Auckland Housing Programme Development Contributions Policy – Transport Assessment

Prepared for Auckland Council
Prepared by Beca Limited and Commute Transportation

15 August 2024

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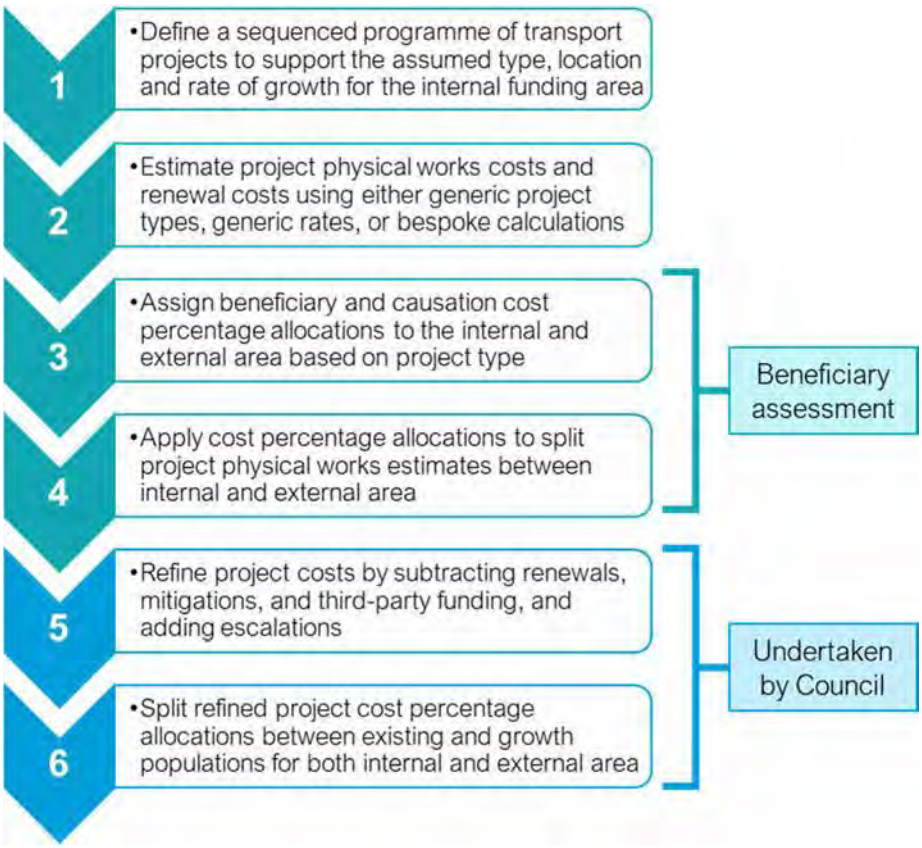
on behalf of	Beca Limited		

Executive Summary

This report documents the transport assessment on behalf of Auckland Council (Council) and Auckland Transport (AT) in regard to preparing transport inputs to Auckland Council's proposed Development Contributions policy for the Auckland Housing Programme (AHP) areas (DC Policy). This assessment has been undertaken by Commute Transportation and Beca (the project team). This assessment draws heavily on the work undertaken as part of the Brownfields Programme Business Case (BPBC) prepared by AT in 2021. The project team's role was to prepare a transportation assessment as specified by Council and providing technical inputs to inform the policy decisions which were made by Council. Beyond these inputs, the project team has not provided advice to Council directly regarding development of their DC policy itself.

The transport planning and engineering information used to prepare this assessment is therefore developed at a 'strategic' level, and not from detailed site investigations, design, or modelling analysis. More detailed analysis would be undertaken for implementation of a project. Given the significant scale and long-term development of this programme, it is not considered feasible to develop detailed designs and capital cost estimates for this extensive programme. This approach is considered suitable for this assessment, when coupled with Council's proposal to include regular updates to the DC policy inputs as new information becomes available.

There are uncertainties around how the AHP area will grow and how infrastructure will be provided over the next 30 years, which the methodology has recognised. This uncertainty is addressed through the methods used in this assessment and Council's policy framework that includes regular review of the inputs. The key steps of the assessment are shown below.



Since the previous BPBC assessment, upgraded regional population forecasts have become available. The Auckland Growth Strategy (AGS) 2023 forecast represents Council's view on regional growth going forward, covering the 2022-2052 period, and reflected policy direction in the Auckland Future Development Strategy (FDS). A full buildout scenario for the AHP areas was provided by Council developed from the AGS forecast for the purposes of this assessment. This scenario follows the original AGS forecast to 2052, with post-2052 growth to achieve full buildout by 2060 and is referred to as the AGS-FBO scenario.

The assessment identified physical works (PW) costs for in-scope projects in each AHP area. The allocation of PW costs to internal and external areas was based on causation and beneficiary assessments. The total PW costs and allocation shares under the AGS FBO scenario are shown below.

Area	Total Physical Works	Allocation	
		Internal	External
Tamaki	$132.3M	$105.2M	$27.1
Mt Roskill	$354.2M	$260.8M	$93.4M
Māngere	$257.8M	$223.4M	$34.4M

1 Purpose, Context and Scope

1.1 Purpose and Background

This report documents the transport assessment on behalf of Auckland Council (Council) and Auckland Transport (AT) in regard to preparing transport inputs to Auckland Council's proposed Development Contributions policy for the Auckland Housing Programme (AHP) areas (DC Policy). This assessment has been undertaken by Commute Transportation and Beca (the project team). This assessment draws heavily on the work undertaken as part of the Brownfields Programme Business Case (BPBC) prepared by AT in 2021. The project teams role was to prepare a transportation assessment as specified by Council and providing technical inputs to inform the policy decisions which were made by Council. Beyond these inputs, the project team has not provided advice to Council directly regarding development of their DC policy itself. AT was involved in the transportation assessment work with the overarching policy development guided by Council based on the 2022 policy.

This analysis includes reference to infrastructure capital cost estimates prepared by AT or sourced from various external sources. Although aggregate network results are presented in this report, the detail of the individual project elements are not included here.

1.2 Previous Assessments

1.2.1 Auckland Brownfields Programme Business Case

The BPBC was undertaken by AT in 2020/2021. The purpose of the BPBC was to identify a package of transport investment to support brownfields growth in the five areas identified within the AHP comprising: Tamaki, Mt Roskill, Oranga, Northcote and Māngere. The areas considered are subject to significant and imminent development with Kāinga Ora having a significant interest in each area. In each of the areas, a level of non Kāinga Ora growth was also considered likely for each precinct. Kāinga Ora is actively planning for initial stages of development and has undertaken integrated transport assessments (ITAs) in several of the growth areas to identify and mitigate the effects of development.

To adopt an integrated approach to transport and land planning, and consider the wider network effects of Brownfields growth, the BPBC considered the condition of the existing transport network in each area and considers future travel forecasts.

Within each of the AHP areas, the BPBC put forward a package of investment in transport infrastructure to accommodate the changing demand and influence the travel behaviour of people in this area. At the time of development, the business case drew heavily on a series of ITAs completed by Kāinga Ora for the various development areas but considered wider growth and network outcomes in addition to the ITA assessments. The BPBC was endorsed by the AT and Waka Kotahi New Zealand Transport Agency (NZTA) Boards in 2021.

While the BPBC considered the Oranga and Northcote areas, these have not been included in this DC policy assessment as these areas are more discrete projects with the infrastructure required having been largely progressed and completed.

Further details on the BPBC recommended network is included in **Section 3**.

1.2.2 Development Contributions underlying policy

The methodology adopted for this transport assessment has made use of Council's existing DC Policy 2022. The transport assessment aspect has built on the underlying policy and more detailed transport assessments undertaken for the Drury DC study which was completed in September 2022 by Te Tupu Ngātahi Supporting

Growth Alliance (SGA). The methodology developed for the Drury DC assessment, along with previous assessments for transport contributions form the starting point for the development of the methodology for this area. The methodology has been adapted from the Drury DC methodology for suitability of application to brownfields areas.

1.3 Relationship to Changes in Policy and infrastructure Planning Processes

Since the BPBC work in 2021, several assumptions around the scale and intensity of brownfields growth have changed. Changes in timing regarding Kāinga Ora development and infrastructure funding have also occurred.

This assessment therefore is based on ongoing uncertainty of regulatory decisions, market forces and infrastructure funding availability. Recognition of the current and future uncertainty regarding the pace, order and details of the planned growth is therefore an important element of this assessment. Considering this issue, the following approach has been adopted:

- Acknowledgement of the uncertainty and hence the need for any infrastructure sequencing and funding plans to be flexible and able to adapt to such ongoing changes in assumptions
- Use of a methodology that:
  - considers both short and long-term, so that longer-term outcomes are not compromised
  - Accepts the need to use assumptions regarding the future, acknowledging the inherent uncertainty in those assumptions
  - Can be readily updated without requiring highly detailed and complex analytical assessment that is highly dependent on the assumptions and inputs used
  - Includes sensitivity testing on key methodology assumptions to inform the likely scale of impact

Council's DC Policy is reviewed at least every three years. These reviews reassess all growth, project requirement and costing assumptions to ensure the policy reflects the latest available information.

1.4 Assumptions on Large Infrastructure Projects

With the BPBC, several assumptions on other large infrastructure projects and programme were noted and formed the basis on which the network was assessed. **Table 1-1**, **Mt Roskill**

Table 1-2, and **Māngere**

Table 1-3 summarise the key projects for Tamaki, Mt Roskill, and Māngere respectively.

1.4.1 Tamaki

Table 1-1: Assumptions on large projects – Tamaki

Project	Influence on the Tamaki transport network
Central rail link (CRL)	While the CRL project is located within the city centre and remote from the Tamaki area, the project is expected to have significant benefits to the Eastern Rail corridor. The Eastern rail line is a critical rapid transit system for the Tamaki area. The current Britomart station arrangement is limiting the frequency in which rail services can travel on the eastern line. Once complete, the CRL project enables additional frequency and capacity for rail services at Panmure and Glen Innes. The CRL project is anticipated to complete construction in late 2025 and open in early 2026.

Project	Influence on the Tamaki transport network
Town centre revitalisation – A key dependency of the development in Tamaki is the town centre revitalisation being undertaken by Tamaki Regeneration Company (TRC) and Eke Panuku.	Provision of local services, shops and jobs is important to the overall outcomes within the Tamaki area. Town centre revitalisation projects are being undertaken by Eke Panuku for the Panmure centre and TRC for Glen Innes. These town centre revitalisation projects have the effect of increasing attractiveness of the centres and potentially increasing local jobs and amenities.

1.4.2 Mt Roskill

Table 1-2: Assumptions on large projects – Mt Roskill

Project	Influence on the Mt Roskill transport network
Auckland Light Rail (ALR)	As part of the development of the BPBC programmes for Mt Roskill and Māngere, the ALR project was assumed to be in place within a 10-year timeframe. This represented both a critical dependence and significant opportunity. The ALR project was expected to run through the Mt Roskill area in the vicinity of Dominion Road/Sandringham Road. The exact route was not known, but the project was assumed to be in place. The light rail project would have a significant impact to both the transport network and land use in the Mt Roskill. Potential effects to Brownfield's programme could include: • Reconfiguration of frequency and local bus services. • Consideration of key interchange points and stations. • Consideration of land use opportunities around the corridor / interchanges such as increases to density. • Lower traffic volumes due to access to high-quality rapid transit. The assumptions on the timing of the ALR project in the BPBC are unlikely to be accurate and a rapid transit project through the Mt Roskill area is unlikely to be delivered by 2031 as assumed in the BPBC. Given this change, project timing and assumptions have been reviewed for required and additional projects. It is noted that the ATAP (2018-2028) model scenarios assumes ALR (or equivalent) to be in place by 2036. This model scenario was used in the Mt Roskill ITA development and hence already considers a later implementation timeframe from the BPBC assumption. This assessment continues to assume that a rapid transit project is implemented through the Mt Roskill Area in line with the ATAP assumptions. If the ALR (or equivalent) project is not implemented, this will result in a significant reduction in public transport accessibility for part of the study area. A key outcome of the ALR project (or equivalent) is facilitation of intensification around the corridor itself in the form of more

Project	Influence on the Mt Roskill transport network
	intensive development in direct catchments. The land use assumptions used in this assessment do not capture this intensification, therefore the assumed land use is considered to reflect the base level of growth without the ALR project.
Connected Communities – multiple corridors in study area	Within the BPBC, Connected Communities operated as a parallel programme considering a number of the critical north-south arterial road corridors within the study area. These included Mt Eden Road, Sandringham Road, New North Road, Richardson Road and Hillsborough Road. The Connected Communities programme has since been disestablished. These corridors play a critical role in accommodating the transport demand of people within the Mt Roskill Growth area, hence have been included in the project list for the area.

1.4.3 Māngere

Table 1-3: Assumptions on large projects – Māngere

Project	Influence on the Māngere transport network
Auckland Light Rail	As part of the development of the BPBC programmes for Mt Roskill and Māngere, the ALR project was assumed to be in place within a 10-year timeframe. This represented both a critical dependence and significant opportunity. The ALR project was expected to run past the Māngere Centre and in the vicinity of Māngere West. The exact route was not known, but the project was assumed to be in place. The light rail project would have a significant impact to both the transport network and land use in the Māngere. Potential effects to Brownfield's programme could include: • Reconfiguration of frequency and local bus services. • Consideration of key interchange points and stations. • Consideration of land use opportunities around the corridor / interchanges such as increases to density. • Lower traffic volumes due to access to high-quality rapid transit. The assumptions on the timing of the ALR project in the BPBC are unlikely to be accurate and a rapid transit project through the Māngere area is unlikely to be delivered by 2031 as assumed in the BPBC. Given this change, project timing and assumptions have been reviewed for required and additional projects. This assessment continues to assume that a rapid transit project is implemented through the Māngere Area in line with the ATAP assumptions. If the ALR (or equivalent) project is not implemented, this will result in a significant reduction in public transport accessibility for part of the study area. A key outcome of the ALR project was facilitation of intensification around the corridor itself in the form of more intensive development in direct catchments. The land use assumptions used

Project	Influence on the Māngere transport network
	in this assessment do not capture that level of intensification, therefore the assumed land use is considered to reflect the base level of growth without the full ALR project.
Southwest Gateway project	The Southwest Gateway programme will provide choice and reliability for how people, and freight, travel around the south and east Auckland, including to and from the airport. The programme aims to provide better public transport, walking/cycling facilities and safer more efficient freight movements. The project is being delivered in stages including: • Stage 1: short term improvements around Puhinui Station, SH20B short term upgrades • Stage 2: state highway widening to support rapid transit and increased access to the state highways to free up local roads  The SH20 and SH20A corridors pass through the Māngere area. Widening of the SH20 and SH20A and upgrades to walking and cycling will provide benefits to the study area. These projects do not form part of the assumed network in the transport models used. If these projects were to be delivered, the accessibility outcomes sought in the area would be enhanced.
Connected Communities – multiple corridors in study area	Within the BPBC, Connected Communities operated as a parallel programme considering area key PT route through the study area. This included the Massey Road / Buckland Road route. The corridor was dropped from the programme during the BPBC process and incorporated in the projects identified as part of the BPBC as the corridor plays a critical role in accommodating the transport demand of people within the Māngere area.

1.5 Key uncertainties

There are several notable uncertainties in this long-term, programme-level assessment. The key areas of uncertainty are identified and discussed in **Table 1-4**. This includes an indication of the potential scale of uncertainty.

Table 1-4: Discussion of key uncertainties

No	Indicative Scale	Topic	Discussion	Approach
1	Medium	Scope of projects	The projects identified in the BPBC, and subsequent updates rely on a high-level assessment with limited design detail. As such, the scope of projects has potential to change as more detailed work is undertaken.	A high-level banded rate approach has been applied with application of appropriate contingency to account for unknowns at this stage.
2	Medium	Rate and sequencing of development	The rate and sequencing of land development is uncertain within the brownfield areas. Within development areas which are predominantly Kainga Ora developed, more certainty is available. In other areas, multiple factors may affect the rate and sequence of development.	The DC policy will be reviewed periodically with updates made on the best available information.
3	High	Timing of project implementation	The AHP and this updated assessment suggest a date when the project is likely to be needed, based on assumptions about land use development. Those assessments did not explicitly consider constraints on funding of the infrastructure, which could defer implementation dates within the programme.	Council to consider any modifications to indicated delivery times based on any constraints/requirements of the DC policy itself. The DC policy will be reviewed periodically with updates made on the best available information.
4	High	External funding	Ongoing regional or national funding for elements of this programme are likely over the life of the programme and can't be readily predicted. These uncertainties could significantly alter the total CAPEX: New external funding of projects could reduce the assessed CAPEX requirements (such as potential funding from the HAF RLTP and NLTP). Conversely, projects such as ALR (or equivalent) which are assumed to be externally funded may not be, requiring significant increase in CAPEX to provide the required local access links.	This uncertainty will remain as an area of uncertainty over the 30+-year development of this area. Council proposes a regular review of the DC assessment
5	High	CAPEX estimates	CAPEX estimates for brownfields projects have been based on a generic intervention type reflecting the uncertainty in project scope. As more detailed scope and timing is known, more refined capital cost estimates will be available.	The DC policy will be reviewed periodically with updates made on the best available information.
6	Low	Causation Assessments	In many cases causation will be confirmed through mitigation requirements in land use planning decisions, including via direct	This uncertainty will remain as an area of uncertainty over the 30+-year development of this area. Council proposes a

No	Indicative Scale	Topic	Discussion	Approach
			agreement between developers and road controlling authorities. This assessment has necessarily relied on assumptions and judgement regarding those likely outcomes.	regular review of the DC assessment as new information becomes available
7	Low	Beneficiary Assessment	The wide range of benefits and complex inter-dependencies between elements has meant this assessment has necessarily relied on assumptions and judgement regarding allocations for projects.	Council to consider uncertainties and sensitivities in defining the funding area and include a regular review of the DC assessment as new information becomes available
8	Low	Level of service uplift and renewal cost estimates	The assessment has adopted AT's approach to these issues. However, uncertainty is inherent in renewal costs over such a large programme.	The assessment could be updated at regular intervals with specific renewal projects if such information becomes available

1.6 Scope of Transport Elements Considered

This DC assessment was based on the scope of projects within the BPBC and augmented to account for recent changes in growth forecasts and updates to the transport network.

The scope of projects identified through the BPBC and updated through this assessment are outlined in **Figure 1-1**,

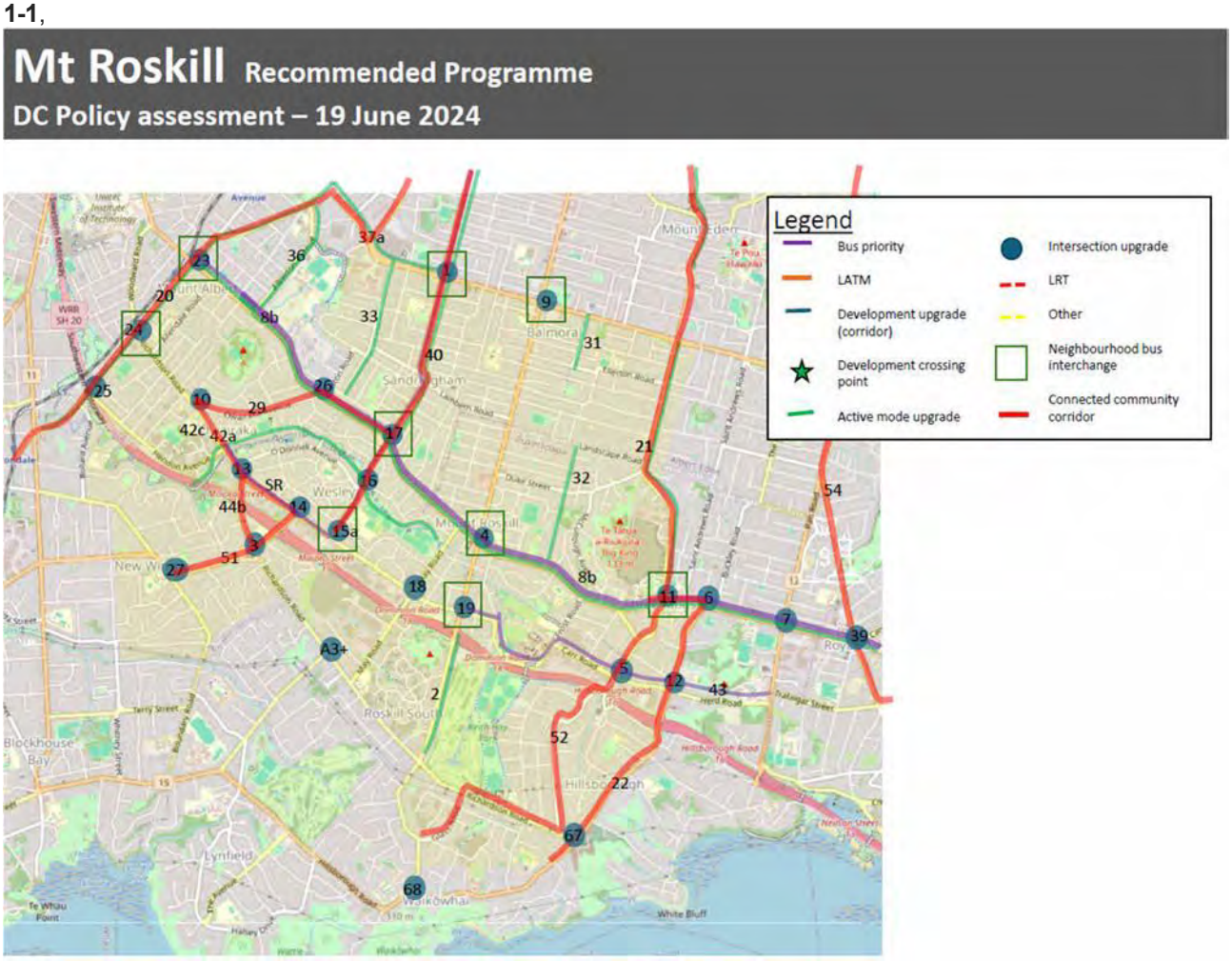


Figure 1-2, and

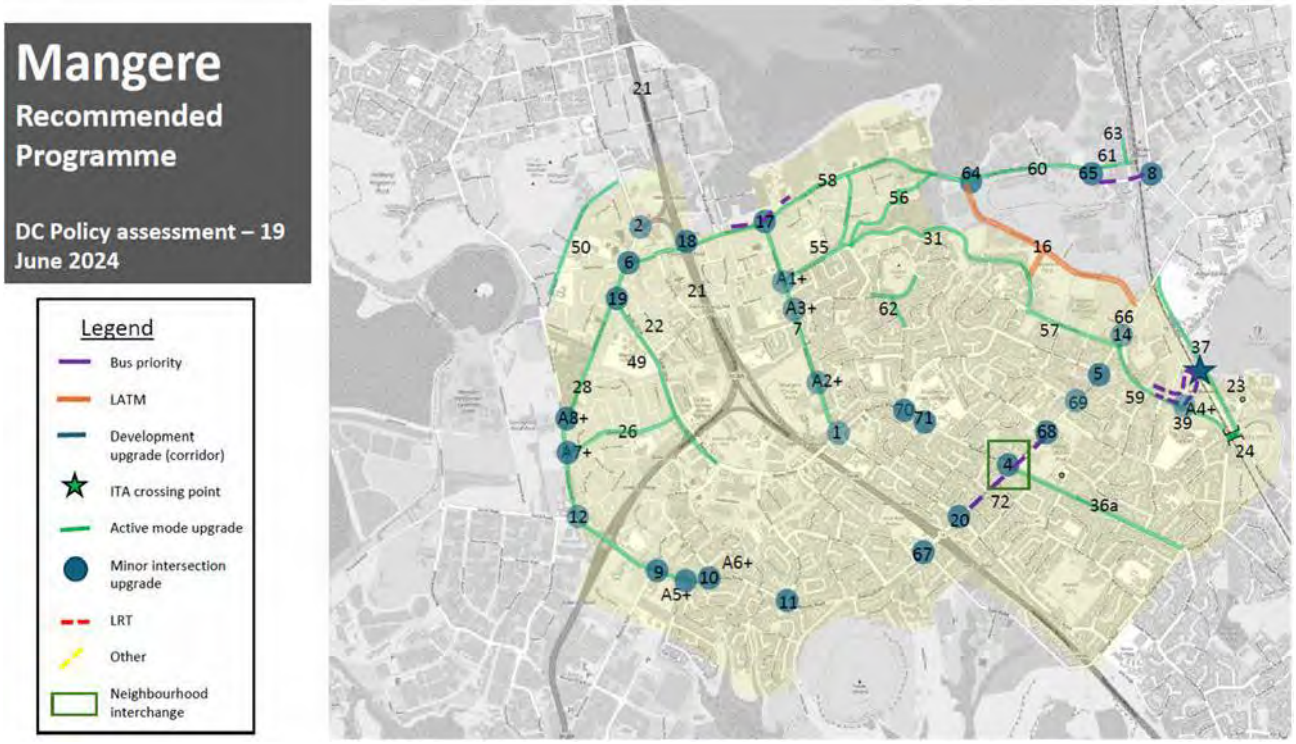


Figure 1-3 for Tamaki, Mt Roskill and Māngere respectively. More details on each project can be found in Appendix A.

