

Pt Chevalier to Westmere Cycleway Business Case

Addendum (August 2022 Update)

August 2022

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Executive Summary

Auckland Transport (AT) developed a Single Stage Business Case (SSBC) to provide the case for investment into the Pt Chevalier to Westmere Cycleway¹, a corridor upgrade connecting the communities of Pt Chevalier and Westmere with improved walking and cycling facilities and bus priority improvements. The proposal seeks to address deficiencies in the existing transport network that will in turn, allow and encourage residents to travel more sustainably.

This addendum updates the Pt Chevalier to Westmere Cycleway SSBC with changes which have occurred since late 2020.

The changes and updates outlined in this addendum continue to provide clear justification for the preferred option. In summary:

- The Expected Estimate (P50) for the project is \$47.0M. The P95 estimate is \$52.6M. The cost estimates were updated by Alta in June 2022, and a parallel cost estimate was prepared by WT New Zealand and the costs finalised in July 2022. It was agreed that the project estimate was acceptable.
- The benefits applicable to this project from the Land Transport Management Benefits Framework are:
 - Benefit #1.1: Impact on social cost of deaths and serious injuries
 - Benefit #8.1: Impact on Greenhouse gases
 - Benefit #10.1: Impact on user experience of the transport system
 - Benefit #10.2: Impact on mode choice
 - Benefit #12.1: Impact on Te Ao Māori
- The Appraisal Summary Table shows the preferred option contributes well to the investment objectives and named benefits and returns a positive BCR of 1.8 with a FYRR of 4.9%.
- The SSBC was peer reviewed by Harrison Grierson in October 2021 and the response to the peer review is included within this addendum with no outstanding issues to note.
- The project has been assessed using the Waka Kotahi Investment Prioritisation Method for the 2021–24 NLTP and has a proposed rating of High-High-Low, giving it a draft investment priority order of 5.
- The project is expected to commence construction in September 2022 and be completed in mid-2024.
- The total construction expected estimate (P50) is \$44.8M (excluding design and reporting costs). The construction costs include \$9.1M of maintenance and rehabilitation costs (figures provided by AT) to be funded by Auckland Transport. Therefore, the expected estimate for construction that Auckland Transport are seeking co-investment from Waka Kotahi at a financial assistance rate (FAR) of 51% is \$37.7M (P50) including the 5.7% AT Funding Administration cost.

¹ The project is now referred to as **Pt Chevalier to Westmere Improvements** to reflect the full corridor upgrade nature of the project. Pt Chevalier to Westmere Cycleway has been retained as the title for this Addendum to ensure consistency with the previous documentation on the project.

1 Introduction and Background

Auckland Transport have developed the Pt Chevalier to Westmere Cycleway Single Stage Business Case (SSBC) to provide the case for investment into the corridor upgrade connecting the communities of Pt Chevalier and Westmere with improved walking and cycling facilities and bus priority improvements.

1.1 Purpose of Addendum

Resolve Group and Mott MacDonald have been commissioned by Auckland Transport to provide an addendum to the Pt Chevalier to Westmere Cycleway SSBC. The purpose of this addendum is to provide an update to:

- Provide further explanation of the option development of the extensive project history as requested by Waka Kotahi.
- Provide further information regarding the timing and funding for the implementation of connecting projects that contribute to the Inner West Cycle Network.
- Update the project's Investment Prioritisation using the Investment Prioritisation Method for the 2021–24 National Land Transport Programme, which replaces the Investment Assessment Framework (IAF) used for the 2018-21 National Land Transport Programme.
- Update the SSBC for the new Land Transport Benefits Framework and Benefits Management Approach, including use of the Appraisal Summary Table (AST).
- Update the Economic Case following the Peer Review, updated cost estimates and as a consequence of the changes with the new MBCM (August 2020) superseding the EEM.
- Update the Financial Case with the new estimates and updated cashflow timelines.
- Update the Management Case in terms of updated timelines and governance.
- Provide a response to the Peer Review completed in October 2021.
- Update the Commercial Case with the preferred procurement model.

1.2 Business Case Development

The Pt Chevalier to Westmere Cycleway SSBC was initially commenced in 2019 by AECOM. It was later updated by Resolve Group and Mott MacDonald in October 2020. The project was then put on hold due to funding constraints in November 2020.

In early 2021, comments were received from Waka Kotahi and the Business Case was updated to address these in September 2021 (following the project's re-commencement in July 2021). These updates produced the latest revision (Version 1.8) of the Business Case, and for the purpose of this addendum it is assumed as the version to proceed this addendum.

The Business Case was peer reviewed in October 2021.

Further comments were received in November 2021 from Waka Kotahi as part of the Investment Quality Assurance (IQA) assessment phase for the project.

This addendum should be read in conjunction with the Pt Chevalier to Westmere Cycleway SSBC, Version 1.8, dated September 2021.

1.3 Problems and Benefits

In October 2020, the following amended problem statements were agreed between AT and Waka Kotahi:

- ***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.***

The ILM investment objectives agreed with Waka Kotahi are:

1. Reduce deaths or serious injuries on the corridors by 66% by 2030
2. Triple active mode share from 8% to 24% 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

1.4 Changes following the commencement and completion of the SSBC

There were several changes since the inception of the SSBC and the completion of the final draft in September 2021, and then further changes since the February 2022 Addendum was issued. These include:

- Waka Kotahi implemented their Investment Prioritisation Method for the 2021–24 National Land Transport Programme, which replaces the Investment Assessment Framework (IAF) used for the 2018–21 National Land Transport Programme. It includes moving from two prioritisation factors to three, to give effect to the Government Policy Statement on Land Transport (GPS) 2021. The SSBC reported the IAF relevant at the time of writing.
- In August 2020, Waka Kotahi launched its new Land Transport Benefits Framework and Benefits Management Approach, which signals a sector focus on benefits, benefits realisation and investment decision-making that contributes to outcomes. The SSBC linked the original Investment Logic Map to the new benefits in an Appraisal Summary Table for the preferred option.
- Waka Kotahi introduced updated economic evaluation procedures in 2020 with the new Monetised Benefits and Costs Manual (MBCM), which replaced the former Economic Evaluation Manual (EEM). The SSBC included an economic evaluation using the MBCM and EEM, as the Pt Chevalier to Westmere Cycleway business case began prior to the August 2020 date for which the MBCM should be used. At the time of writing, it was understood 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.
- Updated timelines and funding for the implementation of connecting projects that contribute to the Inner West Cycle Network.

- Revised designs for the Meola Road / Point Chevalier Road intersection and the proposal and implementation of a roundabout trial at this intersection.
- Value Engineering assessment in early 2021 which included a Safe Systems Assessment, Economic assessment and technical feasibility assessments of different options along Pt Chevalier Road.
- The cost estimates were updated by Alta in June 2022, and a parallel cost estimate was prepared by WT New Zealand and the costs finalised in July 2022.
- A Stage 3 Detailed Design Road Safety Audit / Non Motorised User Audit was completed by TES in May 2022.

1.5 Inner West Cycle Network

The Pt Chevalier to Westmere cycleway forms part of a connected cycle network. The SSBC describes the proposed route as 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 at the south-western end and to both the Pt Chevalier to Herne Bay link and the Waitemata Safe Routes to the northeast, providing a continuous route to the City Centre, via the inner suburbs of Herne Bay, Ponsonby, Grey Lynn, Arch Hill and Freemans Bay.

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. The figure presented in the Business Case is now outdated with the design and funding certainty of several routes progressed beyond the description previously shown and some routes now constructed and operational.

Details on the design status and funding status of the connecting links yet to be constructed are provided in [Table 1](#).

Table 1: Inner West Cycle Network – Links to be completed

ROUTE	CURRENT PHASE (AS AT JULY 2022)	FUNDING SOURCE FOR CONSTRUCTION	EXPECTED COMPLETION OF CONSTRUCTION
Waitemata Safe Routes 1	Design	No NZTA co-funding for this project; this will be funded 100% by the local share.	End of 2023, to be delivered with Point Chevalier cycleway
Waitemata Safe Routes 2	Design	No NZTA co-funding for this project; this will be funded 100% by the local share.	End of 2023, to be delivered with Point Chevalier cycleway
Westmere to Herne Bay	Investigation	Link between Westmere and Herne Bay was not prioritised in the current RLTP 2021. AT are looking at opportunities to build connections to Cox's Bay Reserve via the minor cycling pop up cycleway programme and the Westmere to Herne Bay link is included within AT's indicative \$1B cycle programme (yet to be funded).	TBC - End of 2023

A potential route to connect to the existing cycle path through Cox's Bay Reserve is via William Denny Ave and Fife Street. These are low volume streets and it is anticipated an option could be relatively easily progressed to provide the connection to Herne Bay using the minor cycling pop up cycleway programme. For example, William Denny Ave has approximate AADT of 2,000 vehicles per day which meets the traffic volume criteria for mixed traffic streets in the Transport Design Manual.

A request has been made to the Active Modes Planning Manager by the project team to prioritise the route to Cox's Bay Reserve and it is believed that funds will be made available within the current RLTP period.

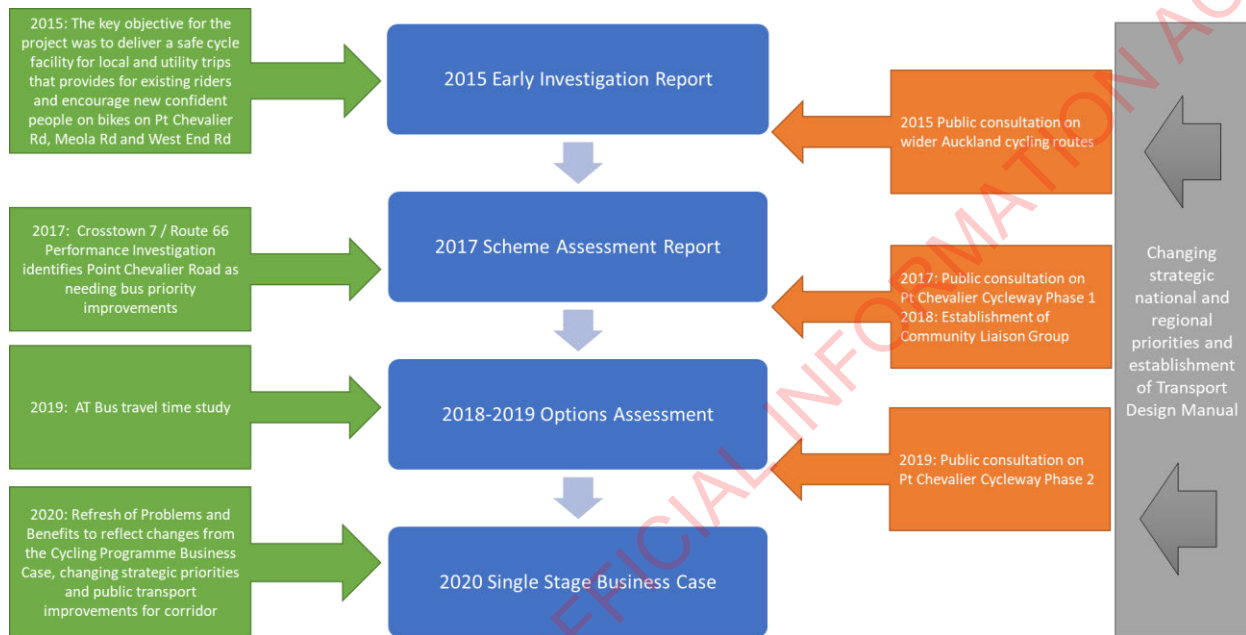
Furthermore, the link between Westmere and Herne Bay is included within AT's indicative \$1B cycle programme (yet to be funded).

On the basis indicated above Auckland Transport believe and maintain that the Pt Chevalier to Westmere cycleway project is connected to the Auckland Cycle Network and offers a valuable extension to the network, which will continue to increase in value as the network is further developed over the next few years.

2 Option Summary

Auckland Transport commenced investigations for cycle facilities on the project corridor in 2015. Between 2015 and 2020, there have been several phases of investigations and these have considered several alternatives and options for cycle facilities. This is summarised in Figure 2.

Figure 2: Project History



Throughout the various investigation and optioneering phases, there is credible evidence to show investment into the corridor to improve cycling and walking access is justified. Section 6 of the SSBC details the option development phases and multi criteria analysis (MCA) assessments for the various cycle facility options (varying widths, on road/off road, protection, bi-directional or uni-directional). As the MCA was developed prior to the SSBC development, the SSBC also includes an assessment of the short-listed options against the agreed Investment Objectives (2020). The assessment against the Investment Objectives is consistent with the preferred route options from the 2018-2019 assessments with the following key considerations contributing to the preferred option selection:

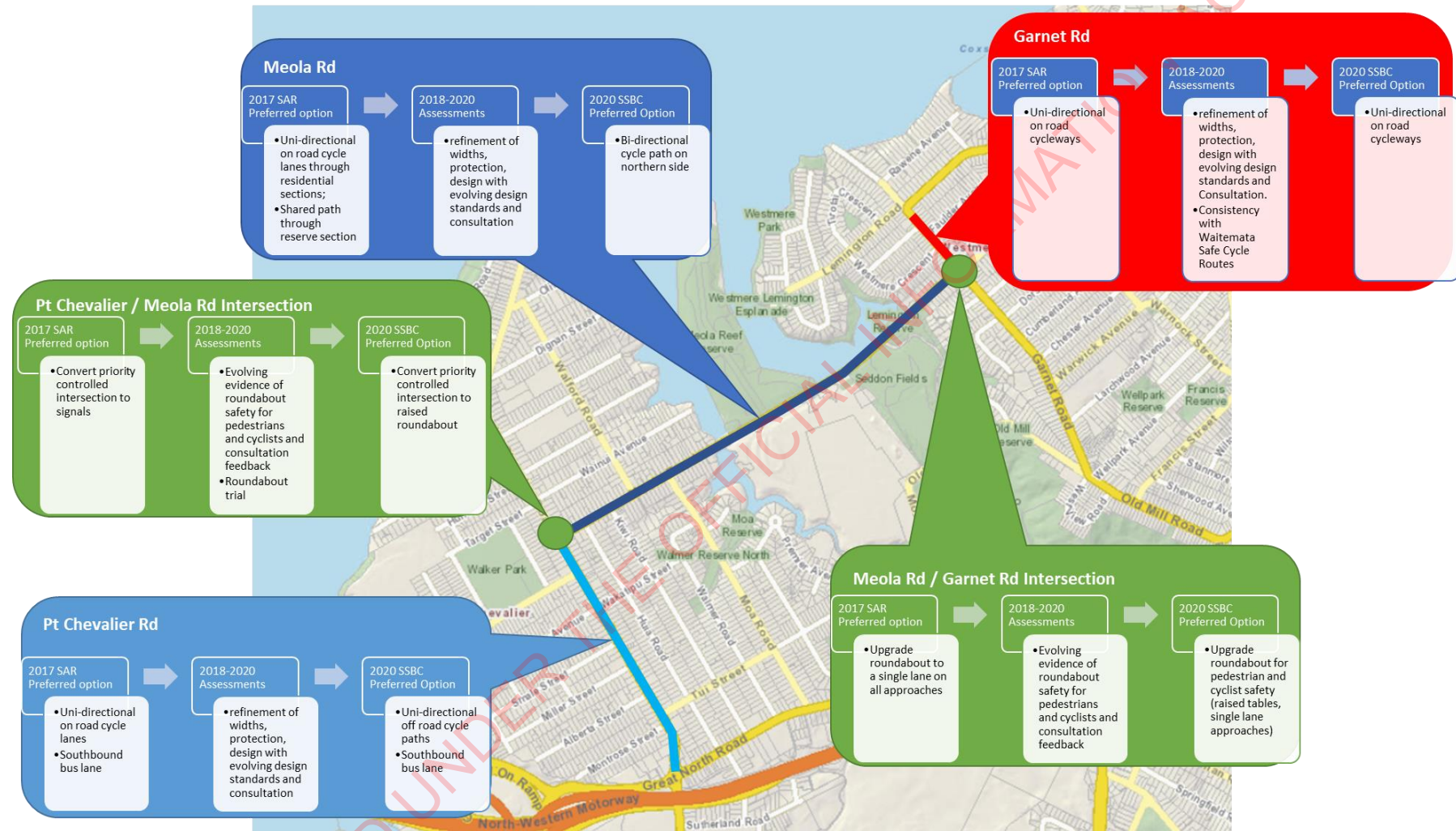
- The original scope of the project in 2015 was Pt Chevalier Road, Meola Road and West End Road (Pt Chevalier to Herne Bay Cycleway). This was subsequently reduced to a length of 2.8 kilometres as no preferred option was identified for West End Road in the 2017 Scheme Assessment Report. An alternative route to Herne Bay using William Denny Avenue and a route through Cox's Bay Reserve is currently in the Investigation phase.
- 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. This is reflected in the preferred option.
- Existing tree roots are very close to the kerb line on **Meola Road** and therefore, removal of the exotic street trees is required to deliver cycle facilities. This has been extensively

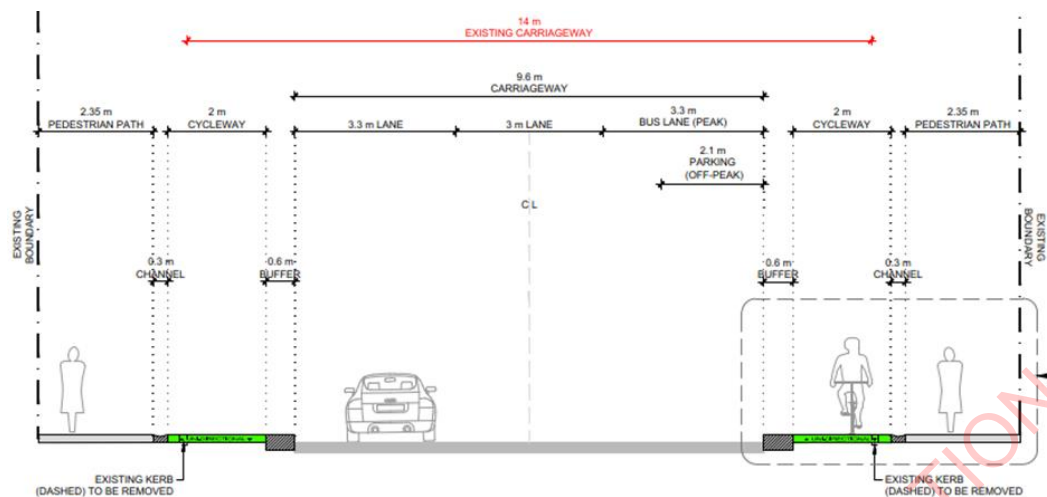
investigated through the assessment phases and the 35 non-native trees are proposed to be replaced with 45 native species. In 2020, an Arboricultural Assessment was completed in the SSBC and it noted that several existing trees are poor specimens. The Arboricultural Assessment recommended the removal of the trees on Meola Road and resource consent has been granted for this removal. 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.

