would allow for safe crossing for all walking and cycling movements. The Scheme Assessment Report recommended that the signalised intersection was progressed as the preferred option.

The roundabout option provides the best benefit to motorised road users however at the time of the Scheme Assessment, studies showed that in urban areas with pedestrian and cyclists present, roundabouts have a very poor crash record and should not normally be considered.

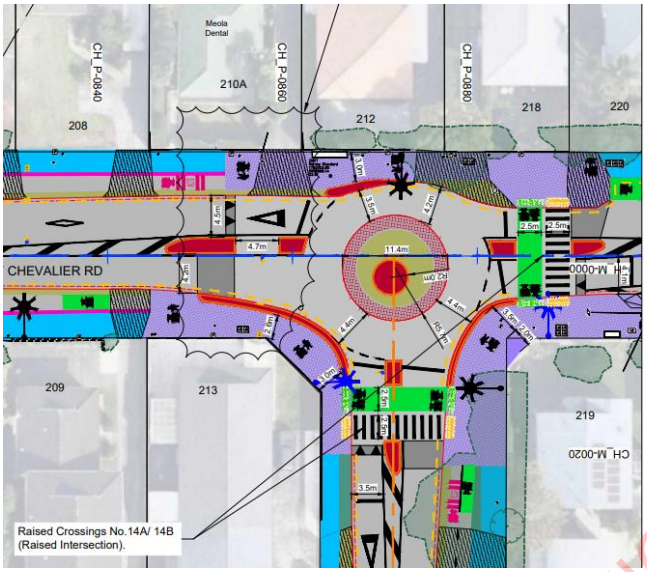
Feedback from public consultation in 2019 raised concerns about the impact of signalisation on travel times. After public consultation and a reconsideration of current best practice, AT recommended that this intersection be readdressed and that a roundabout be investigated. An assessment of the roundabout has confirmed this option will minimise the impact on travel times for bus passengers and general traffic, while improving safety for people walking and cycling.

It is now recognised that a compact single lane roundabout is generally more in line with safe system principles than signalised intersections or priority-controlled intersections. This is because the geometry of a roundabout results in lower vehicle speeds and the impact of vehicle collisions is less likely to result in death or serious injury[20]. However, roundabouts are also associated with poor safety

[20] Austroads Research Report *Understanding and Improving Safe System Intersection Performance*, Austroads, 2017, pg. 7

outcomes for people cycling and people walking. The design of the roundabout can influence this, with raised tables on approaches improving safety outcomes for all users. This will be considered through the detailed design for the roundabout to ensure alignment with Safe System principles.

Figure 29: Point Chevalier Road / Meola Road Intersection

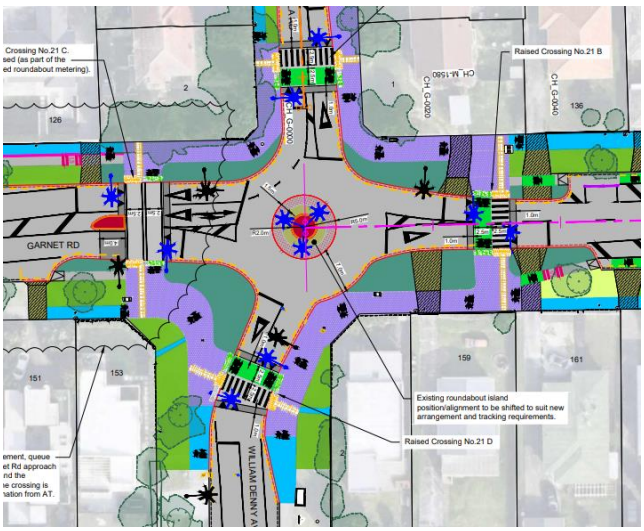


6.6.3 Meola Road / Garnet Road

The current form of this intersection is a roundabout, with two approach lanes on both the Garnet Road legs. The multi-lane entry does not provide the best outcomes for pedestrians or people on bikes and therefore alternative options have been considered, including signals and roundabout metering.

The assessments supported the proposal of a roundabout on a raised table, with two approach lanes on the southern Garnet Road approach and pedestrian (and cyclist) crossings on all approaches as shown in Figure 30.

Figure 30: Meola Road / Garnet Road Intersection



7 Preferred option

7.1 Preferred Option Description

The preferred option will consist of safe cycle facilities on Point Chevalier Road from the intersection of Great North Road, along Meola Road and a section of Garnet Road to the existing pedestrian crossing near Oban Road. The cycle facilities include:

- Separated unidirectional (off-road) cycle paths on both sides of Point Chevalier Road (Option 1B);
- Separated bidirectional (off-road) cycle path on the northern side of Meola Road (Option 2); and
- Separated unidirectional (on-road) cycle lanes on both sides of Garnet Road (tie into Westmere Safe Routes).

The preferred option includes the following intersection upgrades:

- Removal of the left turn slip lane out of Point Chevalier Road into Great North Road;
- Upgrading the Point Chevalier Road, Meola Road intersection from a priority intersection to a roundabout;
- Pedestrian and cycle infrastructure improvements at the existing roundabout at the Meola Road, Garnet Road and William Denny Avenue Intersection.

The preferred option also includes:

- A southbound, morning and evening peak period bus lane on Point Chevalier Road (between Wakatipu Street and Tui Street). On-street parking would be retained outside of the operating hours;
- A reduction in the number of bus stops on Point Chevalier Road from four to three (in each direction);
- Improvements to the layout of bus stops so that they are easily accessible;
- Provision of additional pedestrian and cycling crossing facilities along the corridor including signalised crossings;
- Side road treatments, typically raised crossings;
- Associated lighting and stormwater upgrades;

As part of Auckland Transport's "dig once" policy and joint working delivery approach the project includes the following works:

- Meola Road pavement rehabilitation along its full length;
- Point Chevalier Road reseal along its full length; and
- Undergrounding of the overhead lines on Meola Road[21].

Commented [A2] s 9(2)(a) confirm added footnote around co-funding is accurate below please

[21] Co-funding is requested for the costs to relocate powerlines only. ~~Local share will~~

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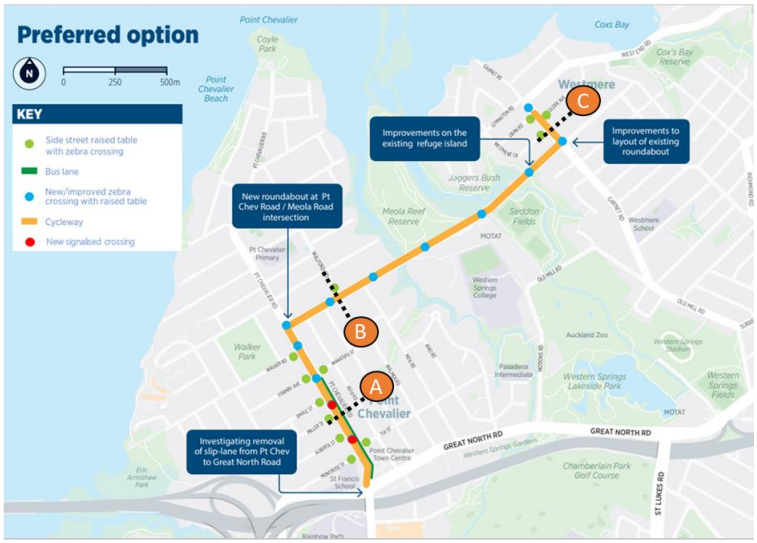
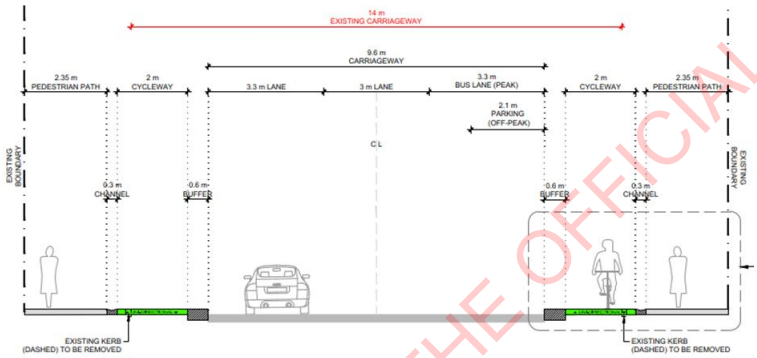
~~These are annotated on the map in~~The preferred option is shown in Figure 31. Refer to the Detailed Design Philosophy Statement[22], ~~contained in(~~ Appendix H~~)~~, for more details ~~of the preferred option~~. Refer to Appendix I for the preferred option drawings.

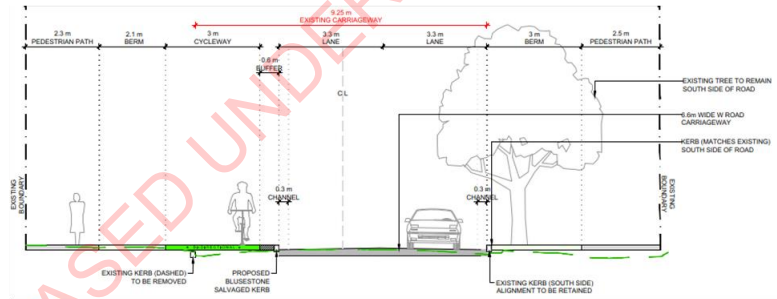
Figure 31: Map of planned works as part of the preferred option

[22]Point Chevalier to Westmere Cycleway, Detailed Design Philosophy Statement, dated September 2020, prepared by Mott MacDonald NZ

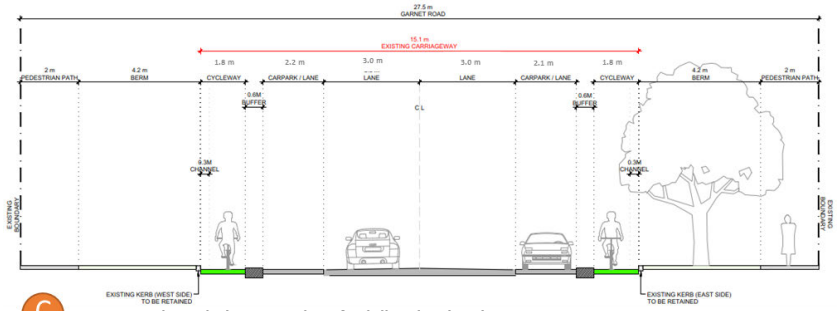




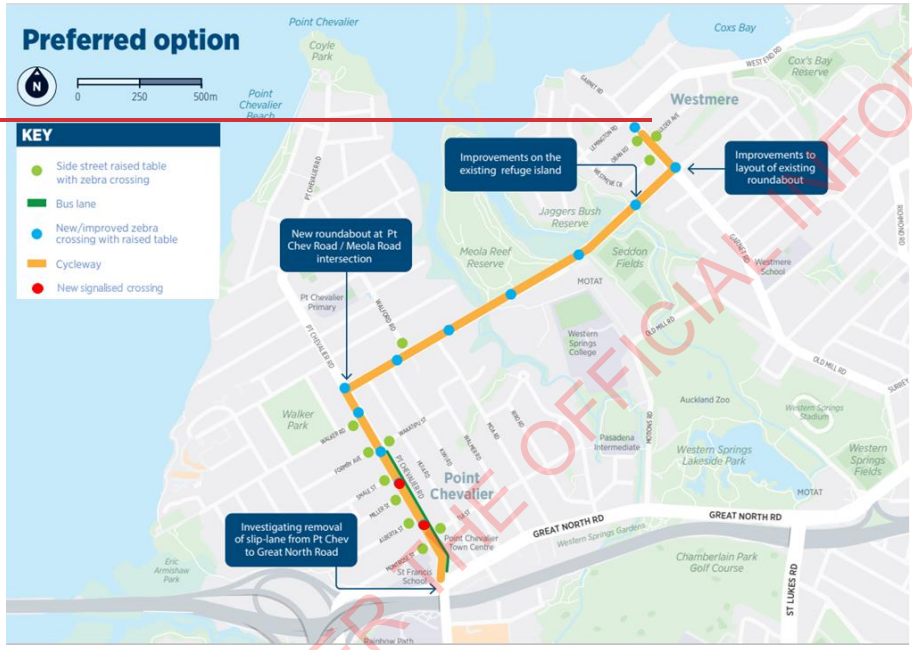
A Pt Chevalier Road – typical cross section of uni-directional cycleway



Meola Road – typical cross section of bi-directional cycleway



C **Garnet Road – typical cross section of uni-directional cycleway**



7.2 Scope

The scope of the project is to deliver improvements to Point Chevalier Road, Meola Road and Garnet Road. Detailed design is currently being completed for the preferred option. Refer to the Detailed Design Philosophy Statement and the design drawings contained in Appendix I for the project scope.

The scheme design recommended to upgrade the Point Chevalier Road / Meola Road intersection to a signalised intersection. However, AT are now proposing to implement a roundabout at the Point Chevalier Road / Meola Road intersection.

AT are proposing a roundabout trial at the intersection to confirm that a roundabout is appropriate. AT will implement the trial when funding is received. The temporary trial will occur for a minimum of four weeks and will occur during the normal school term (i.e. avoiding school holidays) and when traffic flows are considered a reasonably normal level as a result of COVID-19 disruption. This trial needs to be completed before the design of the Point Chevalier Road / Meola Road intersection can be finalised.

As noted previously, the design of the cycle lanes (around street trees) is being progressed through detailed design to minimise the extent of cycle lane narrowing.

8 Preferred option – Assessment

8.1 Outcomes

Table 16 outlines the benefits and investment objectives of the project and the specific measures of evidence that will demonstrate achievement of the objectives with the preferred option. Each element is then discussed below.