1.6.1 Tamaki

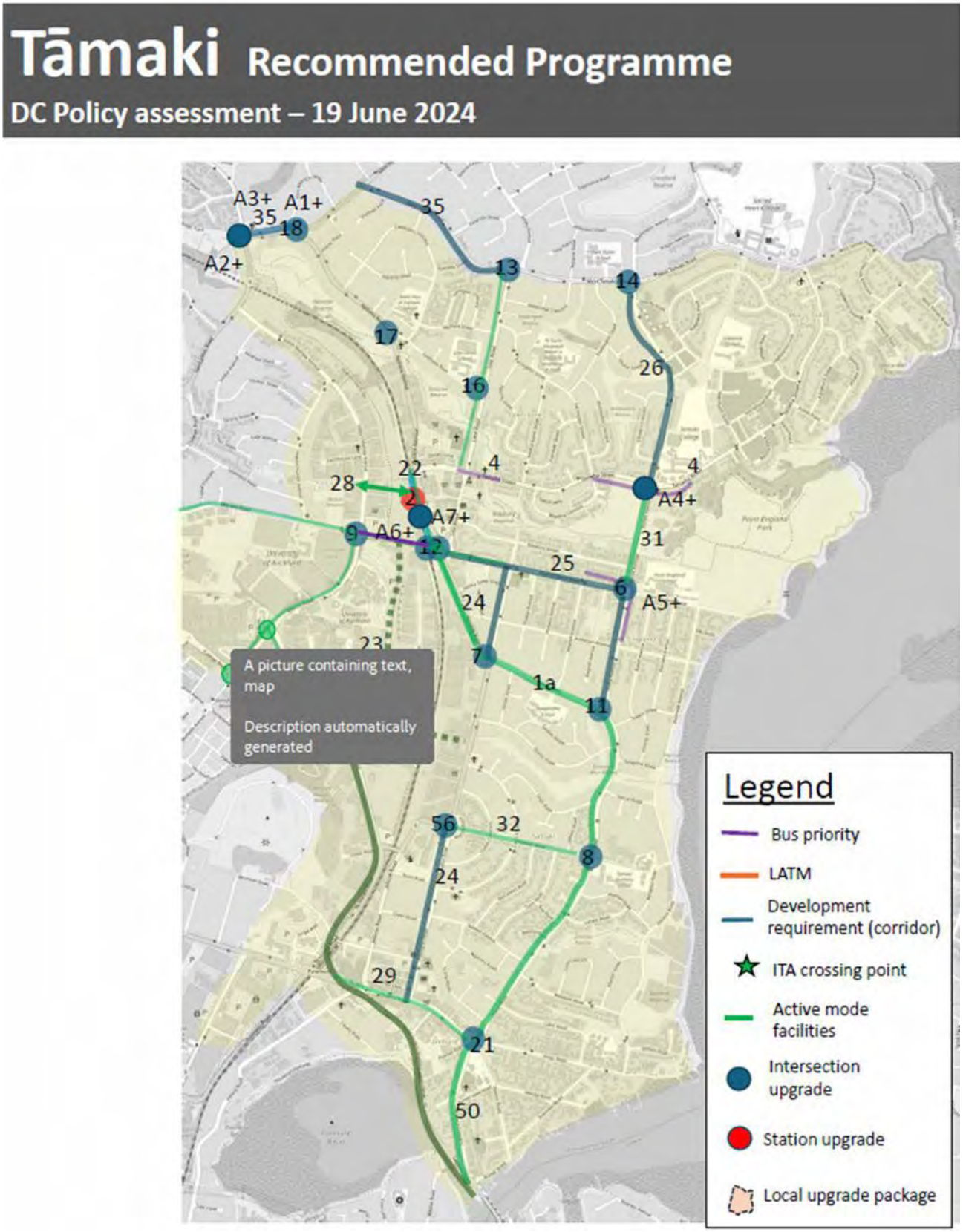


Figure 1-1: Recommended programme for Tamaki

1.6.2 Mt Roskill

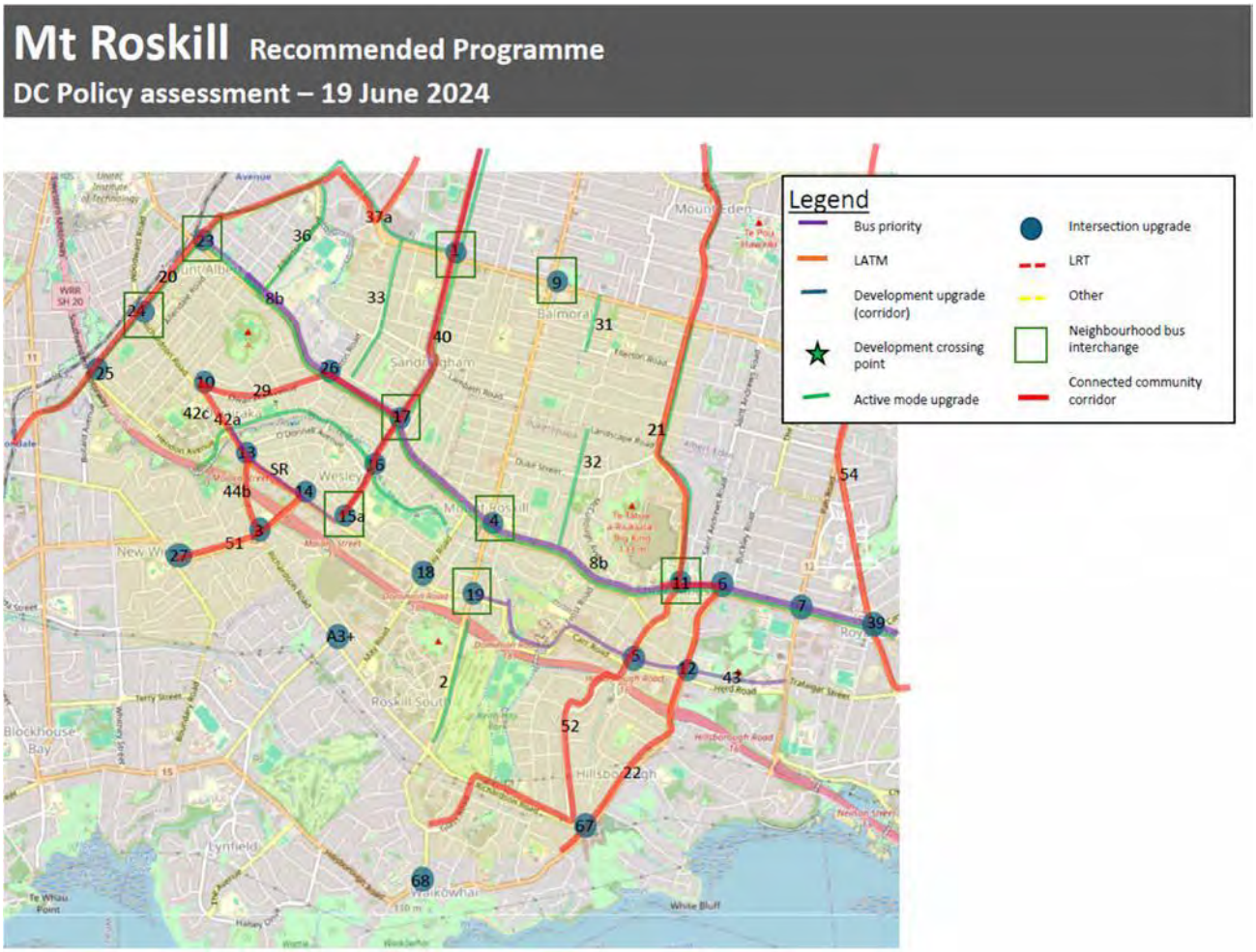


Figure 1-2: BPBC recommended programme for Mt Roskill

1.6.3 Māngere

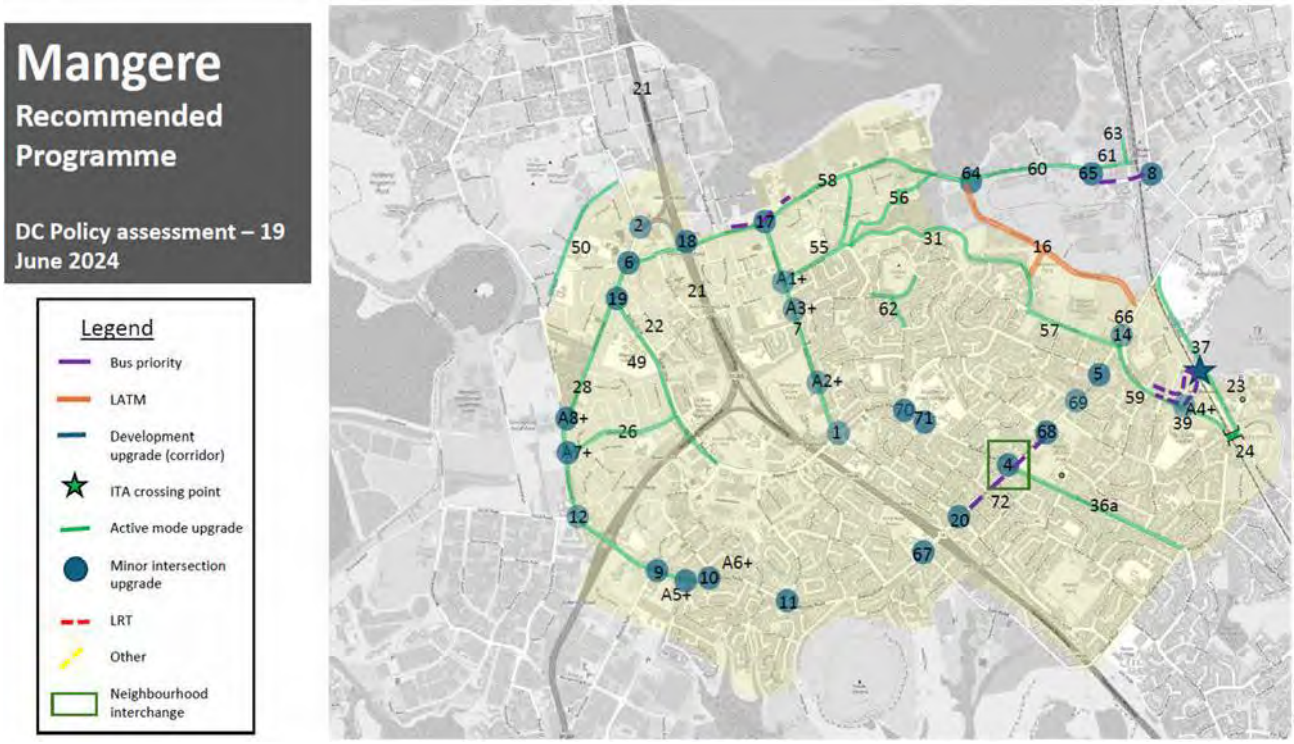


Figure 1-3: BPBC recommended programme for Māngere

Since the recommended network was identified as part of the BPBC, the network has been reviewed in light of changes which has included:

1. Some projects have been removed from the list as these have been completed or are no longer considered required
2. Recent ITA assessments from Kāinga Ora have been considered and resulted in changes to the network
3. A review of local area upgrades has been carried out for the whole study area
4. A review of Road safety has been carried out for the whole study area
5. Consideration has been given to updated growth scenarios compared to the growth assumptions in the BPBC. This has resulted in some additional projects being identified.

This assessment represents a technical assessment by the project team for a specific purpose and is based on key assumptions. This technical assessment is the most suitable data available on which to develop a DC policy for an extended programme of development.

1.7 Report Structure

The remainder of his report is structured as follows:

Chapter 2: Provides the growth context for Tamaki, Mt Roskill and Māngere

Chapter 3: Describes the process to develop a project list

Chapter 4: Describes the DC assessment methodology

Chapter 5: Details the assessment of individual projects and aggregate results

Chapter 6: Discusses key uncertainties and sensitivity testing

2 Growth Context

2.1 Policy and Growth Strategies

Auckland is anticipated to grow significantly over the next 30 years. In order to build Auckland's strengths and the cities unique characteristics, planning for future growth is an imperative.

Around 1.72 million people currently live in Auckland. Tāmaki Makaurau Auckland is anticipated to grow and change significantly over the next 30 years. Over that time, our population is expected to grow by around 520,800 people to a total of 2,230,800.

Auckland will take a quality compact approach to growth and development. A compact Auckland means future development will be focused in existing and new urban areas within Auckland's urban footprint, limiting expansion into the rural hinterland.

The quality aspect of this approach means that:

- most development occurs in areas that are easily accessible by public transport, walking and cycling
- most development is within reasonable walking distance of services and facilities including centres, community facilities, employment opportunities and open space
- future development maximises efficient use of land
- delivery of necessary infrastructure is coordinated to support growth in the right place at the right time.

Growth is enabled throughout most of Auckland's urban footprint, and all neighbourhoods are capable of accommodating growth to some extent. However, some existing urban areas are likely to undergo significant growth. Redevelopment in these areas will be of a scale that will require substantial infrastructure and service investment.

The Tamaki, Mt Roskill and Māngere areas are identified as priority areas for investment to enable intensification and a short to medium term priority for investment as outlined in the Auckland council Future Development Strategy.

2.2 Auckland Unitary Plan

The Auckland Unitary Plan (AUP) sets out the planning parameters which influence the extent to which brownfields intensification can occur.

Further intensification is expected in existing urban areas as these areas continue to develop under existing AUP rules and consents. In addition, Council's proposed Plan Change 78 seeks to enable greater densities within the existing urban areas in line with the Medium Density Residential Standards (MDRS) and the National Policy Statement on Urban Development (NPS:UD), with the predominant change being residential single house zones and mixed housing suburban zones intensifying to mixed housing urban zones. While the final outcomes of the PC78 process are yet to be confirmed, this assessment assumes that similar planning provisions are available to enable the forecast level of growth.

The existing AUP zoning is identified in **Figure 2-1**, **Figure 2-2** and **Figure 2-3** for Tamaki, Mt Roskill and Māngere respectively.

Figure 2-1: Tamaki area AUP zoning

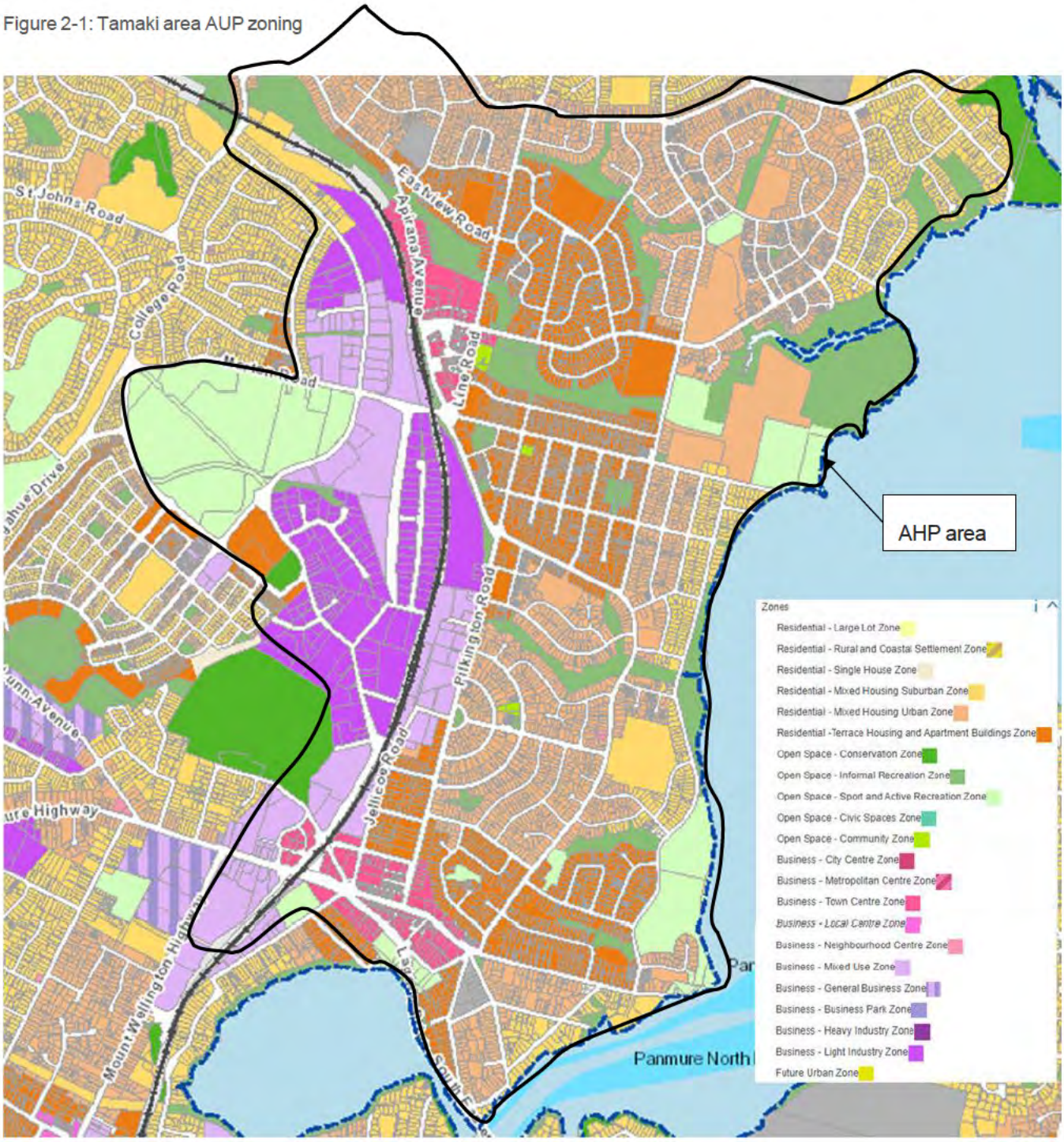


Figure 2-2 Mt Roskill area AUP zoning

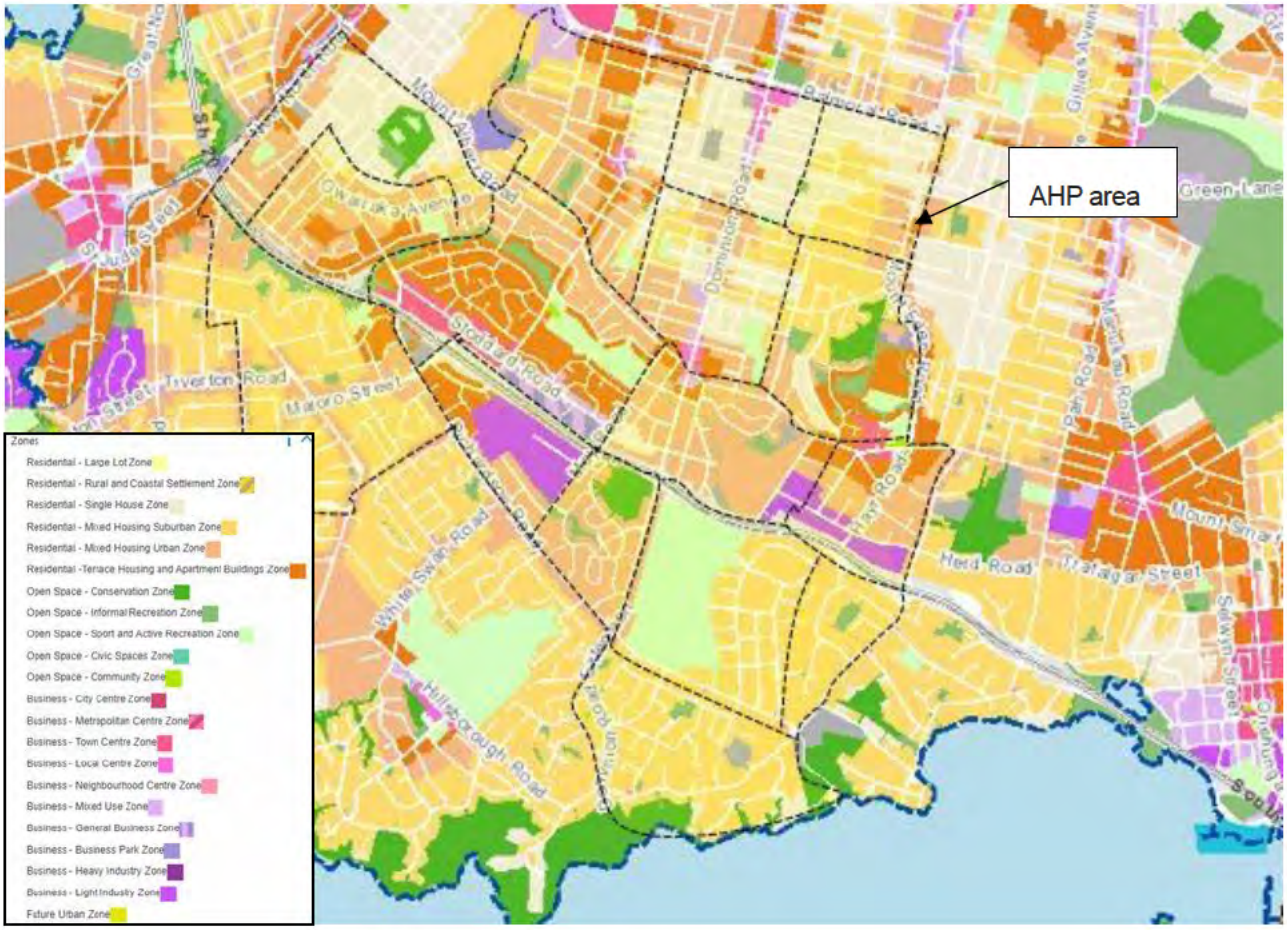
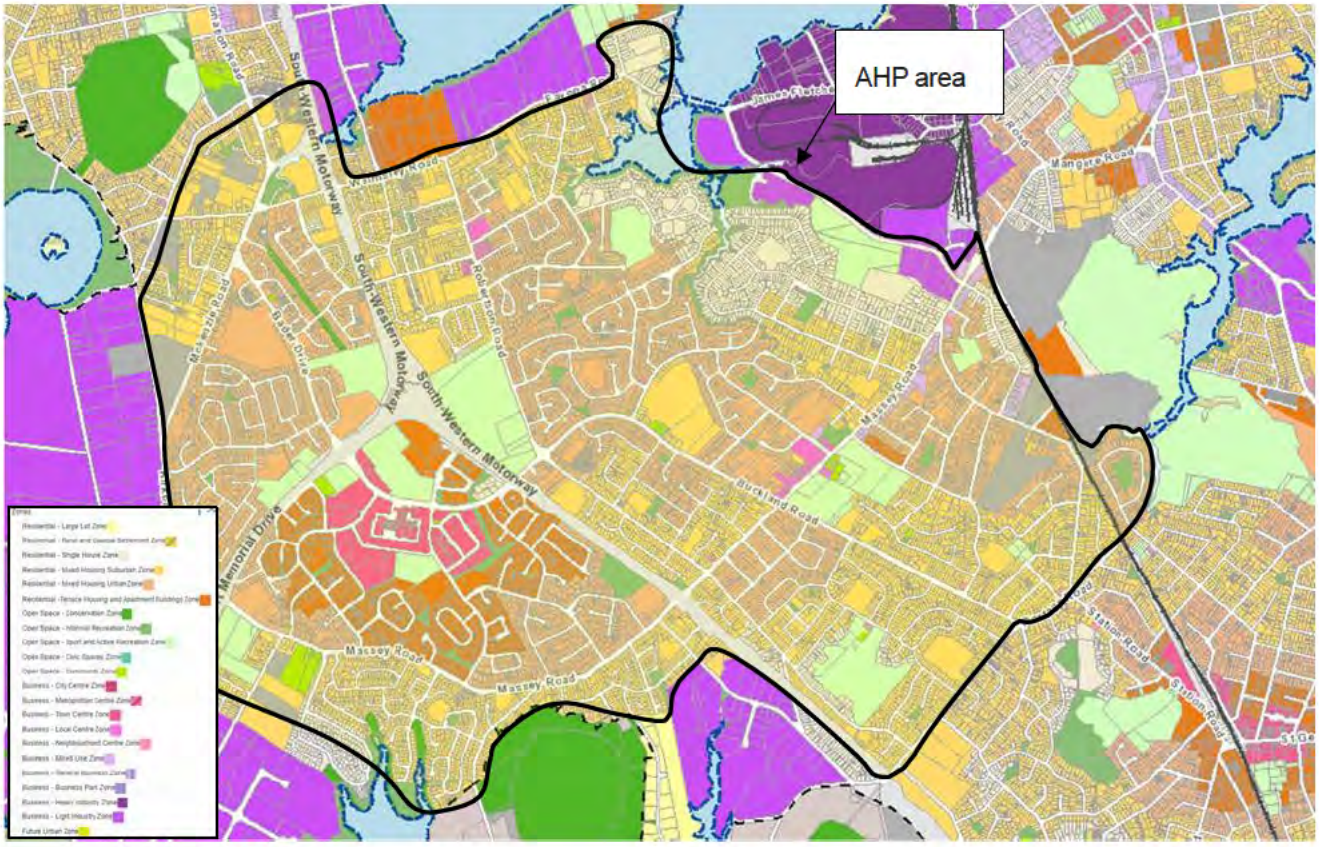


Figure 2-3 Māngere area AUP zoning



2.3 Known Development Plans

Kāinga Ora have a number of smaller scale developments in progress at this time. These have been considered through the BPBC and subsequently through the review of ITA documentation and the Projects identified through the BPBC and subsequent updates.