- 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 investment objectives.
- 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.
- Uni-directional cycle facilities (with the TDM recommended widths) were considered to provide the safest form of cycle facility in residential sections throughout the corridor, however this is balanced against the ability to provide a buffer between vehicles (parked and moving) and pedestrians and the above constraints. The preferred option provides uni-directional cycle facilities on Pt Chevalier Road and Garnet Road and a bi-directional cycle facility on Meola Road.
- The **southbound bus lane** proposed on Point Chevalier Road is the desired outcome of separate AT investigations. There are significant benefits to integrating the required public transport improvements into the corridor upgrade and this is reflected in the agreed Investment objective #3 with the southbound bus lane include in the preferred option.
- To provide safe, quality cycle facilities along the corridor, assessments have concluded that the **Meola Road / Pt Chevalier Road** intersection requires a level of upgrade. In the Scheme Assessment Report, the roundabout option provided the best benefit to motorised road users (least delay) however at the time, 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 as 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. The roundabout design was included in the recent (May 2022) Stage 3 Safety Audit / Non Motorised User Audit. All concerns (minor/moderate) were closed out.
- The project has taken a **Dig-once Approach** and in practice this has meant that walking, cycling, public transport and maintenance have to be taken into account on the project, which although in the short-term has created some difficulties, will in the long-term result in a more enduring and seamless improvement.

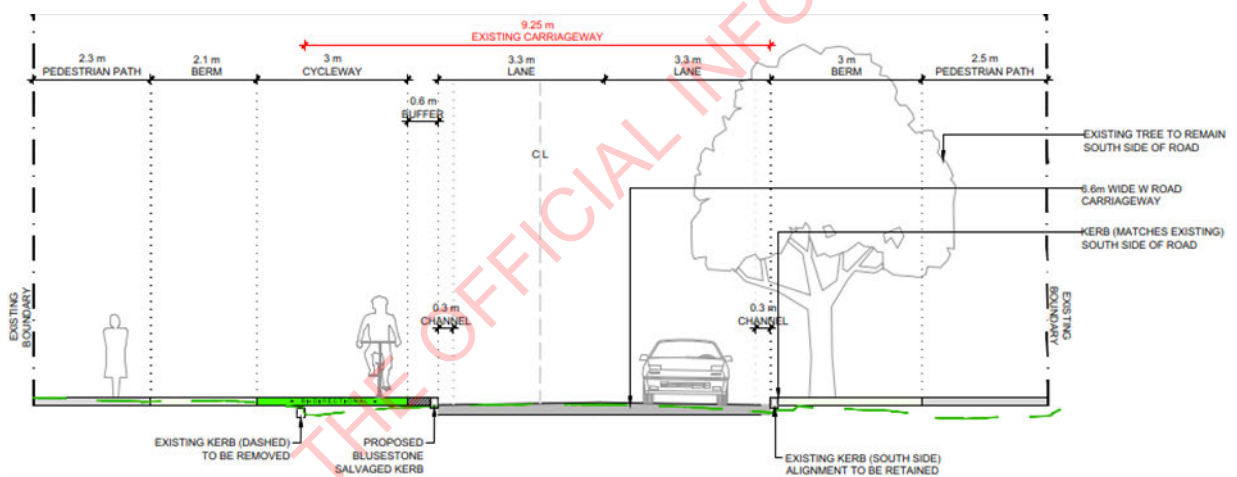
The evolution of the preferred option from the Scheme Assessment Report to the SSBC is summarised in Figure 3.

Figure 3: Preferred Option Evolution

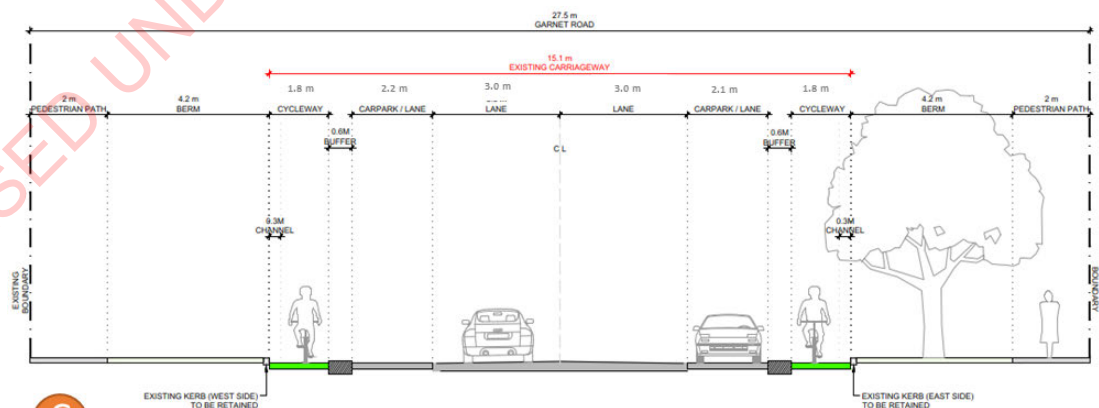




A Pt Chevalier Road – typical cross section of uni-directional cycleway



B Meola Road – typical cross section of bi-directional cycleway



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

3.2 Benefits and opportunities

On 12 October 2020, the benefits and measures that aligned with the objectives for the investment were identified and agreed with Waka Kotahi using the Land Transport Benefits Framework. These are described in [Table 2](#).

Table 2: Benefits and Measures






TRANSPORT OUTCOME	BENEFIT	MEASURE NAME
Healthy and Safe People	1.1 Impact on social cost of deaths and serious injuries	1.1.2 Crashes by Severity
Environmental Sustainability	8.1 Impact on Greenhouse gases	8.1.1 CO2 emissions
		8.1.2 Mode shift from single occupancy private vehicle
Inclusive Access	10.1 Impact on user experience of the transport system	10.1.7 People - throughput (UCP)
		10.1.9 Travel time
	10.2 Impact on mode choice	10.2.3 Spatial coverage - cycle lanes and paths

[Table 3](#) describes the key impacts of the preferred option against the relevant benefit and aligned investment objective.

Table 3: Key impacts of Preferred Option aligned against objectives

BENEFIT	INVESTMENT OBJECTIVE	WAKA KOTAHI PERFORMANCE MEASURE	IMPACT OF PREFERRED OPTION
Changes in user safety: Impact on social cost of deaths and serious injuries.	<i>Reduce Deaths or serious Injuries on the corridors by 66% by 2030</i>	1.1.2 Crashes by severity (Number of crashes by severity)	<p>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.</p> <p>There have been 26 injury crashes along the corridor in the last five years (July 2015 to June 2020). This included 5 pedestrian injury, 2 cycle injury and 19 other traffic injury crashes. There were a further 26 non-injury crashes (total of 52 crashes). The do minimum impact is 198 injury crashes over the 40 year evaluation period.</p> <p>The Deaths and Serious Injury (DSI) equivalent for the corridor is 3.77 DSI over the five year period. With the preferred option in place, there is a predicted DSI savings of 1.62 DSI crashes per five year period, equating to a savings of 13 deaths and serious injury crashes over the 40 year evaluation period, and a savings of 62 all injury crashes.</p> <p>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.</p> <p>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.</p> <p>This will improve safety for all road users, including people on bikes that choose not to use the dedicated cycle facilities.</p> <p>It is proposed to signalise the existing zebra crossing on Point Chevalier Road. 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.</p> <p>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.</p> <p>A Safe Systems Assessment has been undertaken for the proposal and shows that the preferred option will move the corridor closer to a safe system. For each section of Pt Chevalier Road, Meola Road and Garnet Road, the preferred option scores less than 120/448 and therefore provides good compliance with Safe System objectives.</p>

BENEFIT	INVESTMENT OBJECTIVE	WAKA KOTAHI PERFORMANCE MEASURE	IMPACT OF PREFERRED OPTION
<p>Changes in access to social and economic opportunities:</p> <ul style="list-style-type: none"> • Impact on user experience of the transport system • Impact on Mode Choice 	<p>Triple active mode share from 8% to 24% of total journeys to work by 2028</p>	<p>10.1.7 People throughput (UCP) – Number of pedestrians and cyclists</p>	<p>The provision of dedicated cycle facilities will encourage people to cycle more regularly, particularly vulnerable and less confident cyclists.</p> <p>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.</p> <p>This will increase the number of pedestrians and cyclists on the route (i.e. the people throughput).</p> <p>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.</p> <p>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).</p> <p>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.</p> <p>In total, 1,050 cyclists per day are expected by 2038 (more than triple the current volume), based on current land use. This is compared to an estimated do minimum in 2038 of 500 cyclists.</p>
		<p>10.2.3 Spatial coverage - cycle lanes and paths – Percentage completion of the strategic network</p>	<p>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 (do minimum is 0km on this route).</p>

BENEFIT	INVESTMENT OBJECTIVE	WAKA KOTAHĪ PERFORMANCE MEASURE	IMPACT OF PREFERRED OPTION
<p>Changes in access to social and economic opportunities:</p> <p>Impact on user experience of the transport system</p>	<p>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</p>	<p>Impact on user experience of the transport system</p> <p>10.1.9 Travel time – Average travel time in minutes for buses</p>	<p>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 5.</p> <p>Figure 5: Project benefits for public transport</p>  <div data-bbox="1579 502 2016 1021"> <p> Bus lane length 450m</p> <p> Average time saved 45sec**</p> <p> Best time saved 200sec**</p> <p> Bus trips benefited 72**</p> </div> <p><small>Data comes from traffic modelling based on the current bus times during peak, inter-peak and off-peak journey times along Point Chevalier Road.</small></p> <p>The provision of bus lanes will reduce the impact of further residential intensification (and growth in vehicle numbers) on bus journey times.</p> <p>Inconsistent travel times contributes to poor customer experiences and poor perceptions of public transport. The provision of bus lanes will improve travel time reliability.</p> <p>The active mode improvements will make it safer to access public transport. This will support increased public transport patronage.</p>

BENEFIT	INVESTMENT OBJECTIVE	WAKA KOTAHĀ PERFORMANCE MEASURE	IMPACT OF PREFERRED OPTION
Changes in climate: Impact on greenhouse gas emissions	<i>Improve access to / from and within Point Chevalier and Westmere neighbourhoods through active mode facilities</i>	8.1.1 CO₂ emissions – tonnes of CO₂ equivalents emitted	In 2020, there were approximately 33,000 annual tonnes of CO ₂ emitted due to road transport by residents of Pt Chevalier and Westmere. The do minimum impact in 2038 is approximately 32,000 annual tonnes of CO ₂ , with the preferred option reducing this by approximately 70 tonnes per annum.
		8.1.2 Mode shift from single occupancy private vehicle	<p>Current mode cycle to work mode share in both Pt Chevalier and Westmere is 5% (2018 census).</p> <p>Forecast cycle to work mode shares in both Pt Chevalier and Westmere with the preferred option is 7%, showing an increase of cycle mode share by 2%, which equates to a tripling of people on bikes using the corridor (do minimum impact is 6%).</p> <p>The preferred option will <i>increase the number of people walking and people on bikes</i> in Point Chevalier and Westmere and provide health benefits for these people and <i>improve access</i>.</p> <p>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.</p> <p>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.</p>

3.3 Safety Audit

In May 2022, a Stage 3 Detailed Design Road Safety Audit (RSA) / Non Motorised User Audit (NMUA) was completed on the detailed design. The RSA / NMUA identified no serious concerns, four significant concerns and several moderate and minor concerns.

The designer response, Auckland Transport Safety Engineer response, client response and action have been completed for all concerns and comments. All concerns have been agreed between parties and the identified action either addressed in the current drawing set (July 2022) or to be addressed in the implementation phase.

The Road Safety Audit / Non Motorised User Audit is included in Appendix E.

3.4 Cost Estimate

Refer to Section 5: Financial Case.

3.5 Economic Analysis

The SSBC included an economic evaluation undertaken in accordance with the NZ Transport Agency Monetised Benefits and Cost Manual (MBCM) (August 2020) and the former Economic Evaluation Manual (EEM) as the business case had commenced prior to the MBCM rollout of August 2020. It is now understood, the MBCM shall be used for assessment. The net capital costs and derived benefits, the benefit-cost ratio (BCR) and first year rate of return (FYRR) of the preferred option have been updated in July 2022 by Flow Transportation Specialists and are shown in [Table 4](#). These outputs take into account changes as a result of the Peer Review of the project and the June 2022 cost estimate update undertaken by others on behalf of AT.

Table 4: Economic Summary (MBCM)

ECONOMIC EVALUATION	VALUE
Base date for Costs and Benefits	2021
Present Value net Total Project Cost of Preferred Option	\$37.3M
Present Value net Benefit of Preferred Option	\$65.8M
BCR	1.8
First Year Rate of Return (FYRR)	4.9%

Refer to Appendix A for the Economic Analysis.

3.6 Appraisal Summary Table

The Appraisal Summary Table (AST) is a new requirement of the Business Case process and was not in existence during the option development stage for this project. An AST has been completed for the preferred option and is shown in [Table 5](#). Auckland Transport undertook a value engineering process in early 2021. The short-listed option from this assessment has been assessed within an AST and is included in Appendix B.

Table 5: Appraisal Summary Table: Preferred Option

Appraisal Summary Table			
Date:	Updated 6/07/2022	Evaluation Period: (baseline and forecast year) e.g. 2020 - 2060	2020-2060
		Option Name:	Point Chevalier to Westmere - Preferred option
Problem/opportunity statement:	Investment objectives:	How project gives effect to GPS:	How project gives effect to local community outcomes:
The road network in Point Chevalier and Westmere fails to meet the needs of its users, resulting in poor integration between modes and poor safety outcomes, especially for active users.	1. Reduce deaths or serious injuries on the corridors by 66% by 2030.	The Government's main strategic priorities are developing a safer transport system and providing people with better travel options. Point Chevalier to Westmere - Cycleway, bus and safety improvements will implement activities to help achieve these strategies, by providing safe cycling and walking infrastructure in an Auckland inner suburb where travelling by sustainable means offers competitive journey times to motorised modes to gain access to a wide range of social and economic opportunities. Further, improving walking and cycling facilities will encourage local residents to travel sustainably, which in turn will reduce congestion and lower emissions, assisting the GPS's climate priorities	The local community have been extensively consulted on the proposed improvements and their views taken into consideration. They are supportive of improvements to make walking and cycling safer. In particular they like the protected cycleways, the safer streets and the pedestrian crossing facilities, however they are concerned about the loss of parking, which has been addressed by creating additional spaces.
	2. Triple active mode share from 8% to 24% of total journeys to work by 2028		
	3. Public transport travel times are at least as competitive as general traffic between the eastern end of Meola Road and Point Chevalier Road / Great North Road intersection by 2022.		
	4. Improve access to / from and within Pt Chevalier and Westmere neighbourhoods through active mode facilities		

Transport Outcomes		Non-Monetised Impact: (description in numerical or narrative terms)			Monetised Impact: (description in dollar terms in real terms, non-discounted)	
Name of Benefit	Name of Measure:	Baseline:	Do Minimum Impact:	Preferred Option Impact:	Do Minimum Impact:	Option Impact:
Healthy and safe people						
1.1 Impact on social cost and incidents of crashes	1.1.2 Crashes by Severity	52 injury crashes/year (5 pedestrian injury, 2 cycle injury and 19 turning traffic injury crashes over last 5 year period)	198 injury crashes over the next 40 years (48 ped, 29 cyclist, 121 turning traffic)	62 fewer injury crashes over next 40 years (23 ped, 15 cyclist, 24 turning traffic)	\$73,000,000 in non-discounted crash costs over 40-year period	\$47,000,000 in non-discounted crash costs over 40-year period (\$26,000,000 reduction)
Environmental sustainability						
8.1 Impact on greenhouse gas emissions	8.1.1 CO2 emissions	2020 CO2 emissions – approximately 33,000 annual tonnes of CO2 emitted due to road transport by residents of Pt Chevalier and Westmere	Approximately 32,000 annual tonnes of CO2 emitted due to road transport by residents of Pt Chevalier and Westmere in 2038	A further reduction of approximately 70 annual tonnes of CO2 emitted in 2038	\$0	\$590,000 to \$940,000 in non-discounted emissions reduction benefits (low/high CO2 shadow cost rates)
8.1 Impact on greenhouse gas emissions	8.1.2 Mode shift from single occupancy private vehicle	Current mode cycle to work mode share in both Pt Chev and Westmere is 5% (2018 census)	Forecast cycle to work mode shares in both Pt Chev and Westmere of 6%	Forecast cycle to work mode shares in both Pt Chev and Westmere of 7%	\$0	\$12,000,000 in non-discounted road traffic reduction benefits due to mode shift from private car travel to cycling