Table 16: Assessment against the investment objectives

Benefit	Investment Objective	Evidence of how this will be achieved
Improved road safety outcomes and perceptions **KPI 1.1: Decrease in deaths and serious injuries** **KPI 1.2: Improved perception of safety (all and vulnerable users)** **KPI 1.3: Improved infrastructure to reduce risk exposure**	Reduce deaths or serious injuries on the corridors by 66% by 2030	***Healthy and Safe people*** **-** *Impact on social cost of deaths and serious injuries* **#1.1.2 Crashes by Severity**
Increase active transport mode share and participation for all ages, abilities and backgrounds **KPI 3.1: Increase active mode share** **KPI 3.2: increase number of cycling trips (including towards dense activity centres)** **KPI 3.3: Improved access and utilisation of public transport via active modes**	Triple active mode share from 8% to 24% of total journeys to work by 2028	***Inclusive Access*** *– Impact on Mode Choice* **#10.2.3 Percentage completion of the Cycle Network / Spatial Coverage – cycle lanes and paths** ***Inclusive Access*** *– Impact on user experience of the transport system* **#10.1.7 Number of pedestrians and cyclists**
Improve customer experience and the competitiveness of public transport **KPI 2.1: Improve public transport customer experience through reliable journey times** **KPI 2.2: Public transport travel times are more competitive with general traffic** **KPI 2.3: Increase public transport patronage**	Public transport travel times are at least as competitive as general traffic between the eastern end of Meola Road and the Point Chev Rd/Gt North Road junction by	***Inclusive Access*** **-** *Impact on user experience of the transport system* **#10.1.9 Average travel time in minutes**
Improved environmental place and health outcomes in Point Chevalier and Westmere **KPI 4.1: Improved amenity and street environment** **KPI 4.2: Increase community satisfaction of streets and roads**	Improve access to / from and within Point Chevalier and Westmere neighbourhoods through active mode facilities	***Environmental Sustainability*** *– Impact on greenhouse gas emissions* *#8.1.2* Number of pedestrians and cyclists

An Appraisal Summary Table (AST) has been completed for the preferred option and is included in Appendix E.

8.1.1 Improved road safety outcomes and perceptions

Crashes by Severity are expected to reduce as a result of the preferred option. The preferred option will provide a segregated cycle facility for the full route. The design meets the AT TDM Design Standards and will ensure that there is enough separation between cyclists and vehicles, including parked vehicles, which will improve actual and perceptions of safety.

There have been eight injury crashes along the corridor in the last five years. With the preferred option in place, it is predicted there will be 40 less injury crashes over the next 40-year period, resulting in a (non discounted) savings in the social cost of injuries of $19 million.

In total, 25 raised tables will be provided with this project. Of these, 12 raised tables (with priority control) are installed on all side roads to the preferred route. 13 raised tables will be installed along the route. This will ensure that vehicle speeds are reduced to 30km/h where people walking and on bikes are crossing and will help in creating an overall low speed environment along the route.

While no traffic calming devices are proposed on other roads within the vicinity of the route, the raised tables on the side roads will create a 'threshold' type treatment that indicates to drivers they are entering a residential area and should therefore help encourage low vehicle speeds across the wider area.

This will improve safety for all road users, including people on bikes that choose not to use the dedicated cycle facilities.

It is proposed to signalise the existing zebra crossing on Point Chevalier Road to a signalised crossing. The crossing will be raised to ensure a slow speed on the approach to the crossing. Signalisation of the crossing will also improve safety for drivers turning right into and out of Tui Street, by creating gaps in the traffic stream.

The traffic calming devices and additional crossings will also improve safety for walkers through a slower speed environment and more opportunities to easily cross the road.

Consultation was conducted in 2016 to identify routes within this area of Auckland[23] that people would prefer as well as to identify any concerns users had about existing routes

In total, 800 people submitted as part of this wider consultation. The most frequently cited area of concern relevant to this project area, with 267 comments, was Meola Road (between Point Chevalier Road and Garnet Road).

Across the preferred route, there was a general feeling of the route being unsafe or dangerous for cyclists, both at intersections and at mid-block locations. The main reasons for this included high traffic volumes and speeds, conflict with buses, narrow roads, parking hazards and a lack of safe crossing facilities.

In 2019, the scheme design was consulted on and a total of 690 submissions were received. Of these, 350 submitters (approximately 50%) indicated they liked the improved cycleways. This was the most common theme identified from the feedback. Over 200 submitters stated they liked the improved safety and over 200 submitters stated they liked the additional or improved crossing opportunities.

The Meola Road / Point Chevalier Road intersection is proposed to be upgraded to a roundabout. While roundabouts provide safe outcomes, they can be perceived to be unsafe for active mode users. At the Meola Road / Point Chevalier Road intersection, cyclists will transition from the separated facilities to a shared path. The design of the ramp and appropriate signage will allow for safe transition between the facilities without having to travel through the roundabout (on road). On the northern and eastern arm of the Meola Road / Point Chevalier Road intersection, paired cycle and pedestrian crossings will be provided.

The combination of shared paths and paired crossings at the roundabout will address concerns about a lack of safe crossing facilities and concerns about the difficulty of transitioning at intersections. In addition, this will prevent the introduction of new concerns that could affect perceptions of safety with the proposed roundabout.

Overall, the preferred option will address real and perceived safety concerns on the corridor.

[23] Areas included Point Chevalier, Westmere, Grey Lynn, Ponsonby and Herne Bay

8.1.2 Increase active transport mode share and participation for all ages, abilities and backgrounds

The project adds approximately 2.8km to the cycling network with the majority of additional facilities achieving a QoS level 2 and therefore suitable for all ages and abilities. This increases the ***spatial coverage of cycle lanes and paths*** in Auckland by 2.8km.

The provision of dedicated cycle facilities will encourage people to cycle more regularly, particularly vulnerable and less confident cyclists.

Provision of priority-controlled raised crossings will make it easier and safer for people walking to cross the road. This will also make it easier for people to walk and cycle to access public transport.

This will increase the ***number of pedestrians and cyclists on the route*** (i.e. the people throughput).

The provision of dedicated cycle facilities means that over 4,500 more people will live or work with 400m of cycle infrastructure. In addition, more than 2,700 students will be studying at schools within 400m of cycle infrastructure.

Walking and cycling mode share is currently at 8.2% - journey to work, the stretch target in the Investment Objectives is to triple this to 24%, however this could increase further as the cycle network develops and improves cross-city connections for cyclists. For example, the Avondale to New Lynn shared path is currently under construction. Once complete, cyclists would be able to travel largely by separated facilities between Westmere and Avondale (via the Waterview shared path)

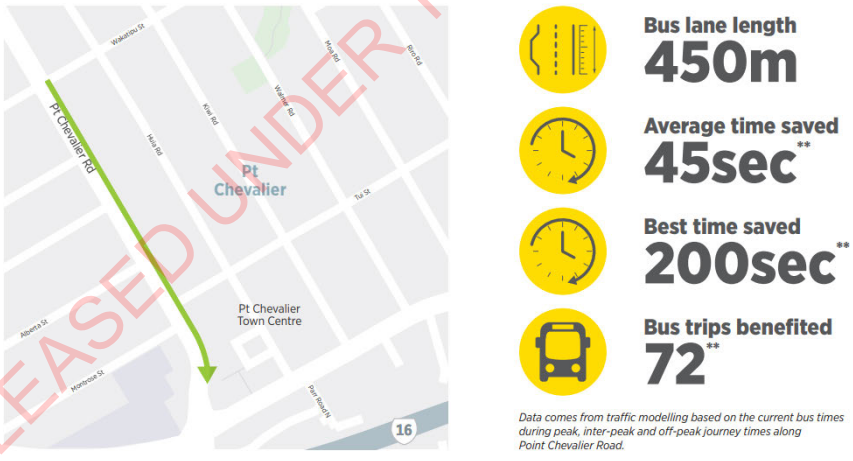
The Housing Urban Development authority (HUD) is investigating the delivery of over 2,000 new dwellings on land currently part of the Unitec precinct. Located in close proximity to Point Chevalier, the new facilities would improve cycling access for future residents associated with this development.

In total, 1,070 cyclists per day are expected by 2038 (more than triple the current volume), based on current land use.

8.1.3 Improve customer experience and the competitiveness of public transport

The southbound bus lane in the morning and evening peak will ***improve bus journey times***, saving on average 45 seconds, which will make bus journeys more competitive with general traffic as shown in Figure 32.

Figure 32: Project benefits for public transport



The provision of bus lanes will reduce the impact of further residential intensification (and growth in vehicle numbers) on bus journey times.

Inconsistent travel times contributes to poor customer experiences and poor perceptions of public transport. The provision of bus lanes will improve travel time reliability.

The active mode improvements will make it safer to access public transport. This will support increased public transport patronage.

8.1.4 Improved environmental place and health outcomes in Point Chevalier and Westmere

The preferred option will ***increase the number of people walking and people on bikes*** in Point Chevalier and Westmere and provide health benefits for these people. Community satisfaction of streets and roads in Point Chevalier and Westmere is expected to significantly increase with the proposed improvements.

The provision of dedicated cycle facilities and improved crossing facilities for cyclists and pedestrians will improve access to community facilities. This will support the use of active modes for local trips around the Point Chevalier and Westmere area.

Meola Road will be replanted with street trees that are native species. The existing street trees are non-native species, and many are in poor quality. Approximately 35 trees are expected to be removed and these will be replaced with 45 new street trees. The increase in number of street trees should improve the amenity of and satisfaction with the street environment.

8.2 Assessment of Preferred Option

8.2.1 Public Participation

Auckland Transport has undertaken several phases of public consultation and stakeholder engagement throughout the design process. The results of consultation and stakeholder engagement were used throughout the project history to confirm the route, select the preferred option and as part of developing the design for the preferred option.

Refer to Section 4 for feedback on stakeholder engagement and to Section 5 for feedback from Mana Whenua.

In November 2019, public consultation was undertaken on the design for the preferred option. While the preferred option includes upgrading Meola Road / Point Chevalier Road intersection to a roundabout, at the time of consultation, a signalised intersection was recommended.

There was significant engagement during public consultation, with approximately 700 submissions received.

The Consultation Report, contained in Appendix C, details the feedback that was received and how AT responded to the feedback.

Approximately two thirds of participants responded positively to the proposed improvements, indicating that overall, participants were supportive of the project.

Some of the key issues raised during public consultation and the response to these concerns are summarised in Table 15.

Table 15: Summary of public feedback

Public Feedback Concern	Response
More cycle parking should be provided	Cycle parking will be added in the detailed design stage

Public Feedback Concern	Response
A roundabout at the Point Chevalier Road / Meola Road intersection	As a result of the feedback raised, a roundabout is being investigated for the intersection through the detailed design phase. This will minimise delays for general traffic and is in line with AT's Vision Zero strategy. The design of the roundabout will consider safe crossing for pedestrians and people on bikes as well as the efficiency of the intersection for traffic flow. **Outcome: investigations for a signalised intersection were discontinued in favour of a roundabout, to reduce the impact of the project on general traffic travel times and provide better alignment with safe systems principles.**
The proposal will increase the number of people that 'rat-run' using side streets, to avoid using Meola Road or Point Chevalier Road	As discussed above, the Point Chevalier Road / Meola Road intersection will be upgraded as a part of this project. Therefore, the likelihood of the proposal increasing the number of people rat-running will be reduced. Signals are proposed for pedestrian points where a person needs to cross more than two lanes of traffic to improve safety for active mode users. The signalised crossings are not expected to cause more delay to vehicle drivers in comparison to the existing zebra crossings (which require drivers to give-way to pedestrians). AT will carry out a monitoring programme to assess the impact on the side streets of the proposal and can adopt additional traffic calming measures for these streets if required.
There is insufficient car parking capacity at the Meola Reef car park	This is out of scope for the project. However, it is noted that the Meola Reef Reserve Development plan will inc ease the number of car parking spaces at the Meola Reef car park.
Raised crossings should be provided on all side streets.	Some side streets on Meola Road have not received the raised table treatment, because they are not on the side of the cycleway. The side tables are expensive to construct. This issue will be re-visited when costs on the project are more certain.
Meola Road should be widened to reduce travel times and retain on-street parking.	Widening Meola Road would significantly increase the cost of the proposal due to constraints within the corridor. With the narrow width of Meola Road, it is not possible to provide both on-street parking and cycleway facilities. A parking occupancy survey was conducted in December 2019. The results of the parking occupancy survey indicate that the demand for on-street parking does not exceed 10 vehicles. The surrounding side streets provide enough on-street parking to accommodate additional demand for parking resulting from the loss of these spaces from Meola Road.
The cycleway should be extended (e.g. suggestions included extending the cycleway to Point Chevalier School or to Coyle Park).	Including cycle facilities on sections of Point Chevalier Road, north of the route, is not included in the project scope. The Local Board has commenced a project feasibility investigation for a cycle facility on Point Chevalier Road, extending from Meola Road to Coyle Park. This would also provide a facility for children to cycle to Point Chevalier School. If this project progresses, it would provide cycle facilities for the full length of Point Chevalier Road and would improve connectivity for local trips.