In the Tamaki area, Kāinga Ora have active developments occurring in the following neighbourhoods:

- Glen Innes Northwest
- Panmure North and Point England

In the Mt Roskill area, Kāinga Ora have active developments occurring in the following neighbourhoods:

- Waikowhai
- Owairaka
- Mt Roskill South
- Wesley West

In the Māngere area, Kāinga Ora have active developments occurring in the following neighbourhoods:

- Aorere
- Middlemore Crescent
- Māngere East
- Māngere West A

- Māngere West B

In addition to active Kāinga Ora neighbourhoods, the following larger scale standalone developments have been considered:

Tamaki - Shundi Development

Shundi have received resource consent for the first stage of development on land at 261 and 263 Morrin Road, Saint Johns, Auckland and construct a residential development consisting of:

- Two residential buildings, being 14 and 18 storeys high and containing 191 residential units;
- A podium beneath and surrounding the buildings that overlies a single-level basement parking area, and provides a platform for communal outdoor courtyards for residents;
- Vehicle and pedestrian accessways and public open spaces; and
- Infrastructure associated with the two buildings and surrounding podium.

The development area is within the Tamaki study area and will increase the number of dwellings to an expected 1,500 in the area and reduce available business land. These dwellings are anticipated to house an additional 5,000 people.

Figure 2-4: Shundi Tamaki Village LTD development stages

Figure 5: Staging Plan

Source: Tāmaki Masterplan, Reset Urban Design

Tamaki - Simplicity living

The Simplicity living development at Kupenga apartments has provided a significant volume of medium/high density living with some 69 units providing built to rent products to investors.

Māngere - Market Cove development

The market cove area north of Walmsley Road in zoned at THAB. The site is intended to be developed with a combination of apartments, terraced housing and some commercial activity to support the residential components.

Figure 2-5: Market cove masterplan

Māngere - Hospital Road

Two major property blocks purchased by west Auckland's Whānau Waipareira and local iwi Ngai Tai Ki Tāmaki Whenua of around 36,500sq m of land adjacent to Middlemore Hospital will provide homes for kaumātua, kuia and whānau with disabilities, as well as a Whānau Ora/Health and Wellness Centre.

The land will be split into 25,000sq m for the Whanau Ora Centre and 10,500sq m for 124 dwelling units targeted primarily for elder social housing.

2.4 Growth Forecasts

Growth forecasts for the wider AHP areas have changed over time in response to changes in strategic thinking and policy. The BPBC used the growth forecasts available at the time (I11.6 scenario) as a basis for the assessment of the network. At the time, the regional growth forecasts were compared with levels of growth proposed by Kāinga Ora.

Since the BPBC work was completed, upgraded regional population forecasts have become available. The Auckland Growth Strategy (AGS) 2023 forecast[1] represents Councils view on regional growth going forward. The AGS forecast increases the level of household, population, and employment growth in the AHP areas over the 2022-2052 forecast period compared to I11.6. Additionally, the AGS forecast does not extend to full buildout values.

A full buildout scenario for the AHP areas was provided by Council developed from the AGS forecast for the purposes of this assessment (AGS FBO). This scenario follows the original AGS forecast to 2052, with post-2052 growth to achieve full buildout by 2060.[2]

[1] Formally, this is known as the AGS_2023_v1 forecast.

[2] Based on a RIMU assessment undertaken in 2022 of AUP plan enabled capacity that identified typical full build out of dwellings could be estimated by a 55% ratio of theoretical capacity.

2.4.1 Tamaki

Within the Tamaki area, the AGS FBO scenario shows an increased rate of household growth across the 30-year period before flattening off post-2052 (see **Figure 2-6**). Population forecasts follow a similar trend to the household growth forecasts (see **Figure 2-7**). Regarding employment forecasts, the AGS FBO scenario shows an increase in employment (see **Figure 2-8**) over the I11.6 scenario in Tamaki area (as per **Section 2.5**).

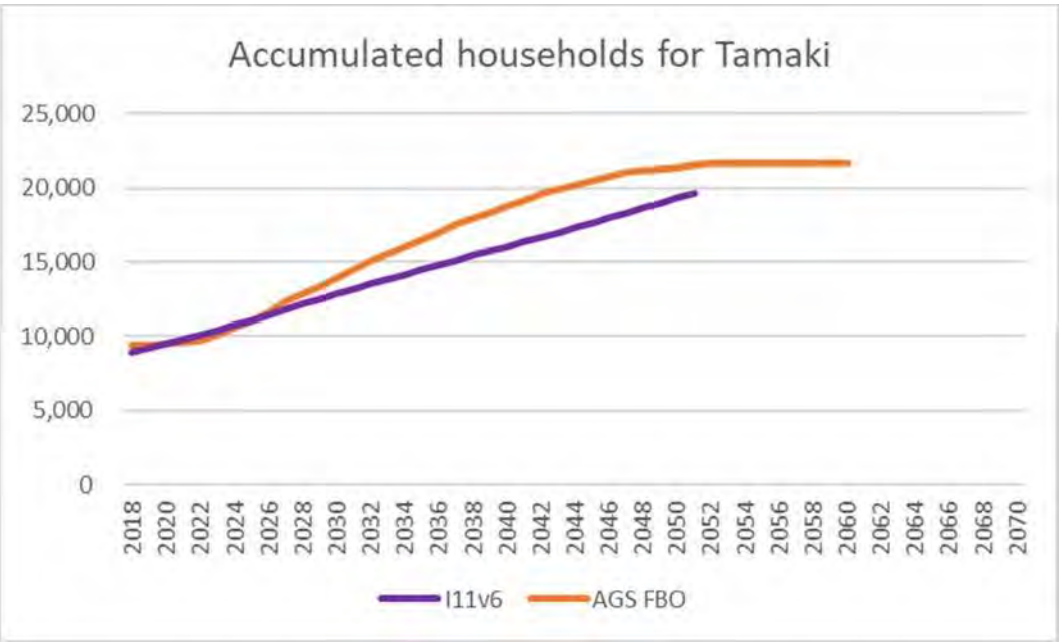


Figure 2-6: Household forecasts for the Tamaki area

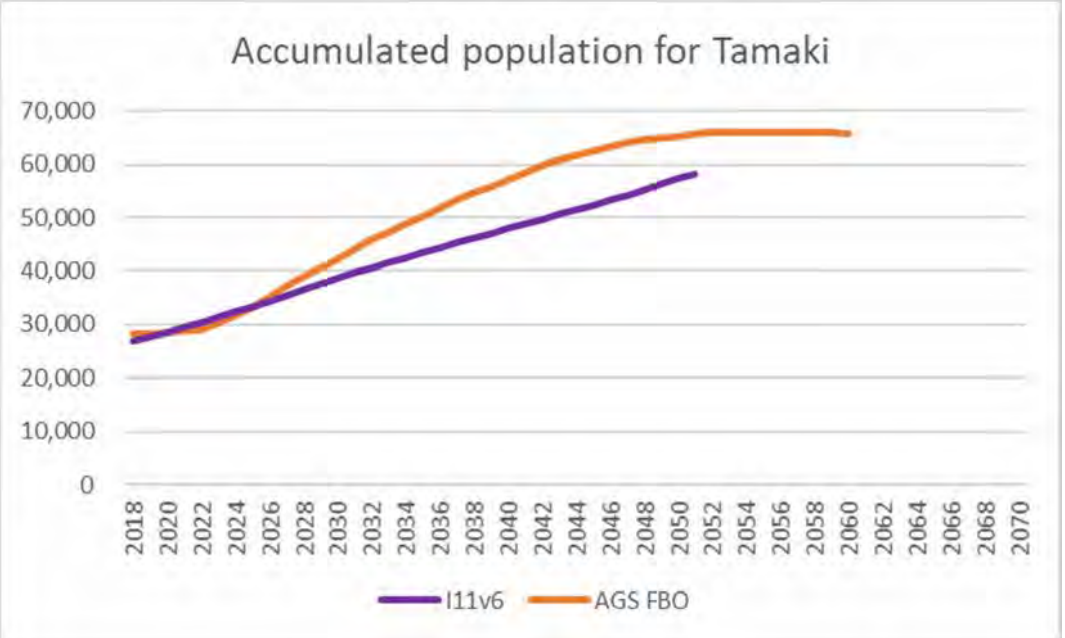


Figure 2-7: Population forecasts for the Tamaki area

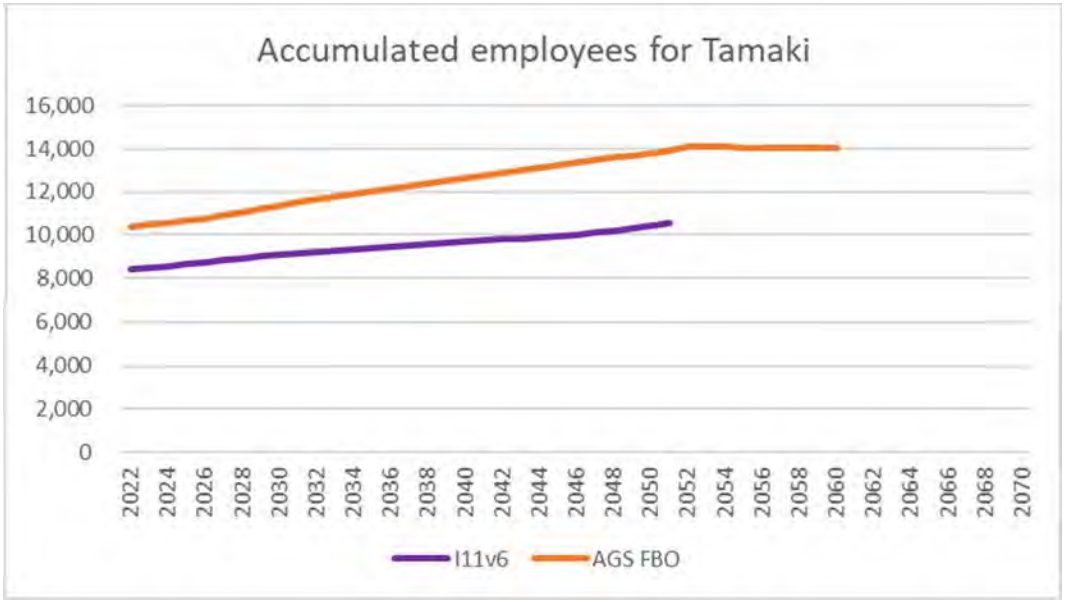
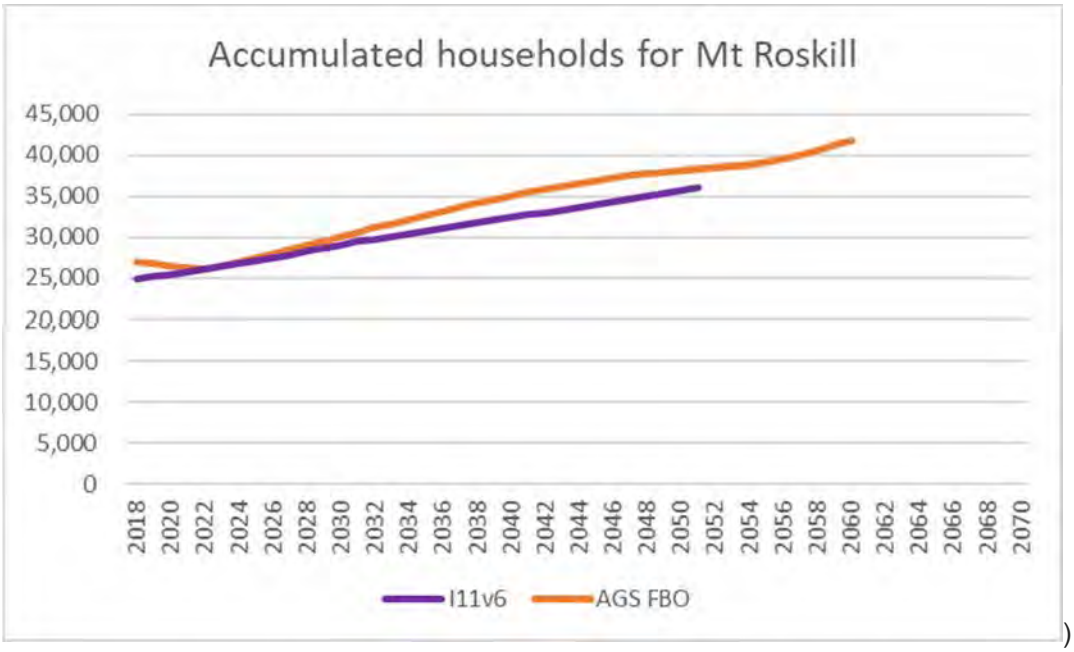


Figure 2-8: Employment forecasts for the Tamaki area

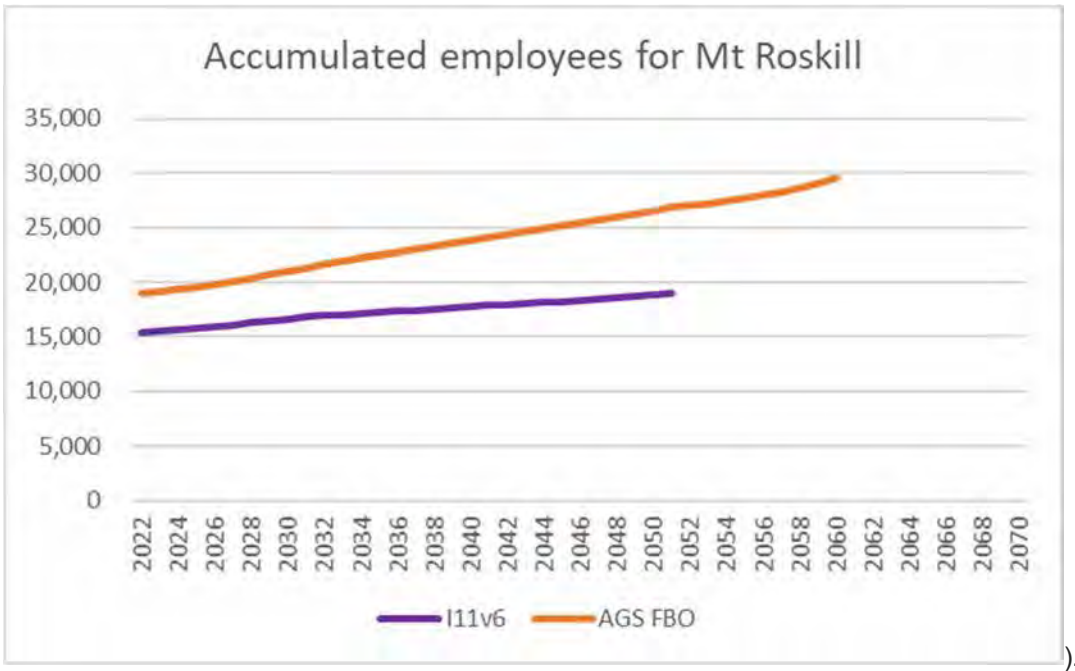
2.4.2 Mt Roskill

The AGS FBO scenario shows a modest increase in household growth (see



) over the I11.6 scenario by 2051 (7% increase), with population showing a similar trend (see **Figure 2-10**). Regarding employment forecasts, the AGS FBO scenario shows an increase (30-40%) in employment in the area when compared with I11.6 scenario (see

Figure 2-10: Population forecasts for the Mt Roskill area



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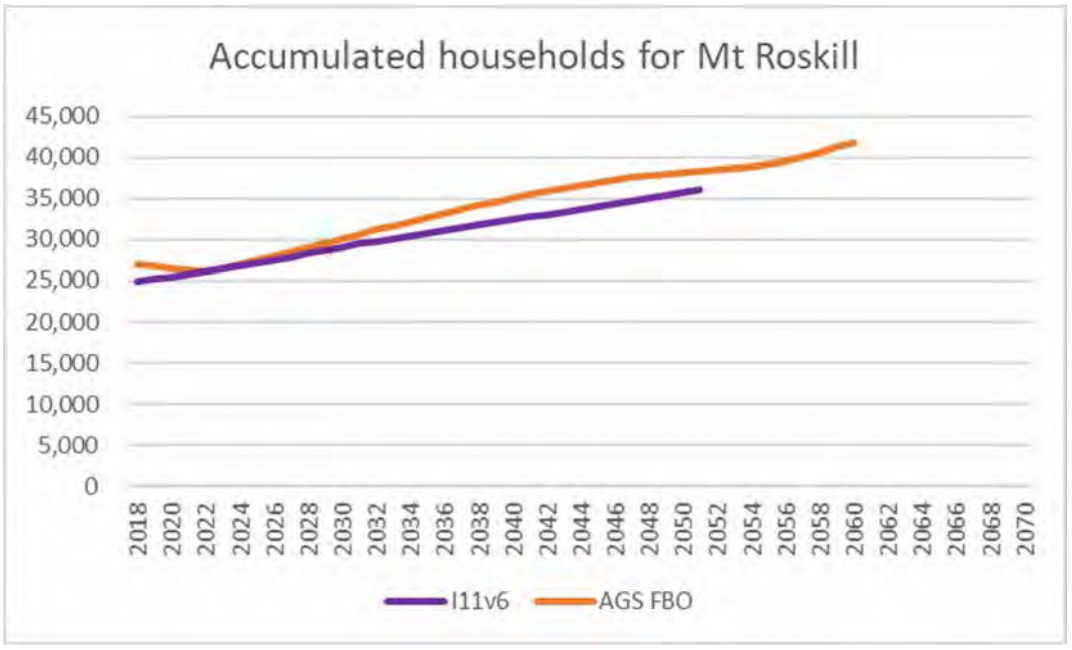


Figure 2-9: Household forecasts for the Mt Roskill area

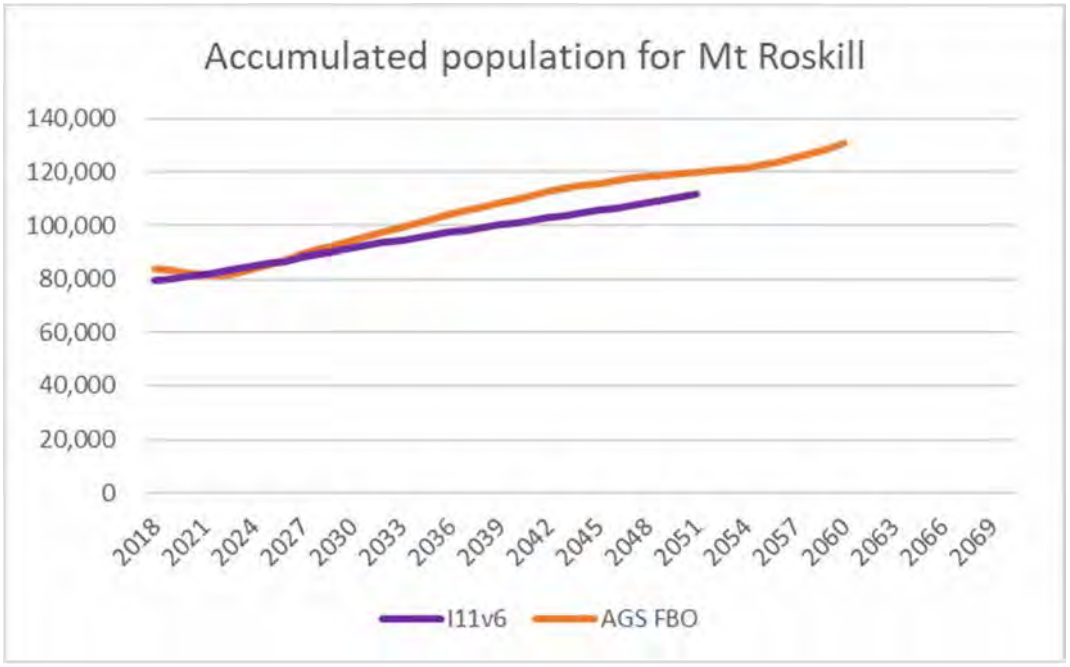


Figure 2-10: Population forecasts for the Mt Roskill area

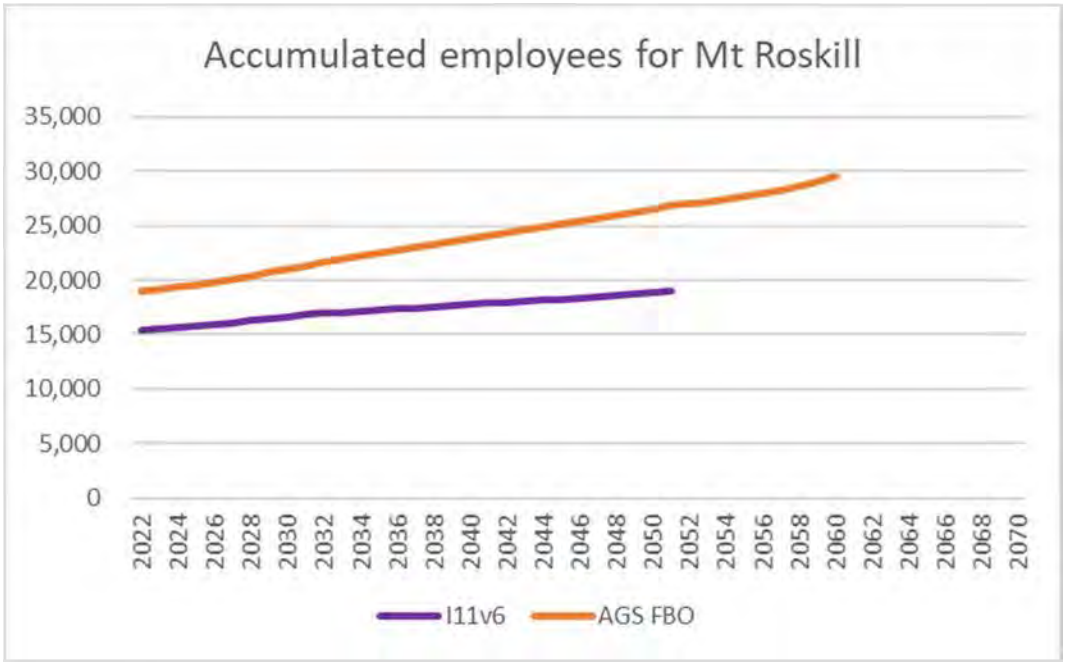


Figure 2-11: Employment forecasts for the Mt Roskill area

2.4.3 Māngere

The AGS FBO scenario shows a minor increase in household growth (see **Figure 2-12**) over the I11.6 scenario (16% by 2051), with population showing a similar trend (see **Figure 2-13**). Regarding employment forecasts, the AGS FBO scenario shows a significant increase in employment (61% by 2051) when compared to the I11.6 scenario (see **Figure 2-14**).