Transport Outcomes		Non-Monetised Impact: (description in numerical or narrative terms)			Monetised Impact: (description in dollar terms in real terms, non-discounted)	
Name of Benefit	Name of Measure:	Baseline:	Do Minimum Impact:	Preferred Option Impact:	Do Minimum Impact:	Option Impact:
Inclusive access						
12.1 Impact on Te Ao Māori		<p>Auckland Transport and the project team are committed to ongoing work with Mana whenua to maximise the Te Aranga outcomes within the project scope:</p> <p>Taiao: An overall positive effect on the environment is expected as existing space for vehicle movement is reallocated to active transport use (walking and cycling); Existing native trees will be preserved; where trees are required to be removed, replanting with site-appropriate native species will be specified.</p> <p>Mauri-Tu: Detailed design investigation will identify opportunities for stormwater treatment utilising swales and to understand the design constraints associated with the closed landfill on Meola Road;</p> <p>Mahi Toi: Opportunities exist for the creative expression of Whakapapa and the introduction of iwi narratives where the cycleway crosses the Waititiko (Meola Creek) and Wai-a-Te Ao (Motions Creek) and at the entrance to the Te Tokaroa (Meola Reef Reserve).</p> <p>Ahi-Ka: The project will increase opportunities for the local community to reconnect with its physical and cultural landscape through moving through, and spending time in the landscape on foot or on bicycle.</p>				
10.1 Impact on user experience of the transport system	12.1.1 Te Ao Māori	February 2017 counts of between 170 and 420 daily cycle trips on Pt Chevalier Road, Meola Road and Garnet Road	Average of 500 daily cycle trips on project links forecast in 2038 Model Reference Case	Average of 1,050 daily cycle trips on project links forecast in 2038 Model Option Case	\$0	\$5,700,000 travel time savings for cyclists \$113,000,000 health benefits
10.1 Impact on user experience of the transport system	10.1.7 People - throughput (UCP)	0 second travel time savings for buses	0 second travel time savings for buses	An average 45 second travel time savings compared to the do minimum for southbound buses	\$0	\$8,800,000 PT travel time and reliability savings
10.1 Impact on user experience of the transport system	10.1.9 Travel time	0 second travel time savings for buses	0 second travel time savings for buses	An average 45 second travel time savings compared to the do minimum for southbound buses	\$0	\$8,800,000 PT travel time and reliability savings
10.2 Impact on mode choice	10.2.3 Spatial coverage - cycle lanes and paths	0km of cycle lanes/paths on route	0km of cycle lanes/paths on route	2.8km of cycle lanes/paths on route	n/a	n/a
1. Summary of Non-Monetised Impacts (Description)		2. Summary of Financial Impacts		3. Summary of Monetised Option Impacts		
<p>There will be 62 less injury crashes over the next 40 year period, resulting in a (non discounted) savings of \$26 million in the social cost of crashes.</p> <p>The preferred option will contribute to environmental sustainability through increasing the number of cyclists and pedestrians on the route and reducing the reliance on the private car (thereby reducing greenhouse gas emissions). A health and environmental benefit of \$113 million from walking and cycling is expected with the preferred option.</p> <p>The project will provide 2.8km of additional cycle lanes for the Auckland cycle network and provide an estimated \$5.7 million in travel time savings for cyclists over the evaluation period.</p> <p>Travel time for buses will reduce with the new bus lane on Point Chevalier Road with an average savings of 45 seconds, resulting in an estimated savings of \$8.8million in travel time and reliability benefits.</p>		Capital Costs (NPV)	\$33,340,000	Total Monetised Benefits, excluding Wider Economic Benefits (WEBs)	\$65,690,000 to \$65,820,000	
				Total Monetised Benefits, including Wider Economic Benefits (WEBs)	\$65,690,000 to 65,820,000	
		Operating Costs (NPV)	\$3,950,000	Total Monetised Benefits (costs) (NPV CAPITAL)	\$ 37,280,000	
		Total Financial Costs (NPV)	\$37,280,000	BCR (excluding WEBs)	1.8	
				BCR (including WEBs)	1.8	

Rationale for selecting preferred option: The preferred option contributes well to the investment objectives and returns a positive BCR of 1.8 with a FYRR of 4.9%. The other shortlisted options will provide a similar benefits. However, the more detrimental environmental impacts, safety concerns and higher financial costs of those options result in the preferred option for selection. A Safe Systems Assessment Framework (SSAF) concluded that the other option did not move the corridor sufficiently towards a safe system, whereas the preferred option does.

3.7 Investment profile for preferred way forward

The Investment Profile for the proposal was completed in 2020 using the Investment Assessment Framework (IAF), current at the time (Sept 2020). The IAF has now been superseded by the Waka Kotahi Investment Prioritisation Method (IPM) for the 2021-24 National Land Transport Programme.

The priority for the investment in the Pt Chevalier to Westmere Improvements has been assessed in accordance with the new Investment Prioritisation Method.

The Method requires the assessment of three factors – GPS alignment, Scheduling and Efficiency. The method requires that 'one relevant criterion' be selected related to each expected benefit and the rating for the activity is assigned based on the highest expected contribution to a single GPS strategic priority. Table 6 assesses each criteria to ascertain the highest rating.

Table 6: Investment Profile

FACTOR	RATING
GPS alignment: Safety	<p><i>HIGH: The proposal addresses DSIs in an area of High Concern (Communities at Risk Register – All deaths and serious casualties table).</i></p> <p>The project address DSIs among people on bikes within central Auckland. Urban central Auckland is listed as an area of High Concern for cycling safety in Waka Kotahi's 2020 Communities at Risk Register.</p> <p>DSI calculations using the KiwiRap method show:</p> <p>3.77 DSIs in the existing corridor environment</p> <p>2.15 DSIs predicted in the upgraded corridor.</p> <p>This is a targeted 42% reduction in death and serious injury crashes over a five year period².</p>
GPS alignment: Better Travel Options: Impact on access to opportunities	<p><i>HIGH: New walking/cycling link forms part of a large or major urban area network</i></p> <p>The 2.8km long Pt Chevalier to Westmere cycleway will provide the gap in the Auckland Inner West Cycle network as described in Section 1.5 above.</p>
GPS alignment: Better Travel Options: Impact on mode choice	<p><i>MEDIUM: Up to 3% change in share of private passenger vehicle-based trips to other modes.</i></p> <p>The project is estimated to result in a 2% increase in cycle to work mode share.</p>
GPS alignment: Climate Change: Impact on Greenhouse Gases	<p><i>MEDIUM: up to 3% reduction in private vehicle kilometres travelled – can use change in AADT as a proxy.</i></p> <p>The project is estimated to result in a less than 3% reduction in vehicle-km travelled within Pt Chevalier and Westmere.</p>

² July 2015- June 2020

FACTOR	RATING
Scheduling - Interdependency	<p><i>Medium rating: Non-delivery of proposed activity in the 2021 NLTP has a moderate impact on realising the estimated benefits of the programme/package, i.e. one or more benefits may not be achieved or may be reduced, or may be delayed for up to 3 years</i></p> <p>The project is part of the Auckland Urban Cycleways programme. Non-delivery of the project will have moderate impacts on the benefits realisation of that programme. The proposed investment provides a key link for the Inner West Cycle Network to enable users to access the City Centre from Pt Chevalier.</p>
Scheduling - Criticality	<p><i>HIGH: Need to undertake this activity in order to deliver/prepare for remainder of programme/package where its implementation is to begin in 2021 or early 2024 NLTP</i></p> <p>The connecting routes on the Inner West Cycle Network are due for completion within the current 2021 NLTP, including Garnet Road, Old Mill Road, Surrey Crescent, Great North Road and improvements to Richmond Road.</p> <p>The overall programme and completed link from Pt Chevalier to the city centre via the above routes will not be delivered if the Pt Chevalier to Westmere cycleway is not progressed. This will impact on the overall cycle programme and the wider Emissions Reduction Plan.</p>
Efficiency	<i>BCR is 1.8 therefore Low rating (L)</i>
Priority order	<i>H-H-L</i>
<p>NLTP priority order</p> <p>Based on a H-H-L the 2021-24 NLTP priority order is 5.</p>	

[Investment Prioritisation Method for the 2021–24 National Land Transport Programme \(nzta.govt.nz\)](https://www.nzta.govt.nz/information-and-consultation/national-transport-programme-2021-24/)

4 Benefits Realisation Plan

A draft benefits realisation and monitoring plan has been developed in [Table 7](#).

Table 7: Benefits and Measures

Benefit	Name	Measure	Baseline	Targets
1.1 Impact on social cost of deaths and serious injuries	1.1.2 Crashes by Severity	Number of crashes by severity Use Waka Kotahi Crash Analysis System	5.2 injury crashes/year (5 pedestrian injury, 2 cycle injury and 19 turning traffic injury crashes over last 5 year period)	Reduce injury crashes by 66%
8.1 Impact on Greenhouse gases	8.1.1 CO2 emissions	Tonnes of CO2 equivalents emitted. Use MSM model	2020 CO2 emissions – approximately 33,000 annual tonnes of CO2 emitted due to road transport by residents of Pt Chevalier and Westmere	Reduce CO2 emissions by agreed target from TERP
	8.1.2 Mode shift from single occupancy private vehicle	Change in cycle mode share compared to private vehicle in the AM peak and all day. Survey cyclist numbers before improvements and annually after improvements.	February 2017 counts of between 170 and 420 daily cycle trips on Pt Chevalier Road, Meola Road and Garnet Road	Triple the cycle mode share (or cycling trips) to local destinations (Point Chevalier shops, Westmere shops, Meola reserve/MOTAT, Coyle Park, Local Schools) by 2028
10.1 Impact on user experience	10.1.7 People – throughput (UCP)	Number of pedestrians and cyclists.	February 2017 counts of between 170 and 420 daily	Triple the number of cyclists using the route by 2028.

Benefit	Name	Measure	Baseline	Targets
of the transport system		Survey cyclist and pedestrian numbers before improvements and annually after improvements. Set up bike/pedestrian counters.	cycle trips on Pt Chevalier Road, Meola Road and Garnet Road	
	10.1.9 Travel time	Peak average travel time of buses from Wakatipu Street to Great North Road Validate against AT Journey planner.	73 seconds	Target a 45 second average travel time saving
10.2 Impact on Mode Choice	10.2.3 Spatial coverage – cycle lanes and paths	Distance of new cycle lanes/paths	0km of cycle lanes/paths on route	2.8km of cycle lanes/paths completed of the Inner West Cycle network

5 Financial Case Update

5.1 Project Cost and Cash Flow

Alta was engaged by AT in June 2022 to update the project cost estimate. The Expected Estimate (P50) for the project is \$47,035,820. This includes construction costs of \$44,777,782.

The construction costs include \$9,074,301 for maintenance / pavement rehabilitation, funded by Auckland Transport's road maintenance programme.

The total construction cost of the project for Waka Kotahi co-funding, excluding the maintenance costs and including the 5.7% AT Funding Administration Cost, is \$37,738,579. The P95 cost is \$42,455,902. This is summarised in Table 8.

Table 8: Cost estimate summary

Cost Estimate	P50 Estimate (2022)	P95 Estimate (2022)
Project Estimate	\$47.0 M	\$52.6 M
Implementation phase	\$44.8 M	\$50.4 M
Maintenance / Rehabilitation works	\$9.1 M	\$10.2 M
Co-funded total (excl AT 5.7% admin)	\$35.7 M	\$40.2 M
Co-funded total (incl AT 5.7% admin)	\$37.7 M	\$42.5 M

The cost estimate and parallel cost estimate are included in Appendix C.

Based on the current estimate, the anticipated cash flow for the investment proposal over its intended life span is set out in Table 9. The projected cash flow is indicative and is dependent on the proposed construction methodology.

Table 9: Project Cost (Expected Estimate (P50)) and Cash Flow

Year	Pre-Implementation (Design) (\$M)	Implementation (Construction) (\$M)	Property (\$M)	Maintenance / Rehab works (\$M)	TOTAL Excluding maintenance funding (\$M)	TOTAL (co-funded) including 5.7% (\$M)
2021/22	\$2.3	\$0.1	\$0	\$0	\$2.4	\$0.1*
2022/23	\$0	\$17.6	\$0	\$4.6	\$13.0	\$13.8*
2023/24	\$0	\$27.1	\$0	\$4.5	\$22.6	\$23.8*
TOTAL	\$2.3	\$44.8	\$0	\$9.1	\$38.0	\$37.7*

*Excluding maintenance / rehabilitation and pre-implementation costs

Refer also to [Table 10](#) for a more detailed breakdown of the funding application.

Maintenance / Rehabilitation Works

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.

None of the rehabilitation work has been completed to date as it needs to be done in conjunction with the cycleway construction. The kerb-lines in Meola Rd are being moved to the south in some places, and are being lifted in others. Overall, the road carriageway will be narrower than the existing road.

The rehabilitation work involves rebuilding of the road pavement between the relocated kerb-lines, and as there are horizontal and vertical changes to the road alignment, the crown of the road is being re-positioned in order to ensure the correct crossfall is provided on both sides of the road.

In summary, the rehabilitation work is an integral part of the project, and could not be done before or after the cycleway construction work.

The resurfacing of Pt Chevalier Road has also been deferred until after the project is complete because of the construction impacts (temporary marking, kerb moving, intersection improvements etc) on the road surface.

The incorporation into the contract of the pavement rehabilitation on Meola Rd and the carriageway resurfacing on Pt Chevalier Rd will considerably reduce the cost of undertaking these works separately and result in significantly less disruption to the community due to the one-dig methodology.

5.2 Timing assumptions

The project is expected to commence construction in September 2022 and be completed in mid-2024.

5.3 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.

5.4 Funding availability

Auckland Transport will seek co-investment from Waka Kotahi at a financial assistance rate (FAR) of 51% for the construction funding.

Refer to [Table 10](#) for the funding application summary, local share availability and the current deficit.

Table 10: Funding Application and Gap

Description	2021/22 Current Financial Year	2022/23 Future Financial Year	2023/24 Future Financial Year	2021-24 TOTALS
Pt Chevalier - Enabling Works Committed	\$120,000	\$1,754,662	\$0	\$1,874,662
Pt Chevalier - Physical works (to be tendered, exc. renewals elements)	\$0	\$10,270,715	\$20,541,430	\$30,812,145
Pt Chevalier - AT Other Costs (inc. MSQA, internal charges, etc)	\$0	\$1,005,557	\$2,011,116	\$3,016,674
Total Cost (per P50 funding application)	\$120,000	\$13,030,934	\$22,552,546	\$35,703,481
Total Cost inc. admin	\$126,840	\$13,773,697	\$23,838,041	\$37,738,579
Approved Budget (for Construction only)	\$3,815,000	\$13,600,000	\$15,504,571	\$32,919,571
Funding Gap	\$3,695,000	\$569,066	-\$7,047,975	-\$2,783,910

The Pt Chevalier to Westmere project budget in the Urban Cycleways Programme is \$34,500,000 over three years – \$6,050,000³ in FY 21/22, \$13,600,000 in FY 22/23, and \$14,850,000 in FY 23/24.

There is additional funding from other Auckland Transport budgets to contribute to the bus lane and safety improvements of \$654,571 in FY 23/24.

The Procurement Plan has identified a deficit of \$2.784M in the budget in order to complete the project including the physical works, various consultant costs during construction plus Auckland Transport staff time. The PCG and Investment Committee have been updated recently (July 2022) with these figures. The way forward agreed by Auckland Transport is that the tender process progresses (August 2022) and once the actual tender price is determined, a report will be submitted to the Investment Committee so the additional budget that is required can be confirmed before the contract is let.

5.5 Parallel Cost Estimates

AT engaged WT New Zealand to undertake a parallel cost estimate in June 2022. This parallel estimate was prepared based on the work in progress draft detailed design drawings, reports and schedule of quantities. A reconciliation process was included in the parallel cost estimate

³ \$2,235,000 Pre-Implementation costs have been subtracted from this figure in Table 10

process involving Alta, WT New Zealand, the AT project team, including the AT's Commercial Quantity Surveying Manager.

A comparison of the estimates is provided in Table 11. The expected estimate from the parallel estimate is within 2% of the project cost estimate. The 95th percentile estimates differ by less than 4%. The difference in the estimates is due to the risk values used. WT used set values of 20% for the expected estimate and a further 15% for the P95.

Alta conducted a more detailed risk assessment on an item category basis (drainage, earthworks, pavement etc) and allowed for the additional costs that could be incurred with these areas of construction.

Through the reconciliation process, it was agreed the Alta cost estimates are acceptable to assume as the project estimates.

Table 11: Comparison with Parallel Cost Estimate

	Project Base Estimate	Project Expected Estimate P50	95th percentile Project Estimate
Project Estimate	\$40.0 M	\$47.0 M	\$52.6 M
Parallel Estimate	\$40.4 M	\$48.1 M	\$55.0 M

The project estimate completed by Alta is thus carried forward as a reasonable P50 Expected Estimate. The P50 Expected Estimate from WT New Zealand is included in the sensitivity testing within the Economic Analysis with a BCR of 1.7.

5.6 Previous Cost Estimates

The SSBC includes cost estimates completed on the scheme design which were updated through a parallel cost process in June 2020. The Expected Estimate (P50) for the project was \$39.1M. This includes construction costs of \$36.3M. There has been no material change to the scope since the scheme cost estimates. The latest cost estimates (June 2022) are based on the detailed design which has provided a more refined cost estimate. The main reasons for the increase in costs since the 2020 cost estimates are:

- General construction costs have increased by around 12- 15% over this 2-year period, due to a range of factors. (Waka Kotahi non structures index has increased 12% between March 2020 and March 2022, excluding bitumen). A 15% increase on the 2020 estimate amounts to \$5.75m.
- The 2020 estimate included nominal amounts of cost escalation within the rates and prices. An additional allowance has been added to the 2022 estimate for cost escalation risk which AT may be exposed to during the delivery phase, where the construction contractor is unwilling to hold this risk. This amounts to a further \$2.1m on the expected estimate.

6 Commercial Case Update

6.1 Procurement Strategy

The preferred procurement strategy provided in the Commercial Case of the 2020 Business Case was a modified Early Contractor Involvement (ECI) model. Following the project going on hold in late 2020, ongoing Covid-19 disruption and changes, the preferred procurement model was reviewed. The programme constraints that were driving an ECI model were no longer as relevant and detailed design progressed without early contractor involvement.

The preferred procurement method is now to procure a physical works contractor to construct the Pt Chevalier to Westmere Improvements project following a single stage tender process.

Also included in the contract are associated works that are funded by programme budgets managed by other teams within Auckland Transport. The incorporation into the contract of these associated works, for example the pavement rehabilitation in Meola Rd and the carriageway resurfacing in Pt Chevalier Rd, Surrey Crescent, Old Mill Rd, and Richmond Rd will considerably reduce the cost of undertaking the works separately and result in significantly less disruption to the community due to the one-dig methodology.

Supplier Selection

The Procurement Estimate amount (<\$50M) allows the procurement of a supplier via the Tier 1 Physical Works Supplier Panel. This will be an NZS:3910 administered contract following a single stage tender process with AT's Tier 1 Physical Works Supplier Panel contractors, using Lowest Price Conforming tender evaluation.