Public Feedback Concern	Response
The cycleway / cycle facilities should be installed on an alternative route such as one of the side streets to Point Chevalier Road	A comprehensive assessment of alternative routes was completed as part of the Early Investigations Report and this confirmed that the preferred route (Point Chevalier Road) would provide the greatest connectivity benefits to other parts of the Auckland Cycle Network. This will make it easier for people cycling to get to where they need to be safely. Many of the local community already use Point Chevalier for people cycling and walking and specific walking and cycling school bus groups to and from the local schools and public transport. Point Chevalier Road also has many destinations such as cafes and local retail stores. Overall, it is considered important to provide for active mode users of all ages and abilities, on a route that was already well-utilised and more likely to support an increase in cycling. This decision was also supported by the Community Liaison Group (CLG).
Pedestrian crossings should be provided on Point Chevalier Road near Great North Road, to support access to the Point Chevalier Mall	A pedestrian crossing at this location presents a number of challenges It would need to be signalised because it requires the crossing of multiple lanes. This raises the likelihood of interfering with the tra fic operation at the Great North Road intersection because of the close proximity. There is also a sharp bend close by, which would result in a safety risk arising because of the reduced visibility. Signalised crossings and zebra crossings on slip lanes allow for people walking to safely cross at the Point Chevalier Road / Great North Road intersection. In addition, the mid-block signalised crossing on Point Chevalier Road (near Tui Street) is approximately 200m to the north of this signalised intersection. Therefore, it was considered that there were enough crossing facilities in the area to support safe access across Point Chevalier Road.
Powerlines should be undergrounded	AT has been in discussions with Vector about the undergrounding of powerlines. This is currently not on Vector's short-term programme. AT recognises there is an advantage of undertaking undergrounding the powerlines at the same time as this project is completed. A scope change has been put to the project change control group to allow the undergrounding to occur. **Outcome: AT is investigating the inclusion of undergrounding powerlines as part of this project.**
Bus stops located 'in-line' with the general traffic lane will cause delay for general traffic	AT Metro no longer recommends the use of indented bus stops. This is because it can be difficult for bus drivers to pull out of the bus stop and merge with general traffic lanes. This creates a safety issue with bus drivers needing to make unsafe or undesirable manoeuvres to exit the bus stop. This can also cause delay to bus passengers and can negatively impact bus travel time reliability during the peak periods. In addition, indented bus stops reduce the amount of road space that could be used to provide facilities for active mode users and public transport. Some of the specific considerations for Point Chevalier Road are noted below. o The placement of bus stops on Point Chevalier Road has been revised, resulting in a reduction in the number of bus stops from four bus stops (in each direction) to three bus stops (in each direction). This will reduce the delay caused to general traffic resulting from passengers boarding and disembarking bus services.

Public Feedback Concern	Response
	○ The number of buses may only cause motorists to encounter a bus stopping at an in-line stop once every 5 minutes. ○ Traffic calming is a substantial component of this project. In-line bus stops contribute to that approach. ○ In the busy commuter peak periods, congestion conditions are experienced on Point Chevalier Road and Meola Road. Therefore, any delays to drivers, resulting from buses stopping at the in-line bus stops, is expected to be minimal.
Drivers turning from the side roads onto Point Chevalier Road will likely wait for a gap in traffic, on the raised table. This will block the 'through route' for active mode users and cause safety issues.	As a result of consultation feedback and a road safety audit, it is now proposed that all raised tables on the side roads will be installed with a priority-control. This will make it clear to drivers that people walking and cycling have priority across the side road. As the detailed design is progressed, this issue will be considered further, to ensure that people walking, and cycling will have space to pass any stationary vehicles. **Outcome: All raised tables on side roads will be installed with zebra crossings.**
Trees should not be replaced from Meola Road / if trees are removed from Meola Road they should be replaced with mature trees.	AT have worked closely with arborists to develop the tree proposal. The health of the trees along Meola Road have been severely compromised by the trimming for the overhead power lines and are nearing the end of their lives. Native trees have been proposed for replacement because they provide greater ecological value and will help enrich biodiversity in the area. The project proposes to plant almost twice the number of trees than are being removed. Therefore, the visual amenity/landscape for Meola Road will also be improved
The new MOTAT car park should be implemented before Meola Road parking is removed	This is a separate project and it may not be feasible to coordinate the projects so that the new MOTAT car park is implemented before the project. However, parking occupancy surveys for Meola Road indicate that the demand for on-street parking can be met from on-street parking available on the surrounding streets.
The Point Chevalier / Meola Road intersection should include an additional pedestrian and cycle crossing on the southern side of the intersection	The signalised option for the Point Chevalier Road / Meola Road intersection did not include a pedestrian crossing on the southern side of the intersection as this would increase delays for all road users at the intersection, including pedestrians (due to increased cycle time). **Outcome: The detailed design is now considering a roundabout instead of a signalised intersection.**

The most substantive change proposed as a result of feedback is to investigate a roundabout at the Point Chevalier Road / Meola Road intersection instead of a signalised intersection.

In addition, the following changes to the preferred option have been made:

- Adjustments to the design of the cycleway and raised table have been made to retain three car parking spaces on Point Chevalier Road and two spaces on Garnet Road.

- There was a request from a business owner for a minor relocation of one of the bus stops on Point Chevalier Road. This option was presented to the business owner and has been accepted and subsequently included in the design.
- A number of submitters have requested a raised table on the Faulder Street crossing point. This will be included in the detailed design.
- There will be a new paired pedestrian and cycle crossing on Meola Road near Moa Street.

8.2.2 Urban Design

Land-use planning has been a key consideration for the project, recognising that people's satisfaction with the street environment is significantly affected by whether people, of all ages and abilities, can safely and comfortably access the local services and amenities that they need.

The project will enhance the amenity of the streetscape and improve people's satisfaction and interaction with their street environment. The preferred option aims to achieve this through providing dedicated cycling facilities and improved pedestrian crossing facilities. This will improve access to local retail, hospitality, cafes, parks and recreation areas, schools and other community facilities. Wherever possible space will be prioritised outside cafes, take-aways and restaurants for outdoor dining to take place. Cycle parking will be located in close proximity to businesses, and nearby car parking will be providing wherever possible. Use of higher quality concrete paving treatments wil be considered where additional visual amenity is required.

During the development of options, the preferred route was assessed using the AT Roads and Streets Framework in order to determine the future typology. Although this is based on a version of the Roads and Streets Framework that has been superseded, the modal priorities established for the preferred route are still appropriate. These modal priorities reflect the constraints within the corridor of the preferred route as well as the land-use of the surrounding area.

A key consideration throughout the development and refinement of options has been the ability to retain existing street trees on the preferred route. Many residents expressed concern about street tree removal during community consultation, reflecting the importance of the trees to the visual amenity of the area. Where street trees could not be retained, options were refined to ensure that new street trees could be planted.

The proposed spatial allocation for pedestrian and cycling infrastructure has been determined though reference to the appropriate chapters of the AT TDM (specifically Cycling Infrastructure, Footpaths and the Public Realm and Public Transport – Bus Infrastructure draft version) and relevant AT Standard Engineering Details.

The Project Team has carried out extensive consultation with AT internal stakeholders in order to achieve a consensus on spatial allocation within the road reserve. In some locations there is insufficient space to provide the preferred dimensions as set out in the TDM for all pedestrian, cyclist and vehicular facilities within the road reserve. In this situation the Project Team has worked with the relevant AT stakeholders to achieve a balanced spatial allocation outcome that delivers the optimal outcome relevant to the project objectives listed above, within the framework of a Vision Zero safety strategy. This collaboration will continue as the detailed is developed.

The existing he itage basalt kerbs will be retained for re-use on site. Basalt kerbs are currently located along most of Point Chevalier Road, Garnet Road and the eastern and western residential sections of Meola Road. Any basalt rock reclaimed from site excavations may be reused in proposed soft landscaped areas.

Street furniture from the standard range of Auckland Transport street furniture will be selected for use across the project. This will include benches, seats, bike racks and rubbish/recycling bins and any required wayfinding signage. Areas of focus will include intersections, bus stops and rest areas along the length of the project.

There is opportunity for bespoke signage, balustrades and furniture to be used. Bespoke street furniture elements can also provide an opportunity for the inclusion of cultural design references to enrich the public realm.

Bus shelters will be provided from Auckland Transport's approved range. Bus stops will incorporate all required signage and infrastructure components as specified by Auckland Transport.

Refer also the Urban Landscape Design Framework in Appendix E that was completed for the Scheme Assessment Report.

8.2.3 Peer Review

A peer review has not yet been completed

8.2.4 Safety Audit

In June 2020, a safety audit was completed on the Scheme Design for the preferred option. The safety audit identified two significant concerns and various moderate and minor concerns. The significant concerns and the project team's response to the concerns are noted below.

- **Significant Concern**: **Raised tables on side roads**. The location of the raised tables at the limit line on side roads could result in drivers positioning themselves on the raised tables while waiting for a safe gap in the traffic stream. The raised table location also means that drivers, turning right from Point Chevalier Road to a side road, may have to stop suddenly to give way to people crossing and come into conflict with the opposing traffic stream.
    - **Response:** It was decided to progress with the design of the raised tables at the limit line of the side roads. Relocating the raised tables away from the limit line would reduce connectivity for people walking and cycling as the crossings would be located away from the desire line. A key priority of the project is to improve the priority for people walking and cycling. Removal of the raised tables would result in drivers having priority at the side roads. It would also reduce the quality of the cycling facility.
- **Significant Concern: Removal of the right turn bay at the Point Chevalier Road / Montrose Street intersection**. There is high demand for right-turn movements at the intersection during peak school pick-up/drop-off times. Therefore, removal of the right turn bay could increase the incidence of rear-end crashes.
    - **Response:** The design of the walking and cycling facilities were amended so that the carriageway can be widened to allow for the retention of a right-turn pocket at the Point Chevalier Road / Montrose Street intersection.

AT considered all of the concerns provided in the safety audit and agreed where these are to be addressed in the detailed design stage. Refer to Appendix K for the full safety audit report and the agreed actions in Section 7 of the Design Philosophy Report (Appendix H).

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8.2.5 Resource Consents

On 9 September 2020, a Duty Commissioner approved the resource consent for the construction of the cycleway on the preferred route. Resource consent was required as the activity was assessed as a Restricted Discretionary under the AUP(OP) and a Controlled Activity under the NESCS. Overall, the activity was assessed as a Restricted Discretionary Activity.

The reasons for resource consent are detailed in Appendix L. In summary, resource consent under the AUP (OP) was required for the following:

- The removal of approximately 35 street trees from Meola Road. This includes street trees larger than 4m in diameter.

- The removal of street trees from Meola Road will also require works within the protected root zone of an existing notable tree and also for trees within the road corridor, which are being retained.
- The removal of street trees, approximately 980m^2 of vegetation and approximately 1,200m^2 area of earthworks within the Significant Ecological Area – Terrestrial overlay on Meola Road.
- Earthworks within the coastal protection yard on Meola Road.
- Noise and vibration for construction works that exceed the permitted standard within a heritage overlay.

Resource consent was also required under the NESCS for earthworks, as soil testing indicated there was soil with concentrations of heavy metals above Auckland Background Concentrations.

The application for resource consent was non-notified as the Duty Commissioner determined that there are no adversely affected persons by the construction of the cycleway. The values of mana whenua would not be adversely impacted and the effects during construction works such as noise and vibration, while causing some inconvenience, could be mitigated through specific construction management measures.

The Duty Commissioner's decision on the resource consent is contained in Appendix L. In summary, the following reasons for approving the resource consent were noted:

- Land disturbance will be minimised to areas where earthworks are required, and these works will be managed in accordance with Council's best practices.
- The works within the Significant Ecological Area overlay will not result in a permanent change to the visual landscape. Replacement planting of street trees will ensure the amenity of the area is maintained.
- The impact of earthworks and vegetation removal will be managed to ensure the long-term health and well-being of street trees that are retained.

8.2.6 Land Acquisition

No land acquisition is required for the preferred option.

8.2.7 Traffic Modelling

Intersection of Point Chevalier Road and Great North Road

LinSig modelling was undertaken for the Poin Chevalier Road / Great North Road intersection to assess the impact of removing the left turn slip lane from Point Chevalier Road to Great North Road.

The morning and evening peak periods were modelled using traffic volumes from 2017[24]. The existing intersection layout was modelled and four options (involving the removal of the left-turn slip lane) were tested for comparison.

The modelling results indicated that the removal of the slip lane would have a negligible impact on the performance of the intersection.

Intersection of Point Chevalier Road and Meola Road

SIDRA modelling was completed for the Point Chevalier Road / Meola Road intersection to compare the traffic impacts of the existing priority controlled intersection with:

- A signalised intersection; and

[24] Traffic volumes have remained reasonably consistent since 2017. The 5-day AADT measured in October 2017 on Point Chevalier Road between Great North Road and Montrose Street was 17,592 veh/day compared to the 5-day AADT measured in October 2019 of 17,560 veh/day.

- A roundabout.

The morning and evening peak periods were modelled using traffic volumes from 2017.

The results of this assessment indicated that a signalised intersection would typically operate at a level of service (LoS) of C or D in the peak periods. AT generally considers this an acceptable level of service for signalised intersections in urban areas for the peak periods.

The proposed roundabout will operate at LoS B in the AM peak period and LoS A in the PM peak period.

Further traffic modelling will be undertaken during the detailed design stage. In addition, to confirm the feasibility of installing a roundabout at this location, AT is also proposing to implement a four-week roundabout trial, subject to receiving funding. It is proposed to construct the roundabout using low-cost measures for the trial. This will allow AT to identify any operational issues with the proposed design of the roundabout that would need to be addressed further through detailed design.

Intersection of Meola Road and Garnet Road

SIDRA modelling was completed for the Meola Road / Garnet Road intersection to compare the traffic impacts of the existing multi lane roundabout with:

- A signalised intersection;
- A single lane roundabout; and
- A roundabout with two approach lanes on Garnet Road south.

Traffic modelling for the single lane roundabout indicated that there would be significant delays to traffic if the roundabout was reduced to single lane approaches on Garnet Road. Modelling for the signalised intersection showed it would also add significant delays to general vehicles (and therefore buses), with queues of over 300m anticipated in the evening peak period in a l options. Consequently, the option to retain two traffic lanes at the southern Garnet Road approach is preferred as this has the least impacts on general traffic (and therefore buses) whilst also improving safety for pedestrians and people on bikes.

8.2.8 Quality of Service

To achieve the investment objectives of increased cyc ing mode share, it is essential that the preferred option provides a high quality cycling environment. This will contribute to improved perceptions of safety and provide a comfortable environment for people cycling.