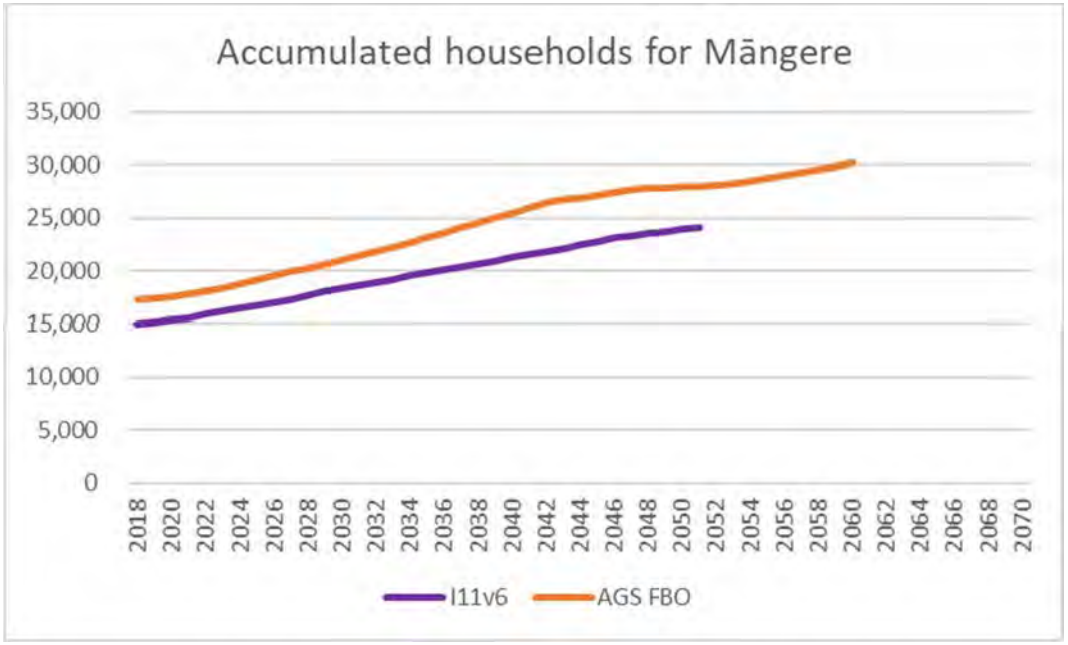


Figure 2-12: Household forecasts for the Māngere area

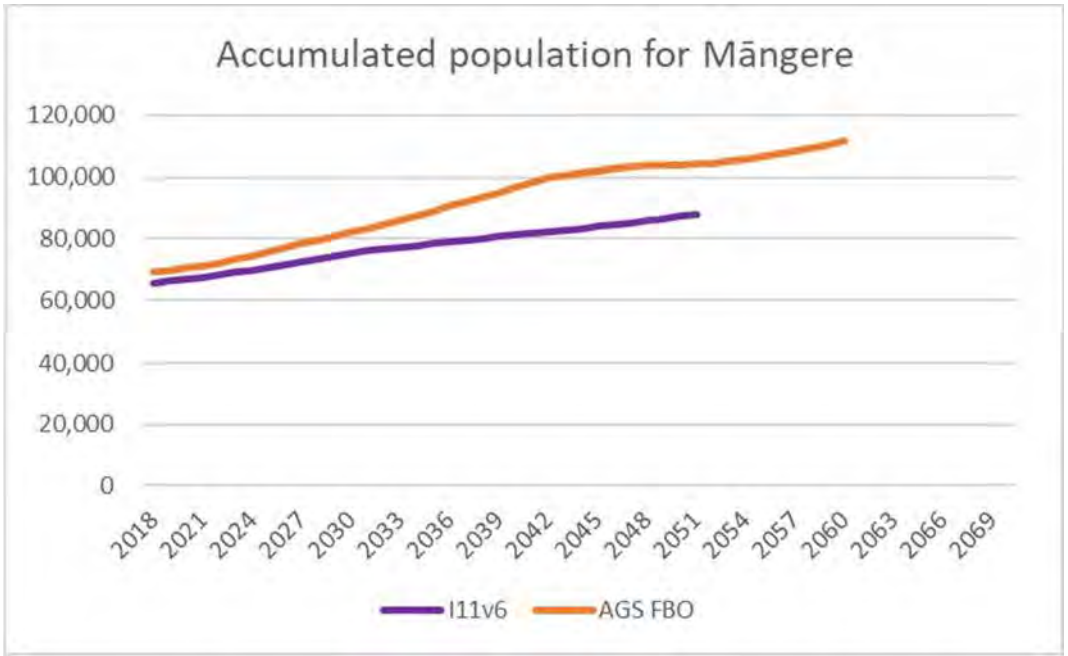


Figure 2-13: Population forecasts for the Māngere area

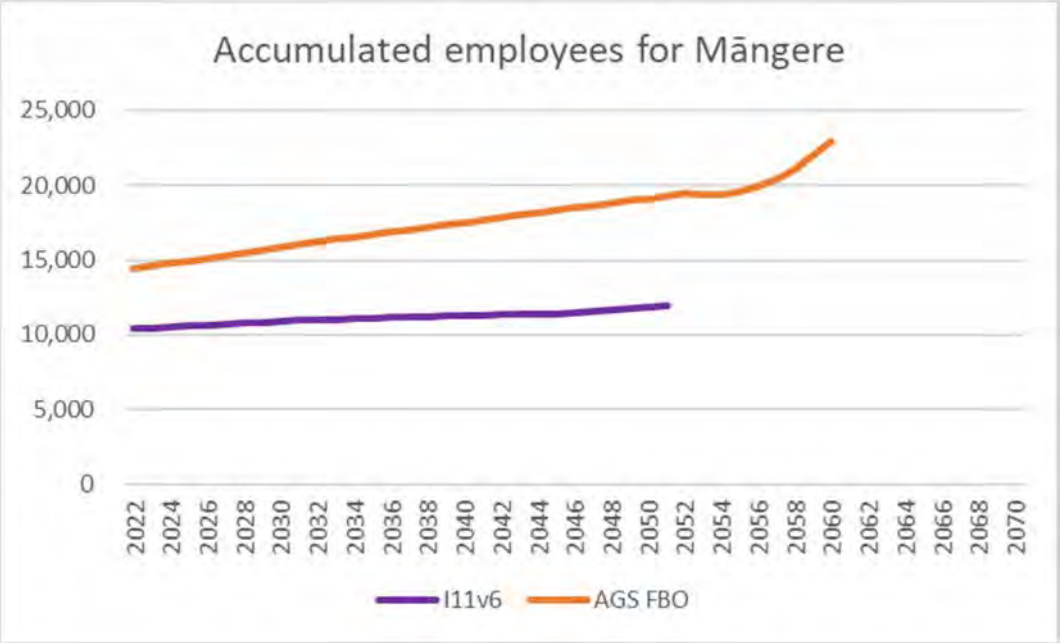


Figure 2-14: Employment forecasts for the Māngere area

2.5 Growth Areas

This assessment has been developed based on the three AHP areas. However, the Macro Strategic Model (MSM) regional model zones (based on Census area units) do not directly match the AHP Precinct boundaries. The MSM model zones have been used for most of the analysis. As such, some adjustment to the assessment areas have been necessary to ensure alignment with MSM zones.

The AGS FBO scenario (as per **Section 2.4**) includes assumed timing of development within each of the MSM zones applicable to the AHP areas. This assessment has considered the timing outlined in the regional model scenarios and has supplemented this forecast with development staging plans from Kāinga Ora in several of the neighbourhoods within each assessment area. Both sources of information have been used to develop indicative project timing.

2.5.1 Tamaki

Figure 2-15 sets out the assessment area, AHP area and MSM zones. Where a significant portion of a MSM zone is included in the AHP area, zones have been included in the study area. Where an insignificant portion of an MSM zone is included in the AHP, the zone has been excluded. Some areas outside the AHP have been added to the study area (dark purple shading) and some minor areas inside the AHP area have been excluded from the study area (cream colour). The dark and light purple area outline the study area used in the DC policy assessment.

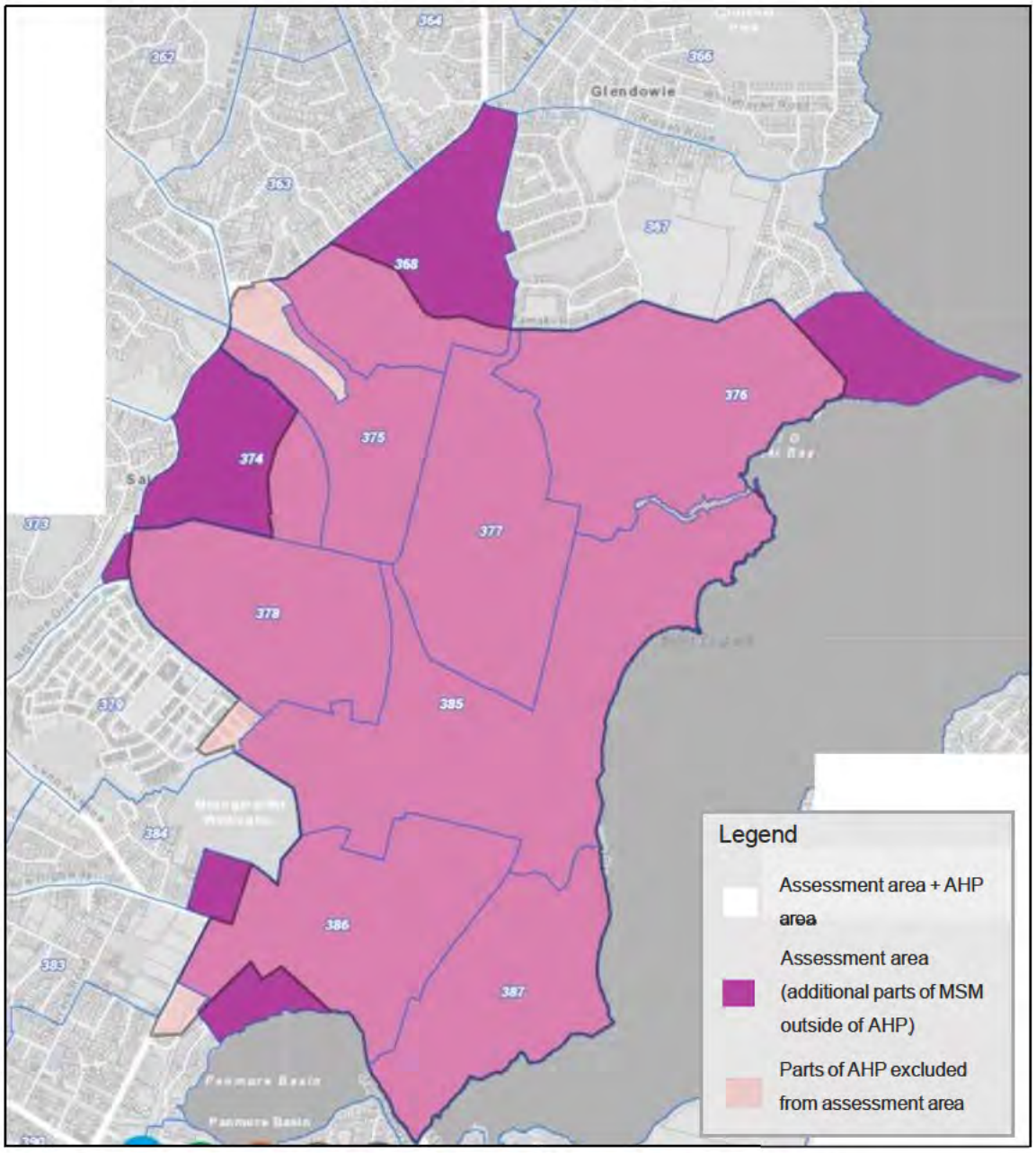


Figure 2-15: Assessment area vs MSM zones vs AHP area – Tamaki

2.5.2 Mt Roskill

Error! Reference source not found. sets out the assessment area, AHP area and MSM zones. Where a significant portion of a MSM zone is included in the AHP area, zones have been included in the study area. Where an insignificant portion of an MSM zone is included in the AHP, the zone has been excluded. Some areas outside the AHP have been added to the assessment area (green shading) and some minor areas inside the AHP area have been excluded from the assessment area (pink colour). The brown and green area outline the assessment area used in the DC policy assessment.

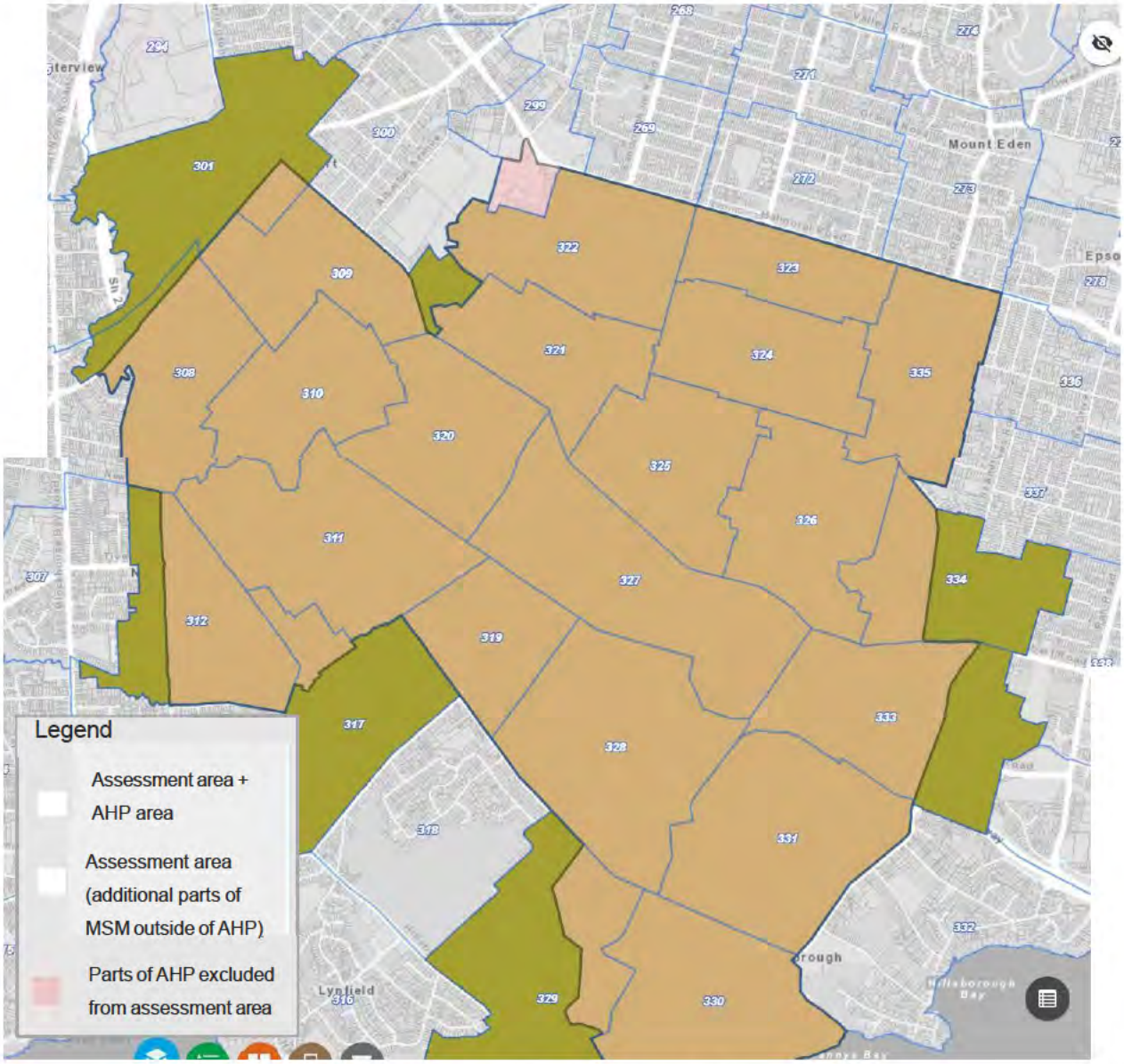


Figure 2-16 Assessment area vs MSM zones vs AHP area – Mt Roskill

2.5.3 Māngere

Error! Reference source not found. sets out the assessment area, AHP area and MSM zones. Some areas outside the AHP have been added to the assessment area (dark purple shading). Where a significant portion of a MSM zone is included in the AHP area, zones have been included in the study area. The dark and light purple area outline the assessment area used in the DC policy assessment.

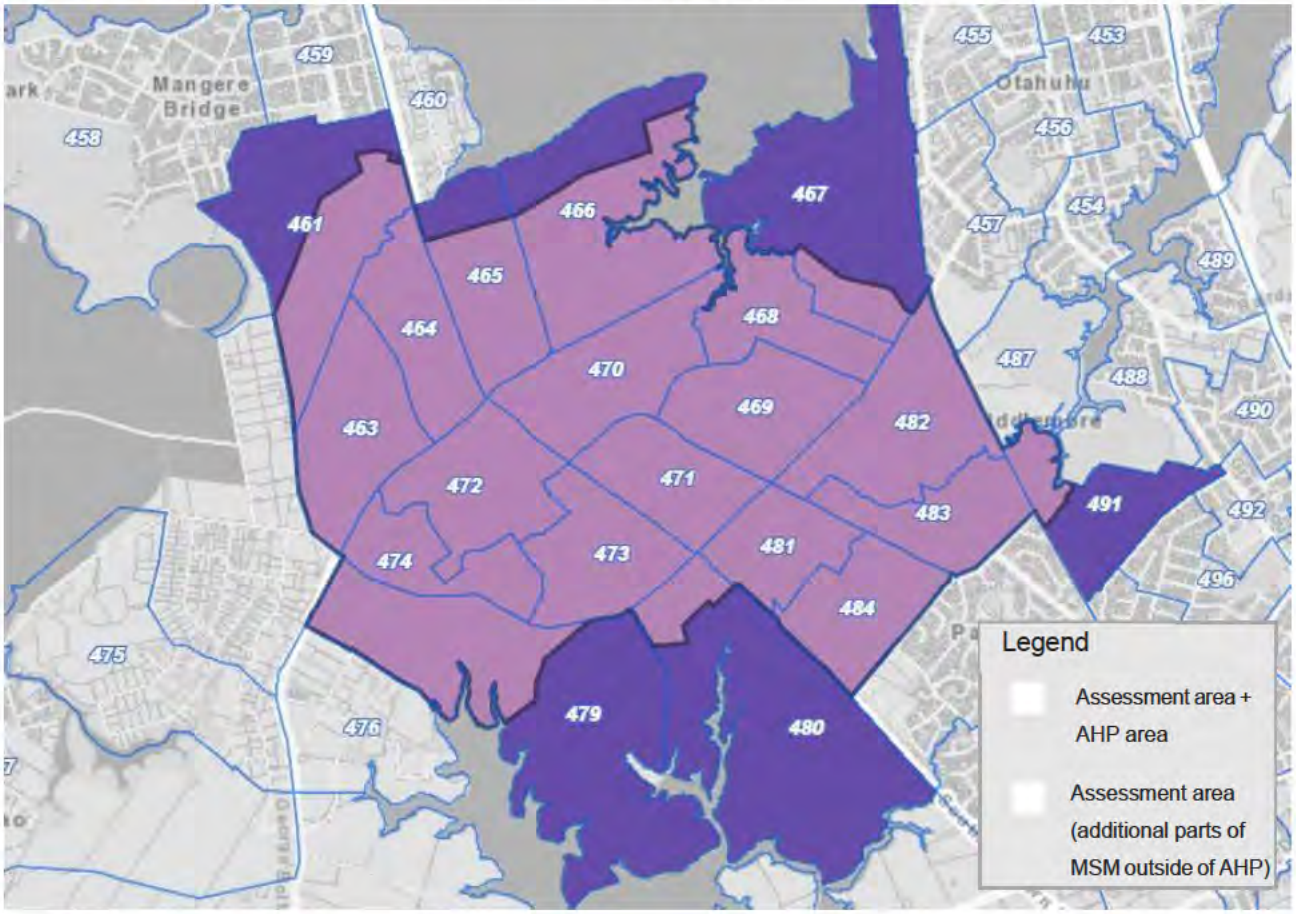


Figure 2-17: Assessment area vs MSM zones vs AHP area – Māngere

2.6 Transport Outcomes Sought

The BPBC outlined a set of outcomes sought through investment into the transport network for each area. The key outcomes from the programme can be summarised as follows:

- A reduction in deaths and serious injuries (DSI)
- A step change in mode share for active modes and public transport with a 10-20% reduction in car use.
- Increases in accessibility for public transport, walking and cycling within development areas particularly at the local level, i.e., accessibility to jobs and social facilities within 15min walk and cycle.
- More people living within 500m of a high-quality cycle facility or rapid transit station

Within the Tamaki area, the BPBC reported the following outcomes of the recommended investment package:

- Reduction of 268 death and serious injury (DSI) crashes over 40 years
- Mode share of 22% for active modes
- 10% more jobs and social opportunities assessable by cycling and public transport

- 200-ton reduction in CO2 emissions per year

Within the Mt Roskill area, the BPBC reported the following outcomes of the recommended investment package:

- Reduction of 316 DSI crashes over 40 years
- Mode share of 22% for active modes
- 10% more jobs and social opportunities accessible by cycling and public transport
- 22,600-ton reduction in CO2 emissions per year

Within the Māngere area, the BPBC reported the following outcomes of the recommended investment package:

- Reduction of 216 DSI crashes over 40 years
- Mode share of 18% for active modes
- 10% more jobs and social opportunities assessable by cycling and public transport
- 17,000-ton reduction in CO2 emissions per year

3 Development of Project List

This section outlines the key considerations/methodology/process for developing the project list for the AHP areas. The project list development followed the steps outlined in **Figure 3-1**.

Figure 3-1: Process to develop AHP project list

Appendix A provides a full list of the project details.

3.1 Brownfields Recommended Programme

The recommended programme is outlined in **Section 1.2.1**.

3.2 Review of changes since the Brownfields Programme Business Case

Since the BPBC, a number of changes / further work has occurred. This was considered with respect to subsequent changes to the transport network.

In the Tamaki area, the following changes were considered:

- Further assessment from Kāinga Ora and Lead Alliance in development of the Tamaki transport demand management study and updated neighbourhood ITAs.
- Confirmation that the proposed upgrade on St Heliers Road is no longer progressing through the connected communities programme
- Progress on the design and construction of several of the upgrades within the 'Links to Glen Innes' project including completion of work on several of the intersections and mid-block sections.

Of relevance in the Mt Roskill area includes:

- Further assessment from Kāinga Ora /Lead Alliance in development of ITAs for several neighbourhood in the area
- The Connected Communities project is no longer progressing. Several of the key north south corridors are considered integral to enabling development of the Mt Roskill area hence have been included in the programme.
- A change in assumed timing of the RTN through this area.
- Progress on the design and construction of several of several upgrades within the area.

Of relevance in the Māngere area includes:

- Further assessment from Kainga Ora /Lead Alliance in development of several areas in the Mangere area.
- Review and revision of the Buckland Road / Massey Road bus priority improvements to separate into individual intersection treatments and a selected section of midblock upgrade.
- A change in assumed timing of the RTN through this area.

This review led to a number of projects being added to and removed from the project list and excluded from this DC policy.

3.3 Local and Safety Assessment

The local and safety assessment is intended to identify the upgrades within a neighbourhood area to accommodate the anticipated growth in dwellings and population. The assessment looks at the safety of the roads, considers the growth and reviews the appropriateness of local and collector roads in an area to cater for transport demand. The methodology used for this assessment follows the following steps:

Step 1: The area context includes gathering of information including road network typology, zoning, and public land holdings. The potential for growth is identified through consideration of Kāinga Ora growth in the zone, private development potential, anticipated changes in the MSM[3] model and consideration of a full build out scenario. The growth is then considered in the context of changes in travel demand extended over time. This considers changes in mode share in the future.

Step 2: The underlying intention of this approach is to account for the additional population (and associated travel) and recognise that with these additional future demands, there will be an increase in the expected exposure to transport safety risks compared to the current situation.

Step 3: The safety performance of the network looks at historic data in each area against national averages and highlights parts of the network which have higher safety risk. The 'Future Connect' database includes a layer highlighting priority safety deficiencies in the transport network for the next 10 years. This is considered along with crash data. The 'Future Connect database' also highlights deficiencies in the walking network.

[3] MSM model is the regional transport model for the Auckland region

Step 4: A professional assessment is made on the network given the current performance and anticipated changes in demand. A framework of changes in transport demand to types of interventions is outlined in **Table 3-1**. This forms a basis on which interventions are identified in each area.

Table 3-1: Framework of growth change thresholds vs intervention matrix

GROWTH CHANGE THRESHOLDS			
	LOW LEVEL	MEDIUM LEVEL	HIGH LEVEL
Vehicle volume (AADT) - increased	0 – 500	500 – 1,000	>1,000
Active modes (cyclists and pedestrian) volume - increased	0 – 50 people/ day	50 -100 people/day	>100 people/day
INTERVENTION MATRIX OPTIONS			
Midblock	• Footpath widening	• Kerb buildouts & pedestrian refuge islands • Speed calming device	• Raised crossing e.g. zebra crossing • Speed calming device
Intersection	• Kerb crossing / pram ramp & tactile pavers (where not existing)	• Threshold treatment e.g. flush treatment • Upgrade priority control e.g. where existing uncontrolled	• Threshold treatment e.g. raised pedestrian crossing

Step 5: The final step is a stocktake of the existing network and identification of necessary interventions and investment to respond to the future safety risk based on estimated changes in the levels of future travel demand.

Full details on the local and safety assessment for the Tamaki, Māngere and Mt Roskill areas is included in Appendix C.

3.4 Review of network against growth assumptions

As outlined in **Section 2.4**2.4, changes in growth assumptions have occurred since the original BPBC work developed a network. Considering changes to the growth assumption because of the change from the I11.6 scenario to the AGS FBO scenario, the transport network has been reviewed in each area.

Transport modelling was undertaken (using the strategic transport model) which compared the AGS FBO scenario against I11.6 to determine the scale and position of changes in transport demand arising from the anticipated changes in growth. Where significant changes are anticipated because of applying the different scenarios, the transport network was reviewed in these locations and changes to the network were considered over and above the BPBC recommended network.

Within the AHP areas, further projects were identified as being required to cater for changes in growth anticipated.

Further details on these projects are included in **Appendix A**.

3.5 Project Staging

A review of project staging was undertaken given the variety of changes since the BPBC. The review considered changes in growth quantum and timing as outlined in **Section 2.4**, drawing on additional information from Kāinga Ora (such as ITAs). Project timings were developed for each of the three growth scenarios (Growth scenarios as set out in **Section 2.4**).

In identifying indicative project timing, a set of principals were considered to guide the assessment which are outlined below:

1. On sites where urban development is occurring:

a) Urbanise existing corridors within and adjacent to development concurrently with that development

b) Provide interim facilities as part of the development and where transport improvements are provided in an interim form, ensure alignment with the full build-out network

2. Beyond sites where development is occurring, stage the form and capacity of the transport network progressively to match both development stages and system needs, including cumulative effects of urban development on transport demands on the network.
3. Provide safe and efficient public transport and active mode facilities from the outset of urban development to support a shift to more sustainable travel.
4. Sequence the provision of public transport (PT) systems/stations to coincide with and support:

a) A commitment to adjacent land use of significant scale within walking distance

b) The need to serve as a strategic PT hub to service a wider catchment with poor PT options

c) Support significant mode shift to PT from early in the development cycle

d) Noting a need to find a balance between criteria (4a and 4c).