The market has been seeking continuity of work offered by larger scale projects which Auckland Transport will achieve with this procurement delivery model. To prepare the market an advanced market notification is to be issued ahead of the published tender.

The scope of works included in the project involves construction of 'business-as-usual' roading assets such as footpaths, off-road cycleways, kerb and channel, drainage, road rehabilitation, traffic signals, street lighting, signs and road markings, raised tables at pedestrian crossings, a new roundabout, and landscaping including new street trees.

Accordingly, the Tier 1 Panel contractors will all have the capability and experience for constructing assets of these types.

The detailed design is complete having been through the Design Review Panel, the Detailed Design Safety Audit and the Resource Consent has been approved. As a result, the contract will be ready to go to tender in September 2022 when all the tender and contract documentation is complete. Following Waka Kotahi funding approval, the contract is planned to be awarded in October 2022 with construction underway in December 2022.

An alternative sourcing option is an open tender two stage approach (Registration of Interest (ROI) and Request for Tender (RFT)). Using an ROI to shortlist approximately three tenderers using quality-based evaluation criteria for a second RFT stage has the advantage of allowing a long list of interested tenderers to be short listed to leave a manageable but still competitive group for the RFT stage.

The two stage approach was not progressed. The procurement estimate is less than \$50M which allows the procurement of a supplier via the Tier 1 Physical Works Supplier Panel, thereby saving time.

The **preferred procurement method** is to procure a Tier 1 Physical Works Supplier Panel contractor to construct the Pt Chevalier to Westmere Improvements project following a single stage tender process.

Procurement Methodology

The tender will be evaluated in one stage being Lowest Price Conforming (LPC). Tenderers will be scored on the basis of:

- Maintaining a high standard of Health and Safety.
- Successful and proactive stakeholder and community engagement throughout the works.
- Delivering the works through a sustainable and effective construction methodology that minimises the project's carbon footprint, minimises the impact on adjacent businesses, minimises the impact on road users, and minimises water consumption and waste going to landfill.
- Ensuring the right resource at the right time will be available to meet programme critical path requirements.
- Providing a strategy to contribute towards positive social outcomes through the project. Development of partnerships with one or more of the Māori/Pasifika businesses that are registered with Amotai (<https://amotai.nz>).

Assessment of participants will also be based on their ability to deliver AT's Sustainable Procurement outcomes. As part of this, suppliers will be required to provide an example of a Sustainability Management Plan that covers all the five following outcome areas, as well as additional reporting requirements as part of Auckland Transport's goal to green the roading network:

1. **Quality Employment:** Providing opportunities of employment for targeted communities, improving incomes, and improving skills through training and development.
2. **Supplier Diversity:** Creating business opportunities for diverse businesses, buying local and improving the skill and development of diverse businesses.
3. **Reduction of Greenhouse Gas Emissions:** Developing and implementing strategic emission reduction activities while supporting subcontractors who reduce emissions.
4. **Circular Economy & reduction of waste:** Developing best practice waste through minimisation and supporting subcontractors who actively reduce waste or provide innovative circular economy principles.
5. **Reduce water consumption:** Develops best practice plans to minimise use of water throughout procurement activities and supports subcontractors who actively reduce water consumption.

Request for Tender (RFT)

Tenders will be evaluated using a one stage RFT tender process with the attributes in [Table 12](#).

Table 12: Request for Tender Evaluation Attributes

Attribute	Weighting
Methodology - Project Specific	
<i>Construction Methodology</i>	15%
<i>Stakeholder Management and Communication</i>	5%
<i>Traffic Management Plan / Staging Plan</i>	10%
<i>Site specific Health and Safety</i>	5%
<i>Project Specific Sustainably Outcomes</i>	5%
Price	60%
TOTAL:	100%

6.2 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).

6.3 Payment Mechanisms

The proposed payment mechanisms will be in accordance with NZS 3910:2013.

6.4 Pricing Framework and Charging Mechanisms

The proposed pricing framework and charging mechanisms will be in accordance with NZS 3910:2013.

6.5 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 7 below.

6.6 Contract Management

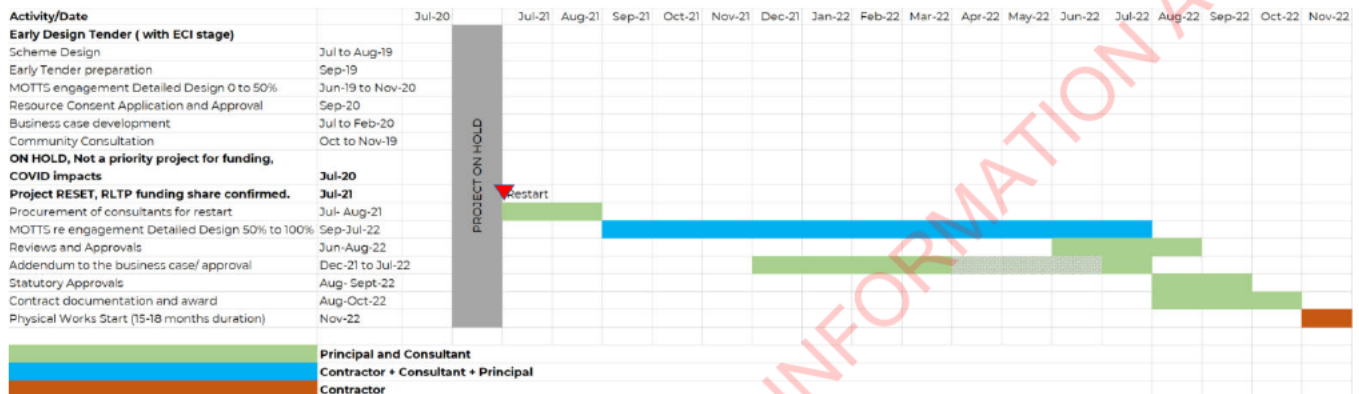
Contract Management will be executed in accordance with the Contract.

7 Management Case Update

7.1 Programme

An updated programme is included in Figure 6.

Figure 6: Programme to Contract Award



7.2 Milestones

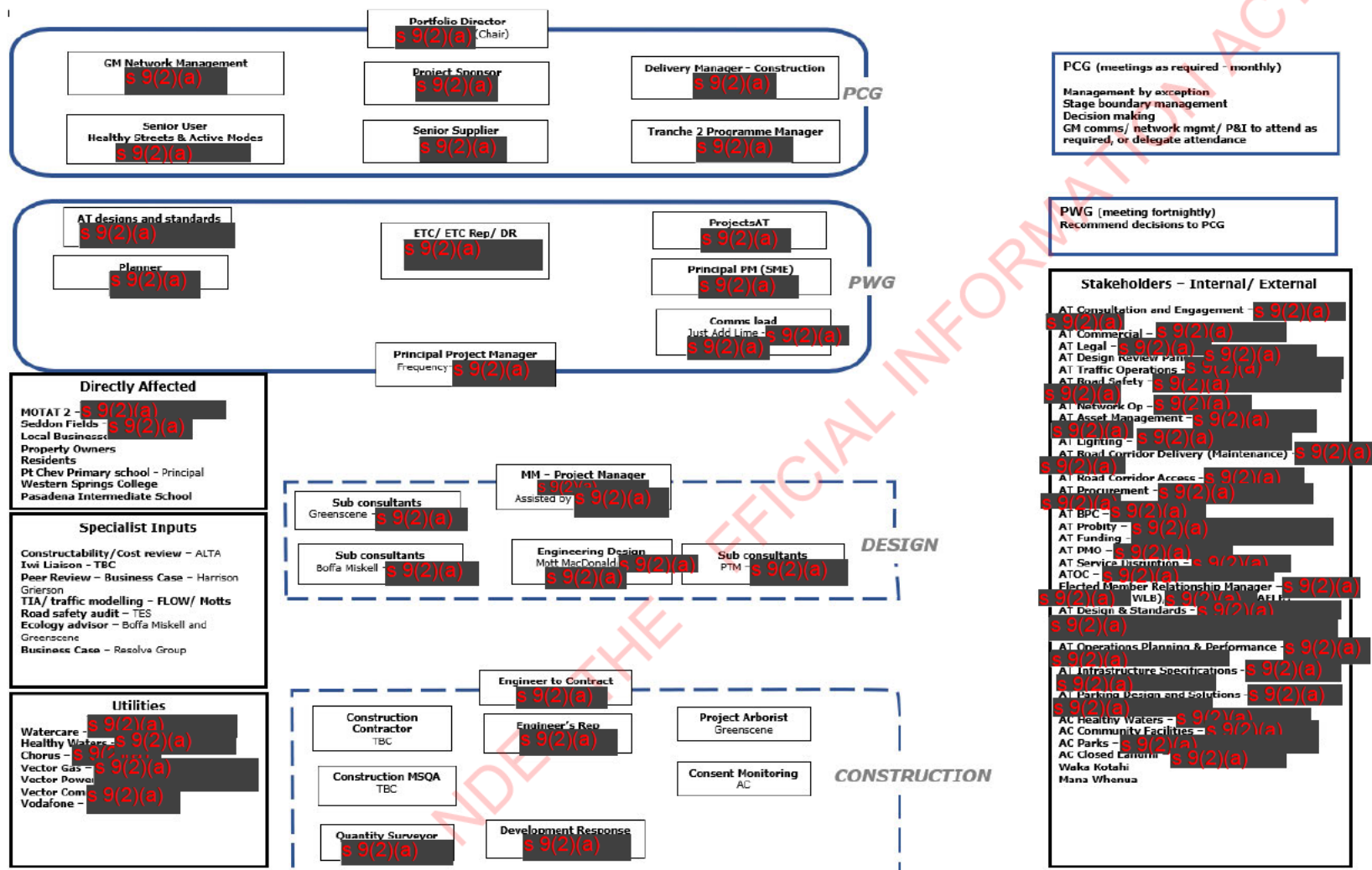
Summary of project milestones are outlined in [Table 13](#). Changes to these dates will be approved through the change request process.

Table 13: Project Milestones

Milestone	Description	Start Date	Finish Date
Business Case Addendum	Obtain approval for business case	Dec 2021	Jul/Aug 2022
Detailed Design	Complete the detailed design phase	Sept 2021	Jul 2022
Internal Consultation	Complete internal consultation	Aug 2019	Ongoing
Procurement/Tendering for Construction	Procurement and award of construction contract (subject to funding)	Aug 2022	Sept 2022
Construction	Construction contract (15-18-month construction period)	Nov 2022	Jun 2024
Project Close	Close out the project	Jun 2024	Dec 2024

The project governance structure is provided in Figure 7.

Figure 7: Project Governance



The Project Delivery roles are provided in [Table 14](#).

Table 14: AT Project Delivery Team Roles

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

7.3 Critical Dependencies

The Project Delivery roles are provided in [Table 15](#).

Table 15: Critical Dependencies

Dependency For / On	Potential Impact
Proposed MOTAT car park will be developed in order to offset the parking loss on Meola Road	<p>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.</p> <p>Stage 1 MOTAT2 carpark is being constructed now and is due for completion in August / September 2022. Auckland Transport will operate / manage the carpark from November 2022. Parking will be free of charge until this date. Public engagement / communications are to be issued soon around parking restrictions and tariffs for this new carpark.</p>
Resource Consent Application	<p>The resource consent application was submitted on the basis that it does not trigger any need for consultation or limited consultation.</p> <p>Resource Consent is approved with conditions to be met.</p> <p>The project team has identified all the actions required as part of the consent conditions, firstly by Auckland Transport prior to the contract commencing, and secondly by the contractor as</p>

Dependency For / On	Potential Impact
	the work proceeds. This information will be included in the contract document, and reference to it will be made in the preamble, specification, and Schedule of Prices as appropriate.
Landowner Approvals (Auckland Council)	<p>Some minor earthworks require landowner approval for temporary occupation where the road batter extents in reserve land.</p> <p>Now that design is completed, Auckland Transport is commencing the process to apply for this Land Owner Application (LOA).</p> <p>Auckland Transport is also reconciling other land issues e.g. where a private landowner has occupied road reserve.</p>
Major Services Relocation	<p>The power poles on Meola Road will need to be relocated to accommodate the cycleway. The assumption to date is that Vector will undertake this work early during the construction programme and not place risk on the overall programme.</p> <p>Vector have completed the design for the undergrounding and will be moving into a procurement phase with the intention to deliver the works prior to the start of the cycleway project.</p> <p>Trees have already been removed to allow this work to be undertaken.</p>

7.4 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. 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 Waka Kotahi the construction may not go ahead, due to lack of funding.
- Construction over a closed landfill: Part of the construction is over a closed landfill – potential of contaminated land.
- Reputation: Loss of public support for project due to loss of on-street parking on Meola Rd /
- ineffective integration and coordination with interfacing projects.
- Power line relocation: 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.

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 the Monthly meetings. Refer to Appendix F for the latest Risk Register.

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8 Peer Review Response

A Peer Review of the SSBC was undertaken by Harrison Grierson in October 2021.

Refer to Appendix D for the Peer Review and the response.

In summary, there were no significant issues raised within the Peer Review. The economic analysis was updated in February 2022 to reflect agreed changes and the BCR changed from 1.8 to 1.9.

Following the updated cost estimates in June 2022, the economic analysis was further updated in July 2022 with the BCR returning to 1.8.

There has been a Stage 3 Safety Audit completed since the peer review was undertaken which further addresses the peer reviewers concerns regarding the signed version of the Stage 2 Safety Audit.

The Peer Review Response has been provided to the Peer Reviewer for their further review and comment and is closed out.

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A. Economic Analysis

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PROJECT PT CHEVALIER TO WESTMERE CYCLEWAY
SUBJECT ECONOMIC CASE
TO § 9(2)(a) (RESOLVE GROUP)
FROM § 9(2)(a)
DATE 20 OCTOBER 2020 (UPDATED 13 JULY 2022)

1 INTRODUCTION

The following document summarises the Economic Case of the proposed Pt Chevalier to Westmere Cycleway project. Sections 2 to 7 of this document are intended to form an input into the project's Single Stage Business Case (SSBC), being prepared by Resolve Group and Mott Macdonald for Auckland Transport.

The project consists of

- ◆ Protected cycle infrastructure along the route
 - One-way protected cycle lanes on each side of Pt Chevalier Road, from Great North Road to Meola Road
 - A two-way protected cycleway on the north side of Meola Road
 - One-way protected cycle lanes on each side of Garnet Road, from Meola Road to Oban Road
- ◆ Significant improvements to pedestrian crossing along the route
 - Raised table and kerb extension treatments of side roads along the route, with zebra crossings (12)
 - A raised table zebra crossing of the left turn slip lane from Great North Road into Pt Chevalier Road, and removing the existing left turn slip lane from Pt Chevalier Road into Great North Road
 - New raised table zebra crossings on Pt Chevalier Road (1), Meola Road (4), the Pt Chevalier Road/Meola Road intersection (2) and at the Meola Road/Garnet Road roundabout (4)
 - Signalising and raising the existing zebra crossing on Pt Chevalier Road north of Tui Street, and a new raised signalised crossing on Pt Chevalier Road north of Miller Road
 - Installing raised tables at existing zebra crossings on Pt Chevalier Road (1), Meola Road (1) and Garnet Road (1)
- ◆ Public transport improvements
 - A southbound bus lane on Pt Chevalier Road, from Wakatipu Street to south of Tui Street
 - A reduction in the number of bus stops on Pt Chevalier Road from 4 to 3 in each direction

- ◆ General traffic changes
 - Removal of the southbound left-turn slip lane from Pt Chevalier Road into Great North Road
 - Installing a roundabout at the Pt Chevalier Road/Meola Road intersection
 - Removal of one eastbound lane on Garnet Road, on approach to the Meola Road roundabout, and metering the westbound approach
 - Removal of some on-street car parking

2 ECONOMIC ASSESSMENT METHODOLOGY

2.1 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 31 August 2020. Previous versions of this technical note included both the EEM and MBCM methodologies. However, Waka Kotahi have subsequently advised that only the MBCM method should be applied. As a result, previous versions of this technical note that included the now redundant EEM methodology should be disregarded.

The economic evaluation applies

- ◆ A 40-year evaluation period
- ◆ A 4% discount rate
- ◆ Current MBCM update factors, published 15 December 2021
- ◆ A 20-month construction period, beginning November 2022 and finishing July 2024. Construction costs have been linearly distributed across the 2022/23 and 2023/24 financial years, and are assumed to be incurred at the midpoint of each financial year.
- ◆ Pre-implementation costs (design) are understood to be sunk costs, and have been omitted from the default evaluation accordingly.

2.2 Intersection modelling

We have developed models of the Pt Chevalier Road/Meola Road intersection using SIDRA. 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 Pt 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 3 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 supplied by AECOM for the Pt Chevalier Road/Great North Road intersection, and these have allowed us to calculate the bus travel time and reliability benefits associated with the proposed morning and evening peaks, southbound bus lane on Pt 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. We have 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).

2.3 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; the traffic calming proposed will improve safety for traffic turning in/out of side streets. A 20% crash reduction factor has been applied, from Waka Kotahi's Crash Estimation Compendium, to all crashes relating to turning-traffic at these treated streets (excluding pedestrian and cyclist crashes, which are addressed below)
- ◆ Removing of all on street car parking on Meola 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 we note 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 48% crash reduction factor has been applied to reported pedestrian crashes, from Waka Kotahi's Crash Compendium. This crash reduction factor is a composite of the compendium's crash reduction factors for raised tables (20%) and kerb extensions (35%), and disregards any additional safety benefits of improved street lighting and zebra crossings.

2.4 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.

We note that more recent land use forecasts were released by Auckland Council in early 2021 ("Scenario I11.6"). The new forecasts assume greater growth within the Unitec site, but marginally less growth in other brownfields areas. We do not anticipate 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 2028 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.

2.5 Estimating pedestrian demand

Estimated pedestrian demands have been developed based on surveyed pedestrian counts on 2 sections of Pt 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.

We have assumed that pedestrian demands will grow at 1.5% per annum, linearly. This matches the 1.5% population growth forecast for Pt Chevalier and Meola Road areas within the MSM model.

3 BENEFIT STREAMS

The following table summarises the discounted benefits assessed for the project.