The project team has carried out extensive consultation with AT internal stakeholders in order to achieve a consensus on spatial allocation within the road reserve. In some locations there is insufficient space to provide the preferred dimensions as set out in the TDM for all pedestrian, cyclist and vehicular facilities within the road reserve. In this situation the Project Team has worked with the relevant AT stakeholders to achieve a balanced spatial allocation outcome that delivers the investment objectives.

The MCA included assessment of each option against the following criteria (under the Transport topic):

Suitable for all ages and abilities of cyclists. High quality facility.

This was assessed using the AT Quality of Service (QoS) evaluation tool. This evaluates each section of a rou e / type of facility against a range of criteria and results in an overall score between 1 (the highest quality) and 4 (the lowest quality).

The preferred option will generally provide a QoS of 2 for the preferred route. The cycle lane will narrow around street trees, to an absolute minimum width of 1.3m, for a maximum length of 10m, per section of localised narrowing. Collaboration with AT internal stakeholders, including the Design Standards team, will continue as the detailed is developed to maximise the QoS where possible.

8.2.9 Assessment of Effects

The preferred option will have both positive and adverse effects on the environment. Nevertheless, adverse effects have been assessed as being no more than minor.

The effects are discussed further in the following sections.

8.2.9.1 Environmental Impact

The preferred option will improve the safety (real and perceived), amenity, comfort and attractiveness for people walking and cycling in Point Chevalier and Westmere. The preferred option will also improve the amenity of the urban realm and streetscape environment while minimising the impacts of construction and environmental effects resulting from the removal of street trees and vegetation.

The construction and operation of the project will generate a range of effects on the environment, both positive and adverse. Resource consent has already been granted for the construction of the cycle facilities. In the decision for granting consent, the Duty Commissioner noted that adverse effects would be no more than minor.

There are conditions of resource consent that have been developed to avoid or mitigate adverse environmental impacts of the construction and operation of the cycle facilities. The mitigation, as required by the conditions of consent includes:

- A Contaminated Land Management Plan is to be finalised prior to commencement of any works, outlining the measures in place to avoid contact with contaminated soil during earthworks.
- A Construction Noise and Vibration Management Plan is to be finalised prior to commencement of any works and will include measures to mitigate impacts to coastal birds and impacts to occupants of any buildings near the construction area. This includes avoiding construction works during nesting season and timing any exceedances of construction noise/vibration to minimise the impact on building occupants
- A Planting and Maintenance Plan will be finalised, prio to the removal of any trees or vegetation, outlining how the ecological value of the area will be maintained or enhanced through planting of new vegetation.
- A Tree Root Protection Methodology Plan is to be finalised prior to commencing works within the protected tree root zone.

For more detail on how adverse environmental impacts will be avoided or mitigated, refer to the Assessment of Environmental Effects in Appendix L.

In addition to the above, the proposed cyc eway will have positive effects on the environment, notably:

- Improve real and perceived safety along the route for people on bikes and people walking.
- Contribute to the implementation of an integrated cycling network, removing gaps in the Auckland Cycling Network and improving the existing low levels of service for people cycling.
- Provide attractive walking and cycling connections between local facilities in the Point Chevalier area.
- Improve the efficiency and reliability of bus services.
- Improve the amenity of the streetscape through removal of street parking and planting of new street trees.

8.2.9.2 Tree alteration and removal

Providing a separated cycle facility, improvements to walking connections and to public transport services and maintaining the existing level of service for general traffic will require some tree removal.

Tree alteration and removal has been one of the key considerations throughout the history of the project and this is documented in the assessment of long list options, contained in Appendix D Early Investigation Report.

The preferred option has been developed to balance providing a high quality cycling facility, against minimising the impact on the environment through tree removal. In some locations on the preferred route, the width of the cycle facility will be narrower than the recommended widths specified in the AT TDM. This will minimise the impacts on street trees. However, AT has collaborated with the walking and cycling specialists in the AT Design Standards team to ensure that the design of the preferred option still provides a high quality facility for people cycling.

The design of the preferred option avoids impacts to the 16 pōhutukawa street trees on Point Chevalier Road. However, as noted above, approximately 35 mature street trees will need to be removed from Meola Road.

An Aboricultural Assessment (Appendix E) has been completed for the street trees on Meola Road and it has been noted that the majority of these are in poor health, resulting from on-going tree alteration and trimming for the overhead powerlines. Of the street trees on Meola Road, only one is a native species and the remaining are non-native species.

The Aboricultural Assessment recommended the removal of the trees on Meola Road and resou ce consent has been granted for this removal.

The design of the preferred option allows for street trees to be replanted on Meola Road Approximately 45 street trees will be replanted, to replace the 35 street trees that are removed.

The locations and quantities of the new street trees was investigated in detail through the appointed arborist GreensceneNZ, in conjunction with the Auckland Council arborist. An Ecological Assessment has been completed and this has confirmed that replacing the non-native species with native species will improve the biodiversity and ecological value of the area and will therefore have positive effects.

For more details refer to Assessment of Environmental Effects in Appendix L.

8.2.9.3 Other effects

A Visual Impact Assessment was prepared and noted that the removal of street trees during construction would result in a moderate to high impact on the visual amenity of the streetscape. Nevertheless, the impact on visual amenity will be mitigated in the short-term through replacement with new trees as well as through the removal of on-st eet parking. As the new trees mature, the visual amenity of the environment will further improve and impacts to visual amenity are not expected in the long-term.

There are no outstanding or significant na ural features and landscapes in proximity to the proposed option, and there are no known potential hazard risks. The proposed option would be constructed, maintained and operated fully w thin the road reserve and therefore would have no effect on the archaeological and heritage a eas near the route.

As described in Section 8.2.2, the basalt kerbs on Point Chevalier Road have heritage value. To reduce the impact of the cycleway on heritage, it is proposed to retain and re-use the basalt kerbs.

The increase in people walking, cycling and using bus services will reduce demand for private vehicle travel. Therefore, it is expected that vehicle pollutant and greenhouse gas emissions will reduce, improving air quality for the surrounding area.

Sections of the route are expected to traverse a closed landfill, with construction activities in these areas presenting a potential risk to workers through disturbance of the landfill cover and subsequent exposure of refuse or release of landfill gas. Exposure will result in only short-term effects to the health of workers involved in construction.

Land disturbance activities associated with construction are expected to impact a shallow area of soil and therefore not expected to encounter waste materials.

There will be no long-term effects on the natural environment.

8.2.9.4 Proposed mitigation

Mitigation is required for a range of activities for the project, as noted above.

Where trees are removed, a Tree Protection Methodology will be used to ensure that tree removal does not impact the root zone for trees that are to remain. The trees that are removed will be replaced with trees that, in the long-term, will be of greater ecological value. A Replanting and Maintenance Plan will be finalised and implemented over a five-year period to ensure that the replanted trees are maintained. This will ensure that the ecological value and amenity of the area is not impacted in the long-term as the result of tree removal.

It is also considered that amenity effects will be mitigated through the street enhancements which will result from the introduction of the cycleway and the removal of on-street parking along the route.

Construction has the potential to impact nesting birds or fledglings and the occupants of buildings near any construction works, through construction noise and vibration. To mitigate these impacts, construction works will be minimised or avoided, where possible, during the bird nesting season. In addition, prior to the commencement of any construction works for the day, the immediate area will be checked for any nesting birds. If nesting birds are identified, construction works cannot re-commence until a suitably qualified ecologist determines there are no longer nesting birds in the area. The impacts of construction works to building occupants will be minimised by communicating with occupants the hours that construction works will be occurring. Where activities result in noise or vibration exceeding the permitted threshold, these activities will be scheduled to occur at times when it will cause less disruption for building occupants.

As noted above, the Contaminated Land Management Plan will be finalised prior to commencing any construction works. This will detail the health and safety measures that will be put in place should any worker come into contact with hazardous material and how monitoring for hazardous material will be conducted. The Contaminated Land Management Plan will also detail the earthworks and sediment control measures to minimise the amount of land disturbance occurring at any one time.

For more details refer to Assessment of Environmental Effects in Appendix L.

8.2.10 Asset Management

The required management regime and costs have been specified and included in the financial case and economic case.

8.2.11 Joint Working

This is discussed in Section 10.11, including financial contributions from maintenance budgets in line with the “dig-once” approach.

8.2.12 Social Impact

While it is difficult to quantify the social impacts of any proposal, the impact of the project on the local community was a key consideration in the development and assessment of options. The project aims to contribute to community well-being by making it easier for people to access local destinations, making walking and cycling safer and more comfortable and ensuring the streetscape environment is enhanced.

Localised social impact was included in the MCA for each option. The scoring criteria for social impact is noted above in Table 11. All options had a positive MCA weighted score for social impact.

The new road layouts will influence the travel patterns of the local community. The project is expected to support mode shift to sustainable travel modes and therefore help to reduce the negative social impacts of high reliance on private vehicle use, such as increased mortality, morbidity and poor wellbeing from physical inactivity.

An increase in the number of people walking and cycling will also enhance the wellbeing of the community, through greater interaction between different people in the community and contributing to increased vitality of the street environment. An increase in people walking and cycling will have physical and mental health benefits.

The project will also improve access to social and economic opportunities through more travel choices.

During construction, there will be temporary construction effects generated and the quality of living environment and amenity of the area will be affected due to tree removal and the discharge of noise, vibration and dust from the site works. As stated above, mitigation measures and strategies have been developed to minimise the noise and vibration effects and ensure the health and wellbeing of local community are maintained during construction.

The works may also result in temporary road closures and detours which may cause local movement patterns to be changed. Alternative routes need to be provided for the residents in the area to ensure the daily commute and travel routine is affected as little as practical.

The temporary road closure may also affect the accessibility of private residential properties in the area. Nevertheless, no changes are required to existing private vehicle cross ngs and all owners/occupiers will be able to access their properties via private vehicle and walking/cycling.

To manage construction impacts, a Communications Management Plan will be prepared that identifies how and when communication with owners/occupiers is conducted. It is recommended that at a minimum, prior notice is given to the owners/occupiers before the commencement of works to ensure that the residents are well aware of the impacts on accessibility.

The community have been consulted as well as the local boards and there is good agreement with the preferred option.

8.2.13 Cost Optimisation

Cost was an important factor in the choice of options for each component and was closely examined and considered throughout the project.

8.2.14 Key Risks

Project risks are identified, quantified and the proposed controls to mitigate or eliminate the risk are provided in the risk register in Appendix J.

Table 16 shows the key risks, potential impacts and the proposed mitigation to reduce the probability and/or impact of the risk.

Table 16: Key risks and mitigation

Category	Risk	Potential impact	Mitigation measures
Time	**Programme delay** caused by:	Additional costs, programme slippage,	The current control of programme delay is considered

Category	Risk	Potential impact	Mitigation measures
	- Project scope not agreed - Funding approval - Consent not received - Undergrounding of utilities	scope change and design re-work, design not ready for Meola Road closure, design does not achieve start for shovel ready funding criteria	specifically as individual risks. The delay associated with funding approval has already been realised. Programme to be reviewed once there is certainty on this.
Scope	**Construction over a closed landfill** -Potential of contaminated excavated material from old landfill -Landfill gases encountered during excavation -Contractors set-down and compound sited in this area	Health and safety of construction workers, budget increase, programme delay, design and construction.	Design consultant to review scheme design and eliminate excavation into landfill through the capping unless absolutely essential e.g. raingardens and tree pits. Ensure the Contaminated Site Management Plan (CLMP) is up to date and followed.
Reputation	**Ineffective integration and coordination with interfacing projects** - interfacing projects, progressing at different design stages and timeframes causes misaligned and uncoordinated design solutions	- Budget increase. - Programme slippage. - Reputational damage to AT as project not seen as coordinated - Scope change and design re-work.	Project information sharing process established to ensure respective projects are kept informed of design development and key design decisions. Ongoing communication with respective parties.

8.2.15 Outstanding issues

It is proposed to upgrade the Point Chevalier Road / Meola Road intersection to a roundabout instead of a signalised intersection.

The design of the roundabout is still being progressed through detailed design. To confirm that it is feasible to implement a roundabout, a trial is proposed (subject to funding) using low-cost measures.

Subject to any significant issues identified with the trial, a roundabout at the intersection will be adopted.

9 Economic Case

9.1 Economic Summary of Project

This table should be updated at each gateway phase as more certainty around the costs and preferred option is known.

Table 17: Economic Summary Table (EEM)

Timing	
Earliest Implementation Start Date	April 2021
Expected Duration of Implementation	15 months
Economic efficiency	
Time Zero	1 July 2020
Base date for Costs and Benefits	1 July 2020
Present Value of Total Project Cost of Do Minimum	$3.0M
Present Value net Total Project Cost of Recommended Option	$35.6M
Present Value net Benefit of Recommended Option (exc. WEBs)	$41.9M
Present Value net Benefit of WEBs of Recommended Option	$0
BCR (exc. WEBs)	1.2
BCR (inc. WEBs)	1.2
First Year Rate of Return (FYRR)	3.8%

9.2 General

At the time of writing, the Transport Agency Waka Kotahi had released a new manual for economic evaluation of transport projects – the Monetised Benefits and Costs Manual (MBCM). This replaced the previous Economic Evaluation Manual (EEM) ~~on 3~~after 1st August 2020 but is intended to be applied only to business cases that began prior to that date. The Point Chevalier to Westmere Cycleway business case began some time prior to that date so should strictly be assessed using the previous EEM methodology.

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We understand that there is some flexibility in the above cut-off date, particularly for walking and cycling projects where the procedures have changed significantly between the EEM and MBCM. Recognising this, we have assessed the project using both methodologies, however Table 17 above relates to the EEM methodology. The MBCM methodology produces an additional $24M of benefits than the EEM methodology. The MBCM methodology produces higher benefits across all benefit streams examined but particularly higher benefit streams in Health benefits and Health and Environment benefits. As the project has chosen to use the EEM methodology predominantly the economic analysis can be considered conservative and the MBCM benefit stream used as a sensitivity measure.