In the Brownfield context, the timing of growth is particularly uncertain over much of the assessment area, as planning rules effectively allow development to occur in most of the assessment area at any time. The areas which are predominantly owned and will be developed by Kāinga Ora are more certain, however funding constraints and priority has potential for timing of these areas to change.

Notwithstanding the inherent uncertainty, the indicative timing for infrastructure projects is unlikely to be accurate at a project level however it provides a reasonable estimate of the spend across the assessment area over time.

3.6 Summary of project lists

As a result of the process outlined above, the project list for the AHP areas has been updated and reviewed considering changes to growth assumptions. The list of projects is summarised in **Appendix A**.

4 Development of Project Cost Allowances

Assumptions have been made to determine the cost allowances for each project in the project list. Projects have been assumed to fall into either a generic or non-generic cost category. The details on the development of the costs are outlined in this section. Refer to **Appendix A** for the summary of project costs.

4.1 Generic Projects

To establish a consistent approach that allows project costs to be directly compared, generic rates have been used where applicable to approximate the project cost in the AHP programme. Refer to the Brownfields generic rates and allowances report which sets out the basis for the brownfield generic rates, cost allowances, and renewals which has been developed and reviewed by experienced AT quantity surveyors. Brownfield generic rates has been applied for this assessment because the AHP programme contains projects that are based in an existing brownfield area.

4.2 Non-Generic Projects

Where generic rates were not appropriate, non-generic costs have been used. There were some projects which the generic rates were not applied because it was not appropriate or there was more detailed cost information available. **Table 4-1, Table 4-2, and Table 4-3** summarise these projects for Tamaki, Mt Roskill, and Māngere respectively.

The renewal allocation has been based on a generic rate where applicable which is identified below. Refer to the Brownfields generic rates and allowances report for details on renewal assumptions.

4.2.1 Tamaki

Table 4-1: Non-generic projects – Tamaki

Project number	Project name	Cost references	Renewal Assumptions
2	Glen Innes Rail Station Upgrade	AT estimate dated March 2024	0% - negligible amount of existing assets which can be considered as a renewal. Station infrastructure assumed to have maintenance life beyond the DC policy
23	Te Horeta Road Upgrade	WSP cost estimate. "Eastern Busway Te Horeta Road Extension – Short List Network Options – Option 3". Dated February 2019	"Midblock – medium/high" generic renewal

The Links to Glen Innes Cycleways projects have been excluded from the costing scope as they are under construction.

4.2.2 Mt Roskill

Table 4-2 Non-generic projects – Mt Roskill

Project number	Project name	Cost references	Renewal Assumptions
20	New North Road upgrade to arterials	From Connected Communities team from 2022. Detailed cost breakdown supplied by AT	"Midblock – medium/high" generic renewal rate
21	Mt Eden Road upgrade to arterials	From Connected Communities team from 2020. Detailed cost breakdown supplied by AT	"Midblock – medium/high" generic renewal rate
22	Hillsborough Road upgrade to arterials	From Connected Communities team from 2020. Detailed cost breakdown supplied by AT	"Midblock – medium/high" generic renewal rate
29	Owairaka Avenue collector road upgrade	From Connected Communities team from 2020. Detailed cost breakdown supplied by AT	"Midblock – medium/high" generic renewal rate
44b	Richardson Road – Stoddard to Maioro	From Connected Communities team from 2020. Detailed cost breakdown supplied by AT	"Midblock – medium/high" generic renewal rate
51	Maioro Street	From Connected Communities team from 2020. Detailed cost breakdown supplied by AT	"Midblock – medium/high" generic renewal rate
40	Sandringham Road	From Connected Communities team from 2020. Detailed cost breakdown supplied by AT	"Midblock – medium/high" generic renewal rate

4.2.3 Māngere

Table 4-3 Non-generic projects – Māngere

Project number	Project name	Cost references	Renewal Assumptions
23	Middlemore rail station upgrade	Supplied by AT in May 2024	No renewals
24	Middlemore rail crossing	Supplied by AT in May 2024	No renewals
39	Middlemore bus interchange	Supplied by AT in May 2024	No renewals
55	Robertson Road / Wakefield Road / Harania Avenue	Based on Māngere Cycling SSBC – Tranche 1	"Midblock – medium" generic renewal rate
56	Harania Stream cycle routes (Cycling SSBC Tranche 1)	Based on Māngere Cycling SSBC – Tranche 1	"Midblock – medium" generic renewal
57	Vine Street (Cycling SSBC Tranche 2)	Based on Māngere Cycling SSBC – Tranche 2	"Midblock – medium" generic renewal
58	Favona Road	Based on Māngere Cycling SSBC – Tranche 2	"Midblock – medium" generic renewal
59	Gray Avenue	Based on Māngere Cycling SSBC – Tranche 2	"Midblock – medium" generic renewal
60	James Fletcher Drive	Based on Māngere Cycling SSBC – Tranche 2	"Midblock – medium" generic renewal
61	Kahu Street	Based on Māngere Cycling SSBC – Tranche 2	"Midblock – medium" generic renewal
62	Garus Ave to Otago Place	Based on Māngere Cycling SSBC – Tranche 2	"Midblock – medium" generic renewal
63	Kahu Street to Otahuhu station Bridge	Based on Māngere Cycling SSBC – Tranche 2	"Intersection – low" generic renewal
64	James Fletcher - Savill Dr/Favona Int	Based on Māngere Cycling SSBC – Tranche 2	"Intersection – low" generic renewal

Project number	Project name	Cost references	Renewal Assumptions
65	James Fletcher/Kahu intersection	Based on Māngere Cycling SSBC – Tranche 2	"Intersection – low" generic renewal
66	Gray Ave/Massey/Vine Intersection	Based on Māngere Cycling SSBC – Tranche 2	"Intersection – low" generic renewal

4.3 Property Acquisition

The projects which are expected to require land take, and the basis for permanent and temporary property acquisitions are noted in **Table**, **Table 4-5**, and **Table 4-6** for Tamaki, Mt Roskill, and Māngere respectively. The costs are indicative and were provided by AT based on available information relating to the scope of the projects. Land costs are inclusive of contingency. See Council's Methodology for Calculating DCs for further information on the approach and assumptions used to assess indicative land costs.

4.3.1 Tamaki

Table 4-4: Property Acquisition – Tamaki

Project number	Project name	Scope/Basis of assumptions	Permanent Acquisition	Temporary Acquisition
2	Glen Innes Rail Station Upgrade	Widening of the existing pedestrian underpass to 5.0m where it passes under the railway line	[redacted]	[redacted]
23	Te Horeta Road Upgrade	Based on WSP drawing 1-C1801.00 – Sheet C104 Rev A3	[redacted]st:	[redacted]

4.3.2 Mt Roskill

Table 4-5 Property Acquisition – Mt Roskill

Project number	Project name	Scope/Basis of assumptions	Permanent Acquisition	Temporary Acquisition
12	Herd Road/Hillsborough Road	East-West bus priority lanes on Herd Road and Carr Road. Assumed 8.65m required from existing kerb (3.5m lane and 5.15m for footpath and berm). 50m approach and 10m departure taper for bus lane.	[redacted]	[redacted]

4.3.3 Māngere

Table 4-6 Property Acquisition – Māngere

Project number	Project name	Scope/Basis of assumptions	Permanent Acquisition	Temporary Acquisition
23	Middlemore rail station upgrade	Based on Rail PBC Station Improvement Option– upgrade to type 3 or 4 station.	[redacted]	[redacted]
24	Middlemore rail crossing	The new road alignment commences from Gray Avenue and climbs at approximately 5% to achieve a 5.0m clearance over the rail corridor. The alignment runs above Hospital Road and ties into the existing road level at the roundabout near the entrance to the car park. A fourth leg will be introduced to the roundabout to provide a connection back into Hospital Road	[redacted]	[redacted]

Project number	Project name	Scope/Basis of assumptions	Permanent Acquisition	Temporary Acquisition
39	Middlemore bus interchange	New bus interchange adjacent to the Middlemore rail station. Reconfiguration of Orakau Road including line marking and parking but no kerb changes. New roundabout at northern end of road	[redacted]	[redacted]

4.4 Footpath Upgrades

In addition to the individual projects, the cost to upgrade existing sub-standard footpaths has been considered and included in the cost. AT footpath data was analysed to determine the lengths of footpaths required to be upgraded to meet Transport Design Manual (TDM) standard of 1.8m wide within the project area. The following assumptions were made:

- Footpaths which were 1.5m or wider were excluded on the assumption they were not a priority to be upgraded. Footpaths less than 1.5m were assumed to be upgraded using the generic footpath rate noted below.
- To avoid double counting with project upgrades, only 'local roads' were considered. Arterials and access road were excluded.
- The footpath upgrade rate of $470/m was used (provided by AT in May 2024), which covers the physical works component to remove an existing 1.5m footpath and build a new 1.8m concrete footpath within the berm, without changing kerb lines. The cost excluding allowances or contingency which are outlined in the brownfields generic rates and allowances report. A renewal component of 4% has been assumed.

5 Development Contributions Assessment Methodology

This section outlines the key considerations and high-level methodology for the DC assessment methodology. It should be noted that **Appendix B** contains a full explanation of the DC assessment methodology and specific examples for use.

5.1 Key Assessment Steps

The overall methodology applied, as guided by AT and Council, is comprised of the key steps described in Error! Reference source not found..

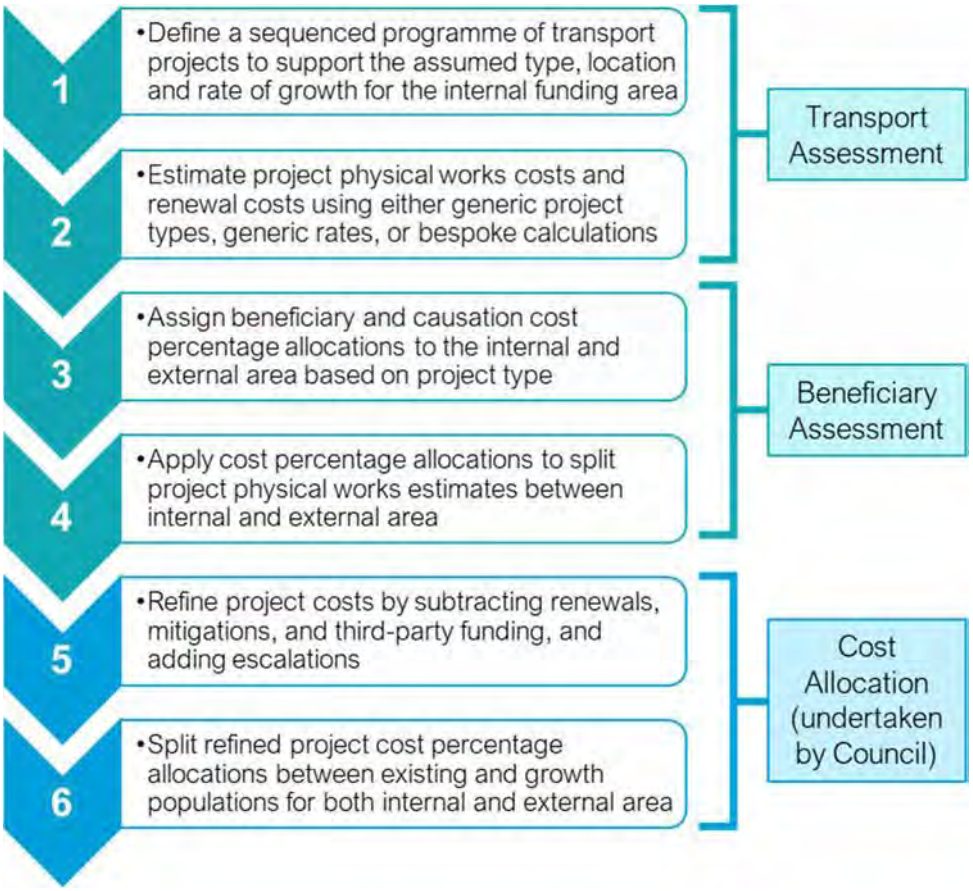


Figure 5-1. Development Contributions methodology – key steps

Appendix A contains the programme of transport projects, along with project details and cost allocations for the steps indicated in Error! Reference source not found..

Appendix B outlines the generic Beneficiary Assessment methodology used in the assessment.

5.2 Beneficiary Assessment Spatial Allocations

The spatial allocation of causation and beneficiaries are a key part of the Beneficiary Assessment and are specific for each AHP area. Costs are allocated spatially on an assessment of the areas, communities, and movements that would either cause the need for the project or benefit from the consequential improvements to accessibility, safety, travel choice, or network resilience. For this assessment, costs are split between internal (population within AHP) and external (population outside AHP).

The benefits of the improvements are assumed to accrue broadly in proportion to the usage of the improved network. Beneficiary shares are estimated using modelled trips from regional transport models on the network to, from, and wholly within the AHP area, and those passing through the AHP area. Through movements not using local infrastructure subject to the DC policy are excluded. For example, through travel using the local network is included, but through travel using strategic State Highways is excluded.

Causation shares are developed on a similar basis, but instead consider whether the projects are likely to provide capacity or outcomes directly needed to support the planned urban development. As such, the causation spatial allocation is typically weighted further towards the AHP area than the beneficiary allocation.

The project type and purpose are used to differentiate default causation and beneficiary shares between the internal (within AHP) and external (outside AHP) areas. The purpose categories are defined as follows:

- **Mostly external:** Projects primarily in response to external growth pressures outside the AHP area and/or required to address wider network purposes.
- **Mostly Internal:** Projects primarily in response to growth pressures internal to the AHP area.
- **Mix:** Projects with a mix of both internal and external purposes.

The default internal and external shares adopted for causation assessments by project type and purpose for Tamaki, Mt Roskill, and Māngere are shown in **Table 5-1**,

Causation – Tamaki

Project Type	Purpose – Mostly External		Purpose – Mix		Purpose – Mostly Internal	
	Internal	External	Internal	External	Internal	External
Intersection – Low	60%	40%	75%	25%	100%	0%
Intersection – Medium roundabout	60%	40%	75%	25%	100%	0%
Intersection – Medium signalised	60%	40%	75%	25%	100%	0%
Intersection – Med/High roundabout	60%	40%	75%	25%	100%	0%
Intersection – Med/High signalised	60%	40%	75%	25%	100%	0%
Intersection – High roundabout	60%	40%	75%	25%	100%	0%
Intersection – High signalised	60%	40%	75%	25%	100%	0%
Midblock – Low	60%	40%	75%	25%	100%	0%
Midblock – Medium	60%	40%	75%	25%	100%	0%
Midblock – Med/High	60%	40%	75%	25%	100%	0%
Speed table	N/A	N/A	N/A	N/A	100%	0%
Speed threshold and signage	N/A	N/A	N/A	N/A	100%	0%
Chicane	N/A	N/A	N/A	N/A	100%	0%
Footpath/Cycle path retrofit	80%	20%	90%	10%	100%	0%
Zebra crossing (at-grade)	80%	20%	90%	10%	100%	0%

Causation – Tamaki						
Station	N/A	N/A	80%	20%	100%	0%
Footpath upgrade	N/A	N/A	N/A	N/A	100%	0%

Table 5-2

, and

Table 5-3 respectively. The default internal and external shares adopted for beneficiary assessments by project type and purpose for Tamaki, Mt Roskill, and Māngere are shown in **Table 5-4**, **Table 5-5**, and **Table 5-6** respectively. These shares vary between AHP areas due to differences in modelled trips.

Table 5-1: Default allocations for causation analysis – Tamaki

Causation – Tamaki						
Project Type	Purpose – Mostly External		Purpose – Mix		Purpose – Mostly Internal	
	Internal	External	Internal	External	Internal	External
Intersection – Low	60%	40%	75%	25%	100%	0%
Intersection – Medium roundabout	60%	40%	75%	25%	100%	0%
Intersection – Medium signalised	60%	40%	75%	25%	100%	0%
Intersection – Med/High roundabout	60%	40%	75%	25%	100%	0%
Intersection – Med/High signalised	60%	40%	75%	25%	100%	0%
Intersection – High roundabout	60%	40%	75%	25%	100%	0%
Intersection – High signalised	60%	40%	75%	25%	100%	0%
Midblock – Low	60%	40%	75%	25%	100%	0%
Midblock – Medium	60%	40%	75%	25%	100%	0%
Midblock – Med/High	60%	40%	75%	25%	100%	0%
Speed table	N/A	N/A	N/A	N/A	100%	0%
Speed threshold and signage	N/A	N/A	N/A	N/A	100%	0%
Chicane	N/A	N/A	N/A	N/A	100%	0%
Footpath/Cycle path retrofit	80%	20%	90%	10%	100%	0%
Zebra crossing (at-grade)	80%	20%	90%	10%	100%	0%
Station	N/A	N/A	80%	20%	100%	0%
Footpath upgrade	N/A	N/A	N/A	N/A	100%	0%

Table 5-2: Default allocations for causation analysis – Mt Roskill

Causation – Mt Roskill						
Project Type	Project Type		Project Type		Project Type	
	Internal	External	Internal	External	Internal	External
Intersection – Low	60%	40%	80%	20%	100%	0%
Intersection – Medium roundabout	60%	40%	80%	20%	100%	0%
Intersection – Medium signalised	60%	40%	80%	20%	100%	0%
Intersection – Med/High roundabout	60%	40%	80%	20%	100%	0%
Intersection – Med/High signalised	60%	40%	80%	20%	100%	0%
Intersection – High roundabout	60%	40%	80%	20%	100%	0%
Intersection – High signalised	60%	40%	80%	20%	100%	0%
Midblock – Low	60%	40%	80%	20%	100%	0%
Midblock – Medium	60%	40%	80%	20%	100%	0%
Midblock – Med/High	60%	40%	80%	20%	100%	0%
Speed table	N/A	N/A	N/A	N/A	100%	0%
Speed threshold and signage	N/A	N/A	N/A	N/A	100%	0%
Chicane	N/A	N/A	N/A	N/A	100%	0%
Footpath/Cycle path retrofit	80%	20%	90%	10%	100%	0%
Zebra crossing (at-grade)	80%	20%	90%	10%	100%	0%
Station	N/A	N/A	80%	20%	100%	0%
Footpath upgrade	N/A	N/A	N/A	N/A	100%	0%

Table 5-3: Default allocations for causation analysis – Māngere

Causation – Māngere						
Project Type	Purpose – Mostly External		Purpose – Mix		Purpose – Mostly Internal	
	Internal	External	Internal	External	Internal	External
Intersection – Low	60%	40%	75%	25%	100%	0%
Intersection – Medium roundabout	60%	40%	75%	25%	100%	0%
Intersection – Medium signalised	60%	40%	75%	25%	100%	0%
Intersection – Med/High roundabout	60%	40%	75%	25%	100%	0%

Causation – Māngere						
Intersection – Med/High signalised	60%	40%	75%	25%	100%	0%
Intersection – High roundabout	60%	40%	75%	25%	100%	0%
Intersection – High signalised	60%	40%	75%	25%	100%	0%
Midblock – Low	60%	40%	75%	25%	100%	0%
Midblock – Medium	60%	40%	75%	25%	100%	0%
Midblock – Med/High	60%	40%	75%	25%	100%	0%
Speed table	N/A	N/A	N/A	N/A	100%	0%
Speed threshold and signage	N/A	N/A	N/A	N/A	100%	0%
Chicane	N/A	N/A	N/A	N/A	100%	0%
Footpath/Cycle path retrofit	80%	20%	90%	10%	100%	0%
Zebra crossing (at-grade)	80%	20%	90%	10%	100%	0%
Station	N/A	N/A	80%	20%	100%	0%
Footpath upgrade	N/A	N/A	N/A	N/A	100%	0%

Table 5-4: Default allocations for beneficiary analysis – Tamaki

Beneficiary – Tamaki						
Project Type	Purpose – Mostly External		Purpose – Mix		Purpose – Mostly Internal	
	Internal	External	Internal	External	Internal	External
Intersection – Low	55%	45%	70%	30%	85%	15%
Intersection – Medium roundabout	40%	60%	60%	40%	85%	15%
Intersection – Medium signalised	40%	60%	60%	40%	85%	15%
Intersection – Med/High roundabout	40%	60%	60%	40%	85%	15%
Intersection – Med/High signalised	40%	60%	60%	40%	85%	15%
Intersection – High roundabout	30%	70%	50%	50%	75%	25%
Intersection – High signalised	30%	70%	50%	50%	75%	25%
Midblock – Low	55%	45%	70%	30%	85%	15%
Midblock – Medium	40%	60%	60%	40%	75%	25%
Midblock – Med/High	40%	60%	55%	45%	75%	25%
Speed table	N/A	N/A	N/A	10%	100%	0%

Beneficiary – Tamaki						
Speed threshold and signage	N/A	N/A	N/A	10%	100%	0%
Chicane	N/A	N/A	N/A	10%	100%	0%
Footpath/Cycle path retrofit	50%	50%	75%	25%	95%	5%
Zebra crossing (at-grade)	50%	50%	75%	25%	95%	5%
Station	N/A	N/A	80%	20%	100%	0%
Footpath upgrade	N/A	N/A	N/A	N/A	100%	0%

Table 5-5: Default allocations for beneficiary analysis – Mt Roskill

Beneficiary – Mt Roskill						
Project Type	Purpose – Mostly External		Purpose – Mix		Purpose – Mostly Internal	
	Internal	External	Internal	External	Internal	External
Intersection – Low	70%	30%	80%	20%	90%	10%
Intersection – Medium roundabout	50%	50%	70%	30%	90%	10%
Intersection – Medium signalised	50%	50%	70%	30%	90%	10%
Intersection – Med/High roundabout	50%	50%	70%	30%	90%	10%
Intersection – Med/High signalised	50%	50%	70%	30%	90%	10%
Intersection – High roundabout	40%	60%	60%	40%	80%	20%
Intersection – High signalised	40%	60%	60%	40%	80%	20%
Midblock – Low	60%	40%	80%	20%	90%	10%
Midblock – Medium	50%	50%	70%	30%	80%	20%
Midblock – Med/High	40%	60%	65%	35%	80%	20%
Speed table	N/A	N/A	90%	10%	100%	0%
Speed threshold and signage	N/A	N/A	90%	10%	100%	0%
Chicane	N/A	N/A	90%	10%	100%	0%
Footpath/Cycle path retrofit	50%	50%	75%	25%	95%	5%
Zebra crossing (at-grade)	50%	50%	75%	25%	95%	5%
Station	N/A	N/A	80%	20%	100%	0%
Footpath upgrade	N/A	N/A	N/A	N/A	100%	0%

Table 5-6: Default allocations for beneficiary analysis – Māngere

Project Type	Beneficiary – Māngere					
	Purpose – Mostly External		Purpose – Mix		Purpose – Mostly Internal	
	Internal	External	Internal	External	Internal	External
Intersection – Low	55%	45%	70%	30%	85%	15%
Intersection – Medium roundabout	40%	60%	60%	40%	85%	15%
Intersection – Medium signalised	40%	60%	60%	40%	85%	15%
Intersection – Med/High roundabout	40%	60%	60%	40%	85%	15%
Intersection – Med/High signalised	40%	60%	60%	40%	85%	15%
Intersection – High roundabout	30%	70%	50%	50%	75%	25%
Intersection – High signalised	30%	70%	50%	50%	75%	25%
Midblock – Low	55%	45%	70%	30%	85%	15%
Midblock – Medium	40%	60%	60%	40%	75%	25%
Midblock – Med/High	40%	60%	55%	45%	75%	25%
Speed table	N/A	N/A	N/A	10%	100%	0%
Speed threshold and signage	N/A	N/A	N/A	10%	100%	0%
Chicane	N/A	N/A	N/A	10%	100%	0%
Footpath/Cycle path retrofit	50%	50%	75%	25%	95%	5%
Zebra crossing (at-grade)	50%	50%	75%	25%	95%	5%
Station	N/A	N/A	80%	20%	100%	0%
Footpath upgrade	N/A	N/A	N/A	N/A	100%	0%

This process allocates project PW costs between internal and external areas only. The causation and beneficiary shares are split between existing and growth populations by Council after this assessment using change in Household Unit Equivalents (HUE) calculated from the AGS forecast (see **Section 2.4**) between a given baseline and future year. The split between existing and growth populations can be approximated using estimated HUE.[4]

[4] Estimated HUE = Households + ε × Employment, where $0 \leq \varepsilon \leq 1$

6 Development Contributions Assessment Results

This assessment details the allocation of base physical works (PW) costs for the AHP between internal and external populations only (see Error! Reference source not found.). Further DC analysis, including escalation, mitigation adjustments, and further splitting of external causation and beneficiary shares, is conducted by Council.

PW cost estimates for each project are documented in **Appendix A**, with this section only providing the aggregate totals. The PW cost estimates used in this DC assessment exclude property costs, escalations and proportions of project costs estimated for renewals. Results for each AHP area are presented separately in the remainder of this section.