Table 1: Summary of project benefits

Benefit stream	Source of benefits	Discounted benefits
Cycling benefits		
Travel time savings	Reduction in perceived travel times	\$2.2 million
Crash cost savings	Crash reductions due to cycle infrastructure	\$3.8 million
Health benefits	Benefits of increased physical activity	\$35.1 million
Walking benefits		
Travel time	n/a	\$nil
Crash cost savings	Crash reductions due to crossing improvements	\$4.4 million
Health & environment	Benefits of increased physical activity and reduced private car travel	\$10.0 million

Table 1: Summary of project benefits

Benefit stream	Source of benefits	Discounted benefits
Public transport benefits		
Travel time savings	Travel time savings due to southbound bus lane	\$1.1 million
Reliability benefits	Reduction in late buses due to southbound bus lane	\$2.2 million
General traffic benefits		
Travel time, congestion, vehicle operating and reliability costs	Travel cost changes due to intersection changes	-\$1.1 million
	Travel cost changes due to mode shift away from private car travel	\$4.6 million
Crash cost savings	Crash reductions due to traffic calming at intersections	\$3.2 million
Emissions reduction benefits ¹	Emissions reductions due to mode shift away from private car travel	\$0.2 - \$0.4 million
Total benefits		\$65.7 - \$65.8 million

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, as per Section 2.2
- ♦ 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 (including delays for bus services)
- ♦ 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
- ♦ Non-monetised benefits, such as the mental health benefits of increased physical activity.

4 PROJECT COSTS

Project costs of \$47.04 million have been supplied by Auckland Transport and include

- ♦ \$2.26 million in pre implementation costs already incurred. These sunk costs have been omitted from the analysis
- ♦ \$44.78 million in construction costs

We understand that \$8.59 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

¹ The MBCM applies requires emissions benefits to be calculated using both a low and high shadow cost for CO₂ emissions

without the project. This cost contribution has been assigned to both the project and the Do Minimum, effectively deducting it from the project costs.

We have assumed an annual maintenance cost of 0.5% of the capital costs (\$224,000 per annum).

Discounted, these costs sum to \$37.3 million.

5 BENEFIT COST RATIO

The project has an estimated benefit cost ratio of 1.8 (\$65.7 million benefits, \$37.3 million costs)

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 ($\pm 20\%$)
- ♦ 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 MBCM SP11 method
- ♦ Assessing a high future uptake of e-bikes (resulting in more and longer e-bike trips, but conversely lower health benefits per km)
- ♦ Including all sunk costs
- ♦ Including the \$8.59 million component for pavement rehabilitation
- ♦ Applying a parallel cost estimate developed by WT Partnership of \$48.1 million
- ♦ Applying the P95 cost estimate of \$52.6 million
- ♦ Omitting the public transport reliability benefits; this last sensitivity test has been included to address an item raised by the peer reviewers of this assessment

The results are presented below

Table 2: Benefit Cost Ratios – Sensitivity Tests

Sensitivity Test Scenario	Discounted Project BCR
Low active mode demands (-20%)	1.4
P95 cost estimate	1.5
Including pavement rehabilitation costs	1.5
Including sunk costs	1.7
Low general traffic decongestion rate (SP11)	1.7
Public transport reliability benefits omitted	1.7
Parallel cost estimate	1.7
Default BCR	1.8
High general traffic decongestion rate	2.1

Table 2: Benefit Cost Ratios – Sensitivity Tests

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

We note that omitting the public transport reliability benefits, as recommended by the peer reviewers, does not result in a material change to the project's BCR.

7 INVESTMENT ASSESSMENT FRAMEWORK ASSESSMENT

The Waka Kotahi Investment Prioritisation Method for the 2021–24 NLTP is used to give effect to the Government Policy Statement on land transport 2021 (GPS 2021) in the 2021–24 NLTP. Investment prioritisation is undertaken to ascertain the priority order of an activity after a business case is presented for endorsement and a funding decision is requested, in order to check that the activity is above the investment threshold.

The Investment Prioritisation Method for 2021–24 NLTP has three factors, namely GPS Alignment, Scheduling and Efficiency. We have assessed each in turn below

Table 3: 2021-24 NLTP Investment Prioritisation

Prioritisation criteria		Assessment
GPS Alignment	Safety	High rating: the project address DSIs among people on bikes within central Auckland. Urban central Auckland is listed as an area of High Concern for cycling safety in Waka Kotahi's 2020 Communities at Risk Register
	Better travel options	High rating: the project will provide new cycling links that will form part of a major urban area network
	Better travel options and climate change	Medium rating: less than 3% increase in cycle to work mode shares predicted for Pt Chevalier and Westmere
	Climate change	Medium rating: the project is estimated to result in a less than 3% reduction in vehicle-km travelled within Pt Chevalier and Westmere
	Improving freight connections	Not applicable

Table 3: 2021-24 NLTP Investment Prioritisation

Prioritisation criteria		Assessment
Scheduling	Interdependency	Medium rating: the project is part of the Auckland Urban Cycleways programme. Non-delivery of the project will have moderate impacts on the benefits realisation of that programme
	Criticality	High rating: the connecting routes on the Inner West Cycle Network are due for completion within the current 2021 NLTP, including Garnet Road, Old Mill Road, Surrey Crescent, Great North Road and improvements to Richmond Road. The overall programme and completed link from Pt Chevalier to the city centre via the above routes will not be delivered if the Pt Chevalier to Westmere cycleway is not progressed. This will impact on the overall cycle programme and the wider Emissions Reduction Programme.
Efficiency		Low: BCR of 1.8 (with a sensitivity test range of 1.4 to 2.1)

The project has a proposed rating of High-High-Low, giving it a draft investment priority order of 5.

B. Appraisal Summary Tables

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Appraisal Summary Table

Date: 22/12/2021	Evaluation Period: (baseline and forecast year) e.g. 2020 - 2060 2020-2060	Option Name: Point Chevalier to Westmere – Option 1 (50% Detailed Design)
Problem/opportunity statement: The road network in Point Chevalier and Westmere fails to meet the needs of its users, resulting in poor integration between modes and poor safety outcomes, especially for active users.	Investment objectives: 1 Reduce deaths or serious injuries on the corridors by 66% by 2030. 2. Triple active mode share from 8% to 24% of total journeys to work by 2028 3. Public transport travel times are at least as competitive as general traffic between the eastern end of Meola Road and Point Chevalier Road / Great North Road intersection by 2022. 4. Improve access to / from and within Pt Chevalier and Westmere neighbourhoods through active mode facilities	How project gives effect to GPS: The Government's main strategic priorities are developing a safer transport system and providing people with better travel options. Point Chevalier to Westmere - Cycleway, bus and safety improvements will implement activities to help achieve these strategies, by providing safe cycling and walking infrastructure in an Auckland inner suburb where travelling by sustainable means offers competitive journey times to motorised modes to gain access to a wide range of social and economic opportunities. Further, improving walking and cycling facilities will encourage local residents to travel sustainably, which in turn will reduce congestion and lower emissions, assisting the GPS's climate priorities.
		How project gives effect to local community outcomes: The local community have been extensively consulted on the proposed improvements and their views taken into consideration. They are supportive of improvements to make walking and cycling safer. In particular they like the protected cycleways, the safer streets and the pedestrian crossing facilities, however they are concerned about the loss of parking, which has been addressed by creating additional spaces.

Transport Outcomes	Non-Monetised Impact: (description in numerical or narrative terms)				Monetised Impact: (description in dollar terms in real terms, non-discounted)	
	Name of Measure:	Baseline:	Do Minimum Impact:	Preferred Option Impact:	Do Minimum Impact:	Option Impact:
Healthy and safe people 1.1 Impact on social cost and incidents of crashes	1.1.2 Crashes by Severity	5 2 injury crashes/year (5 pedestrian injury, 2 cycle injury and 19 turning traffic injury crashes over last 5 year period)	198 injury crashes over the next 40 years (48 ped, 29 cyclist, 121 turning traffic)	62 fewer injury crashes over next 40 years (23 ped, 15 cyclist, 24 turning traffic)	\$73,000,000 in non-discounted crash costs over 40-year period	\$48,000,000 in non-discounted crash costs over 40-year period (\$25,000,000 reduction)
Environmental sustainability 8.1 Impact on greenhouse gas emissions	8.1.1 CO2 emissions	2020 CO2 emissions – approximately 33,000 annual tonnes of CO2 emitted due to road transport by residents of Pt Chevalier and Westmere	Approximately 32,000 annual tonnes of CO2 emitted due to road transport by residents of Pt Chevalier and Westmere in 2038	A further reduction of approximately 70 annual tonnes of CO2 emitted in 2038	\$0	\$590,000 to \$930,000 in non-discounted emissions reduction benefits (low/high CO2 shadow cost rates)
8.1 Impact on greenhouse gas emissions	8.1.2 Mode shift from single occupancy private vehicle	Current mode cycle to work mode share in both Pt Chev and Westmere is 5% (2018 census)	Forecast cycle to work mode shares in both Pt Chev and Westmere of 6%	Forecast cycle to work mode shares in both Pt Chev and Westmere of 7%	\$0	\$12,000,000 in non-discounted road traffic reduction benefits due to mode shift from private car travel to cycling

Transport Outcomes	Non-Monetised Impact: (description in numerical or narrative terms)				Monetised Impact: (description in dollar terms in real terms, non-discounted)	
Name of Benefit	Name of Measure:	Baseline:	Do Minimum Impact:	Preferred Option Impact:	Do Minimum Impact:	Option Impact:
Inclusive access 12.1 Impact on Te Ao Māori	12.1.1 Te Ao Māori	Auckland Transport and the project team are committed to ongoing work with Mana whenua to maximise the Te Aranga outcomes within the project scope: Taiao: An overall positive effect on the environment is expected as existing space for vehicle movement is reallocated to active transport use (walking and cycling); Existing native trees will be preserved; where trees are required to be removed, replanting with site-appropriate native species will be specified. Mauri-Tu: Detailed design investigation will identify opportunities for stormwater treatment utilising swales and to understand the design constraints associated with the closed landfill on Meola Road; Mahi Toi: Opportunities exist for the creative expression of Whakapapa and the introduction of iwi narratives where the cycleway crosses the Waititiko (Meola Creek) and Wai-a-Te Ao (Motions Creek) and at the entrance to the Te Tokaroa (Meola Reef Reserve). Ahi-Ka: The project will increase opportunities for the local community to reconnect with its physical and cultural landscape through moving through, and spending time in the landscape on foot or on bicycle.				
10.1 Impact on user experience of the transport system	10.1.7 People - throughput (UCP)	February 2017 counts of between 170 and 420 daily cycle trips on Pt Chevalier Road, Meola Road and Garnet Road	Average of 500 daily cycle trips on project links forecast in 2038 Model Reference Case	Average of 1,050 daily cycle trips on project links forecast in 2038 Model Option Case		\$5,600,000 travel time savings for cyclists \$113,000,000 health benefits
10.1 Impact on user experience of the transport system	10.1.9 Travel time	0 second travel time savings for buses	0 second travel time savings for buses	An average 45 second travel time savings compared to the do minimum for southbound buses	\$0	\$8,700,000 PT travel time and reliability savings
10.2 Impact on mode choice	10.2.3 Spatial coverage - cycle lanes and paths	0km of cycle lanes/paths on route	0km of cycle lanes/paths on route	2.8km of cycle lanes/paths on route	n/a	n/a
1. Summary of Non-Monetised Impacts (Description)		2. Summary of Financial Impacts		3. Summary of Monetised Option Impacts		
There will be 62 less injury crashes over the next 40 year period, resulting in a (non discounted) savings of \$25 million in the social cost of crashes. The preferred option will contribute to environmental sustainability through increasing the number of cyclists and pedestrians on the route and reducing the reliance on the private car (thereby reducing greenhouse gas emissions). A health and environmental benefit of \$113 million from walking and cycling is expected with the preferred option. The project will provide 2.8km of additional cycle lanes for the Auckland cycle network and provide an estimated \$5.6 million in travel time savings for cyclists over the evaluation period. Travel time for buses will reduce with the new bus lane on Point Chevalier Road with an average savings of 45 seconds, resulting in an estimated savings of \$8million in travel time and reliability benefits.		Capital Costs	\$31,740,000	Total Monetised Benefits, <u>excluding</u> Wider Economic Benefits (WEBs)	\$65,260,000 to \$65,390,000	
				Total Monetised Benefits, <u>including</u> Wider Economic Benefits (WEBs)	\$65,260,000 to 65,390,000	
		Operating Costs	\$3,190,000	Total Monetised Benefits (costs) (NPV CAPITAL)	\$ 34,930,000	
				BCR (excluding WEBs)	1.9	
		Total Financial Costs	\$34,930,000	BCR (including WEBs)	1.9	

Rationale for selecting preferred option: The preferred option contributes well to the investment objectives and returns a positive BCR with a FYRR of 4%. The other shortlisted option (bi directional cycle lanes along Point Chevalier Road and uni directional cycle lanes along Meola Road) will provide a similar benefits (\$55M compared to \$65M), however there are significant safety concerns with Option 2B which do not come through the economic assessment but rather the Safe Systems Assessment Framework (SSAF) completed in 2021.

Appraisal Summary Table

Date: 22/12/2021	Evaluation Period: (baseline and forecast year) e.g. 2020 - 2060 2020-2060	Option Name: Point Chevalier to Westmere – Option 2b (value engineered option alternative – bi directional cycleway along west side of Pt Chevalier Rd, reduced bus lane length)	
Problem/opportunity statement: The road network in Point Chevalier and Westmere fails to meet the needs of its users, resulting in poor integration between modes and poor safety outcomes, especially for active users.	Investment objectives:	How project gives effect to GPS: The Government's main strategic priorities are developing a safer transport system and providing people with better travel options. Point Chevalier to Westmere - Cycleway, bus and safety improvements will implement activities to help achieve these strategies, by providing safe cycling and walking infrastructure in an Auckland inner suburb where travelling by sustainable means offers competitive journey times to motorised modes to gain access to a wide range of social and economic opportunities. Further, improving walking and cycling facilities will encourage local residents to travel sustainably, which in turn will reduce congestion and lower emissions, assisting the GPS's climate priorities.	How project gives effect to local community outcomes: The local community have been extensively consulted on the proposed improvements and their views taken into consideration. They are supportive of improvements to make walking and cycling safer. In particular they like the protected cycleways, the safer streets and the pedestrian crossing facilities, however they are concerned about the loss of parking, which has been addressed by creating additional spaces.
	1. Reduce deaths or serious injuries on the corridors by 66% by 2030.		
	2. Triple active mode share from 8% to 24% of total journeys to work by 2028		
	3. Public transport travel times are at least as competitive as general traffic between the eastern end of Meola Road and Point Chevalier Road / Great North Road intersection by 2022.		
	4. Improve access to / from and within Pt Chevalier and Westmere neighbourhoods through active mode facilities		

Transport Outcomes		Non-Monetised Impact: (description in numerical or narrative terms)			Monetised Impact: (description in dollar terms in real terms, non-discounted)	
Name of Benefit	Name of Measure:	Baseline:	Do Minimum Impact:	Option Impact:	Do Minimum Impact:	Option Impact:
Healthy and safe people 1.1 Impact on social cost and incidents of crashes	1.1.2 Crashes by Severity	5.2 injury crashes/year (5 pedestrian injury, 2 cycle injury and 19 turning traffic injury crashes over last 5 year period)	198 injury crashes over the next 40 years (48 ped, 29 cyclist, 121 turning traffic)	50 fewer injury crashes over next 40 years (17 ped, 11 cyclist, 22 turning traffic)	\$73,000,000 in non-discounted crash costs over 40-year period	\$62,000,000 in non-discounted crash costs over 40-year period (\$11,000,000 reduction)
Environmental sustainability 8.1 Impact on greenhouse gas emissions	8.1.1 CO2 emissions	2020 CO2 emissions – approximately 33,000 annual tonnes of CO2 emitted due to road transport by residents of Pt Chevalier and Westmere	Approximately 32,000 annual tonnes of CO2 emitted due to road transport by residents of Pt Chevalier and Westmere in 2038	A further reduction of approximately 56 annual tonnes of CO2 emitted in 2038	\$0	\$472,000 to \$744,000 in non-discounted emissions reduction benefits (low/high CO2 shadow cost rates)
8.1 Impact on greenhouse gas emissions	8.1.2 Mode shift from single occupancy private vehicle	360 cyclists per day in 2028 Model Reference case. Current mode cycle to work mode share in both Pt Chev and Westmere is 5% (2018 census)	514 cyclists per day in 2038 Model Reference case. Forecast cycle to work mode shares in both Pt Chev and Westmere of 6%	855 cyclists per day in 2038 Model Option case. Forecast cycle to work mode shares in both Pt Chev and Westmere of 6%	\$0	\$10,600,000 in non-discounted road traffic reduction benefits due to mode shift from private car travel to cycling

Transport Outcomes	Non-Monetised Impact: (description in numerical or narrative terms)				Monetised Impact: (description in dollar terms in real terms, non-discounted)	
Name of Benefit	Name of Measure:	Baseline:	Do Minimum Impact:	Option Impact:	Do Minimum Impact:	Option Impact:
Inclusive access 12.1 Impact on Te Ao Māori	12.1.1 Te Ao Māori	Auckland Transport and the project team are committed to ongoing work with Mana whenua to maximise the Te Aranga outcomes within the project scope: Taiao: An overall positive effect on the environment is expected as existing space for vehicle movement is reallocated to active transport use (walking and cycling); Existing native trees will be preserved; where trees are required to be removed, replanting with site-appropriate native species will be specified. Mauri-Tu: Detailed design investigation will identify opportunities for stormwater treatment utilising swales and to understand the design constraints associated with the closed landfill on Meola Road; Mahi Toi: Opportunities exist for the creative expression of Whakapapa and the introduction of iwi narratives where the cycleway crosses the Waititiko (Meola Creek) and Wai-a-Te Ao (Motions Creek) and at the entrance to the Te Tokaroa (Meola Reef Reserve). Ahi-Ka: The project will increase opportunities for the local community to reconnect with its physical and cultural landscape through moving through, and spending time in the landscape on foot or on bicycle.				
10.1 Impact on user experience of the transport system	10.1.7 People - throughput (UCP)	February 2017 counts of between 170 and 420 daily cycle trips on Pt Chevalier Road, Meola Road and Garnet Road	Average of 500 daily cycle trips on project links forecast in 2038 Model Reference Case	Average of 855 daily cycle trips on project links forecast in 2038 Model Option Case	\$0	\$4,300,000 travel time savings for cyclists \$100M health benefits
10.1 Impact on user experience of the transport system	10.1.9 Travel time	0 second travel time savings for buses	0 second travel time savings for buses	<10 second travel time savings for buses	\$0	\$2,200,000 PT travel time and reliability savings
10.2 Impact on mode choice	10.2.3 Spatial coverage - cycle lanes and paths	0km of cycle lanes/paths on route	0km of cycle lanes/paths on route	2.8km of cycle lanes/paths on route	n/a	n/a
1. Summary of Non-Monetised Impacts (Description)		2. Summary of Financial Impacts		3. Summary of Monetised Option Impacts		
There will be 50 less injury crashes over the next 40 year period, resulting in a (non discounted) savings of \$11 million in the social cost of crashes. The bus lane in option 2B stops approximately 270 m short of the Great North Road intersection. This distance is greater than the modelled average queue length on Pt Chevalier Road, so the benefits of the reduced bus lane are likely to be small (25% of the benefits of the previous, full length bus lane) and result in the option unlikely to meet Investment objective 3. Option 2b provides a 2-way cycleway through a residential setting, which generally result in reduced safety outcomes as turning traffic may not be expecting cyclists to be travelling in the 'contra flow' direction. Option 2B results in the greatest number of conflict points with 6 side streets. In addition to reducing actual safety, the above will have an impact on perceived safety, with this in turn affecting cycle demand on Pt Chevalier Road. This reduces future demand on Pt Chevalier Road. A Safe Systems Assessment Framework concluded that this option did not move the corridor sufficiently towards a safe system.		Capital Costs	\$23,000,000	Total Monetised Benefits, <u>excluding</u> Wider Economic Benefits (WEBs)	\$55,200,000	
				Total Monetised Benefits, <u>including</u> Wider Economic Benefits (WEBs)	\$55,200,000	
		Operating Costs	\$1,100,000	Total Monetised Benefits (costs) (NPV CAPITAL)	\$24,100,000	
				BCR (excluding WEBs)	2.3	
		Total Financial Costs	\$24,100,000	BCR (including WEBs)	2.3	

Rationale for selecting preferred option: Option 2b returns a positive BCR of 2.3, however the option has safety issues, does not meet investment objective 3 well and has forecast significantly lower cycle demand than Option 1 over the next 40 years. Option 1 (50% Detailed Design) remains the preferred option. A Safe Systems Assessment Framework concluded that this option did not move the corridor sufficiently towards a safe system.