The economic evaluation applies:

- A 40-year evaluation period
- A 6% discount rate (EEM method) or 4% discount rate (MBCM)
- Cu rent EEM update factors, published December 2019
- A 15-month construction period, beginning April 2021. Construction costs are assumed to be incurred at the midpoint of the construction period, with pre-implementation costs incurred at the start of construction.

Intersection modelling

The economics evaluation has used SIDRA models of the Point Chevalier Road/Meola Road intersection. These models have used existing traffic data and have been used to compare the traffic impacts of the existing priority control to the proposed roundabout control.

The models have been used to determine the general traffic effects of the proposed changes to the Point Chevalier Road/Meola Road intersection, using standard economic evaluation procedures. Economic effects included are:

- Travel times
- Congestion (driver frustration)
- Vehicle operating costs
- Emissions costs
- Trip reliability costs

The latter three economic effects have been estimated based on the travel time and congestion costs. We note that the travel time and congestion cost savings typically account for 70-80% of the general traffic benefits, as is expected to be the case for this project.

LINSIG models have been used for the Point Chevalier Road/Great North Road intersection, and these have allowed the calculation of the bus travel time and reliability benefits associated with the proposed morning and evening peaks, southbound bus lane on Point Chevalier Road.

Traffic effects at the Meola Road/Garnet Road intersection have been omitted from the economic evaluation, as the eastbound approach lane being removed is currently little used. Removing this lane is not expected to have a significant economic effect. It is assumed that the metering proposed for the westbound approach will be applied only when this will provide a benefit to other approaches, and that the economic effects are positive. As a result, omitting this metering from the economics is a conservative assumption.

We have assumed that peak period traffic volumes will remain constant into the future (ie 0% growth).

Safety benefits

Safety benefits have been calculated for the various road safety elements of the project. The analysis has considered the reported crash history from July 2015 to June 2020, inclusive. Crash reductions have been applied to the following project elements:

Traffic calming throughout the project; a 20% crash reduction factor has been applied to existing general traffic crashes, from Waka Kotahi's Crash Estimation Compendium

Removing of all on-street car parking on Meola Road, and the removal of on-street parking on the west side of Point Chevalier Road; a 100% crash reduction factor has been applied to general traffic crashes related to parked or parking cars

The proposed separated cycle infrastructure: an assumed 50% crash reduction has been applied to the reported cyclist crashes on the project's length. The Crash Estimation Compendium does not provide a crash reduction factor for separated cycleways, but it is noted that 4 of the 5 reported cyclist crashes would be very unlikely if the project was in place. The fifth, involving a car manoeuvring out of a driveway, may have been less likely to occur if the project makes cyclists more conspicuous

Raised tables, kerb extensions and zebra crossings throughout the project; an 80% crash reduction factor has been applied to reported pedestrian crashes, from Waka Kotahi's Pedestrian Planning and Design Guide, table 6.4). This crash reduction factor applies to raised zebra crossings but omits the

impacts of kerb extensions (estimated to be 35% in the Crash Estimation Compendium). This assessment is conservative as a result.

Estimating cycle demand

Estimates of future cyclist trips through the project have been developed using the Auckland Cycle Model (ACM). This strategic cycle demand model uses the Auckland Council's land use forecasts relevant at the start of the business case process ("Scenario I11.4") as well as forecast person trips from the Macro Strategic Model (MSM) to estimate future cycle demands, in response to cycle infrastructure investment. The ACM was developed to replicate a 2016 base and has been calibrated in the area of the project using local count data.

More recent land use forecasts were released by Auckland Council in early 2020 ("Scenario I11.5"). These forecasts assume greater growth within the Unitec site, but little change elsewhere within the project area. It is not anticipated that this change will materially affect the demand forecasts on the proposed cycleway.

The ACM has been used to produce estimated cycle demands with and without the project, for 228 and 2038 forecast years. In 2028, the model forecasts on average 700 daily cyclists on the project (actual estimates vary along the length of the project), increasing to 1,070 daily cyclists in 2038. The 2028 and 2038 models include surrounding investment in cycle infrastructure, including Westhaven to Akoranga and completion of the rest of the Auckland Urban Cycleways programme. Those projects collectively make cycling on Point Chevalier Road and Meola Road far more attractive than it is today, which explains the significant growth.

Estimating pedestrian demand

Estimated pedestrian demands have been developed based on surveyed pedestrian counts on two sections of Point Chevalier Road and at the Meola Road/Garnet Road roundabout. The economic evaluation assumes that the package of pedestrian improvements that the project delivers will result in a 10% increase in pedestrian demands.

It is assumed that pedestrian demands will grow at 1.5% per annum, linearly. This matches the 1.5% population growth forecast for Point Chevalie and Meola Road areas within the MSM model.

9.3 Benefit Streams

Table 18 summarises the discounted benefits assessed for the project.

Table 18: Summary of Project Benefits

Benefit stream	Source of benefits	Discounted benefits	
		EEM method	MBCM method
Cycling Benefits			
Travel time savings	Reduction in perceived travel times	$1.4 million	$2.1 million
Accident cost savings	Crash reductions due to cycle infrastructure	$2.7 million	$3.8 million

Benefit stream	Source of benefits	Discounted benefits	
		EEM method	MBCM method
Health benefits	Benefits of increased physical activity	$20.5 million	$33.0 million
Walking benefits			
Travel time	n/a	$nil	$nil
Accident cost savings	Crash reductions due to crossing improvements	$5.5 million	$7.5 million
Heath & environment	Benefits of increased physical activity	$5.2 million	$9.9 million
Public transport benefits			
Travel time savings	Travel time savings due to bus lane and fewer bus stops	$0.7 million	$1.1 million
Reliability benefits	Reduction in late buses due to bus lane and fewer bus stops	$1.3 million	$2.0 million
General traffic benefits			
Travel time, congestion, vehicle operating, emissions and reliability costs	Travel cost changes due to intersection changes	-$0.9 million	-$1.1 million
	Travel cost changes due to mode shift away from car use	$2.9 million	$4.3 million
Accident cost savings	Crash reductions due to traffic calming at intersections	$2.6 million	$3.2 million
Total benefits		**$41.9 million**	**$65.9 million**

Note: All benefit streams have been discounted at the appropriate MBCM/EEM annual discount rates, including the general traffic disbenefits. However, it is assumed that there is no future annual growth in general traffic volumes. Ie: the undiscounted general traffic disbenefits remain constant th oughout the evaluation period.

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The above economic benefits exclude a number of potential benefit streams that have been assumed to be negligible, or that are impractical to quantify. These include

- The effects of removing a short eastbound through lane on Garnet Road, on approach to the Meola Road roundabout. These are assumed to be negligible.
- The travel time effects of removing car parking on Meola Road, which is known to cause traffic delays at times when car parking occurs on both sides of the street.
- The travel time savings of new zebra crossings for pedestrians, most notably at the Garnet Road and Meola Road intersection, where pedestrians currently experience a high delay.
- Converse to the above, the travel time impacts of new zebra crossings on general traffic.

9.4 Project Costs

Project costs have been supplied by Auckland Transport and include:

- $2.8 million in pre implementation costs
- $36.3 million in construction costs

We understand that $3.3 million of the above construction costs will be funded by Auckland Transport's road maintenance programme, for pavement rehabilitation that would have been required with or without the project. This cost contribution has been assigned to both the project and the Do Minimum, effectively deducting it from the project costs.

An annual maintenance cost of 0.5% of the capital costs ($181,000 per annum) is assumed.

Discounted, these costs sum to between $35.6 million (EEM method) and $37.3 million (MBCM method).

9.5 Benefit cost ratio

The project has an estimated benefit cost ratio of:

- 1.2 using the EEM method ($41.9 million benefits, $35.6 million costs)
- 1.8 using the MBCM method ($65.9 million benefits, $37.3 million costs)

9.6 Benefit cost ratio sensitivity testing

A series of sensitivity tests have been run on the economic evaluation. These test the effects of:

- Higher and lower active mode demands (±20%)
- Applying a higher general traffic decongestion rate based on aggregated results from three 2026 forecast area traffic models
- Applying a lower general traffic decongestion rate, based on the default EEM SP11 method
- Applying the default EEM SP11 cycle health benefits, which conservatively apply only to that portion of each new cycle trip that takes place on the project (EEM method only)
- Assessing a high future uptake of e-bikes (resulting in more and longer e-bike trips, but conversely lower health benefits per km when applying the MBCM economic method)

The results are presented in Table 19

Table 19: Benefit Cost Ratios – Sensitivity Tests

Sensitivity Test Scenario	Discounted Project BCR	
	EEM method	MBCM method
Default EEM SP11 cycle health benefits	0.88	n/a
Low active mode demands (-20%)	0.96	1.4
Low general traffic decongestion rate (SP11)	1.1	1.7
Default BCR	**1.2**	**1.8**
High general traffic decongestion rate	1.4	2.0

Sensitivity Test Scenario	Discounted Project BCR	
	EEM method	MBCM method
High future e-bike uptake	1.6	2.1
High active mode demands (+20%)	1.4	2.1

9.7 Investment Assessment Framework Assessment

Results Alignment

Results alignment ratings for walking and cycling projects may include Low, Medium, High or Very High ratings. In order to achieve a High rating, the Point Chevalier to Westmere cycleway must address one or more of the criteria for Safety, Access – thriving regions, Access – thriving cities or Environment. The meets the following criteria for a High rating

"Safety

Addresses a high predicted walking or cycling safety risk"

"Addresses a high perceived safety risk to the use of a mode"

"Access – liveable cities

- *Targets the completion and promotion of networks in major metros to enable access to social and economic opportunities"*

The project forms part of the Auckland Urban Cycleways Programme (UCP) and the wider Auckland Cycling PBC. Together with existing cycle infrastructure such as the Northwestern Cycleway, other components of the UCP already under construction such as the Waitemata Safe Routes, the Herne Bay walking and cycling improvements and the Victoria Street Cycleway, as well as future cycle infrastructure, the project forms a part of a cohesive cycle network for Auckland's inner west. It will enable cycle access from the inner west to social and economic opportunities within the city centre.

- *"Supports increasing the uptake of children using walking and cycling especially to and from school"*

The project enables increased numbers of school children to travel to Point Chevalier Primary, Western Springs College, Westmere School and Pasadena Intermediate by bicycle. It also improves existing pedestrian crossing facilities for children walking to these schools.

"Environment

- *Enables a significant modal shift from private motor vehicles to active modes"*

The project enables a significant mode shift away from private car travel to active modes, primarily for commute to work and school trips.

Cost-Benefit Appraisal

As discussed in Section 9.5, the Point Chevalier to Westmere Cycleway has a BCR of between 1.2 (EEM method) and 1.8 (MBCM method).

Investment Assessment Framework (IAF) Prioritisation

With a High results alignment and a BCR range of 1.2 (EEM) to 1.8 (MBCM), the project achieves an IAF priority order of 5.

9.8 Incremental Assessment

The different options considered on this project had elements which were the same in all cases. For example, one option may have had unidirectional cycle lanes on Point Chevalier Road or a roundabout as opposed to traffic signals at the junction of Point Chevalier and Meola, but all options had bi-directional cycle lanes on Meola Road as this was the only viable solution. Consequently, it was difficult to consider the options considered as mutually exclusive. Further, the other options tended to be ruled out for other reasons such as failing to meet minimum standards in the Transport Design Manual or failing safety assessments. In light of the above an incremental analysis was not practicable.

9.9 Do-Minimum Option

The Do-Minimum was the Do-Nothing option apart from the rehabilitation work discussed in Section 9 3 Project Costs.

9.10 Economic Peer Review

Comment on any significant findings from the peer review and AT's response.

10 Financial Case

The Financial Case reports on the affordability, funding arrangements, financial planning and joint working opportunities for the project.

The construction costs for the project is $36.3M (including $3.3M of maintenance contribution). The total cost of the project, excluding maintenance but including the 5.7% AT Funding Admin Cost, is $34.9M. The cost estimate is included in Appendix F.

10.1 Project Cost and Cash Flow

Based on the current estimate, the anticipated cash flow for the investment proposal over its intended life span is set out in Table 20 below. The projected cash flow is indicative and is dependent on the proposed construction methodology.

Table 20: Project Cost and Cash Flow

Project cost (Expected Estimate)					
Year	**IBC/DBC ($ 000 / $m)**	**Pre-Implementation (Design) ($M)**	**Implementation (Construction) ($M)**	**Property ($M)**	**TOTAL ($M)**
2019/20	Sunk Cost	$0	$0	$0	$0
2020/21	0	$2.8	$9.3	$0	$12.1
2021/22			$27.0		$27.0
TOTAL	**$0**	**$2.8**	**$36.3**	$0	$39.1

Note: The total amount of $39.1M is inclusive of 5.7% administration component

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10.2 Timing assumptions

The project is expected to commence construction in Q2 of 2021 and be completed in Q4 2022.

10.3 Ongoing Maintenance and Operations Costs

The ongoing expenditure allows for a 0.5% of the total project cost is an annual maintenance cost (approx. $181,000 per annum), including the following key costs:

- Operating Costs
- Maintenance Costs
- Renewals Costs.

Whilst the expenditure allowance of 0.5% of the total project cost for annual maintenance is lower than normal, the actual expenditure allowance is realistic for quantity of the infrastructure proposed. This is due to the proposal having a higher than average per kilometre project cost for a cycling improvement

10.4 Funding availability

Auckland Transport will seek co-investment from the Waka Kotahi at a financial assistance rate (FAR) of 51%. ~~However, due to less local funding being available due to the financial effects of Covid 19 on~~

~~Auckland Council and AT, it is understood that there is a possibility that Waka Kotahi may wish to 'front load' the entire cost of the project and AT would subsequently predominantly fund another project so that the 51% FAR is maintained overall and much needed investment is able to be accelerated.~~

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10.5 Comparison Against Previous Cost Estimates

The estimate from the previous phase of work was based on a scheme that no longer met Auckland Transport's Strategic Intent, nor provided the quality of service expected for a new cycleway project. An alternative option from the 2017 work evaluated the costs of a scheme that is similar nature to the current preferred option and was costed at approximately $11.1m (excluding Meola Road pavement rehabilitation). The costs for the current proposals are within expected levels, with an increased level of detail, and consideration of escalation.