The following sensitivity tests were undertaken:

- **100% Causation:** Use 100% causation allocation, rather than 50% causation:50% beneficiary
- **100% Beneficiary:** Use 100% beneficiary allocation, rather than 50% causation:50% beneficiary
- **Internal Allocation +:** Shift a maximum of 10% from external allocations to internal allocations[5]
- **Internal Allocation-:** Shift a maximum of 10% from internal allocations to external allocations
- **Modified AGS**
- **Extended AGS**

[5] The amount shifted between allocations is not necessarily 10% and is dependent on the floor and ceiling of the baseline allocations (e.g., A baseline allocation of 95% internal, 5% external will become 100% internal, 0% external under the Internal Allocation + sensitivity test, which is a shift of only 5%).

6.1 Tamaki

The overall allocation of PW cost for the projects in **Appendix A** for the Tamaki AHP area under the AGS FBO scenario is shown in **Figure 6-1**.

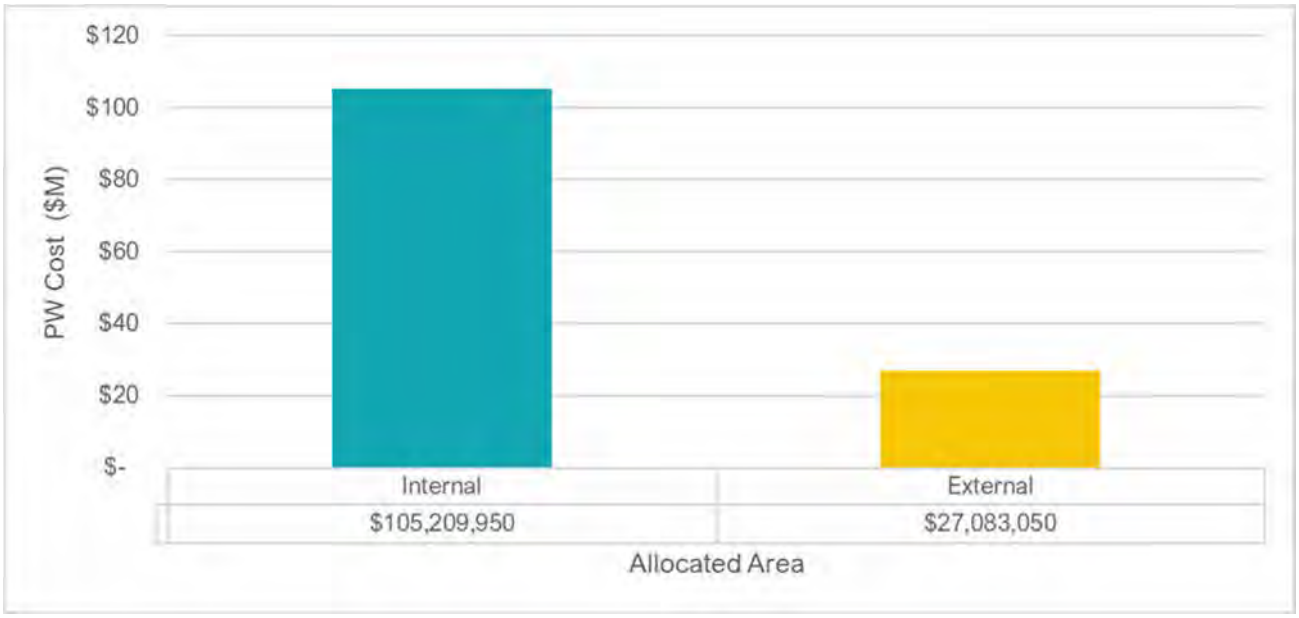


Figure 6-1: Total physical works cost estimates for the Tamaki AHP area under the AGS FBO scenario

An indication of the profile of PW cost over the programme life for the Tamaki AHP area under each scenario is shown in **Figure 6-2** . These costs are allocated to the estimated first operational year of the project, and as such does not reflect the likely cash-flow of projects that take longer than one year to implement.

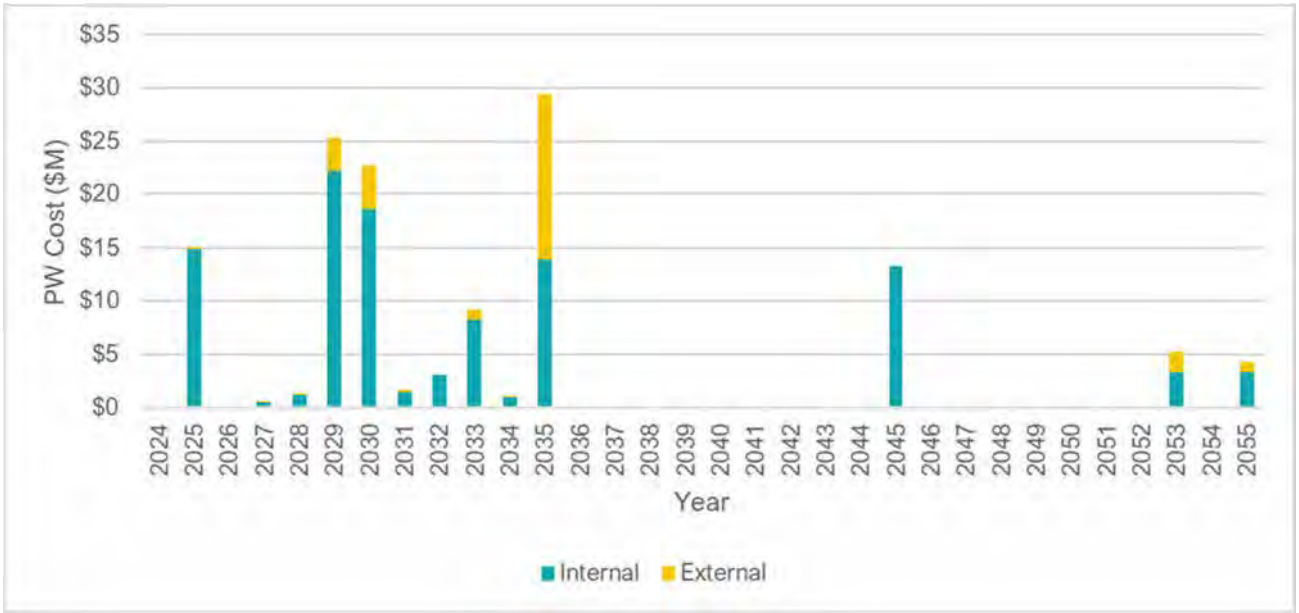


Figure 6-2: Indicative physical works cost estimates for the Tamaki AHP area under the AGS FBO scenario

The total PW cost by internal and external area for each sensitivity test for the Tamaki AHP area is shown in **Figure 6-3**Figure 6-3, with variances from the baseline assessment in terms of absolute cost shown in **Figure 6-4**Figure 6-4**.**

	Internal	External
Baseline Total	$105,209,950	$27,083,050
100% Causation	$113,328,000	$18,965,000
100% Beneficiary	$97,091,900	$35,201,100
Internal Allocation +	$112,414,550	$19,878,450
Internal Allocation -	$91,980,650	$40,312,350

Figure 6-3: Sensitivity test results for the Tamaki AHP area

	Internal	External
100% Causation	$8,118,050	-$8,118,050
100% Beneficiary	-$8,118,050	$8,118,050
Internal Allocation +	$7,204,600	-$7,204,600
Internal Allocation -	-$13,229,300	$13,229,300

Figure 6-4: Sensitivity test cost variance from baseline for the Tamaki AHP area

6.2 Mt Roskill

The overall allocation of PW cost for the projects in **Appendix A** for the Mt Roskill AHP area under the AGS FBO scenario is shown in **Figure 6-5**Figure 6-5.

Figure 6-5: Total physical works cost estimates for the Mt Roskill AHP area under the AGS FBO scenario

An indication of the profile of PW cost over the programme life for the Mt Roskill AHP area under the AGS FBO scenario is shown in **Figure 6-6**. These costs are allocated to the estimated first operational year of the project, and as such does not reflect the likely cash-flow of projects that take longer than one year to implement.

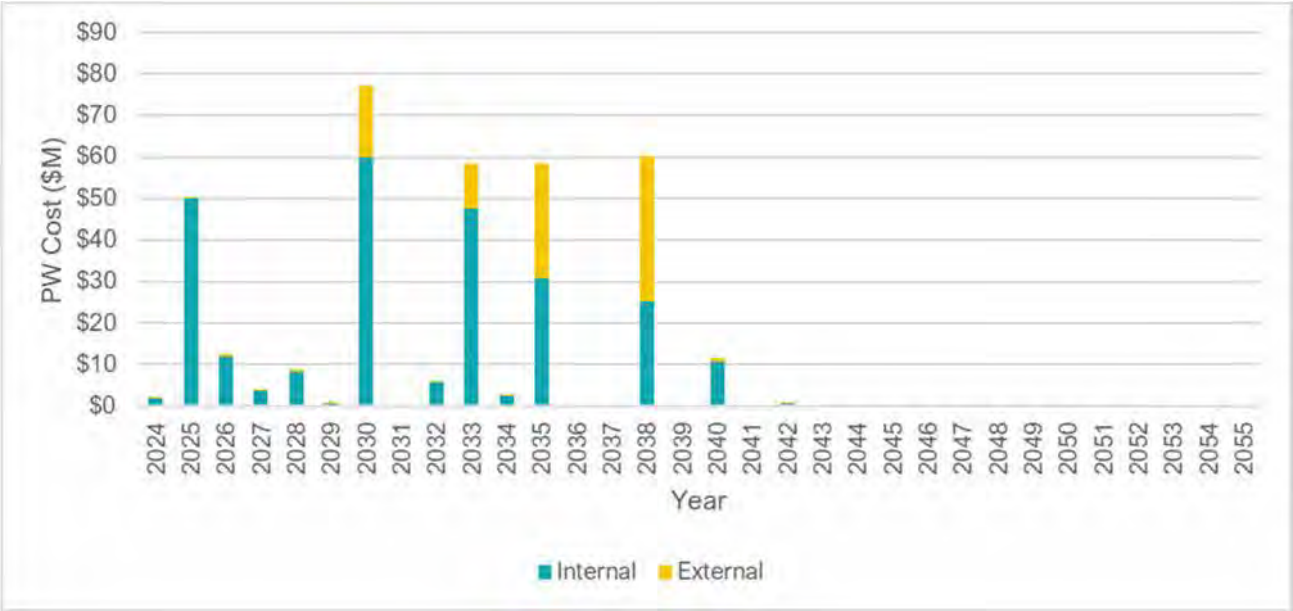
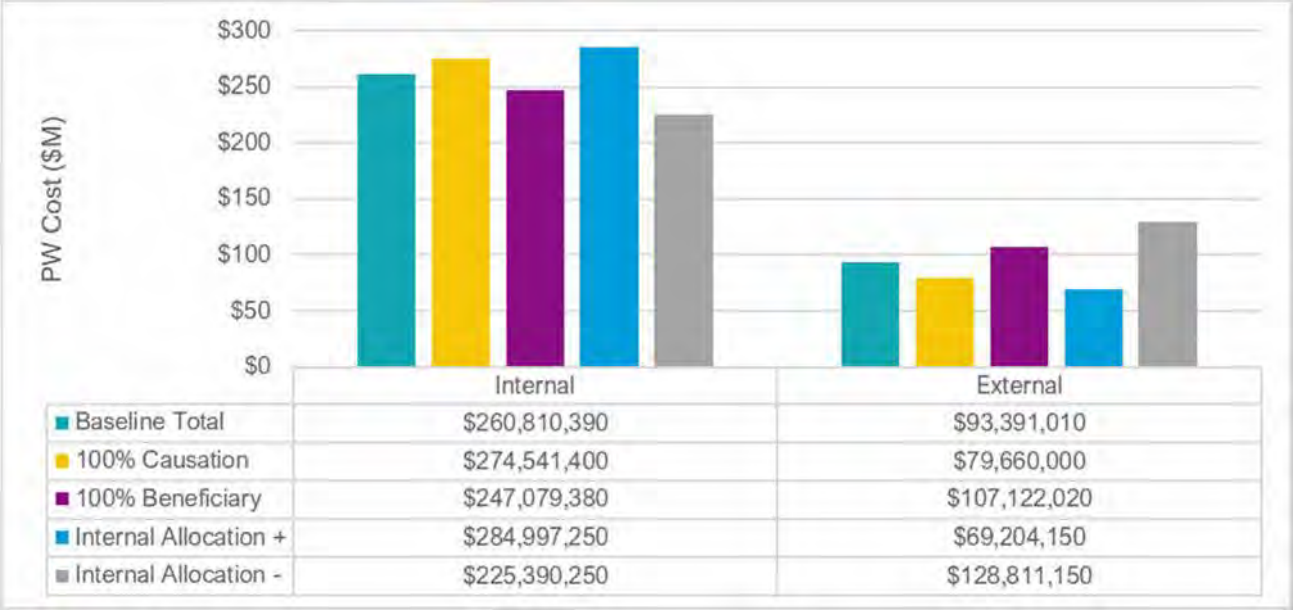


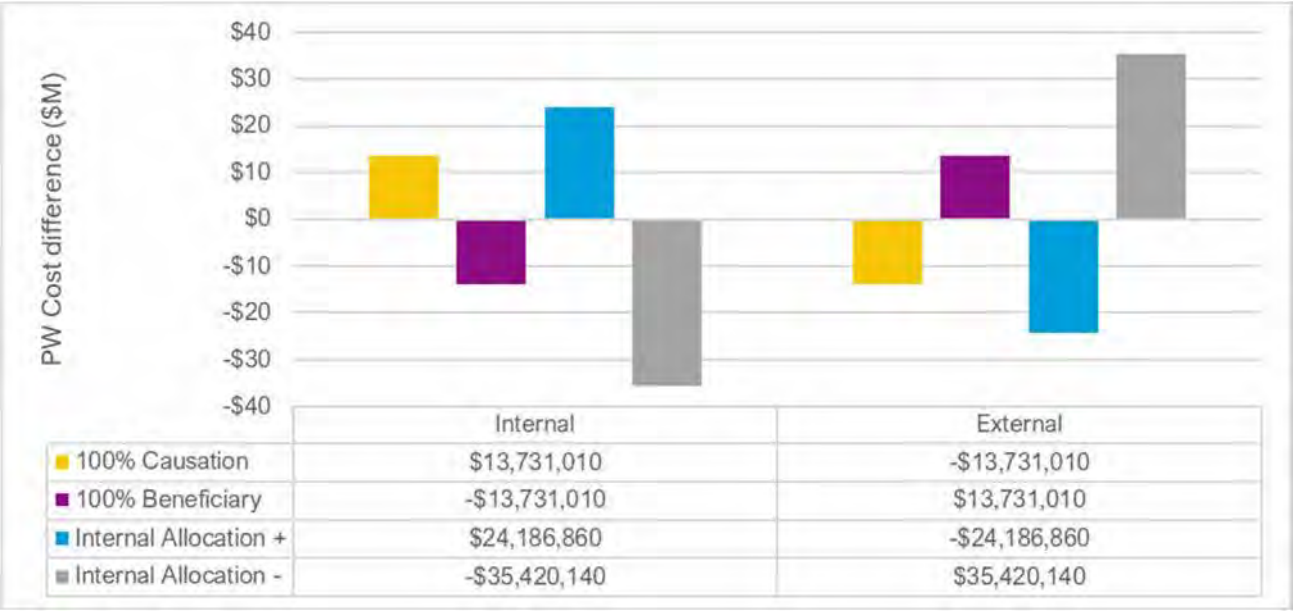
Figure 6-6: Indicative physical works cost estimates for the Mt Roskill AHP area under the AGS FBO scenario

The total PW cost by internal and external area for each test for the Mt Roskill AHP area is shown in **Figure 6-7**Figure 6-7, with variances from the baseline assessment in terms of absolute cost shown in **Figure 6-8**Figure 6-8.



	Internal	External
Baseline Total	$260,810,390	$93,391,010
100% Causation	$274,541,400	$79,660,000
100% Beneficiary	$247,079,380	$107,122,020
Internal Allocation +	$284,997,250	$69,204,150
Internal Allocation -	$225,390,250	$128,811,150

Figure 6-7: Sensitivity test results for the Mt Roskill AHP area



	Internal	External
100% Causation	$13,731,010	-$13,731,010
100% Beneficiary	-$13,731,010	$13,731,010
Internal Allocation +	$24,186,860	-$24,186,860
Internal Allocation -	-$35,420,140	$35,420,140

Figure 6-8: Sensitivity test cost variance from baseline for the Mt Roskill AHP area

6.3 Māngere

The overall allocation of PW cost for the projects in **Appendix A** for the Māngere AHP area under the AGS FBO scenario is shown in **Figure 6-9**Figure 6-9.

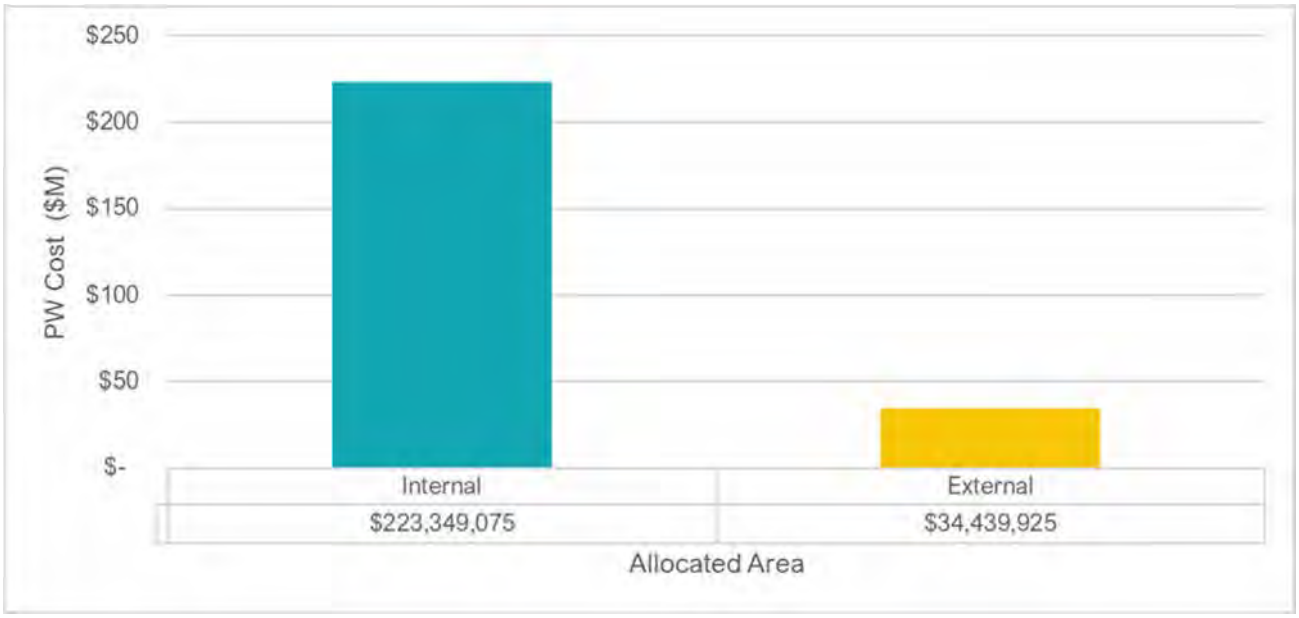


Figure 6-9: Total physical works cost estimates for the Māngere AHP area under the AGS FBO scenario

An indication of the profile of PW cost over the programme life for the Māngere AHP area under the AGS FBO scenario is shown in **Figure 6-10**Figure 6-10. These costs are allocated to the estimated first operational year of the project, and as such does not reflect the likely cash-flow of projects that take longer than one year to implement.

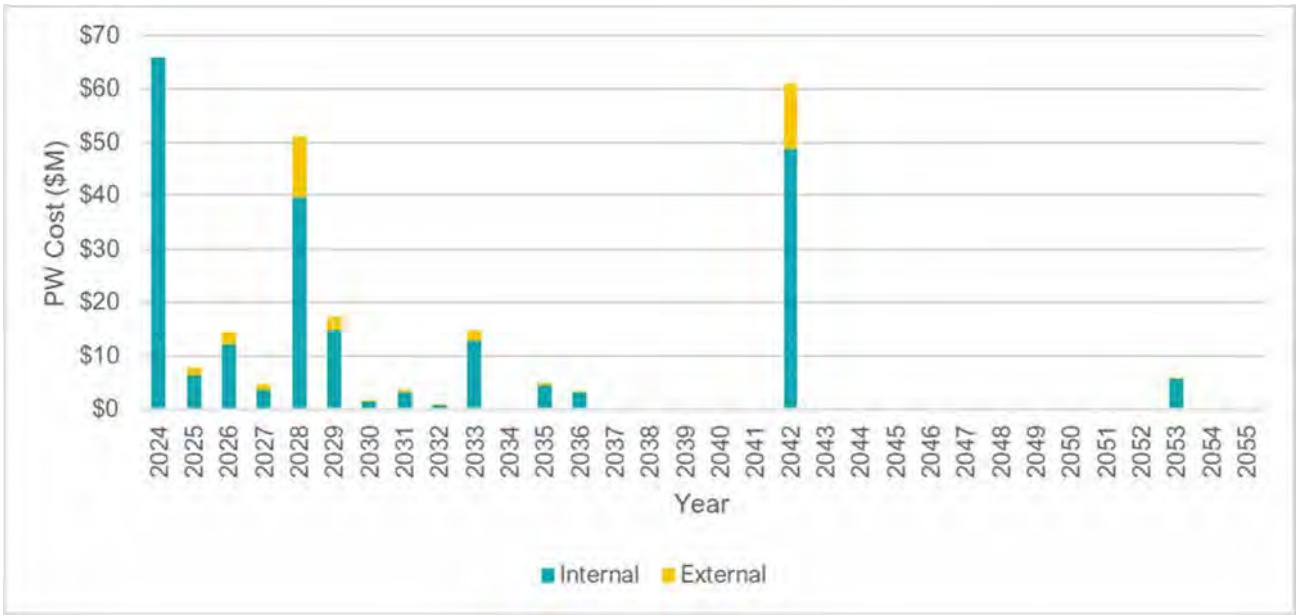
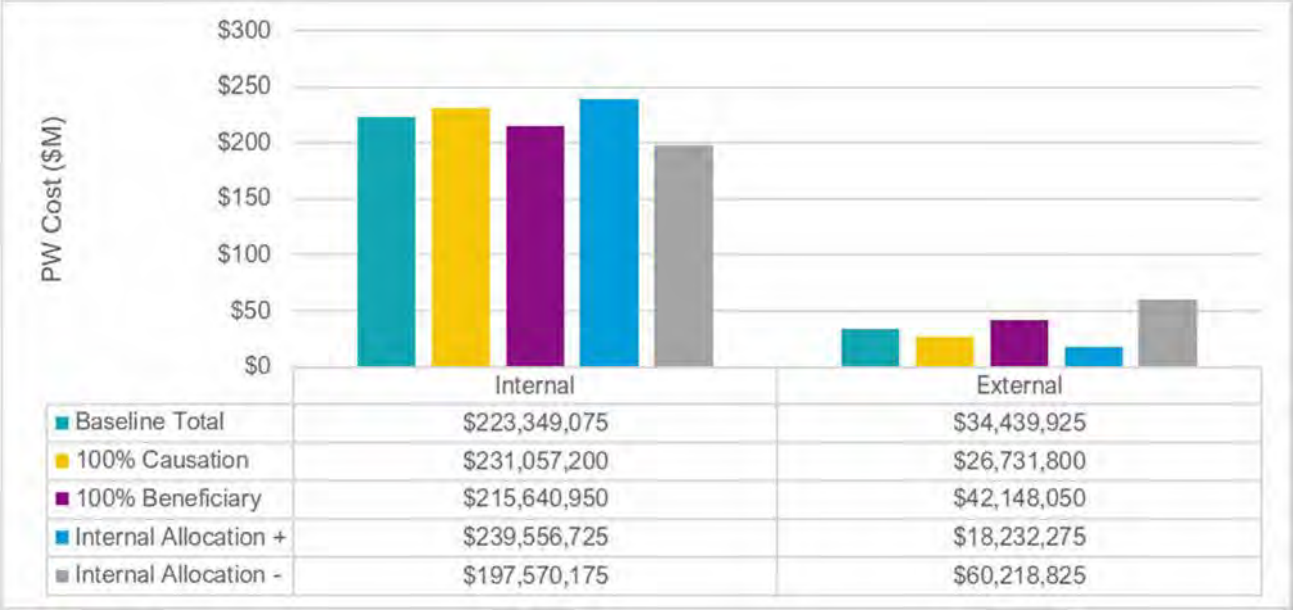


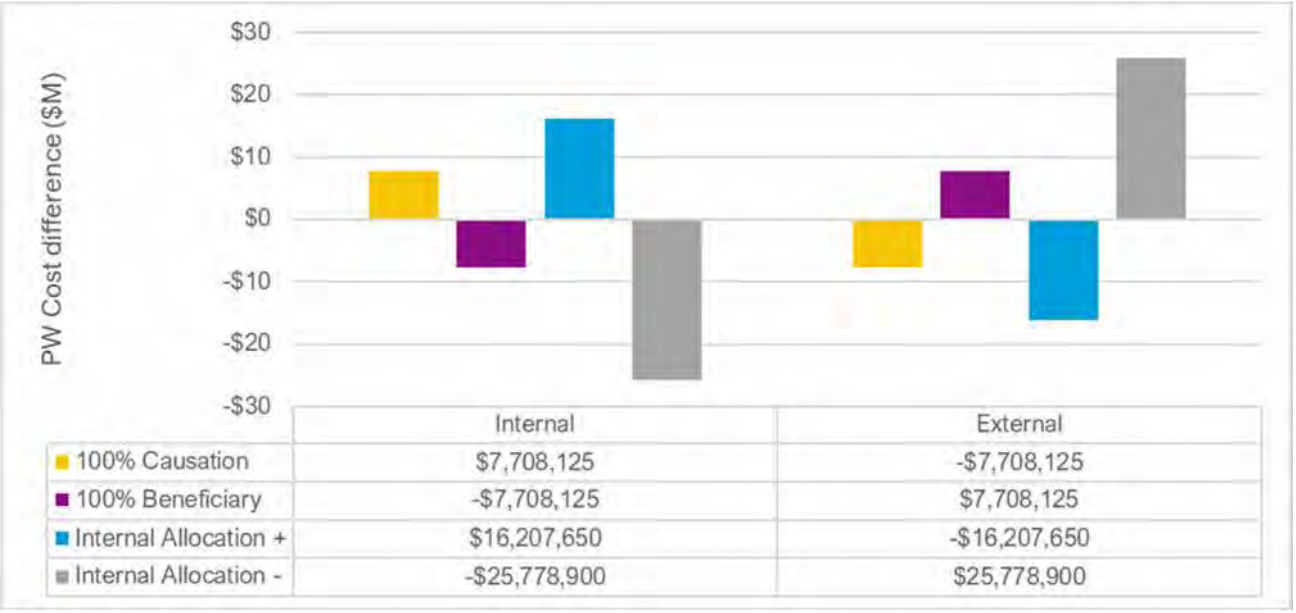
Figure 6-10: Indicative physical works cost estimates for the Māngere AHP area under the AGS FBO scenario

The total PW cost by internal and external area for each test for the Māngere AHP area is shown in **Figure 6-11**Figure 6-11, with variances from the baseline assessment in terms of absolute cost shown in **Figure 6-12**Figure 6-12.