The Safety concerns are included in the SSAF, with Option 1 moving the corridor closer to a safe system compared to Option 2. The main identified differences are:

Option 2b has fewer raised crossings on the side roads and along Pt Chevalier hence the projected operating speed is higher than Option 1 – likelihood and severity of pedestrian and cycle crashes (and all crashes) is more in Option 2b than Option 1.

Option 2b includes a bi directional cycle lane which is “on road” across side roads compared to Option 1 which takes cyclists on a cycle path across the raised (paired) crossing – severity of cycle crashes is more in Option 2b than Option 1.

Transport Outcomes	Non-Monetised Impact: (description in numerical or narrative terms)				Monetised Impact: (description in dollar terms in real terms, non-discounted)	
Name of Benefit	Name of Measure:	Baseline:	Do Minimum Impact:	Option Impact:	Do Minimum Impact:	Option Impact:
<p>Option 2b includes a bi directional cycle lane – A safety concern associated with the bi-directional options compared to the uni-directional option is that where there are a high number of residential driveways (as is the case with Pt. Chevalier Road) drivers are not always expecting cyclists from both directions.</p> <p>Option 1 provides a roundabout at the Meola Road / Pt Chevalier Road intersection , whereas Option 2b retains the existing give way control T intersection. Option 1 provides good compliance with safe system objectives.</p> <p>Option 2b has a mid block pedestrian signal which is not raised. It is more likely crashes with pedestrians will occur in Option 2b (compared to Option 1) and the likely severity is greater in Option 2b than with Option 1.</p> <p>Note: This AST was formulated in Dec 2021 from information assessed through the value engineering exercise in early 2021.</p>						

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C. Cost Estimates (2022)

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Project Estimate - Form E

PE2

Project Name: PT Chevalier to Westmere Improvements - DRAFT

Pre-Implementation Estimate 2

Item	Description	Base Estimate	Contingency	Funding Risk Contingency
A	Nett Project Property Cost	N/A	N/A	N/A
B	Project Development Phase			
	- Consultancy Fees			
	- AT Managed Costs			
B	Total Project Development	Sunk	Sunk	Sunk
C	Pre-implementation Phase			
	- Consultancy Fees	s 9(2)(b)(ii)		
	- AT Managed Costs			
C	Total Pre-implementation			
D	Implementation Phase			
	Implementation Fees			
	- Consultancy Fees	s 9(2)(b)(ii)		
	- AT Managed Costs			
	- Construction Monitoring Fees			
	- Tree removal			
	- Chorus OHUG			
	- Vector OHUG			
	Sub Total Base Implementation Fees	4,076,113	815,223	611,417
	Physical Works			
	1 Environmental Compliance	s 9(2)(b)(ii)		
	2 Site Clearance and Demolition			
	3 Earthworks			
	4 Ground Improvements			
	5 Drainage			
	6 Pavement and Surfacing			
	7 Bridges			
	8 Retaining Walls			
	9 Traffic Services			
	10 Service Relocations			
	11 Streetscape & Urban Design			
	12 Landscaping			
	13 Traffic Management and Temporary Works			
	14 Preliminary and General			
	15 Off Site Overheads and Profit			
	Escalation			
	Sub Total Base Physical works	33,655,266	6,231,180	4,985,806
D	Total for Implementation Phase	37,731,379	7,046,402	5,597,223
E	Project Base Estimate (A+C+D)	39,989,417		
F	Contingency (Assessed/Analysed) (A+C+D)		7,046,402	
G	Project Expected Estimate (E+F)		47,035,820	
Nett Project Property Cost Expected Estimate			N/A	
Project Development Phase Expected Estimate			Nil	
Pre-implementation Phase Expected Estimate			Nil	
Implementation Phase Expected Estimate			44,777,782	
H	Funding Risk Contingency (Assessed/Analysed) (A+C+D)			5,597,223
I	95th percentile Project Estimate (G+H)			52,633,042
Nett Project Property Cost 95th percentile Estimate				N/A
Project Development Phase 95th percentile Estimate				Nil
Pre-implementation Phase 95th percentile Estimate				Nil
Implementation Phase 95th percentile Estimate				50,375,004

Date of Estimate: 1 June 2022	Cost Index (Qtr/Year)	June 2022
Estimate prepared by: s 9(2)(a)	Signed	s 9(2)(a)
Estimate internal peer review by: s 9(2)(a)	Signed	
Estimate external peer review by	Signed	
Estimate accepted by AT	Signed	

Note: (1) These estimates are exclusive of escalation and GST.
 (2) Project Development Phase Estimates are set to Nil as these are now sunk costs.
 (3) Nett Project Property Cost not applicable.

Project Estimate - Form D

PE1

Project Name: PT Chevalier to Westmere Improvements

Pre-Implementation Estimate 1

Item	Description	Base Estimate	Contingency	Funding Risk Contingency
A	Nett Project Property Cost	N/A	N/A	N/A
B	Project Development Phase			
	- Consultancy Fees			
	- AT Managed Costs			
B	Total Project Development	Sunk	Sunk	Sunk
C	Pre-implementation Phase			
	- Consultancy Fees	s 9(2)(b)(ii)		
	- AT Managed Costs			
C	Total Pre-implementation	2,258,038		
D	Implementation Phase			
	Implementation Fees			
	- Consultancy Fees	s 9(2)(b)(ii)		
	- AT Managed Costs			
	- Construction Monitoring Fees			
	- Tree removal			
	- Chorus OHUG			
	- Vector OHUG			
	Sub Total Base Implementation Fees	4,076,113	815,223	733 700
	Physical Works			
	1 Environmental Compliance	s 9(2)(b)(ii)		
	2 Site Clearance and Demolition			
	3 Earthworks			
	4 Ground Improvements			
	5 Drainage			
	6 Pavement and Surfacing			
	7 Bridges			
	8 Retaining Walls			
	9 Traffic Services			
	10 Service Relocations			
	11 Streetscape & Urban Design			
	12 Landscaping			
	13 Traffic Management and Temporary Works			
	14 Preliminary and General			
	15 Off Site Overheads and Profit			
	16 Escalation			
	Sub Total Base Physical works	34,103,727	6,820,777	6,138,300
D	Total for Implementation Phase	38,179,962	7,636,000	6,872,000
E	Project Base Estimate (A+C+D)	40,438,000		
F	Contingency (Assessed/Analysed) (A+C+D)		7,636,000	
G	Project Expected Estimate (E+F)		48,074,000	
Nett Project Property Cost Expected Estimate			N/A	
Project Development Phase Expected Estimate			Nil	
Pre-implementation Phase Expected Estimate			Nil	
Implementation Phase Expected Estimate			45,815,962	
H	Funding Risk Contingency (Assessed/Analysed) (A+C+D)			6,872,000
I	95th percentile Project Estimate (G+H)			54,946,000
Nett Project Property Cost 95th percentile Estimate				N/A
Project Development Phase 95th percentile Estimate				Nil
Pre-implementation Phase 95th percentile Estimate				Nil
Implementation Phase 95th percentile Estimate				52,687,962

Date of Estimate: 8 July 2022	Cost Index (Qtr/Year) 3/2022
Estimate prepared by: s 9(2)(a)	Signed
Estimate internal peer review by: s 9(2)(a)	Signed
Estimate external peer review by	Signed
Estimate accepted by AT	Signed

Note: (1) These estimates are inclusive of escalation and GST.
 (2) These estimates are exclusive of GST.
 (2) Project Development Phase Estimates are set to Nil as these are now sunk costs.
 (3) Nett Project Property Cost not applicable.

D. Peer Review Response

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Report Section Reference	Issue description	AT Comment	HG Comment	Resolved Y/N
5.3 Economic Evaluation General Comments	We sense checked the Flow spreadsheet using the crash cost saving of walking and cycling facilities (SP11-6) as an example and the results were not comparable. We therefore have some general concerns with the parameters used in the Flow spreadsheet. Furthermore, the Flow spreadsheet includes some naming issues likely due to copy and pasting. It is assumed that the content and formulas are correctly applied although the spreadsheets yield a number of referencing errors that are linked to Flows internal servers. ACTION: Update referencing errors and naming errors so that the Excel spreadsheet can be cross referenced and formulas checked/reviewed.	Not unexpected that SP11-6 would give different results to our spreadsheet. SP11 does not allow us to tailor our assessment to suit output format of the Auckland Cycle Model, or to reflect local/project conditions. If they were the same, we would not have developed a bespoke spreadsheet. It's not clear what naming issues are in the spreadsheet. Extenal links draw on output dumps from the cycle model, which have been stripped out to reduce file size. Will upload full economics spreadsheet to file sharing folder.	Agree with the response. The spreadsheet has been reviewed. Agreed with the response.	Y
5.3 Economic Evaluation General Comments	It is noted that there is no consideration for non-monetised benefits. Non-monetised benefit measures focus on quantitative or qualitative measurement of the impact of an investment. The assessment was developed by Waka Kotahi and is effective from 31 August 2021. We consider that the project would benefit from this assessment as it pertains to 'changes in perceptions of safety' and 'change in human health', the latter which considers the impact on physical and mental health which are not captured in the EEM assessment. ACTION: Consider undertaking the assessment for non-monetised benefits developed by Waka Kotahi or state why it is not necessary.	The Non-monetised Benefits and Costs Manual recommends that 'chagnes in perceptions of safety' and 'changes in human health' both be investigated. However, the NMBCM is currently in draft, with assessment methods to be provided in a future re-release of the manual. We recommend noting that the economic evaluation omits non-monetised benefits, and is conservative as a result.	Agree with the response. Based on our understanding, the Non-monetised Benefit Manual (dated July 2020) was published on 13th August 2020 and it is not a draft version but the assessment methodology will be updated in a future re-release of th emanual.	Y
5.3.1 Factors and Assumptions	The project construction cost was assumed to be \$36.3 million, which is lower than the latest cost estimate prepared by ALTA as described in Section 5.2 of this report. This will result in an inflated BCR. ACTION: We recommend that the BCR is updated with the latest cost estimate or confirming that the cost estimate was appropriate for the scheme design.	The evaluation applies total expected project costs of \$39.1m: - \$2.8m pre-implementation (design) costs - \$36.3m construction & implementation costs These costs are consistent with those in the SSBC. Note that these (default) expected costs differ from ALTA's parallel estimate of \$40.3m. We have sensitivity tested the effects of ALTA's higher expected cost estimate, with the resulting BCR reducing from 1.87 to 1.81.	Agree with the response.	Y
5.3.2 Key Issues	The economic evaluation report identified three benefit impacts for this project being Travel time savings, crash cost-saving, and health benefits. However, according to the Evaluation Manual (EEM) which provides the list of benefit impacts of transportation activities, these main benefits were Travel time cost savings, vehicle operating cost savings, crash cost savings, mode change benefits, walking and cycling benefits, walking and cycling cost savings. The technical note does not explain the reason of disregarding the other benefit factors as part of the economic evaluation for this project. The logical method was to consider all these benefit impacts in the economic evaluation and disregard those with negligible discounted benefits. ACTION: We recommend that the technical note be updated to reflect and document why any benefits are disregarded.	The assessment of general traffic benefits has applied the EEM/MBCM's composite rate for veh-km reduced. This composite rate includes travel time costs, congestion costs, vehicle operating costs and emissions reduc ion costs. The composite rate does not break down the balance of these benefits, so they have been simply reported as 'travel time', given that component will be the largest of the 4. Similarly, the general traffic disbenefits include all 4 components. Walking and cycling benefits/cost savings refer to W&C health, travel time and safety benefits, all of which have been assessed.	Agree with the response.	Y
5.3.3 Cycle Lane Crash Cost Saving	To assess the cost saving of the proposed cycle lane, a 50% crash reduction factor is applied and the report states that "The Crash Estimation Compendium does not provide a crash reduction factor for separated cycleways, but we note that 4 of the 5 reported cyclist crashes would be very unlikely if the project was in place" The discounted benefits resulted from the cycle lane crash reduction based on the EEM and MBCM methods are \$2.7M and \$3.8M respectively. However, crash reduction factor for urban cycle treatment is available in Table 37 of Crash Estimation Compendium. The crash reduction factor for a new separated cycle path along roads is nil. It is explained that separated cycle treatment may increase the intersection and access crashes and therefore it may cancel the benefits that occur along mid-block sections. Where paths can be provided away from intersections and accesses without suitable mitigation of crash risk, there may be an increase in cycle crashes. The main benefits of such facilities are a reduction in the perceived risk of cycling by the public. ACTION: Excluding the accident cost saving benefit reduces the total discounted benefit. It is recommended that this item is clarified in the technical note.	Disagree. The Crash Compendium is inconclusive on the safety benefits of separated cycle infrastructure, but is correct in appreciating that treatment of intersections is critical. In this regard, the design of the project carefully considers these, with raised tables at conflict points. The Crash Compendium recommends a crash reduction rate of 20% for on-road cycle lanes more than 1.4m wide. The addition of physical separators between cyclists and general traffic, plus slowing general traffic at conflict points with raised tables, would both result in further crash reductions. International research confirms this, with a recent study from the Netherlands concluding that physically protected cycle lanes resulted in a 50%-60% crash reduction, relative to painted cycle lanes.	Agree with the response.	Y
5.3.4 On-street Parking Removal Accident Cost Saving	It should be noted that in Table 34 of the Crash Estimation Compendium, it is stated that Research indicates that banning parking on one side only may increase crashes. Disbenefits of parking removal on one side should be considered in the assessment. ACTION: It is recommended that the technical note be updated with a description of what was included in the assessment and consideration for any disbenefits of removing car parking on one side of the road.	The assessment drew on existing crash data of: 4 reported crashes on Meola Rd involving parked/parking cars, and 1 reported crash of this type on Pt Chev Rd. Removing the 1 Pt Chev Rd crash has no effect on the BCR.	Agree with the response.	Y
5.3.5 Zebra Crossings Accident Cost Saving	According to Table 38 of the Crash estimation compendium, the crash reduction factor for installing zebra crossing on two lane roads with 50km/hr speed limit is nil. Therefore, the discounted benefits from the proposed zebra crossings on side roads would be lower and this would consequently result in a lower BCR. ACTION: It is recommended that the economic evaluation be updated to reflect the crash reduction factors in Table 38 of the crash estimation compendium. It is recommended that the updated factor be reduced.	The proposed zebra crossings are not being installed in isolation. They are to be accompanied by both raised tables (20% crash reduction in Crash Compendium) and kerb extensions (35% reduction). Combined, these 2 factors alone provide a 48% crash reduction $[(100\%-20\%)\times(100\%-35\%)]$. Improved street lighting is also generally proposed at each crossing location, and we do not consider the 80% reduction applied unrealistic, given the combination of 4 treatments. Nonetheless, we have updated the economic analysis to apply a more conservative 48% crash reduction.	Agree with the response.	Y