10.6 Parallel Cost Estimates

A parallel cost estimate was completed by ALTA in April 2020. This parallel estimate was prepared based on the drawings, reports and schedule of quantities provided by AECOM for the scheme design. The schedule of quantities was reviewed against the drawings provided and adjustments made and notified to AECOM where differences existed. Several review meetings were held with AECOM to compare estimates and narrow the differences identified in the estimates.

A comparison of the estimates is provided in Table 21~~Table 21~~~~Table 21~~. The expected estimate from the parallel estimate is within 3% of the project cost estimate. The 95th percentile estimates differ by approximately 7% due to the assumptions around the funding risk.

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Table 21: Comparison with parallel cost estimate

	Project Base Estimate	Project Expected Estimate	95th percentile Project Estimate
Project Estimate	$32.6 M	$39.1 M	$41.5 M
Parallel Estimate	$32.3 M	$40.3 M	$44.0 M

The project estimate is thus carried forward as a reasonable expected estimate.

10.7 Capitalisation of Assets

Capitalisation of the individual component of the project will be based on the asset class description (cycleways, footpaths, traffic signals, pavements, lighting, bridges and other structures, etc) prescribed in the Asset Creation Form. The asset creation will be completed upon the issue of the Practical Completion Certif cate to be supported by As-Built Plans. The As-Built Plans will be one of the deliverables from the successful contractor.

10.8 Project Revenues

There are no sources of project revenues identified.

10.9 Funding Assumptions

The funding assumption is made that the activity will be funded from Auckland Transport's local share (49%) with 51% Transport Agency's contribution (subject to Transport Agency's funding approval).

The underlying assumption is that the cost estimates are accurate within -15%+25% and there will be no budget overruns.

10.10 Financial Risk

Alternative funding sources are not being considered; therefore, project financing risk has not been assessed.

10.11 Joint working opportunities

This project has captured a number of opportunities to cooperate on adjoining projects or major related maintenance works. These include:

10.11.1 Meola Road Pavement Rehabilitation

The rehabilitation of the Meola Road pavement has been on the maintenance programme for several years but was deferred in order to undertake the works in conjunction with the cycleway in-line with AT's "dig once" policy. The construction of the cycleway along Meola Road results in a reduction in width from 9.1 to 7.0 metres and a shift in both the horizontal and vertical alignments. This re-alignment is not uniform due to the varying nature of Meola Road and as a result of the adjacent constraints (trees, crossings, bus infrastructure, bridges).

The result of this is that the centreline of Meola Road will have a significant and varying shift. Kerbs on both sides will need to be re-aligned. Meola Road will require a significant amount of re-shaping as a result of the cycleway construction. By incorporating the pavement rehabilitation into the project, the project significantly benefits because there is a financial contribut on from the maintenance budget of $2,474,340. This amount also covers some strengthening of Meola Road to meet the required structural capacity over the design life of the Meola Road pavement. It is noted if the cycleway was to progress without the rehabilitation, a pavement in such poor condition would have required significant preparation works, just for a re-shaping.

A 6-week closure is likely required for the construction works. As an ancillary benefit, considering the space constraints and heavy tidal flow during morning and evening peaks, undertaking both works at the same time is a significant benefit to the local community, commuters and Auckland Transport. Separately, the projects would have created disruption for nearly twice this time period.

Combining the project with the rehabilitation therefore shares a works scope required by both projects, as well as minimising disruption.

10.11.2 Point Chevalier Resurfacing

The construction of the cycleway on Point Chevalier Road, associated traffic calming, intersection improvements and bus lane requires kerb lines to be moved and lanes to be re-marked due to the horizontal shift. There will likely be significant temporary marking and blacking out of existing lines, which will leave the surface in poor condition at the end of construction. The only viable option is re-surfacing of Point Chevalier Road when works are complete.

The project will therefore receive funding from the maintenance budget of $825,660 as a contribution to resurfacing Point Chevalier Road.

10.11.3 Integration of Greenway Connections Motions Road to Meola Road

A new walking and cycling shared path known as the 'Greenways Connection' between Motions Road and Meola Road will be constructed at approximately the same time on MOTAT owned land. The project

team have been working in coordination with MOTAT and Western Springs College (from which students currently use this route en masse and will benefit most from the new connectivity) to ensure a safe connection between the two cycle facilities. In response, we have adjusted the location of the proposed crossings and bus stops on Meola Road and included a raised table at the MOTAT entrance. This will assist with traffic calming and provide a safe crossing point for pedestrians and people on bikes joining the new cycleway on Meola Road.

10.11.4 Streetscape and Ecological Value

The streetscape and ecological value along Point Chevalier Road and Meola Road will be enhanced as part of the project. Four new pōhutakawa trees are planned for Point Chevalier Road to complement the existing pōhutakawa. On Meola Road, space requirements dictate the need to remove approximately 35 trees which are non-native species. These trees have been significantly damaged by the trimming for the overhead power lines and require further trimming in order to meet the mandatory safety clearance for high vehicles.

The project team have worked closely with an arborist to assess and make recommendations for the changes. AT have also communicated the tree replacement proposal to Iwi, who are fully supportive particularly because the replacement trees will be native trees.

The native trees support native wildlife and will contribute to the regeneration of species that are threatened by lack of habitat and food. The proposal will replace approximately 35 non-native species with 45 native species, increasing the total number of street trees.

10.11.5 Stormwater Treatment

The project has a negative net contribution to vehicle trafficked impervious area, as Point Chevalier Road, Meola Road and Garnet Road all capture existing carriageway for the cycleway. This will result in the effective reduction of contaminant run-off in stormwater. The project will also implement some stormwater treatment in the form of rain gardens and stormwater filters.

AT have coordinated with the Healthy Waters team at Auckland Council, who have indicated their willingness to contribute financially for these facilities. The level of the Healthy Waters contribution is not yet known. Healthy Waters will also become the owners and maintainers of the resultant stormwater infrastructure.

10.11.6 Lighting

All of the existing lighting in the project area is High Pressure Sodium (HPS) lamps. The entire project area will be upgraded to Light Emitting Diode (LED) lamps. The changes to lighting include:

- New poles required because of new infrastructure (such as crossings)
- Replacement poles because of changed geometry / location
- Same pole in same position but upgraded lamp to LED.

The project will fund the costs of project related changes, but lamp upgrades will be installed by the AT Street Lighting department from their own budget.

This will result in uniform lighting and a substantial improvement to current conditions across the whole project area.

10.11.7 Power Line Undergrounding

Over the years most of the project route has had the power lines undergrounded (about 1.8km out of 2.4km). However, there remains about 600 metres on Meola Road west that is contains overhead power lines. There has been substantial pressure from the community to get this section completed.

For this project, the undergrounding is not essential. However, the 600 metres of overhead lines will need relocation (an approximate 1 metre lateral shift) in order to provide the new cycleway. The cost

of the relocation of the poles is about $700,000, which is a project cost. The cost of the undergrounding would be in the order of $1.5M.

The project team will put forward the value proposition for including the undergrounding option in this project to the PCG for approval as a scope change. The additional benefits will be:

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- Less limitation on the replacement planting options. The new trees will be located on the same line as the power infrastructure. Planting trees that, after about 5 years, incur the same difficulties as the current trees because of the overhead lines is not desirable;
- Relocating the poles will require completely new poles. This will then be a sunk cost should the undergrounding happen at a later date. The cost of the poles is substantial;
- There would be reputational damage to AT and to Vector should the pole relocation happen now, and the undergrounding take place in a few years for not coordinating the projects;
- There is a desire from the community for the undergrounding to be completed and to bring uniformity and general aesthetic benefits to the corridor. This issue received many comments in the cycleway consultation, despite not being directly related and is a constant topic in community engagements on the project.

10.11.8 Meola Reserve Parking Upgrade

The Meola Reserve entrance is on the northern side of Meola Road. The car park regularly becomes full and on-street parking on Meola Road is used for the overflow (typically up to about eight additional vehicles). The local board has approved a project to undertake an expansion of the car park to about double its current capacity. This will remove the need for people to use Meola Road which integrates well with the cycleway project. Crossings to Meola Reserve will also be upgraded.

11 Commercial Analysis

11.1 Introduction

It was confirmed by the Auckland Transport Board that the project is approved to procure and construct as per the procurement strategy outlined below. Upon completion, the asset will be transferred to AT for the responsibility of its operation and maintenance.

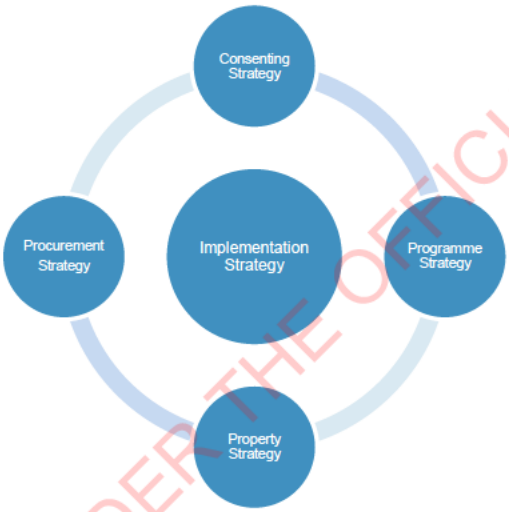
11.2 Output Based Specification

A range of outcomes and outputs that will form the basis of the full specification is currently under development. The new facility design has been developed as per the AT Transport Design Manual (TDM), and any other relevant standard, unless a departure is agreed with AT.

11.3 Implementation Strategy

The project is to be delivered as a single contract, with the Contractor to determine the programme that best meets the outcomes sought from the Contract.

Figure 33: Implementation Strategy



11.4 Procurement Model

The following sourcing/ procurement contract models were considered:

- Traditional;
- Early Tender Design (with an ECI component)
- Full ECI (Margin and negotiated P&G based).

These are further discussed in the Early Tender Procurement Strategy (Appendix N), with the preferred model being a modified ECI model in an Early Design tender model.

An ECI stage in the Early Design tender procurement model will encourage a collaborative approach to the project delivery - most notably working in coordinating with key stakeholders within AT to ensure that the operational plans in place will allow for minimal disruption to the residents and road users in

the area throughout the project lifecycle. This issue will affect the reputational outcome for AT, particularly as the project is combining the Meola Road rehabilitation delivery with the Point Chevalier cycleway.

There is an opportunity for a Contractor to add value during the design phase in innovation and efficiency, as well as effectively manage supply chain pressures. The ECI model allows for early identification of design optimising opportunities and appropriate allocation of risk to the party best able to manage that risk.

An informal market sounding of AT Tier 1 Panel members and other Contractors with prior experience of roadside civil and pavement rehabilitation projects could indicate whether an appetite to tender for the Point Chevalier cycleway project is robust. Prior to issuing a Request for Tender (RFT) it is intended to arrange a pre-tender interactive with interested tenderers. During the tender period, opportunities for a further tenderer-specific interactive will be arranged to respond to questions and comments arising during the tender submission period.

By adopting this approach, tenderers would discuss how they would address the key project issues before finalising their tenders, rather than addressing details of these issues after a contract is let. This would give both the tenderer and AT greater certainty about the acceptability of the offer being tendered.

Of particular relevance, will be information on how the tenderer proposes staging the construction works given working on pavement rehabilitation, resurfacing and cycleway projects to be delivered under one package of works and minimizing disruptions along the route.

After consideration, the project team recommend pursuing an Early Tender procurement as likely to achieve the best overall outcome for this project subject to market engagement to gauge the Contractor appetite for this model.

The contract will be professional service bespoke contract based on the Downtown Infrastructure Programme precedent, which will be novated to a modified NZS3910:2013 contract reflecting the ECI model. These modifications will be informed by prior ECI lessons learned, particularly the recent Downtown Infrastructure Programme ECI contract.

Supplier Selection Method

The following Supplier Selection method is recommended for the proposed Contract Model:

Stage 1 (Pre-Construction):

- AT Quality Based Method with fixed P&G and margins for Stage 1 and Stage 2
- Pricing to be cost reimbursable, as established on a tendered schedule of rates to a capped estimate.

Stage 2 (Construction):

- Novation to a modified NZS3910:2013 contract subject to satisfactory completion of the pricing, design, documentation, approvals and procurement activities during Pre-Construction;
- Subtrades tendered competitively with AT evaluation involvement/oversight, with fixed P&G and margins established at Pre-Construction tender;
- Self-performing work to be priced on an open book basis reconciled against an independent parallel estimate. This function to be performed by a suitably ECI-experienced Quantity Surveyor; and,
- At completion of detailed design, a final reconciliation between the Contractor and parallel estimator to agree a lump sum or target price for the entirety of Stage 2.

The preferred tenderer should be chosen on:

- Demonstrated track record and relevant experience of road corridor working and the ECI contract model;
- The competency and experience of the proposed Contractor team;
- Demonstrated mature health and safety, quality, supply chain management and other processes being robust, well-supported and appropriate to the scale, challenges and complexity of the project;

- Demonstration of a partnering and 'no surprises' approach to achieving the project's critical success factors and introducing innovation to add project value; and,
- Their submitted fixed P&G and margin.

The reason for recommending a Quality based evaluation is that until the design is completed pricing of the Stage 2 Construction cannot be accurately achieved and the emphasis for Stage 1 Pre-Construction should be on securing the most competent Contractor team able to enhance the project design and outcomes without the rates of these individuals being a deciding factor in the contract award.

Price tension for Stage 2 Construction is retained by fixing the P&G and margin percentages, parallel estimation and reconciliation with the Contractor's pricing and demonstrating competitive tendering of subtrades with AT involvement.