	Internal	External
Baseline Total	$223,349,075	$34,439,925
100% Causation	$231,057,200	$26,731,800
100% Beneficiary	$215,640,950	$42,148,050
Internal Allocation +	$239,556,725	$18,232,275
Internal Allocation -	$197,570,175	$60,218,825

Figure 6-11: Sensitivity test results for the Māngere AHP area



	Internal	External
100% Causation	$7,708,125	-$7,708,125
100% Beneficiary	-$7,708,125	$7,708,125
Internal Allocation +	$16,207,650	-$16,207,650
Internal Allocation -	-$25,778,900	$25,778,900

Figure 6-12: Sensitivity test cost variance from baseline for the Māngere AHP area

7 Summary

This report documented the transport assessment for Council's proposed DC policy for the Tamaki, Mt Roskill, and Māngere AHP areas. This assessment draws heavily on the work undertaken as part of the BPBC prepared by AT in 2021. The project team's role was to prepare a transportation assessment as specified by Council and providing technical inputs to inform the policy decisions which were made by Council. Beyond these inputs, the project team has not provided advice to Council directly regarding development of their DC policy itself.

The transport planning and engineering information used to prepare this assessment is therefore developed at a 'strategic' level, and not from detailed site investigations, design, or modelling analysis. More detailed analysis would be undertaken for implementation of a project. Given the significant scale and long-term development of this programme, it is not considered feasible to develop detailed designs and capital cost estimates for this extensive programme. This approach is considered suitable for this assessment, when coupled with Council's proposal to include regular updates to the DC policy inputs as new information becomes available.

This report documents the methodology adapted from AT applications elsewhere. There are significant uncertainties around how the AHP area will grow and how infrastructure will be provided over the next 30 years, which the methodology has recognised. This uncertainty is addressed through the methods used in this assessment and Council's policy framework that includes regular review of the inputs.

The assessment identified PW costs for in-scope projects in each AHP area. The allocation of PW costs to internal and external areas was based on causation and beneficiary assessments. The total PW costs and allocation shares under the AGS FBO scenario are shown in **Table 7-1**.

Table 7-1: Total physical works and allocation shares for each AHP area

Area	Total Physical Works	Allocation	
		Internal	External
Tamaki	$132.3M	$105.2M	$27.1
Mt Roskill	$354.2M	$260.8M	$93.4M
Māngere	$257.8M	$223.4M	$34.4M

A

Appendix A – Project List

TAMAKI PROJECT LIST

Project number	Project name	Project Description	Operational Date	Include in DC model	Reasoning for inclusion/exclusion	Project Type
1a	Tripoli Road to Apirana Avenue upgrade to collector road	Collector road upgrade with active mode facilities	2030	Include		Midblock – Medium
2	Glen Innes Rail Station Upgrade	Upgrade to rail facilities	2045	Include		Station
3	Taniwha St / Elstree Ave intersection upgrade	Signalised intersection with no land take		Exclude	No longer required following further ITA assessment	
4	Taniwha Street bus priority on approaches to Elstree Avenue roundabout	Taniwha Street localised bus priority east of Elstree Avenue roundabout	2029	Include		Midblock – Low
5	Taniwha Street (west) collector road upgrade	Taniwha Street localised bus priority west of Elstree Avenue roundabout	2029	Include	Bus lanes proposed on approach instead of full midblock upgrade	Midblock – Low
6	Elstree Ave / Pt England Rd intersection interim upgrade	Intersection upgrade - roundabout	2028	Include		Intersection upgrade – Medium roundabout
7	Pilkington Rd / Tripoli Rd intersection upgrade	Intersection upgrade	2033	Include		Intersection upgrade – Low
8	Hobson Dr / Tripoli Rd intersection upgrade	Intersection upgrade	2030	Include		Intersection upgrade – Medium roundabout
9	Merton Road / Morrin Road intersection upgrade	Assume signalisation	2030	Include		Intersection upgrade – Medium/High roundabout
11	Tripoli Road / Erima Avenue intersection upgrade	Intersection upgrade	2030	Include		Intersection upgrade – Medium roundabout
12	Line Road / Apirana Ave intersection upgrade including Rail Overbridge	Assume signalisation in conjunction with item 10. No property	2031	Include		Intersection upgrade – High roundabout
13	West Tamaki Road / Line Road intersection upgrade	Intersection upgrade	2030	Include		Intersection upgrade – Medium roundabout
14	West Tamaki Road / Elstree Avenue intersection upgrade	Intersection upgrade	2033	Include		Intersection upgrade – Medium roundabout
15b	Line Road collector road upgrade	More substantial upgrade to cater for increased traffic		Exclude	Captured by project 38. Not feasible to provide anything further in availiable road space.	
16	Eastview Rd / Line Rd intersection upgrade	Convert current priority to future roundabout	2030	Include		Intersection upgrade – Medium roundabout
17	Eastview Rd / Apirana Ave intersection upgrade	Intersection upgrade	2025	Include		Intersection upgrade – Low

TAMAKI PROJECT LIST

Project number	Project name	Project Description	Operational Date	Include in DC model	Reasoning for inclusion/exclusion	Project Type
18	St Heliers Bay Road / Apirana Ave intersection interim upgrade	Intersection upgrade for active modes	2031	Include		Intersection upgrade – Low
19	St Heliers Bay Road / Kohimarama Road intersection upgrade	Intersection upgrade		Exclude	Review of intersection by AT confirmed no project required.	Intersection upgrade – Low
20	Line Road / Taniwha St intersection upgrade	Assume signals with some land take		Exclude	Links to GI have addressed W+C Covered under the bus priority on Taniwha item - Line 60. Roundabout to remain	
21	Queens Rd / Church Cres intersection upgrade	Intersection upgrade	2029	Include		Intersection upgrade – High roundabout
22	Apirana Ave / Taniwha St intersection upgrade	Assume signals with some land take		Exclude	Links to GI have addressed W+C. No further upgrades considered nessecary	
23	Te Horeta Road upgrade	Separate project to provide a new road link parallel to Rail corridor	2035	Include		Other
24	Pilkington Road street frontage upgrade	Collector Road upgrade. Maintaining kerb to kerb for the most part.	2029	Include		Midblock – Medium
25	Pt England Road street frontage upgrade	Collector road upgrade	2029	Include		Midblock – Medium/High
26	Elstree Avenue street frontage upgrades - north of Taniwha	Collector road upgrade	2033	Include		Midblock – Medium/High
27b	Apirana Avenue	Active mode upgrade		Exclude	Removed as no longer a cycle route in Future connect	
28	Glen Innes rail station - access cycleway and Felton Matthew	Connection between station platform		Exclude	Captured in station upgrade	
29	Queen Road Active mode	Active mode upgrade	2029	Include		Midblock – Low
30	Stewart / Green Road active mode	Active mode upgrade		Exclude	Covered in the local neighbourhood items	
31	Elstree Avenue (pt. England to Taniwha)	Active mode upgrade	2030	Include		Midblock – Low
32	Hobson Drive	Active mode upgrade	2029	Include		Midblock – Low
33	Cycleway extension GI to Panmure	Active mode facility		Exclude	Overlap with Te Horeta and Pilkington road project	

TAMAKI PROJECT LIST

Project number	Project name	Project Description	Operational Date	Include in DC model	Reasoning for inclusion/exclusion	Project Type
34	Felton Matthew Avenue upgrade	General upgrade to collector status		Exclude	No longer considered to be required. Frontage can be upgraded as and when development occurs. No corridor project interdependencies / route continuity considerations.	
35	West Tamaki Road upgrade	General upgrade to collector status	2030	Include		Midblock – Medium
36	Apirana Avenue	Pedestrian mall within GI centre		Exclude	Sufficently covered by Link 2 GI and Station upgrade. Pedestrian mall is no lon	
37a	Taniwha Rd between Line Rd and West Tamaki Rd – 230m	Active mode upgrade		Completed		
37b	Taniwha Road (between Apirana Avenue and Line) Route 2A	Active mode upgrade	2024	Exclude	Completed	
38	Line Road (between Line Road and West Tamaki Road) Route 1	Active mode upgrade	2024	Exclude	Part of a funded programme	
39A	Apirana North Route 4A	Active mode upgrade	2024	Exclude	Part of a funded programme	
39B	Apirana South Route 4B	Active mode upgrade	2024	Exclude	Part of a funded programme	
40A	Pt England Road Route 3	Active mode upgrade	2024	Exclude	Part of a funded programme	
40B	Pt England /Line / Apirana / Merton roundabout	Active mode upgrade	2024	Exclude	Part of a funded programme	
41	Merton Road West Route 6B (between College Road and Morrin Rd)	Active mode upgrade	2024	Exclude	Part of a funded programme	
X	Merton Rd East Route 6A (between Morrin Rd and Apirana Ave)	Active mode upgrade	2024	Exclude	Part of a funded programme	
42, 43	Morrin / Stonefield Road Route 5 (between Merton Road and Stonefield's Avenue and between Morrin Road and College Road)	Active mode upgrade	2024	Exclude	Part of a funded programme	
44	Taniwha Street/Line Road	Active mode upgrade to intersection		Exclude	Captured in above items	
45	Taniwha Street/Elstree Avenue	Active mode upgrade to intersection		Exclude	Captured in above items	
46	Apirana Avenue/Pilkington Road	Active mode upgrade to intersection		Exclude	Captured in above items	

TAMAKI PROJECT LIST

Project number	Project name	Project Description	Operational Date	Include in DC model	Reasoning for inclusion/exclusion	Project Type
47	Merton Road/Morrin Road	Active mode upgrade to intersection		Exclude	Captured in above items	
48	Stonefield's Avenue/Morrin Road	Active mode upgrade to intersection		Exclude	Captured in above items	
49	Stonefield's Avenue/College Road signalised intersection	Active mode upgrade to intersection		Exclude	Captured in above items	
50	Church Cres - Collector Road Upgrade	Road upgrade with cycle facilities	2030	Include		Midblock – Medium
51	Panmure North - Local neighbourhood roading asset renewal and upgrades	Local road package	2032	Exclude	Legacy package of local upgrades - superceded by other items	
52	Point England - Local neighbourhood roading asset renewal and upgrades	Local road package	2024	Exclude	Legacy package of local upgrades - superceded by other items	
53	Northwest Glen Innes - Local neighbourhood roading asset renewal and upgrades	Local road package	2027	Exclude	Legacy package of local upgrades - superceded by other items	
54	Glen Innes North East - Local neighbourhood roading asset renewal and upgrades	Local road package	2035	Exclude	Legacy package of local upgrades - superceded by other items	
55	Glen Innes Central - Local neighbourhood roading asset renewal and upgrades	Local road package	2035	Exclude	Legacy package of local upgrades - superceded by other items	
56	Pilkington Rd / Jellicoe Rd intersection upgrade	Roundabout intersection upgrade	2027	Include		Intersection upgrade – Medium roundabout
	Point England Panmure North Local Transport Upgrades Phase 1 Stage 1	Package of local improvements		Exclude	KO line item - superceded by other items	
	Point England Panmure North Local Transport Upgrades Phase 1 Stage 2	Package of local improvements		Exclude	KO line item - superceded by other items	
	Point England Panmure North Local Transport Upgrades Phase 1 Stage 3	Package of local improvements		Exclude	KO line item - superceded by other items	
	Point England Panmure North Local Transport Upgrades Phase 1 Stage 4	Package of local improvements		Exclude	KO line item - superceded by other items	
	Point England Panmure North Local Transport Upgrades Phase 1 Stage 5	Package of local improvements		Exclude	KO line item - superceded by other items	
	Point England Panmure North Local Transport Upgrades Phase 1 Stage 6	Package of local improvements		Exclude	KO line item - superceded by other items	

TAMAKI PROJECT LIST

Project number	Project name	Project Description	Operational Date	Include in DC model	Reasoning for inclusion/exclusion	Project Type
	Point England Panmure North Local Transport Upgrades Phase 1 Stage 7	Package of local improvements		Exclude	KO line item - superceded by other items	
	Point England Panmure North Local Transport Upgrades Phase 1 Stage 8	Package of local improvements		Exclude	KO line item - superceded by other items	
	Point England Panmure North Local Transport Upgrades Phase 1 Stage 9	Package of local improvements		Exclude	KO line item - superceded by other items	
	Glen Innes North West Stage 1	Package of local improvements		Exclude	KO line item - superceded by other items	
	Glen Innes North West Stage 2	Package of local improvements		Exclude	KO line item - superceded by other items	
	Glen Innes North West Stage 3	Package of local improvements		Exclude	KO line item - superceded by other items	
	Glen Innes North West Stage 4	Package of local improvements		Exclude	KO line item - superceded by other items	
	Glen Innes North West Stage 5	Package of local improvements		Exclude	KO line item - superceded by other items	
	Glen Innes North West Stage 6	Package of local improvements		Exclude	KO line item - superceded by other items	
	Glen Innes North West Stage 7	Package of local improvements		Exclude	KO line item - superceded by other items	
	Glen Innes North West Stage 8	Package of local improvements		Exclude	KO line item - superceded by other items	
	Glen Innes North West Stage 9	Package of local improvements		Exclude	KO line item - superceded by other items	
A1+	St Heliers Bay Road / Apirana Ave intersection upgrade	Provide bus priority through this area	2053	Include		Intersection upgrade – High signals
A2+	St Heliers Bay Road / Kohimarama Road intersection upgrade	Provide bus priority through this area	2053	Include		Intersection upgrade – High signals
A3+	Midblock upgrade on St Heliers Bay between Kohimarama and Apirana	Provide bus priority through this area	2053	Include		Midblock – Medium/High
A4+	Taniwha St / Elstree Ave intersection upgrade	Signalised intersection with no land take	2055	Include		Intersection upgrade – Medium/High signals

TAMAKI PROJECT LIST

Project number	Project name	Project Description	Operational Date	Include in DC model	Reasoning for inclusion/exclusion	Project Type
A5+	Elstree Ave / Pt England Rd intersection upgrade	Signalised Intersection upgrade	2055	Include		Intersection upgrade – High signals
A6+	Merton Road / Morrin Road intersection upgrade	Intersection upgrade for capacity and active modes	2055	Exclude	Double up	Intersection upgrade – High signals
A6+	Merton Road Midblock	Widening to 4 lanes between Merton and Apirana	2053	Include		Midblock – Medium/High
A7+	Apirana Ave ped signals	Pedestrian crossing facility	2053	Include		Zebra crossing (at-grade)
LS1.1	Point England and Panmure North	Local and safety improvements - intersection upgrades	2025	Include		Intersection upgrade – Low
LS1.2	Point England and Panmure North	Local and safety improvements - speed tables	2025	Include		Local Area traffic management – Speed table
LS1.3	Point England and Panmure North	Local and safety improvements - speed threshold and signage	2025	Include		Local Area traffic management – Speed threshold & signage
LS1.4	Point England and Panmure North	Local and safety improvements - crossings	2025	Include		Zebra crossing (at-grade)
LS2.1	Glen Innes Northwest	Local and safety improvements - intersection upgrades	2025	Include		Intersection upgrade – Low
LS2.2	Glen Innes Northwest	Local and safety improvements - speed tables	2025	Include		Local Area traffic management – Speed table
LS2.3	Glen Innes Northwest	Local and safety improvements - speed threshold and signage	2025	Include		Local Area traffic management – Speed threshold & signage
LS2.4	Glen Innes Northwest	Local and safety improvements - crossings	2025	Include		Zebra crossing (at-grade)
LS3.1	Glen Innes Northwest 2	Local and safety improvements - speed tables	2028	Include		Local Area traffic management – Speed table
LS3.2	Glen Innes Northwest 3	Local and safety improvements - speed threshold and signage	2028	Include		Local Area traffic management – Speed threshold & signage
LS4.1	Glen Innes Northeast	Local and safety improvements - intersection upgrades	2030	Include		Intersection upgrade – Low
LS4.2	Glen Innes Northeast	Local and safety improvements - speed tables	2030	Include		Local Area traffic management – Speed table

TAMAKI PROJECT LIST

Project number	Project name	Project Description	Operational Date	Include in DC model	Reasoning for inclusion/exclusion	Project Type
LS4.3	Glen Innes Northeast	Local and safety improvements - speed threshold and signage	2030	Include		Local Area traffic management – Speed threshold & signage
LS5.1	Glen Innes Central	Local and safety improvements - speed tables	2030	Include		Local Area traffic management – Speed table
LS5.2	Glen Innes Central	Local and safety improvements - speed threshold and signage	2030	Include		Local Area traffic management – Speed threshold & signage
LS6.1	Employment precinct	Local and safety improvements - intersection upgrades	2033	Include		Intersection upgrade – Low
LS6.2	Employment precinct	Local and safety improvements - speed tables	2033	Include		Local Area traffic management – Speed table
LS6.3	Employment precinct	Local and safety improvements - speed threshold and signage	2033	Include		Local Area traffic management – Speed threshold & signage
LS6.4	Employment precinct	Local and safety improvements - crossings	2033	Include		Zebra crossing (at-grade)
LS7.1	Panmure Central	Local and safety improvements - speed tables	2032	Include		Local Area traffic management – Speed table
LS7.2	Panmure Central	Local and safety improvements - speed threshold and signage	2032	Include		Local Area traffic management – Speed threshold & signage
FU	Footpath upgrades - Tamaki	Upgrading deficient footpaths <1.5m wide to 1.8m minimum standard width	2025	Include		Footpath upgrade
57	Erima Ave between Tripoli Rd and Pt England Road	North-South Active mode and PT network connections.	2034	Include		Midblock – Low

MT ROSKILL PROJECT LIST

Project number	Project name	Project Description	Operational Date	Include in DC model	Reasoning for inclusion/exclusion	Project Type
1	Sandringham Road / Balmoral Road intersection upgrade	Neighbourhood interchange + medium intersection upgrade	2026	Include		Intersection upgrade – Medium signals
2	Dominion Road Extn upgrades to arterials	Active mode + bus priority	2030	Include		Midblock – Medium/High
3	Maioro St / Richardson Rd intersection upgrade	Minor intersection Upgrade	2027	Include		Intersection upgrade – Medium signals
4	Mount Albert Rd / Dominion Rd intersection upgrade	Neighbourhood interchange + medium intersection upgrade	2033	Include		Intersection upgrade – Medium signals
5	Hayr Road / Carr Road intersection upgrade	Intersection upgrade	2038	Include		Intersection upgrade – Medium/High roundabout
6	Mount Albert Road / Hillsborough Road intersection upgrade	Intersection upgrade	2033	Include		Intersection upgrade – Medium/High signals
7	Mount Albert Road / Pah Road intersection upgrade	Neighbourhood interchange + medium intersection upgrade	2033	Include		Intersection upgrade – Medium signals
8b	Mount Albert Road upgrades to arterials	seperated cycle facilities	2033	Include		Midblock – Medium/High
9b	Dominion Rd / Balmoral Rd intersection upgrade	Neighbourhood interchange + medium intersection upgrade	2026	Include		Intersection upgrade – Medium signals
10	Richardson Rd / Owairaka Ave intersection upgrade	Signalisation of priority intersection	2026	Include		Intersection upgrade – Medium signals
11	Mt Albert Rd / Mt Eden Rd intersection upgrade	Neighbourhood interchange + medium intersection upgrade	2034	Include		Intersection upgrade – Medium signals
12	Hillsborough Rd / Herd Rd / Carr Rd intersection upgrade	Intersection upgrade	2028	Include		Intersection upgrade – High signals
13a	Richardson Rd / O'Donnell Ave intersection upgrade	Intersection upgrade	2026	Include		Intersection upgrade – Medium signals
13b	Stoddard Rd / Richardson Rd intersection upgrade	Intersection upgrade	2026	Include		Intersection upgrade – Medium/High signals
14	Stoddard Rd / Denize Rd intersection upgrade	Intersection upgrade	2026	Include		Intersection upgrade – Medium/High signals
15a	Stoddard Rd / Sandringham Rd Extn intersection upgrade	Minor upgrade with bus priority on approaches		Exclude	Covered by 15b	Intersection upgrade – High signals
15b	Stoddard Rd / Sandringham Rd Extn intersection upgrade	Neighbourhood interchange + medium intersection upgrade	2032	Include		Intersection upgrade – Medium/High signals

MT ROSKILL PROJECT LIST

Project number	Project name	Project Description	Operational Date	Include in DC model	Reasoning for inclusion/exclusion	Project Type
16a	Sandringham Rd Extn / O'Donnell Ave intersection upgrade	Intersection upgrade	2028	Include		Intersection upgrade – Medium roundabout
16b	Sandringham Rd Extn / Gifford Ave intersection upgrade			Exclude	Completed	Intersection upgrade – Low
17	Mount Albert Rd / Sandringham Rd intersection upgrade	Neighbourhood interchange + medium intersection upgrade	2026	Include		Intersection upgrade – Medium signals
18	May Road / Stoddard Road / Denbigh Avenue intersection upgrade	Intersection upgrade	2028	Include		Intersection upgrade – Medium signals
19b	Dominion Road / Denbigh Avenue intersection upgrade + neighbourhood interchange	Neighbourhood interchange + medium intersection upgrade	2028	Include		Intersection upgrade – Medium signals
23B	New North Rd / Mt Albert Rd intersection upgrade	Neighbourhood interchange + medium intersection upgrade	2035	Include		Intersection upgrade – Medium signals
24B	New North Rd / Richardson Rd intersection upgrade	Neighbourhood interchange + medium intersection upgrade	2035	Include		Intersection upgrade – Medium signals
26	Mount Albert Rd / Owairaka Ave intersection upgrade	Intersection upgrade	2035	Include		Intersection upgrade – Medium/High signals
27	Maioro Street / New Windsor Road intersection upgrade	Intersection upgrade	2040	Include		Intersection upgrade – Medium signals
30	May Rd collector road upgrade	KO upgrade		Exclude	Completed	
31	Matipo Street collector road upgrade	KO upgrade	2042	Include		Midblock – Low
32	Parau Street collector road upgrade	KO upgrade	2040	Include		Midblock – Low
33	Fowlds Avenue collector road upgrade	KO upgrade	2034	Include		Midblock – Low
34	Hendon Avenue collector road upgrade	KO upgrade		Exclude	Completed	
34	Hendon Avenue collector road upgrade	KO upgrade		Exclude	Completed	
36	Alberton Avenue collector upgrade	Active modes	2033	Include		Footpath/Cycle path retrofit
37a	Balmoral Road between Sandrigham and New North	Active mode and bus priority	2040	Include		Midblock – Medium/High