Report Section Reference	Issue description	AT Comment	HG Comment	Resolved Y/N
5.3.6 Raised Tables Accident Cost Saving	According to Table 38 of the Crash estimation compendium, the crash reduction factor for a raised table treatment is 20%. The assessment assumes an 80% crash reduction factor. It is important to note that the Crash estimation compendium states that "The 80% reduction specific in the previous version of EEM was an error." ACTION: It is recommended that the update factor be reduced to 20% in this instance or a description supporting the use of a higher factor be included in the technical note.	See above	Agree with the response.	Y
5.3.8 Public Transport Benefits	<p>According to the summary of project benefits provided in Table 1 of the technical note, it is considered that the proposed bus lane in addition to the reduction of one us stop would results in travel time saving and reliability benefits.</p> <p>There are a couple of matters that should be considered or responded to. Firstly, it is not clear if the travel time benefit is from the bus operation perspective or from the passenger's travel time perspective. The demand along the bus route is constant. A reduction from four to three bus stops increases the bus stop spacing. Consequently, some passengers would be required to walk longer distances to reach the bus stops. However, we have reviewed ATs requirements for bus stops and consider that the bus stop spacing is appropriate. Therefore, we do not expect any disbenefits from the removal of the bus stop.</p> <p>This might have a benefit relating to bus operating costs and efficiency on the network, but the benefit would be negligible considering the length of bus lane along Pt Chevalier Road is about 1km. In addition, given that passenger demand does not change, reducing the number of stops would result in a distribution of passenger demand among these three stops or concentrating on two stops which could result in a longer dwell time and longer bus travel time. However, given the short length, this would likely result in a negligible impact.</p> <p>Given the matters above, it is logical to assess the discounted benefit of the bus lane on the southbound lane only and the discounted benefits of bus stop removal on the northbound of Pt Chevalier Road. In light of these assumptions, it is expected that the discounted benefit would be lower. ACTION: It is recommended that the technical note be updated to confirm that the discounted benefit of the bus lane on the southern lane only has been included and comment as to whether there are any discounted benefits of bus stop removal on PT Chevalier Road.</p>	<p>Travel time benefits have only been calculated for southbound buses.</p> <p>The calculation of PT reliability benefits has assumed:</p> <ul style="list-style-type: none"> - 50% of buses run late - the bus lane will reduce the average late time for southbound buses by 15 seconds (for the above ate buses) <p>Benefits associated with consolidating bus stops have not been directly calculated.</p> <p>Each of the above have been clarified in the technical note.</p> <p>We note that PT reliability benefits account for 3% of the overall benefits, so the above assumptions do not have a large impact on the BCR.</p>	<p>According to the NZTA Waka Kotahi investment Performance Measure, to measure the Punctuality is the measurement of the Public Transport reliability which is defined as:</p> <p><i>Percentage of scheduled service trips between 59 seconds before and 4 minutes 59 seconds after the scheduled departure time of selected points.</i></p> <p>https://www.nzta.govt.nz/planning-and-investment/planning-and-investment-knowledge-base/archive/201821-nltp/monitoring-and-reporting-on-investments/benefits-management-approach/investment-performance-measurement/list-of-investment-performance-measures/</p> <p>Given that the reliability has been assumed and not calculated and considering that this parameter account for 3% of the overall benefits then, it is suggested to be disregarded in the economic evaluation.</p>	<p>Y- If the PT reliability benefits are removed the BCR drops from 1.87 to 1.81. This does not make a material difference to the BCR or investment priority.</p> <p>We have added this as a sensitivity test to our Economics Tech Note testing the removal of the PT reliability benefits, as suggested by the peer reviewers, concluding that it doesn't materially affect the BCR.</p>
5.3.10 Sensitivity Analysis	ACTION: We recommend that the sensitivity analysis is updated following the updates to the economic evaluation	Sensitivity tests have been updated	Agree with the response.	Y
8.1 Road Safety Audit Appendix K	A road safety audit ('RSA') was carried out on the Scheme Design drawings in April 2020 by Traffic Engineering Solutions ('TES'). The document includes comments from the designer, however, the designer themselves has not signed the document or identified which representative has undertaken the response. Furthermore, the RSA does not contain details from ATs Road Safety Engineer, the client decision or the action taken. ACTION: Finalise RSA include signatures, comments from ATs Road Safety Engineer and the client decision and action taken.	<p>There is a further version of the RSA which contains the AT Road Safety Engineers comments and the Client Decision (see attached). Due to the change in designer (AECOM (responsible for the Preliminary design) to Mott MacDonald (appointed to carry out the detailed design)) in May 2020 following the RSA, the document was not signed by the Designer for the RSA at the time (AECOM) and the 'Action Taken' was not filled out and the preliminary design was not updated. However, on their engagement for the detailed design, Mott MacDonald worked with AT in agreeing the actions taken and updated the design to address the RSA comments. These are recorded in the Design Philosophy Statement (Section 7, Appendix H of the SSBC). AT agree with the recorded actions within the Design Philosophy Report and Mott MacDonald confirm that these actions are included in the Detailed Design. In addition the Peer Reviewer of the Business Case dated Oct 2021 (Harrison and Grierson) states in the peer review (Section 8.1) 'We have reviewed the draft detailed design drawings and all of the key issues have been addressed. A road safety audit of the Detailed Design drawings has yet to be undertaken. However, we consider that this is of low risk, given the long consultation period with key stakeholders and that the issues identified in the scheme design road safety audit have been addressed'.</p> <p>An RSA for the Detailed Design will be undertaken in 2022.</p>	Agree with the response.	Y

E. Road Safety Audit / Non Motorised User Audit (2022)

Refer to separate document titled "*Point Chevalier – Westmere
Cycleway Stage 3 Detailed Design RSA / NMUA May 2022*"

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F. Risk Register

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Project Qualitative Risk Register for : 365-20-671-PS - Pt Chevalier to Westmere Improvements, Detailed Design

AT Contract No. 365-20-671-PS; PO - PO 4300017275; AT PM - **S 9(2)(a)** External)
Prepared by: Mott MacDonald; Project No. 419032; PM **S 9(2)(a)**
Date last reviewed: 09-Mar-2022



#	What broader category does this risk fall under?	What is the risk?	Who is the person responsible for monitoring this risk?	What causes that uncertainty?	What is the impact to the project should the event occur?	What is your current control to manage the risk?	How well will those CURRENT CONTROLS work to change the risk profile?	What is the consequence if the risk occurs anyway?	How likely is it to occur with the current controls in place?	Probability x Impact	What is your backup plan if your preventative measure fails?	WHO is Accountable to make this happen?	When was this risk identified?	When was this risk last reviewed?	Change in risk rating in review	Active or Non-Active Risk
IDENTIFY				ANALYSE										CONTROL		
Risk #	Risk Category	Risk	Risk Owner	Cause	Impact (Narrative)	Current Control	RCE	Impact Value (Consequence)	Probability (Likelihood)	Risk Level (Rating)	Treatment Task	Treatment Owner	Date identified	Review Date		Status
RISK-001	Scope	Material changes to the current scheme design	AT & MMD	- Public consultation, RSA and internal consultation comments on the current scheme design have not been reconciled and design updated where required to address the comments - Review and acceptance of current scheme design by stakeholders has not been completed.	- Additional cost - Programme slippage - Scope change and design re-work	The design team and AT have conducted workshops and forums to: 1) Review public consultation comments and agree if any material changes to the design are required to address these. 2) Review RSA / internal AT comments and agree if any material changes to the design are required to address these. 3) Are carrying out any additional internal consultation required to gain full stakeholder acceptance of current design. Time / Cost/ Quality impact of changes to be quantified before acceptance of change by both teams. Escalation to AT Design Review Committee for decision to move forward if required Deliverable is agreed DPS and continue to liaise with stakeholders	Generally Sound	3	4 (High » 50%-75%)	Moderate threat			27/05/2020	5/10/2020	Closed as scheme design changes are understood and being managed	Closed
RISK-002	Time	Programme delay	AT & MMD	- Current scheme design is not agreed and may change resulting in delay to commencement of detailed design. - Project scope is not fixed resulting in delay to commencement of detailed design. - Delay to funding approval - 29-09-2021 Risk Closed - Consent not received - 29-09-2021 Risk Closed - Delay due to undergrounding of utilities	- Additional cost - Programme slippage - Scope change and design re-work - Design not ready for Meola Road closure - Design does not achieve start for shovel ready funding criteria	The current control of programme delay is considered specifically as individual risks. The delay associated with funding approval has already been realised. Programme being developed as staged funding is available.	Generally Sound	4	3 (Medium » 20%-50%)	Moderate threat			27/05/2020	9/03/2022	No change	Open
RISK-003	Project Plan	Ineffective management of AT internal stakeholders	AT & MMD	- Dissatisfied internal stakeholders from previous involvement on project up to this point. - Less than desirable engagement and involvement from key internal stakeholders - Lack of, or delay in decision making by internal stakeholders - Conflicting interests and objectives between internal stakeholder prevents decision making	- Additional cost - Scope change and design re-work - Programme delayed	- Establish a comprehensive stakeholder management approach from the outset, which has involvement and buy-in from all internal stakeholders, and has a well-defined decision-making and conflict resolution process. - Regular meetings / collaborative workshops with AT internal stakeholders to discuss progress and design decisions requiring stakeholder input and decisions. - Establish a risk register to communicate with internal stakeholders - AT to communicate implications of delay to SMEs and proactively manage the DRP process. Involve PMP and ELT as required to facilitate collaboration of SMEs	Generally Sound	3	3 (Medium » 20%-50%)	Moderate threat			27/05/2020	9/03/2022	Probability increase has increased risk from Low to Moderate. Need for change evidenced by Pavement SME involvement.	Open
RISK-004	Reputation	Ineffective management of external stakeholders	AT & MMD	- Dissatisfied external stakeholders from previous involvement on project up to this point. - Less than desirable engagement and involvement from external stakeholders - Lack of, or delay in decision making by external stakeholders - Conflicting interests and objectives between stakeholders prevents decision making	- Withdrawal of funding commitment (e.g. from Healthy Waters) - Programme change. - Project re-work.	- Establish a comprehensive stakeholder management approach from the outset, which outlines the interest for each stakeholder in the project and risk perception, and as a well-defined engagement approach, and decision-making and conflict resolution process. - Meet with stakeholders individually to agree project rationale. This includes Vector, Chorus, Healthy Waters, Watercare and Mana Whenua. The programme, constraints and objectives of the project to be clearly outlined and the reasons for them. - Public Consultation feedback report issued in week ending 10 July 2020. - AT to communicate any issues raised by external stakeholder - AT to Re-establish and Re-engage with the community liaison group - Design developed geometrically so that AT can update external stakeholders with confidence	Generally Sound	3	2 (Low » 2% to 20%)	Moderate threat			27/05/2020	9/03/2022	No change but being monitored. Positive response from business owners and local board	Open
RISK-005	Reputation	Dissatisfaction by Business Association and Affected Businesses Engagement	AT	- Dissatisfaction from AT's previous engagement and consultation on project proposals up to this point.	- Objection to the proposal. - Additional cost - Programme slippage. - Reputational damage to AT	- Meet with stakeholders individually to agree project rationale. This includes business owners. The programme, constraints and objectives of the project to be clearly outlined and the reasons for them. - Re-engage with the community liaison group - Public Consultation feedback report issued in week ending 10 July - Design developed geometrically so that AT can update external stakeholders with confidence	Generally Sound	4	2 (Low » 2% to 20%)	Moderate threat			27/05/2020	9/03/2022	No change but being monitored. Positive response from business owners and local board	Open
RISK-006	Reputation	Ineffective integration and coordination with interfacing projects	AT & MMD	- Interfacing projects, progressing at different design stages and timeframes causes misaligned and uncoordinated design solutions - Interfacing projects include: MOTAT gateway, roundabout trial at Pt. Chevalier Rd / Meola Road intersection, queue metering at Garnet Rd, overhead lines undergrounding, Meola Road Rehabilitation contract. 2021-12-06: Related Risk for Carpark Loss (coordination with interfacing project by MOTAT) is included a separate item, RISK-037.	- 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. - MOTAT can act. Design interface details and MOTAT programme obtained. On going liaison MOTAT access and operations agreed via meeting and e-mails. - Roundabout trial delayed due to funding and COVID restrictions. Design progressing assuming roundabout is permanent solution. - Queue metering included as part of contract and assumed to be approved by AT - Vector / Chorus progressing undergrounding design. Meeting held. AT issuing PO. - To be confirmed there are no changes required by the Meola Road rehabilitation contract. Design progressing no change. - If appointed agree with EDI contractor on design requirements for Meola Road early.	Improvement Required	4	3 (Medium » 20%-50%)	Moderate threat		AT	27/05/2020	9/03/2022	No change	Open
RISK-007	Reputation	Late delivery and completion of Vector power line and Chorus lines undergrounding on Meola Road West section	AT - VECTOR - CHORUS - MMD	- Funding availability delays procurement process - Procurement process between organisations causes delays. - Potential prolongation of designs due to complexity, availability of resources etc. - Potential prolongation of installation due to long lead in times for materials and availability of resources	- Programme change. - Design and construction re-work. - Additional cost	- Early engagement and agreement with Vector and Chorus. - Coordination meeting with Vector and Chorus held. Agreed undergrounding will be undertaken in advance of main works. - Clear understanding of the rationale for undergrounding power lines e.g. to provide full width cycleway and for the good of the street and the community. - Ongoing liaison with Vector and Chorus - Street lighting design concept provided to Vector to support their design - Ego have been appointed by Vector to design undergrounding - Vector looking to source material from another project acknowledging importance of this project	Generally Sound	4	3 (Medium » 20%-50%)	Moderate threat			27/05/2020	9/03/2022	No change	Open
RISK-009	Time	Late design response affecting programme	MMD Baffa Miskell PTM Greenscene	- Design Team's late response and actions. - Poorly managed stakeholders' engagement process	- Design change. - Programme slippage. - Late delivery of the project. - Damage AT reputation.	- The Design Team to capture design opportunity areas early and keep the design development on track. - Close design communication between consultants. - Proactive project management and contact with AT PM.	Generally Sound	2	2 (Low » 2% to 20%)	Low threat			27/05/2020	9/03/2022	No change	Open
RISK-010	Quality	Errors / omissions in design documentation	MMD Other Consultants	- Design Quality Management Plan is not implemented effectively. - Ineffective scope management and tracking	- Programme slippage. - Damage AT reputation.	- Quality Management processes to be followed and audited on regular basis. - Scope management tools such as design registers etc. to be implemented	Generally Sound	4	1 (Very Low » <2%)	Low threat			27/05/2020	9/03/2022	No change	Open

Project Qualitative Risk Register for : 365-20-671-PS - Pt Chevalier to Westmere Improvements, Detailed Design

AT Contract No. 365-20-671-PS; PO - PO 4300017275; AT PM - **S 9(2)(a)** (External)
Prepared by: Mott MacDonald; Project No. 419032; PM - **S 9(2)(a)**
Date last reviewed: 09-Mar-2022



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IDENTIFY				ANALYSE							CONTROL					
Risk #	Risk Category	Risk	Risk Owner	Cause	Impact (Narrative)	Current Control	RCE	Impact Value (Consequence)	Probability (Likelihood)	Risk Level (Rating)	Treatment Task	Treatment Owner	Date identified	Review Date		Status
RISK-011	Finance	Omissions in cost estimate	MMD Other Consultants	- Cost estimate does not comprehensively cover project scope - Cost estimate does not include appropriate allowances for project risk and complexity	- Project scope decrease - Cost blow out - Request for additional funding	- Cost estimate prepared by others. Quantities to be reviewed after detailed design. - Changes to design to be reviewed to consider cost consequences. - Value Engineering sessions to be held during and after the design process.	Generally Sound	4	2 (Low » 2% to 20%)	Moderate threat			27/05/2020	9/03/2022	No change	Open
RISK-012	Scope	Delay to Traffic Resolutions approval	AT - PTM	- Lack of consultation with TCC and understanding of requirements	- Programme slippage. - Scope change and project re-work	- PTM consultants have been engaged to undertake all this work including consultation with the TCC team in AT. PTM have a strong relationship with TCC and an extensive amount of experience with the traffic resolution process and desirable outcomes - Option to bring TCC process forward if required - TCC Process can be accelerated if required - Early involvement of PTM has started	Generally Sound	4	3 (Medium » 20%-50%)	Moderate threat			27/05/2020	9/03/2022	No change. Continue to monitor	Open
RISK-013	Scope	Unavailability or delay in issue of design information from third parties	AT	- Information requested is provided late and/or it is incomplete.	- Programme slippage. - Scope change and project re-work	- Requests for information are recording in progress meetings and progress reporting. - If data is not provided in a timely manner escalate the request. - Request for information to be discussed at each progress meeting and in reporting.	Generally Sound		2 (Low » 2% to 20%)	Moderate threat			27/05/2020	9/03/2022	No change. Continue to monitor. Designer working around delay.	Open
RISK-014	Time	Late award of design contract	AT & MMD	Design contract has been awarded a week later than anticipated.	Programme change. Project. Scope Change.	Regular discussion and communication within the project team. AT project manager to manage the project scope. Reconciling consultation feedback/RSA Workshop in week 1 to identify and scope changes. Time allowed in programme to design changes. Put procedure in place to ensure speedy and decisive decision making	Generally Sound	2	5 (Very High » >75%)	Moderate threat			27/05/2020	5/10/2020		Closed
RISK-015	Scope	EDI model - Contractor involvement does not provide anticipated benefit	AT	- EDI contractor not appointed due to funding constraints	- Contractor cannot input to constructability and value engineering - Programme change. - Scope Change and project re-work - EDI contractor cannot be used for underground investigations and topographic surveys - Pavement design cannot be optimised	- Programme and design to progress without EDI input - MM have recommended additional site investigations and survey to AT - Pavement design to continue using the legacy AECOM design as this approved the AT Assets Team.	Generally Sound	2	2 (Low » 2% to 20%)	Low threat			27/05/2020	5/10/2020	Risk closed as current controls reconcile it	Closed
RISK-016	Finance	Availability of Funding i.e. Shovel Ready funding application is not approved	AT	- The project, classified as 'Shovel Ready' by the Infrastructure Industry Reference Group, has not been approved for government funding.	- Project delayed / stopped	- AT to fund the project. - NZTA may provide 100% funding up front with agreement to pay back 50% later.	Improvement Required	5	4 (High » 50%-75%)	Large threat			27/05/2020	29/09/2021	Risk Closed - Funding confirmed.	Closed
RISK-017	Scope	External reviews and safety audit e.g. BECA street lighting review	AT & MMD	- There are large number of reviews – RSA, NMU, Design, Constructability, Lighting to be undertaken and reconciled. - Non-collaborative or constructive added value approach of reviewers	- Budget increase. - Programme delay. - Scope Change and project re-work	- Risk to cost and programme specifically for street lighting due to BECA involvement if iterations of review not avoided / managed pragmatically. - 2022/03/02 - Street Lighting review no longer required due to appointment of AT approved lighting designer, LDR. Risk remains for other external reviews. - RSA and ATOC reviews to be undertaken early. Risk involved with AT SMEs remain - see Risk 003	Generally Sound	3	3 (Medium » 20%-50%)	Moderate threat			27/05/2020	9/03/2022	No change	Open
RISK-018	Scope	Utilities relocation works	AT & MMD	- Utilities design teams being busy - Long lead in times for material and manpower	- Budget increase. - Programme change. - Scope Change and project re-work	- Joint approach from day one. AT's authority will assist in gaining early approval. - AT received quotes for utility investigations. To be awarded subject to funding. - 2021/09/29 - Utilities Investigations Underway - 2022/03/02 - Utilities Pilot Trenching Investigations completed. SW investigations not yet awarded.	Generally Sound	3	2 (Low » 2% to 20%)	Moderate threat			27/05/2020	9/03/2022	No change Emerging risk being monitored	Open
RISK-019	Scope	Site Investigations	AT & MMD	Site investigation data not being available from previous stages (e.g. for the stormwater design and utilities relocation design)	- Budget increase. - Programme delay while design data collected - Scope Change and project re-work. - Incomplete design leading to claims during construction	- Background review / Gap Analysis undertaken on previous work - MM have recommended additional site investigations and survey to AT - AT have invited quotes and will award subject to funding. - 2021/09/29 - Utilities Investigations Underway	Generally Sound	4	3 (Medium » 20%-50%)	Moderate threat			27/05/2020	29/09/2021	Risk Closed - 2021/09/29 - Utilities investigations underway	Closed
RISK-020	Scope	SS/SW existing pipes conditions	AT & MMD	Pipes replacement requirement.	- Scope change - Budget increase. - Programme delay while design data collected	- MM have recommended CCTV investigation - Healthy Water and Watercare engagement. - AT have sent CCTV investigation undertaken already. - AT have invited quotes and will award subject to funding - Design to consider maintenance rather than renewal - 2022/03/02 - SW investigations yet to be awarded.	Generally Sound	4	2 (Low » 2% to 20%)	Moderate threat			27/05/2020	9/03/2022	No change	Open
RISK-021	Scope	Stormwater Design requirements	AT & MMD	- Unknown requirements. - SW strategy is unclear and the previous design is inconsistent and uncoherent	- Scope change and project re-work. - Budget increase.R36 - Programme delay	- MM have held positive meeting with Healthy Waters - More coherent strategy developed as part of DFS. This to be developed as part of the design. - SW consent not required	Generally Sound	4	3 (Medium » 20%-50%)	Moderate threat			27/05/2020	9/03/2022	No change but focus going forward. Resourcing a challenge.	Open
RISK-022	Reputation	Tree Procurement	AT - Boffa Miskell AC	- Specified tree species and sizes are not available at nurseries.	- Consent conditions not complied with - Additional cost - Delay whilst trees procured - Poorer trees supplied	- Early tree procurement once funding confirmed (i.e. trees tagged at nursery) - Type and location of new trees to be agreed as part of next stage of design development	Generally Sound	3	4 (High » 50%-75%)	Moderate threat			27/05/2020	9/03/2022	No change	Open