The proposed evaluation criteria are outlined in Table 22~~Table 22~~~~Table 22~~.

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Table 22: Tender evaluation criteria

Scored Criteria	**RFT Weight %**
Track record demonstrating prior experience with complex, multi-disciplinary vertical builds in rail environment, including 3 recent references	20%
Skills and experience of Contractor Team Pre-Construction and Construction Stages	35%
Methodology to meeting the project critical success factors	45%
Mandatory Criteria	
Commitment to ISNetworld registration status 'Approved' by construction	Pass/Fail
Health & Safety ACC Tertiary or Secondary accreditation	Pass/Fail
Ability to obtain a surety with a bank registered in New Zealand or an Insurance company with a credit rating of no less than A-registered with the Reserve Bank of New Zealand for 10% of the current contract value estimate. Refer to: http://www.rbnz.govt.nz/regulation-and-supervision/insurers/ra ing	Pass/Fail
Quality Management Systems which are independently certified ISO9001 compliant	Pass/Fail
Prior experience as a head contractor in an ECI contract	Pass/Fail
Schedule of Rates to be provided	Pass/Fail
Fixed P&G and Margin for Construction stage	Pass/Fail

11.5 Risk Allocation and Transfer

As the Contractor will be provided with a detailed design, to then construct, Auckland Transport will hold the risk for technical elements of the project, and the contractor will carry the risks associated with the delivery of the project (e.g. Traffic Management, compliance with consents, resource availability etc).

11.6 Sourcing Options

The following options were considered:

- Tier 1 Panel

- Two Stage approach including an evaluated Registration of Interest (ROI) stage
- Single Stage approach

Tier 1 Panel

Approaching the Tier 1 Panel would be the quickest route to engagement. All the contractors are pre-qualified and there is an existing and well-understood contractual framework in place. It is expected that the works would attract interest from several of the Panel members, given that most of the work is general civil. Procurement is not proposed to be restricted to the Tier 1 supplier panel on the basis of the Panel Agreement: "Where there are works that Auckland Transport determines, in its sole discretion, to contain elements that are of a specialised nature (e.g., value of building structure is more than 50% of the contract value... Auckland Transport may choose to procure such works from outside of the Panel."

Two Stage

A two stage approach where an initial ROI uses quality-based evaluation criteria to shortlist approximately three tenderers for a second RFT stage is not recommended. One of the advantages of the ROI is it allows a long list of interested tenderers to be short listed to leave a manageable but still competitive group for the RFT stage; however indications are that, whilst the market is competitive there are a limited number of suppliers that could complete the works.

Single Stage Approach

A single stage approach can be carried out within a shorter timeframe, eliciting greater benefits from the ECI model by involving the Contractor in the project during late preliminary design stage. Given the limited number of suitably experienced Contractors expected to tender for the project, short listing of tenderers through a two stage approach is not considered necessary.

Recommended

The single stage approach is recommended.

11.7 Payment Mechanisms

The proposed payment mechanisms will be based on AT physical works suppliers panel framework and will be linked to performance and availability.

11.8 Pricing Framework and Charging Mechanisms

The AT physical works suppliers panel framework would have its own measures including incentives, deductions and performance targets.

11.9 Contract Length

The scenarios for contract length and proposed key contractual clauses will be confirmed as part of the procurement process. They will generally reflect the programme for the implementation phases provided in Section 13 below.

11.10 Contract Management

Contract Management will be executed in accordance with the Contract.

12 Management Case

This project will be developed and delivered by Auckland Transport utilising the Project Management Framework (PMF15) unless otherwise stated in this document. Contract Management will be executed in accordance with the Contract.

This Management Case details the project planning, governance structure, risk management, communications and stakeholder management and assurance processes that will be established for the construction of the project. The management case also sets out the benefits realisation framework and mechanisms to monitor the performance of the project post completion to ensure that the benefits from the investment are realised and will include measures for assessment and evaluation.

12.1 Project Plan and Schedule

Figure ~~Figure~~ ~~Figure~~ 33 illustrates the schedule through to the Contract Award based on the preferred procurement method outlined in the Commercial Case. The programme is based on completing the project by June 2021, however, it may need to be updated when further details of funding approval become available.

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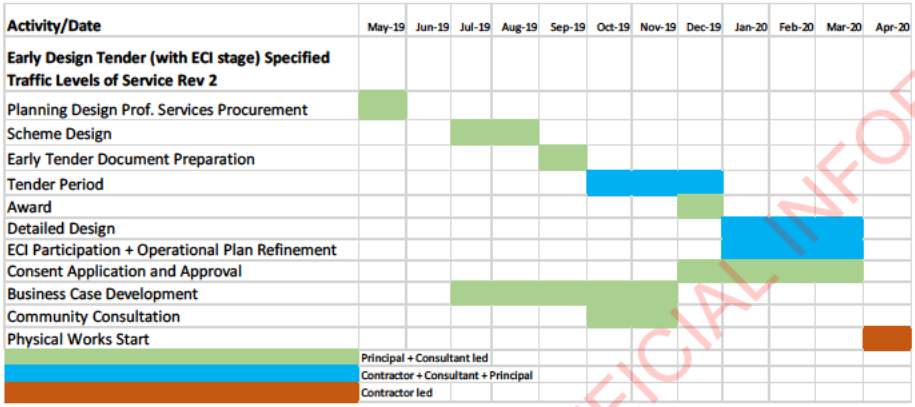
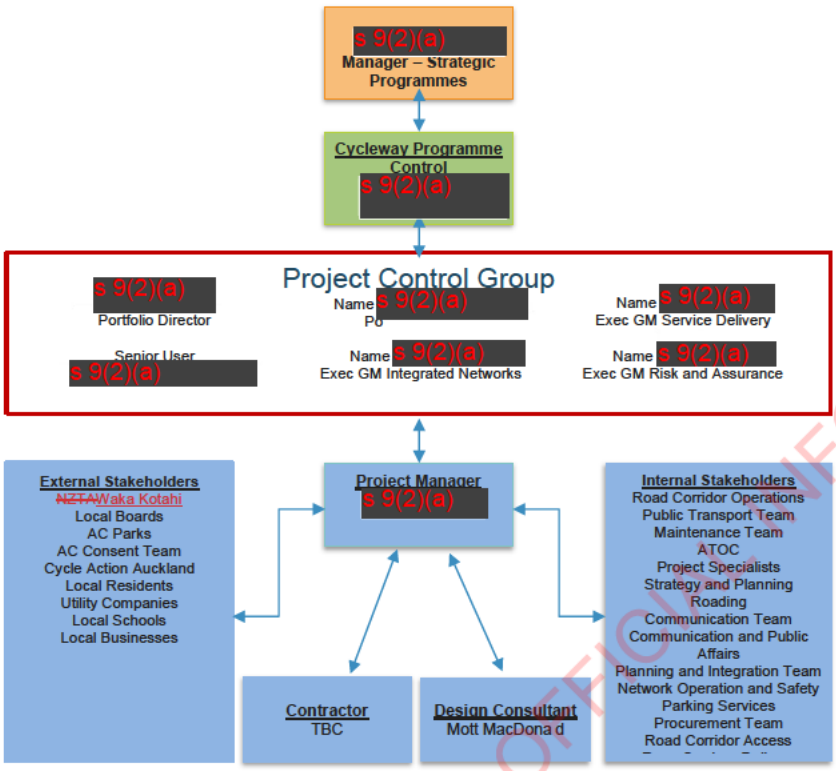
Figure 33: Programme to Contract Award



12.2 Project Roles and Governance

The project governance structure is provided in Figure 34

Figure 34: Project Governance



The roles and responsibilities are provided in Table 23.

Table 23: Roles and Responsibilities

Role	Responsibility
Project Manager	In accordance with Section 3.3.1 of Auckland Transport's Project Management Framework (PMF15) The Project Manager will: • Build and manage the relationship with the client. • Negotiate with the client and agree how the requirements and objectives will be achieved. • Prepare a project plan, detailing all activities required to deliver the project to agreed time, cost and quality standards – This plan is the Project Initiation Document (PID) at. • Negotiate and agree the delivery of the project with internal support staff. • Monitor progress against plans, initiate remedial action and resolve problems to ensure delivery. • Identify and manage risks. • Carry out a detailed Stakeholder Analysis. • Produce a Stakeholder Engagement and Communication Plan. • Manage the project finances together with the departmental finance officer. • Prepare expenditure forecasts and actuals as required. • Provide regular reports to the Project Control Group (PCG) on project progress and maintain the project history for audit purposes. • Escalate issues/problems where appropriate.
Project Sponsor	In accordance with Section 3.3.2 of Auckland Transport's Project Management Framework (PMF15) • Remains in place for the duration of the programme or project. • Recognised as the owner of the project throughout the organisation. • Owner of overall business change. • Responsible for the successful delivery of project. • Ensures the project is technically and financially compliant. • Ensures the project is identified in the organisation's LTP and Integrated Transport Programme. • Proactive in providing leadership and direction throughout life of project. • Provides approvals and decisions that affect project progress and delivery. • Chair the PCG meetings. • Escalates issues beyond the delegated authority of the PCG to the SMT.
Client (End User)	In accordance with Section 3.3.3 of Auckland Transport's Project Management Framework (PMF15)
Project Control Group (PCG)	In accordance with Section 3.3.4 of Auckland Transport's Project Management Framework (PMF15) Project Control Groups (PCG's) are decision making bodies that ensure the right activities are taking place, undertaken correctly and are in alignment with strategic goals. The PCG provides a forum for senior management to better understand the scope, benefits and financial and contractual status of infrastructure projects,

Role	Responsibility
	enabling informed decisions to be made and ensuring a high level of communication with stakeholders. The PCG will discuss any key issues or potential delivery risks that may have adverse implications for Auckland Transport (AT) in terms of time and cost; or being of a high public profile / politically sensitive nature whilst ensuring a zero harm focus on project delivery is maintained. Any approvals or endorsements required that are outside of the PCG's delegated financial authority will be referred to the AT Chief Executive or AT Board. The PCG members are not involved in the day to day management of the project but rather set the broad direction to be implemented by the project team responsible for the delivery and administration of the project. The PCG will be responsible for number of approvals including: • Ensure that the input from both the PCG and other User Groups in the development process is effectively achieved and, when required, that any issues of dispute between relevant parties are resolved • Provide a discussion forum with the authority to respond to requests fo decisions or recommendations received from the Project Sponsor • Assist the Project Sponsor in the development of service plans, master plans, business cases, facility plans and contract documentation • Receive and endorse monthly project reports prepared by the Project Sponsor • Ensure the development of resources, schedules and associated costing • Ensure that the organisational and/or wo k practice changes from the agreed Business Cases are identified and achieved • Provide direction and guidance to themselves about objectives and strategies • Report progress to the SMT o a project steering group (if applicable) on a monthly basis • Establish Project User Groups to provide user requirements and input into the project development process • Meet monthly at a regular time convenient to all members or as the project timetable dictates and, • The PCG or its Chair may co-opt temporary members onto the PCG as required. The Secretary to the PCG • will be in attendance and the PCG may invite others to attend meetings where necessary. • The PCG is responsible to the SMT or a project steering group, where applicable. • Project Closure

Project Delivery Team & Resources

The AP Project Delivery Team is provided in Table 24.

Table 24: AT Delivery Team

Role	Name
Project Manager	s 9(2)(a)
Planning Specialist	
Property Specialist	
Cycling & Walking	
Urban Design	
Stormwater	
Mana Whenua Engagement	
Communications	
Public Transport	
Road Operations	
Road Safety	

12.3 Resourcing

The resources required through the construction phase is provided in Table 25.

Table 25: Resources required in the construction phase

Construction Phase	Role	Internal / External	Time Frame	% Effort
AT	Planner	Internal	3 month	10%
	Contract Manager	Internal	1.25yrs	50%
	Senior Engineer	Internal	1.0 yrs	20%
	Graduate Engineer	Internal	1.0 yrs	30%
	Commercial Support	Internal	1.0 yrs	15%
	Quantity Surveyor	Internal	1.0 yrs	15%
	Comm s Support	Internal	1.0 yrs	20%
External	Engineer to Contract (TBC)	External	1.0yrs	10%
	Designers	External	1.0 yrs	20%
Iwi	Iwi Artworks (TBC)	External	1.0 yrs	5%
Contractor	TBC		1.0 yrs	100%

12.4 Milestones

Summary of project milestones are outlined in Table 26. Changes to these dates will be approved through the change request process. Authorisation levels will depend on the impact severity of the change in accordance with Auckland Transport's Project Management Framework (PMF15).

Table 26: Project Milestones

Milestone	Description	Start Date	Finish Date
Design Business Case	Obtained approval for design business case	June 2019	Oct 2020
Procurement/Tendering for Design	Procurement and award of design contract	Jan 2019	May 2019
Draft Detailed Design Report	Complete the draft detailed design phase	June 2019	October 2020
Internal Consultation	Complete internal consultation	August 2019	Ongoing
Consultation	Complete internal and external consultation	August 2019	December 2020
Resource Consents	Prepare, lodge and obtain approval from Auckland Council	Feb 2020	April 2020
Land Acquisition	Undertaking land take negotiation and sign agreements under PWA	N/A	N/A
Business case for Construction	Prepare construction business case and approvals	Oct 2020	Feb 2021
Procurement/Tendering for Construction	Procurement and award of construction contract (subject to funding)	Feb 2021	May 2021
Construction	Construction contract (15-18-month construction period)	June 2021	December 2022
Project Close	Close out the project		Dec 2022

12.5 Project Assumptions

The key project assumptions which are relevant to the project are:

The ability of AT consultants to successfully resource and deliver the project.
The project will gain co-share funding from ~~NZTA~~Waka Kotahi.
The construction market capacity will be available to deliver the project.