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AT Contract No. 365-20-671-PS; PO - PO 4300017275; AT PM - **S 9(2)(a)** External)

Prepared by: Mott MacDonald; Project No. 419032; PM **S 9(2)(a)**

Date last reviewed: 09-Mar-2022



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IDENTIFY				ANALYSE							CONTROL					
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RISK-023	Scope	Construction over a closed landfill	AT & MMD Contractor	- Potential of contaminated excavated material from old landfill - Landfill gates encountered during excavation - Contractors setdown and compound sited in this area	- Health and safety of construction workers - Budget increase. - Programme delay - design and construction - Contractors setdown and compound sited in this area	- MM have reviewed scheme design and are eliminating excavation into landfill through the capping unless absolutely essential e.g. raingardens and tree pits. To be discussed with Council Tree team as part of AoA. - SW and tree design philosophy developed to mitigate need for excavation. - Ensure the Contaminated Site Management Plan (CLMP) is up to date and followed.	Generally Sound	4	4 (High » 50%-75%)	Large threat			27/05/2020	9/03/2022	No change. Delay due to slow response being realised.	Open
RISK-024	Environment	Leachate Interceptor Trench under proposed footpath	AT & MMD Boffa Miskell	Footpath cannot be constructed over the leachate drain	- Budget increase. - Programme change. - Scope Change and project re-work	Early engagement with AC internal stakeholders - Barton Bauzon Confirmed at meeting on 24 June 2020 that footpath can be built over leachate trench.	Generally Sound	3	1 (Very Low » <2%)	Low threat			27/05/2020	5/10/2020	Closed as confirmed with Council at meeting on 24 June that footpath can be built over leachate drain	Closed
RISK-025	Environment	Reclaimed land into the Meola Reef Reserve	AT & MMD Boffa Miskell	AC does not allow using reserve land for a strip of earthworks in Meola Reef Reserve	- Budget increase. - Programme delay - Scope Change and project re-work	- Ensure AT follows up with AC Landowner. - Review geometric design in this area - Approval currently pending the outcome of the Tree Asset Owner Approval (TAOA) and closed landfill asset owner approval	Generally Sound	3	4 (High » 50%-75%)	Moderate threat			27/05/2020	9/03/2022	No change	Open
RISK-027	Scope	Existing concrete slab on Pt. Chevalier Road	AT & MMD	Former tramway concrete slab is located just below the surfacing on Pt Chev Rd	- Programme delayed on site - Additional cost e.g. for trenches - Re-work - 2021-11-08 Concerns raised during constructability workshop regarding cost and practicality of reusing the existing bluestone kerbs above the existing slab. If deemed not feasible, the project may need to apply for an amendment to the resource consent conditions. Will either need to saw-cut and break-out section of existing slab or saw-cut each bluestone kerb (to be correct uniform height and to have a flat base).	- AT have organised a hydrovac survey and provided this to ascertain the limits plus depth of concrete slab - MM have developed construction detail - awaiting AT feedback - 2021-11-08 Desktop investigation underway to determine suitability and practicality of reusing the existing bluestone kerbs by means of saw-cutting each kerb block. Site investigation also underway to confirm typical size(s) of the bluestone kerbs. - 2022-02-03 MMD issued a Pt Chev Rd K&C Technical Note with recommendations (e-mail from CH 22/12/21). Awaiting Decision on the inclusion of sub-soil drain under K&C on Pt Chevalier Road. In the absence of a decision from AT, the design will proceed on the assumption that new subsols drains are to be installed below the K&C.	General Sound	3	4 (High » 50%-75%)	Moderate threat			1/07/2020	9/03/2022	No change	Open
RISK-028	Scope	Crossing at Ch. 1400 on downhill section of Meola Road	AT & MMD	Speed of vehicles on downhill section and location of raised table on this section	- Programme delayed - Additional cost - Re-work	- MM / AT to discuss options at 23/7/20 workshop. - Detail agreed and developed. Will involve some additional cost. - To be discussed at workshop with AT internal stakeholders - 2021-09-29 Reduced Probability to low. Risk Level to low. Design solution agreed with AT SMEs during workshops in 2020.	Generally Sound	2	2 (Low » 2% to 20%)	Low threat			1/07/2020	9/03/2022	No change	Open
RISK-029	Scope	Narrow cross section on Meola Road East	AT	Narrow lanes on Meola Road East causes vehicle crashes / conflicts (i.e. buses)	- Re-work - Programme delay	- Cross section for vehicles at 6.6m not to be reduced - AT Metro consulted and accept 6.6m - 2022/02/03 - Departure from Standards application DEP 002 approved by AT.	Generally Sound	1	4 (High » 50%-75%)	Low threat			1/07/2020	9/03/2022	No change	Open
RISK-030	Scope	Business Parking impact	AT & MMD	Project impacts on business parking to install cycleway	- Programme delayed - AT reputation - Re-work	- Previous design has investigated provision of additional business parking (standards can be reduced if needed to provide this) and the inclusion of loading / unloading zones (including for heavy vehicles to organic wines) and use of time-restricted parking. - AT to consider re-engagement with business owners impacted - AT to consider the option of a 'Departure from Standard' based on the ASD checks/requirements - this would allow the retention of more on-street parking.	Generally Sound	3	3 (Medium » 20%-50%)	Moderate threat			1/07/2020	9/03/2022	No change. Probability reduced due to stakeholder engagement	Open
RISK-031	Scope	Pavement Design	AT	Funding restricts the use of the legacy pavement design as proposed by AECOM and approved by AT Assets team or the Contractor proposes an alternative. This would require design by MMD.	- Programme delayed - Additional cost - Re-work	- AT to carefully consider the consequences of accepting an alternative pavement design that alters the geometric design - Design progressing on using an overlay as per the scheme design 2021-09-29 Risk of re-work of pavement design for Meola Road has been realised. Risk kept open as preferred solution for Pavement Design is still underdevelopment. 2022-02-03 Pavement Design Memo issued to AT. Recommendation accepted in principle.	Improvement Required	3	2 (Low » 2% to 20%)	Moderate threat			1/07/2020	9/03/2022	No change	Open
RISK-032	Scope	Vehicle barrier structural functionality	AT	Implementation of the cycleway means that the capacity of the vehicle barrier needs to be reviewed	- Programme delayed - Additional cost - Re-work	- This was raised previously by AECOM as part of the legacy scheme design. During the tender stage AT stated that this was not to be considered and the only works to the bridge culvert were the upgrading of a higher pedestrian barrier to accommodate cyclists. - The risk is reduced as the project will reduce vehicle speeds and the kinetic impact - No crash record here - Barrier upgrade should be considered when culvert upgraded	Generally Sound	3	1 (Very Low » <2%)	Low threat			1/07/2020	5/10/2020	Agree risk can be closed at the Risk Workshop	Closed
RISK-033	Scope	Narrow paths and drop offs	AT & MMD	The topography means that the completed project will have steep drop offs	- Additional cost - Re-work	- Design to minimise narrow paths and drop off where possible - Use of fences (for pedestrian and cyclist safety) where drop offs greater than 1m cannot be avoided.	Generally Sound	1	4 (High » 50%-75%)	Low threat			1/07/2020	9/03/2022	No change	Open
RISK-034	Scope	Levels at vehicles crossings / back fall to properties	MMD	The pavement rehabilitation and the proposed horizontal realignment of Meola Rd means that the geometric design in this area will require careful consideration of the crossfalls. The design team have been advised that further changes to the proposed horizontal alignment of the cyclepath and road Meola Rd are not to be considered during detailed design.	- Potential delay - Re-work - Additional consultation with owners	- MMD design team to investigation options/solutions for areas of concern. - 2022/02/03 - MMD have developed geometric design and have proposed the way forward (see email dated 02-Feb-2022). A Departure From Standards will need to be applied for.	Generally Sound	2	3 (Medium » 20%-50%)	Moderate threat			1/07/2020	9/03/2022	No change	Open
RISK-036	Cost	COVID working restriction on workers	AT	Social distancing (and any other) requirements for workers operating under COVID alert levels.	This may have impacts on site investigations, the design, and the construction phase. Impacts include: - Design Programme delayed - Construction Programme delayed - Additional cost - Also a Health & Safety concern (health of workers).	- Keep under review - Review cost contingency - 2022/02/03 - The threat of community outbreak and spread of the latest COVID variant (Omicron) is considered Moderate to High at this time.	Improvement Required	3	3 (Medium » 20%-50%)	Moderate threat		AT	10/09/2020	9/03/2022	No change	Open

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RISK-037	Reputation	Loss of Public Support for project due to loss of on-street Parking on Meola Rd / Ineffective integration and coordination with interfacing projects	AT	- Loss of On-Street Parking on Meola Rd due to this project was reliant on the provision of new off-street parking to be provided by others (interfacing projects). - The existing on-street parking is used by users of Seddon Fields and users of the Meola Reef Reserve Dog Park. - The applicable Interfacing projects include: MOTAT 2 Carpark and Greenway Project and the Auckland Council Meola Reef Reserve Te Tokarua Development Plan. - The Meola Reef Redevelopment Plan included two options for upgrading the existing off-street carpark to increase capacity. However, on 2021-11-18, the project team were advised that Auckland Council Community Facilities have "no plans" to upgrade the Meola Reef car park. - The public consultation messaging on Auckland Transport's website (https://at.govt.nz/projects/roadworks/paint-chevalier-improvements/#feedback) states that MOTAT will be providing 350 new car parks. However, on 2021-12-01, the project team were advised that MOTAT can only confirm 'Stage 1' of the MOTAT 2 Carpark project. This includes 155 carparks. 'Stage 2' which included an additional 199 carparks has no planned implementation at this time (as MOTAT do not have confirmed budget for this stage). Furthermore, MOTAT has advised that while the carparks are currently planned to be available to the general public, charges will apply to use the parking. It should also be noted, that as this will be a privately managed carpark, AT have no control over future changes to this car park (such as increasing charges, further restrictions, time restrictions, gated areas, and complete loss of public access).	- Reputational damage to AT as public likely to oppose the loss of free parking near Meola Reef Reserve and Seddon Fields. - Scope change / design re-work if AT deems it necessary to mitigate parking loss through a change in design.	- On-Street Parking Loss is partially offset by the new carpark - MOTAT stage 1 - which is under construction. - Revised Communications Strategy is recommended. - 2022/02/03 - Risk to reputation remains large. A request for information pertaining to parking loss on Meola Rd was received from an NZ Herald journalist on 01-Feb-2022.	Improvement Required	4	4 (High » 50%-75%)	Large threat			6/12/2021	9/03/2022	No change	Open
RISK-038	Time	High Water Table / Potential Salt Water in Central section of Meola Rd	AT & MMD & Contractor	- The central section of Meola Rd (near Meola Reef, MOTAT, and Seddon Fields) is on low-lying land. - During site investigations, the contractor (Downer) reported the water table was shallow and tidal.	Construction (Scope/Time/Cost/Health&Safety): - The tidal water table will need to be considered during construction ground works. Works may need to be programmed around the tides, potentially causing construction delays. Stability of ground may be lower than normal so extra temporary support is likely needed for open trenches and excavations (particularly for any tree pits in this area). Design (Scope/Time/Cost): - Proposed materials and proposed trees species should consider that the ground water is likely to be high is salt.	- Tenderers/Contractors Methodology to consider the impact of tidal ground water. - Ground Stability is a Safety in Design Risk - see SID Register Item #1.08 - Design to consider the impact of groundwater that is high in salt.	Improvement Required	3	4 (High » 50%-75%)	Moderate threat			6/12/2021	9/03/2022	No change	Open
RISK-039	Property	Private property boundaries on Council land and AT has footpaths on private land	AT	Land boundaries have not been properly reconciled in the past	- Reputation of AT - Re-design - Delay on site	- AT Property team to resolve ahead of physical works - AT have appointed a Property Team contact - Julian Harrison - Tubb	Generally Sound	1	4 (High » 50%-75%)	Low threat			24/01/2022	9/03/2022	No change	Open
Opp #	Opp Category	Opp	Opp Owner	Cause	Impact (Narrative)	Current Control	RCE	Impact Value (Consequence)	Probability (Likelihood)	Opp Level (Rating)	Treatment Task	Treatment Owner	Date Identified	Review Date		Status
OPP-001	Scope	Opportunity - Road rule changes	AT	Future Road Rule Change will give priority for people crossing at side roads and this may reduce the need/requirements for signage to enforce this.	- Cost saving - Improvement in visual amenity	Opportunity - AT to monitor	Generally Sound	-2	2 (Low » 2% to 20%)	-Small opportunity			1/07/2020	9/03/2022	No change	Open
OPP-002	Scope	Opportunity - Improved Streetscape - Te Aranga Māori design principles	AT & MMD	The changes to the pedestrian fences on the Meola Road bridge culvert present the opportunity to incorporate artwork.	- Improvement in visual amenity - Promotion of cultural identity	Opportunity - Boffa Miskell to manage. Eols being received from Iwi artists. Opportunity realised.	Generally Sound	-2	3 (Medium » 20%-50%)	-Moderate opportunity			1/07/2020	9/03/2022	Closed as opportunity being pursued	Closed
OPP-003	Scope	Opportunity - Improved Pedestrian Amenity and Safety on Meola Road	AT	No raised table crossings are currently planned for the roads on the south side of Meola Road - Huia Rd, Moa Rd, and Kiwi Rds - as these are not on the cycleway and for budgetary reasons.	- Improved safety	Opportunity if funding is found as the project progresses through value engineering etc	Generally Sound	-4	3 (Medium » 20%-50%)	-Moderate opportunity			1/07/2020	9/03/2022	No change	Open
OPP-004	Scope	Opportunity - Reducing tree pit volumes	AT	TDM requires 10 cubic metre pits for each tree. This is a risk in excavating around utilities and adjacent to live carriageway. Potential to reduce the size (may be a necessity in some locations). 2021-11-08 - during constructability workshop, it was recommended that details for 3 different pit sizes are included in the design. The contractor can then select the appropriate size where (unknown) constraints are discovered during construction phase (It is recommended that the contract requires a minimum of, say, 5 small, 5 medium, 5 large pits).	- Cost saving - Constructability and safety improvement - Shortened construction period	Opportunity. Safety in Design and Value engineering opportunity especially in area of closed landfill.	Generally Sound	-4	3 (Medium » 20%-50%)	-Moderate opportunity			1/07/2020	9/03/2022	Closed as tree pit volumes achieved whilst not impacting on closed landfill based on info available.	Closed
OPP-005	Cost	Opportunity - Reducing stormwater infrastructure	AT	2021-11-08 - During the constructability workshop the opportunity of using ACO KerbDrains to allow channels to bypass raised tables without the need for additional catchpits (and lead pipes). There are several recent examples of ACO KerbDrains installed on the Auckland Transport network at raised tables.	2021-11-08 - Cost saving - Constructability and safety improvement - Shortened construction period - Mitigate the risk in gaining EPA approval for stormwater. - Aligns with Watercare's desired outcome of minimising any increase in inletting capacity to the network (applicable for Pt Chev Rd where catchpits drain to wastewater network).	Opportunity. Safety in Design and Value engineering opportunity.	Generally Sound	-3	3 (Medium » 20%-50%)	-Moderate opportunity			8/11/2021	9/03/2022	No change. Opportunity being pursued.	Open
Abbreviations: AIP Approval in Principle AoA Asset Owner Approval AT Auckland Transport MMD Mott MacDonald BML Boffa Miskell Limited																