12.6 Constraints

The key project constraints exist within the construction operation area. These are:

- The Meola Road corridor. The work to be undertaken in the Meola Road corridor is substantial across and includes fence to fence boundaries in terms of space. Maintaining the traffic environment, and in particular keeping 2 lanes open for the tidal peaks of commuter traffic, will require substantial compromise to construction activities. This risk is being managed by a proposed 6 week closure over the 2020 Xmas period;
- Parking for Seddon Fields users. Currently parking overflow from Seddon Fields spills onto Meola Road. Current indications are that the new car park at MOTAT which will in future cater for all the Seddon Fields parking requirements will finish 2 months after Meola Road construction. There is likely to be a 2 month period during the football season when the adjacent road parking is not available and users will have to travel from nearby streets -4-500metres away to Seddon Fields on the footpath.
- The businesses on PT Chevalier Road will experience disruption outside their property frontages during construction. There are about 10 businesses that will be affected and this includes café's and restaurants which rely on the environment to create business. AT will manage this with a complete "Development Response" plan designed to reduce the impact and develop opportunities for those affected.
- The major intersection upgrade works at Point Chev and Meola T-intersection will require careful operational planning in order to reduce the disruption. This could include a combination of night works, diversions and works during the Meola Road closure

12.7 Dependencies

The key project dependencies are outlined in Table 27.

Table 27: Project Dependencies

Dependency For / On	Potential Impact
Proposed MOTAT car park will be developed in order to offset the parking loss on Meola Road	Re-design of the Meola Road section of the project would be required, requiring significant re scoping. The likelihood of this is low as the project has confirmed funding in place and is being developed.
Resource Consent Application	The resource consent application is being entered on the basis that it does not trigger any need for consultation or limited consultation. However, this will only be known for certain upon completion of the application processing.
Landowner Approvals (Auckland Council)	Some minor earthworks require landowner approval for temporary occupation where the road batter extents in reserve land.
Major Services Relocation	The power poles on Meola Road will need to be relocated to accommodate the cycleway. At this stage the assumption is that Vector will undertake this work early during the construction programme and not place risk on the overall programme. This has not yet been confirmed.

Commented [A6] s 9(2)(a) WK question: Has there been any consideration as to how the MOTAT Carpark construction traffic will access the MOTAT site during the works on Meola Road?

12.8 Project Controls

Project Meetings

The project will use standard project meeting templates such as:

- Meeting Agenda
- Meeting Minutes
- Projects Meetings for each stage:
- Project initiation meeting
- Kick-off meeting
- Design Workshops
- Risk workshops
- Project team meetings
- Design review meetings
- Stakeholder meetings
- Pre-tender meetings

The project team will also undertake a number of stakeholder presentations to key stakeholders, both internal and external. This includes the Albert Eden and Waitemata Local Boards, the AT Executive Team, ~~NZTA~~Waka Kotahi, Iwi and the Tier 1 Panel Contractors.

12.9 Risk Management

In order to mitigate generic risks and project specific risks that emerge through a project, a Risk Management Plan has been implemented in the following manner:

- Hold risk workshops with key stakeholders at project milestones.
- Update the existing Risk Register that identifies both inherent and residual risks.
- Regular monitoring and updating of the Risk Register until project completion.
- Risk management in accordance with controls and mitigation identified in the Risk Register.

A project risk register has been established and maintained throughout the life of the project. This will be reviewed at each progress meeting and the top 5 key risks have been included in the monthly PHR. A risk assessment has been completed and potential risks have been identified of high to low threats.

The top risks are:

- Project Funding: If the project does not receive it's co-funding from ~~NZTA~~ Waka Kotahi the construction may not go ahead, due to lack of funding.
- The design: The project exists in a busy urban environment with substantial coordination between design issues required within existing (mostly spatial) constrains. The risk Is that the designers are unable to achieve a safe design that balances the risk between absolute design standards and practical solutions.
- The project is reliant upon the relocation of power infrastructure. The timing of the infrastructure relocation could impact the construction programme of the main contractor.
- Design risk workshops have been held. A Pre-construction risk workshop will also be undertaken, prior to commencement of physical works. The risk register will be maintained as a live document throughout the project life

Any significant risks or issues that arise and have not been identified or sufficiently allowed for and which affects budget and time by the criteria above, project manager will assess the risk. If the risk level changes due to new situation, it will be presented to the Sponsor through PHR

12.10 Issue Management

The project maintains an issues register that will be used throughout the project life. It is treated as a working document and, at this stage, forms a key component of the communication between the project delivery team, planners and the designers.

Project Tolerances

The Project Manager is notifying the Project Sponsor via the monthly project status report of any changes that sit outside accepted tolerances. Any change to the project scope and deliverables, or departure from the project requirements will require a formal Project Change Request which must be authorised by the Project Control Group. Guidelines for criteria that would be specifically addressed are as follows.

Scope

Any change in scope by the client, end user, other party will be assessed first by the project manager by completing a scope change request application. The time/ cost impact of the requested scope change will be presented to the Change Project Control Group (CPCG) and the project Sponsor for approval before implementation. The outcome of the CPCG and Sponsor's decisions will be reported in the monthly PHR.

The scope change will not be implemented until the project manager has the written approval to effect the change.

Budget

If the design phase budget is forecast to exceed the approved budget, then the project manager will initiate the variation to the budget process for consideration by the Sponsor. Approved variations will be reported in the monthly PHR. For Transport Agency subsidised projects, a copy will also be sent to the Funding team to initiate a Cost Scope Adjustment (CSA)to help offset the additional cost of the project.

The project manager cannot commit additional budget until it is approved by the appropriate financial delegation. The project manager will realistically reforecast the total expected cost of the project on a monthly basis within SAP system.

Programme

If the design phase project schedule baseline date for completion is likely to extend by one month or more, the project manager will assess the cost implications of the extension of time and present to the Sponsor for approval. The outcome of the Sponsor's decision will be reported in the monthly PHR

12.11 Quality Management

The project has maintained standard quality standards appropriate for AT, specifically:

AT Code of Practice (Design Manual)
Austroads Standards
Safe systems approach
Urban Design Framework
Standard Engineering Detail (S.E.D)
Development Code NZ & Auckland
CPTED (Crime Prevention Through Environmental Design)
Accessibility Standards

Any deviation rom the standards would require sign-off by the Policy & AMP Specialist (Robert McSpadden) and the project manager will be responsible for initiating and close- off of the standard AT quality deviation/departure process.

The following reviews of the documentation has been undertaken at suitable stages of the design phase to maintain the quality,

Technical peer review by the AT specialist staff.
Technical peer reviews of the design documentation by an external consultant.
Peer review of economic analysis and cost estimates.

Acceptance

Safety Audits and peer reviews
External stakeholder acceptance
Traffic Control Committee sign off
Auckland Council Parks sign off
Consents approval
Mana Whenua approval
Project Objectives met

Peer Review

In-house peer reviews will be undertaken by:

Design Office
Safety in Design
Traffic Operations
Transport Services
AT Metro (bus services)

External reviews will be undertaken by:

Auckland Council Design Office

Change Control

All changes will be requested, costed and recorded outside of any parameters set by the project manager. By instigating this process, the project manager will assess the impact that changes will have on the project as a whole from a cost and time perspective. The change(s) will provide valuable information at the post-project review meeting when final outcomes are compared against the original Project Initiation Document (PID) refer to Appendix K.

The project manager will brief anyone who is involved in completing a Work Package as part of the project on the change process. Levels of change authorisation should be known from the outset of each phase.

Any change request must include a detailed description of the proposed change and its impact on the project as a whole, or in respect to time, cost and quality. Some changes could have significant impact and may require PCG/Project Sponsor approval. The Project Manager will determine the level of authorisation required based on the tolerances agreed in the Business Case document. Once approved, the work package will be updated and reissued

A project control register will be kept within the project site.

Cost Management

If the design phase budget is forecast to exceed the approved budget by + 10 %, then the project manager will initiate the variation to the budget process for consideration by the Sponsor. The approved variation will be reported in the monthly PHR. The project manager cannot commit additional budget until it is approved by the appropriate financial delegation. The project manager will reforecast the total expected cost of the project on a monthly basis within the SAP system.

Contract Management

All necessary contractual arrangements with third parties will be signed off prior to starting construction.

Commented [A7 s 9(2)(a) I suggest we remove this paragraph if it is not required

Commented [A8R7]:

Safety Audits

A Road Safety Audit (RSA) will be undertaken as per the Transport Agency guidelines at the end of Detailed Design phase and at the end of Construction. The audits will be undertaken using the following processes:

The Independent Road Safety Auditor is an external consultant.
The Road Safety Audit response by the designer.
The Internal Road Safety Engineer will review and provide comments
The Project Manager will make the final decision.

Health and Safety

Confirmation of health and safety requirements will be finalised once a contractor for physical works is in place.

Post Implementation

As part of the project, it is proposed to install permanent cycle counters to measure the changes in cyclists following implementation. This is a separate piece of work which is being done for all Urban Cycleway Projects.

13 Assessment profile

The project was assessed using the NZ Transport Agency Investment Assessment Framework (IAF). It is based on the accumulated strategic case, options assessment and economic case. An assessment profile of HL has been determined for the project using the Transport Agency's funding allocation process as detailed below:

Results alignment of the problem, issue or opportunity that is being addressed: **High**

The meets the following criteria for a High rating

"Safety

- "Addresses a high predicted walking or cycling safety risk"

  Urban KiwiRAP indicates Point Chevalier Road between Gt North Road and Meola Road has a Medium High Collective Risk classification. This is reflected in crash statistics which indicated that between 2015 and 2019, 5 of the 6 active mode crashes occurred midblock.

- "Addresses a high perceived safety risk to the use of a mode"

  Consultation responses often mention the issue of Meola Road and Point Chevalier Road being a hostile environment for pedestrians, especially when they need to cross the road.

"Access – liveable cities

- Targets the completion and promotion of networks in major metros to enable access to social and economic opportunities"

  The project forms part of the Auckland Urban Cycleways Programme (UCP) and the wider Auckland Cycling PBC. Together with existing cycle infrastructure such as the Northwestern Cycleway, other components of the UCP already under construction such as the Waitemata Safe Routes, the Herne Bay walking and cycling improvements and the Victoria Street Cycleway, as well as future cycle infrastructure, the project forms a part of a cohesive cycle network for Auckland's inner west. It will enable cycle access from the inner west to social and economic opportunities within the city centre.

- "Supports increasing the uptake of children using walking and cycling especially to and from school"

  The project enables increased numbers of school children to travel to Point Chevalier Primary, Pasadena Intermediate, Western Springs College and Westmere School by bicycle. It also improves existing pedestrian crossing facilities for children walking to these schools.

"Environment

- Enables a significant modal shift from private motor vehicles to act ve modes"

  The project enables a significant mode shift away from private car travel to active modes, primarily for commute to work and school trips.

Cost-benefit appraisal rating of the proposed solution: **Low**

As discussed in Section 9 the Point Chevalier to Westmere Cycleway is expected to have a BCR of 1.2.

Investment Assessment Framework (IAF) Prioritisation

With a High results alignment and a BCR of 1.2, the project achieves an IAF priority order of 5.

14 Lessons Learned and Post-Implementation Monitoring

14.1 Lessons Learned

While planning, the project team reviews the results of past projects. This prevents similar projects from making the same mistakes. The team evaluates its own successes and failures and records them in a Lessons Learned Database.

The project Manager is accountable to the review the project lessons learned data provided be the team and facility to learn how to improve project management methods and productivity and it provides an opportunity for the team to take effective action and have control over the future that increase job satisfaction, moral, and ability to take joy in work.

14.2 Post Implementation Monitoring - Approach and Schedule

The proposed benefits realisation framework is set out below.

Table 28: Benefits Framework

Project Objectives	Benefits Realisation KPI
Provide infrastructure to support and encourage trips by bike to local centres such as Point Chevalier and Westmere	Mode share: Triple the cycle mode share (or cycling trips) to local destinations (Point Chevalier shops, Westmere shops, Meola reserve/MOTAT, Coyle Park, Local Schools)
Create a link for all ages and abilities cyclists between the central western suburbs and the CBD via the North-western cycleway or the Proposed Western Waterfront connection through Herne Bay, the Westhaven Promenade and Wynyard Quarter. Link and expand the Auckland Cycle Network	Access: Increase in % of people of all ages and abilities cycling along the route (Monitor) Access: Percentage completion of the strategic cycle network
Improve real and perceived safety along this route for the target cyclist groups.	Safety: A 20% reduction in vulnerable user crashes, and vulnerable user DSI's by 2028 Access: Perception of Safety and ease of cycling (Monitor)
Increase levels of cycling along the route and in the city centre in general to contribute to reducing the growth of car trips	Triple the number of cyclists using the route by 2028. Triple the cycling mode share (or cycle trips) for trips to longer distance (including CBD) by 2028
Look for opportunities to deliver cycle parking.	Design outcome: Provision of cycle parking
Deliver appropriate facilities along Meola Road and Point Chevalier Road to provide a safer, more coherent and attractive route that improves mobility for pedestrians, people on bikes, public transport and its users of all ages and abilities. The design will also improve/reflect the character and value of the community	Cycling: Quality of service (outlined above) Public transport: Reduce variability to daytime (10am to 2pm) levels Public transport: Reduce variability to daytime (10am to 2pm) levels Pedestrians: Increase in pedestrian volumes

15 Appendices

Appendix Reference	Appendix Title
Appendix A	ILM
Appendix B	Strategic & Context Review
Appendix C	Stakeholder Engagement
Appendix D	Long List Options Assessment
Appendix E	Option Assessment
Appendix F	Cost Estimate of the Preferred Option
Appendix G	Economic Evaluation
Appendix H	Design Philosophy Statement
Appendix I	Preferred Option Drawings
Appendix J	Risk Register
Appendix K	Safety Audit
Appendix L	Resource Consent Application
Appendix M	Scheme Assessment Report 2017
Appendix N	Early Tender Procurement Strategy