MT ROSKILL PROJECT LIST

Project number	Project name	Project Description	Operational Date	Include in DC model	Reasoning for inclusion/exclusion	Project Type
39	Royal Oak Roundabout	Signals - PT upgrade / walking and cycling	2038	Include		Intersection upgrade – High signals
41	Oakley Creek Greenway / Owairaka Greenway	Greenway active mode faiclity	2027	Exclude	LB funded	Footpath/Cycle path retrofit
43	Denbigh / Sommerset / Carr midblock	Bus priortity	2032	Include		Midblock – Low
57	Mt Roskill walking and cycling bridges over SH20 new			Exclude	Has been reassessed by KO and is no longer a requirement of the ITAs	
61	Roskill South Transport - Intersection upgrades			Exclude	Superceded by neighbourhood loacl and safety items	
62	Waikowhai local transport upgrades			Exclude	Superceded by neighbourhood loacl and safety items	
63	Owairaka - Local neighbourhood roading asset renewal and upgrades			Exclude	Superceded by neighbourhood loacl and safety items	
64	Roskill South - Local neighbourhood roading asset renewal and upgrades			Exclude	Superceded by neighbourhood loacl and safety items	
65	Wesley - Local neighbourhood roading asset renewal and upgrades			Exclude	Superceded by neighbourhood loacl and safety items	
66	Waikowhai - Local neighbourhood roading asset renewal and upgrades			Exclude	Superceded by neighbourhood loacl and safety items	
67	Richardson / Hillsborough Road	Intersection upgrade	2027	Include		Intersection upgrade – Medium/High roundabout
68	Dominion Road Ext / Hillsborough Road	Intersection upgrade	2026	Include		Intersection upgrade – Low
20	New North Road upgrades to arterials	Snake bus lanes on approaches to intersections and two way cycleway on northern side from Blockhouse bay to St Lukes. T2 lane on St Lukes Road. Bus lane on Morningside. Cycleway on Morningside tieing into Sainbury Road	2035	Include		Other
21	Mt Eden Road upgrades to arterials	Balmoral south – snake bus lanes with cycleways on both sides – to Duke Street, Bus Lanes Mt Eden to Hillsborough.	2038	Include		Other
22	Hillsborough Road upgrades to arterials	Hillsborough Road – Two Way cycleway	2035	Include		Other
29	Owairaka Avenue collector road upgrade	two way cycleway on northern side	2035	Include		Other
44b	Richardson Road - Stoddard to Maioro	Bus priority upgrade (K2K) - Snake bus lanes	2035	Include		Other

MT ROSKILL PROJECT LIST

Project number	Project name	Project Description	Operational Date	Include in DC model	Reasoning for inclusion/exclusion	Project Type
51	Maioro Street	Dynamic bus lanes and cycleways	2033	Include		Other
40	Sandringham Road	Bus Priority and active modes	2030	Include		Other
	Sandringham Rd Upgrade - Stoddard Road to Mount Albert Road			Exclude	Overlap with Sandringham road connected communities item	
SR	Stoddard Road upgrade - Richardson to Denize midblock	Midblock upgrade for bus priority and active modes	2026	Include		Midblock – Medium/High
	Youth / Dominion Road			Exclude	Done	
	Howell Cres / Richardson road			Exclude	Done	
	Youth/Roseman/ Balfron			Exclude	Done	
	Playfair Ave			Exclude	Done	
	Wesley West Local Transport Upgrades - Stage 1			Exclude	KO item Superceded by neighbourhood loacl and safety items	
	Wesley West Local Transport Upgrades - Stage 2			Exclude	KO item Superceded by neighbourhood loacl and safety items	
	Wesley West Local Transport Upgrades - Stage 3			Exclude	KO item Superceded by neighbourhood loacl and safety items	
	Wesley West Local Transport Upgrades - Stage 4			Exclude	KO item Superceded by neighbourhood loacl and safety items	
	Wesley West Local Transport Upgrades - Stage 5			Exclude	KO item Superceded by neighbourhood loacl and safety items	
	Wesley West Local Transport Upgrades - Stage 6			Exclude	KO item Superceded by neighbourhood loacl and safety items	
	Waikowhai local transport upgrades stage 1			Exclude	KO item Superceded by neighbourhood loacl and safety items	
	Waikowhai local transport upgrades stage 2			Exclude	KO item Superceded by neighbourhood loacl and safety items	
	Waikowhai local transport upgrades stage 3			Exclude	KO item Superceded by neighbourhood loacl and safety items	

MT ROSKILL PROJECT LIST

Project number	Project name	Project Description	Operational Date	Include in DC model	Reasoning for inclusion/exclusion	Project Type
	Waikowhai local transport upgrades stage 4			Exclude	KO item Superceded by neighbourhood loacl and safety items	
	Waikowhai local transport upgrades stage 5			Exclude	KO item Superceded by neighbourhood loacl and safety items	
	Waikowhai local transport upgrades stage 6			Exclude	KO item Superceded by neighbourhood loacl and safety items	
	Owairaka transport local upgrades stage 1			Exclude	KO item Superceded by neighbourhood loacl and safety items	
	Owairaka transport local upgrades stage 2			Exclude	KO item Superceded by neighbourhood loacl and safety items	
	Owairaka transport local upgrades stage 3			Exclude	KO item Superceded by neighbourhood loacl and safety items	
	Owairaka transport local upgrades stage 4			Exclude	KO item Superceded by neighbourhood loacl and safety items	
	Roskill South local transport upgrades stage 1			Exclude	KO item Superceded by neighbourhood loacl and safety items	
	Roskill South local transport upgrades stage 2			Exclude	KO item Superceded by neighbourhood loacl and safety items	
	Roskill South local transport upgrades stage 3			Exclude	KO item Superceded by neighbourhood loacl and safety items	
	Roskill South local transport upgrades stage 4			Exclude	KO item Superceded by neighbourhood loacl and safety items	
A1+	Hillsborough Road / White Swan	Bus priority signals	2040	Exclude	Exclude as not related to study area	Intersection upgrade – Medium/High signals
A2+	Hillsborough Road / Dominion Road ext	Bus priority signals	2045	Exclude	Exclude as double up with item 68	Intersection upgrade – Medium/High signals
A3+	White Swan / Richardson Road	Lower end intersection upgrade for bus priority	2040	Include		Intersection upgrade – Medium roundabout
LS1.1	Sandringham	Intersection upgrades	2026	Include		Intersection upgrade – Low
LS1.2	Sandringham	Speed tables	2026	Include		Local Area traffic management – Speed table
LS1.3	Sandringham	Speed threshold and signage	2026	Include		Local Area traffic management – Speed threshold & signage

MT ROSKILL PROJECT LIST

Project number	Project name	Project Description	Operational Date	Include in DC model	Reasoning for inclusion/exclusion	Project Type
LS2.1	Dominion Road	Intersection upgrades	2026	Include		Intersection upgrade – Low
LS2.2	Dominion Road	Speed tables	2026	Include		Local Area traffic management – Speed table
LS2.3	Dominion Road	Speed threshold and signage	2026	Include		Local Area traffic management – Speed threshold & signage
LS3.1	Three Kings	Intersection upgrades	2025	Include		Intersection upgrade – Low
LS3.2	Three Kings	Speed tables	2025	Include		Local Area traffic management – Speed table
LS3.3	Three Kings	Speed threshold and signage	2025	Include		Local Area traffic management – Speed threshold & signage
LS3.4	Three Kings	Crossings	2025	Include		Zebra crossing (at-grade)
LS4.1	Roskill Schools and Warren and Carr	Intersection upgrades	2028	Include		Intersection upgrade – Low
LS4.2	Roskill Schools and Warren and Carr	Speed tables	2028	Include		Local Area traffic management – Speed table
LS4.3	Roskill Schools and Warren and Carr	Speed threshold and signage	2028	Include		Local Area traffic management – Speed threshold & signage
LS4.4	Roskill Schools and Warren and Carr	Crossings	2028	Include		Zebra crossing (at-grade)
LS5.1	Mt Albert East	Speed tables	2027	Include		Local Area traffic management – Speed table
LS5.2	Mt Albert East	Speed threshold and signage	2027	Include		Local Area traffic management – Speed threshold & signage
LS5.3	Mt Albert East	Crossings	2027	Include		Zebra crossing (at-grade)
LS6.1	New Windsor	Intersection upgrades	2028	Include		Intersection upgrade – Low
LS6.2	New Windsor	Speed tables	2028	Include		Local Area traffic management – Speed table
LS6.3	New Windsor	Speed threshold and signage	2028	Include		Local Area traffic management – Speed threshold & signage

MT ROSKILL PROJECT LIST

Project number	Project name	Project Description	Operational Date	Include in DC model	Reasoning for inclusion/exclusion	Project Type
LS6.4	New Windsor	Crossings	2028	Include		Zebra crossing (at-grade)
LS7.1	Hillsborough	Speed tables	2027	Include		Local Area traffic management – Speed table
LS7.2	Hillsborough	Speed threshold and signage	2027	Include		Local Area traffic management – Speed threshold & signage
LS8.1	Mt Eden and Balmoral	Intersection upgrades	2029	Include		Intersection upgrade – Low
LS8.2	Mt Eden and Balmoral	Speed tables	2029	Include		Local Area traffic management – Speed table
LS8.3	Mt Eden and Balmoral	Speed threshold and signage	2029	Include		Local Area traffic management – Speed threshold & signage
LS8.4	Mt Eden and Balmoral	Crossings	2029	Include		Zebra crossing (at-grade)
LS9.1	Wesley Malcolm and Roma	Intersection upgrades	2025	Include		Intersection upgrade – Low
LS9.2	Wesley Malcolm and Roma	Speed tables	2025	Include		Local Area traffic management – Speed table
LS9.3	Wesley Malcolm and Roma	Speed threshold and signage	2025	Include		Local Area traffic management – Speed threshold & signage
LS10.1	Waikowhai	Intersection upgrades	2024	Include		Intersection upgrade – Low
LS10.2	Waikowhai	Speed tables	2024	Include		Local Area traffic management – Speed table
LS10.3	Waikowhai	Speed threshold and signage	2024	Include		Local Area traffic management – Speed threshold & signage
LS11	Owairaka		2023	Exclude	Done	
LS12	Mt Roskill South		2023	Exclude	Done	
FU	Footpath upgrades - Mt Roskill	Upgrading deficient footpaths <1.5m wide to 1.8m minimum standard width	2025	Include		Footpath upgrade
69	Dominion Rd/Richardson Rd/Dominion Rd ext - Change from roundabout to signalisation.	To accommodate active modes (e.g. providing priority pedestrian crossing on all approaches) and public transport (e.g. enabling frequent bus movements along both arterial routes through the intersection) improvements.	2028	Include		Intersection upgrade – High signals

MANGERE PROJECT LIST

Project number	Project name	Project Description	Operational Date	Include in DC model	Reasoning for inclusion/exclusion	Project Type
1	Bader Drive / Robertson Road intersection upgrade	Active mode treatment at existing roundabout.	2027	**Include**		Intersection upgrade – Medium/High roundabout
2	Mckenzie Road / Coronation Road / SH20 Interchange intersection upgrade	Existing Roundabout upgrade	2028	**Include**		Intersection upgrade – Medium roundabout
4	Massey Road / Buckland Road intersection upgrade	upgrade to existing signals with bus priority and active modes	2029	**Include**		Intersection upgrade – Medium/High signals
5	Massey Road / Tennesse Avenue intersection upgrade	Existing priority to be retained. Minor marking changes proposed	2029	**Include**		Intersection upgrade – Low
6	Walmsley Road / McKenzie Road / Miller Road intersection upgrade	Existing Roundabout upgrade	2029	**Include**		Intersection upgrade – Medium/High roundabout
7	Robertson Road kerb realignment	Collector road upgrade	2036	**Include**		Midblock – Low
8	Walmsley Road / Kaka Road intersection upgrade	Upgrade to existing signals	2035	**Include**		Intersection upgrade – Low
9	Kirkbride Road / Westney Road / Jordan Road intersection upgrade	Existing signals upgrade	2035	**Include**		Intersection upgrade – High signals
10	Massey Road / Thomas Road intersection upgrade	Active mode treatment at existing priority intersection		**Exclude**	**Done**	
11	Massey Road / Mascot Avenue intersection upgrade	Active mode treatment at existing priority intersection		**Exclude**	**Done**	
12	Kirkbride Road / Ascot Road intersection upgrade	Existing signals upgrade	2031	**Include**		Intersection upgrade – Medium/High signals
13	Richard Pearse Drive / Ascot Road intersection upgrade		2035	**Exclude**	**Existing signals with active modes. Nothing needed**	
14	Massey Road / Gray Avenue intersection upgrade	Existing priority intersection to be replace by signals with bus priority. Within the scope for Middlemore area.	2031	**Include**		Intersection upgrade – Medium signals
15	Favona Road / James Fletcher Drive to provide cycle lane arterials	Midblock upgrades for active modes	2035	**Exclude**	**Covered by Mangere SSBC**	Midblock – Low
16	Savill Drive upgrade	Midblock upgrade	2035	**Include**		Midblock – Low
17	Walmsley Road / Robertson Road / Market Cove access intersection upgrade	Existing intersection upgrade	2026	**Include**		Intersection upgrade – Medium/High signals
18	SH20 / Walmsley Road Interchange intersection active modes upgrade	Existing signals upgrade	2029	**Include**		Intersection upgrade – Low
19	Bader Drive / McKenzie Road intersection upgrade	Existing intersection upgrade	2028	**Include**		Intersection upgrade – Medium roundabout

MANGERE PROJECT LIST

Project number	Project name	Project Description	Operational Date	Include in DC model	Reasoning for inclusion/exclusion	Project Type
20	Massey Road / Robertson Road / Henwood Road intersection upgrade	Existing signals - Bus priority	2029	**Include**		Intersection upgrade – Medium/High signals
21	State Highway 20 and SH20A cycle lanes			**Exclude**	Part of a wider programme	
22	Mangere light rail			**Exclude**	Part of a wider programme	
23	Middlemore Rail Station Upgrade	Station upgrade	2042	**Include**		Other
24	Middlemore Rail Crossing New	New road connection over rail corridor	2028	**Include**		Other
25	Jordan Road	LATM		**Exclude**	Captured in local items	
26	Idlewild Avenue	Active mode upgrade	2033	**Include**		Midblock – Medium
27	Mangere Centre park link	Active mode facility		**Exclude**	LB type project	
28	Kirkbride / Mackenzie active mode upgrade	Active mode upgrade		**Exclude**	Part of another programme	
29	Wakefield and Gadsby	LATM		**Exclude**	Captured in local items	
30	Harania Marys Foreshore path	Active mode facility	2028	**Exclude**	Part of another programme	Footpath/Cycle path retrofit
31	Lenore Foreshore path	Active mode facility	2028	**Exclude**	Part of another programme	Footpath/Cycle path retrofit
32	Wickman Way	LATM	2026	**Exclude**	Captured in local items	
33	Tennessee Avenue	LATM	2026	**Exclude**	Captured in local items	
34	Vine Street	LATM	2026	**Exclude**	Captured in local items	
35	Grey Avenue	LATM	2026	**Exclude**	Captured in local items	
36	Buckland Road (south of Massey)	Active mode upgrade	2033	**Include**		Midblock – Medium
37	Hospital Road	Midblock upgrade	2028	**Include**		Midblock – Medium
38	Walmsley Road PT priority	Bus priority measures and interchange with rail station		**Exclude**	**Superseded by items 67-72**	

MANGERE PROJECT LIST

Project number	Project name	Project Description	Operational Date	Include in DC model	Reasoning for inclusion/exclusion	Project Type
39	Middlemore Western Bus Interchange	Bus stops / station access from western side	2031	Include		Other
41	Garus to Bukem Active mode link	Active mode link		Exclude	up with Mangere East Garus to	
42	Garus Avenue	LATM		Exclude	up with Mangere East Garus to	
49	Bader Drive active modes	Midblock upgrade	2026	Include		Midblock – Medium
50	Mountain Road collector road upgrade	Midblock upgrade of collector	2033	Include		Midblock – Medium
55	Robertson Road / Wakefield Road / Harania Ave	(Cycling SSBC Tranche 1) Deliver Cycling facilities	2025	Include		Other
56	Harania Stream cycle routes (Cycling SSBC Tranche 1)	(Cycling SSBC Tranche 1) Deliver off-road facilities along Harania Stream	2026	Include		Other
57	Vine Street (Cycling SSBC Tranche 2)	(Cycling SSBC Tranche 2) Deliver Cycling facilities	2028	Include		Other
58	Favona Rd	Midblock upgrade including minor intersections	2029	Include		Other
59	Gray Ave	Midblock upgrade including minor intersections	2029	Include		Other
60	James Fletcher Dr	Midblock upgrade including minor intersections	2029	Include		Other
61	Kahu St	Midblock upgrade including minor intersections	2028	Include		Other
62	Garus Ave to Otago Pl	Off road path	2027	Include		Other
63	Kahu Street to Otahuhu station Bridge	Intersections (Including off-road cycleway junction)	2027	Include		Other
64	James Fletcher - Savill Dr/Favona Int	Intersections (Including off-road cycleway junction)	2029	Include		Other
65	James Fletcher - Kahu Int	Intersections (Including off-road cycleway junction)	2029	Include		Other
66	Gray Ave -Massey-Vine Int	Intersections (Including off-road cycleway junction)	2029	Include		Other
67	Massey Road / Tidal	PT priority at existing signals	2029	Include		Intersection upgrade – Medium signals
68	Massey Road / Yates Road	Existing priority intersection replaced with signals	2029	Include		Intersection upgrade – Medium signals

MANGERE PROJECT LIST

Project number	Project name	Project Description	Operational Date	Include in DC model	Reasoning for inclusion/exclusion	Project Type
69	Massey / Fergusson Street	Existing priority to be retained. Minor marking changes proposed	2029	**Include**		Intersection upgrade – Low
70	Buckland Road / Wickman	Bus Priority at signals	2029	**Include**		Intersection upgrade – Medium/High signals
71	Buckland Road / Ashley Avenue	Bus Priority at signals	2029	**Include**		Intersection upgrade – Medium/High signals
72	Massey Road bus priority between Buckland Road and Robertson (450m)	Midblock upgrade for bus priority	2029	**Include**		Midblock – Medium/High
3b1	Buckland Road / Massey Road Bus Priority road upgrade for bus lanes. Stage 1	Bus priority + active modes		**Exclude**	**Superseded by items 67-72**	
3b2	Buckland Road / Massey Road Bus Priority road upgrade for bus lanes Stage 2	Bus priority + active modes		**Exclude**	**Superseded by items 67-72**	
A1+	Robertson / Wakefield intersection	Existing priority upgrade	2053	**Include**		Intersection upgrade – Medium/High signals
A2+	Robertson / McKinstry intersection	Existing priority upgrade	2053	**Include**		Intersection upgrade – Medium/High signals
A3+	Robertson / Gadsby Road intersection	Existing priority upgrade	2053	**Include**		Intersection upgrade – Medium/High signals
A4+	Gray / Orakau intersection	Existing priority upgrade	2053	**Include**		Intersection upgrade – Medium/High signals
A5+	Naylors Drive / Massey Road intersection	Existing priority upgrade	2053	**Include**		Intersection upgrade – Medium/High signals
A6+	Massey Road / Thomas Road intersection	Existing priority upgrade	2053	**Include**		Intersection upgrade – Medium/High signals
A7+	Idlewood / Kirkbride intersection	Existing priority upgrade	2053	**Include**		Intersection upgrade – Medium/High signals
A8+	Kirkbride / Mckenzie intersection	Existing priority upgrade	2053	**Include**		Intersection upgrade – Medium/High signals
FU	Footpath upgrades - Mangere	Upgrading deficient footpaths <1.5m wide to 1.8m minimum standard width	2024	**Include**		Footpath upgrade
LS1.1	Te Ararata (Mangere West) A	Speed threshold and signage	2025	**Include**		Local Area traffic management – Speed threshold & signage
LS1.2	Te Ararata (Mangere West) A	Chicanes	2025	**Include**		Local Area traffic management – Chicane
LS10.1	Aorere	Intersection upgrades	2025	**Include**		Intersection upgrade – Low
LS10.2	Aorere	Speed threshold and signage	2025	**Include**		Local Area traffic management – Speed threshold & signage

MANGERE PROJECT LIST

Project number	Project name	Project Description	Operational Date	Include in DC model	Reasoning for inclusion/exclusion	Project Type
LS10.3	Aorere	Chicanes	2025	Include		Local Area traffic management – Chicane
LS10.4	Aorere	Crossings	2025	Include		Zebra crossing (at-grade)
LS11.1	Middlemore	Speed threshold and signage	2028	Include		Local Area traffic management – Speed threshold & signage
LS11.2	Middlemore	Chicanes	2028	Include		Local Area traffic management – Chicane
LS11.3	Middlemore	Crossings	2028	Include		Zebra crossing (at-grade)
LS2.1	Te Ararata (Mangere West) B	Speed threshold and signage	2025	Include		Local Area traffic management – Speed threshold & signage
LS2.2	Te Ararata (Mangere West) B	Chicanes	2025	Include		Local Area traffic management – Chicane
LS2.3	Te Ararata (Mangere West) B	Crossings	2025	Include		Zebra crossing (at-grade)
LS3.1	Te Ararata (Mangere West) C	Speed threshold and signage	2025	Include		Local Area traffic management – Speed threshold & signage
LS4.1	Mangere Central	Intersection upgrades	2030	Include		Intersection upgrade – Low
LS4.2	Mangere Central	Speed threshold and signage	2030	Include		Local Area traffic management – Speed threshold & signage
LS4.3	Mangere Central	Chicanes	2030	Include		Local Area traffic management – Chicane
LS5.1	Favona	Intersection upgrades	2029	Include		Intersection upgrade – Low
LS5.2	Favona	Speed threshold and signage	2029	Include		Local Area traffic management – Speed threshold & signage
LS5.3	Favona	Chicanes	2029	Include		Local Area traffic management – Chicane
LS6.1	Buckman and Wickman	Speed threshold and signage	2030	Include		Local Area traffic management – Speed threshold & signage
LS6.2	Buckman and Wickman	Chicanes	2030	Include		Local Area traffic management – Chicane
LS6.3	Buckman and Wickman	Crossings	2030	Include		Zebra crossing (at-grade)
LS7.1	Sutton Park	Intersection upgrades	2032	Include		Intersection upgrade – Low

MANGERE PROJECT LIST

Project number	Project name	Project Description	Operational Date	Include in DC model	Reasoning for inclusion/exclusion	Project Type
LS7.2	Sutton Park	Speed threshold and signage	2032	Include		Local Area traffic management – Speed threshold & signage
LS7.3	Sutton Park	Chicanes	2032	Include		Local Area traffic management – Chicane
LS8.1	Mangere East	Speed threshold and signage	2028	Include		Local Area traffic management – Speed threshold & signage
LS8.2	Mangere East	Chicanes	2028	Include		Local Area traffic management – Chicane
LS8.3	Mangere East	Crossings	2028	Include		Zebra crossing (at-grade)
LS9.1	Otaki O Te Whenua	Intersection upgrades	2030	Include		Intersection upgrade – Low
LS9.2	Otaki O Te Whenua	Speed threshold and signage	2030	Include		Local Area traffic management – Speed threshold & signage
LS9.3	Otaki O Te Whenua	Chicanes	2030	Include		Local Area traffic management – Chicane
	Friesian Drive kerb realignment			Exclude	Covered by local and safety items	
	Ashgrove Road kerb realignment			Exclude	Covered by local and safety items	
	McKinstry Avenue kerb realignment			Exclude	Covered by local and safety items	
	Te Ararata A local transport upgrades stage 1			Exclude	Covered by local and safety items	
	Te Ararata A local transport upgrades stage 2			Exclude	Covered by local and safety items	
	Te Ararata A local transport upgrades stage 3			Exclude	Covered by local and safety items	
	Te Ararata A local transport upgrades stage 4			Exclude	Covered by local and safety items	
	Te Ararata B local transport upgrades stage 1			Exclude	Covered by local and safety items	
	Te Ararata B local transport upgrades stage 2			Exclude	Covered by local and safety items	
	Te Ararata B local transport upgrades stage 3			Exclude	Covered by local and safety items	
	Te Ararata B local transport upgrades stage 4			Exclude	Covered by local and safety items	

MANGERE PROJECT LIST

Project number	Project name	Project Description	Operational Date	Include in DC model	Reasoning for inclusion/exclusion	Project Type
	Te Ararata B local transport upgrades stage 5			Exclude	Covered by local and safety items	
	Te Ararata B local transport upgrades stage 6			Exclude	Covered by local and safety items	
	Mangere East local transport upgrades stage 1			Exclude	Covered by local and safety items	
	Mangere East local transport upgrades stage 2			Exclude	Covered by local and safety items	
	Mangere East local transport upgrades stage 3			Exclude	Covered by local and safety items	
	Mangere East local transport upgrades stage 4			Exclude	Covered by local and safety items	
	Mangere East local transport upgrades stage 5			Exclude	Covered by local and safety items	
	Aorere local transport upgrades stage 1			Exclude	Covered by local and safety items	
	Aorere local transport upgrades stage 2			Exclude	Covered by local and safety items	
	Aorere local transport upgrades stage 3			Exclude	Covered by local and safety items	
	Aorere local transport upgrades stage 4			Exclude	Covered by local and safety items	
	Aorere local transport upgrades stage 5			Exclude	Covered by local and safety items	
	Otaki o Te Wai local transport upgrades stage 1			Exclude	Covered by local and safety items	
	Otaki o Te Wai local transport upgrades stage 2			Exclude	Covered by local and safety items	
	Otaki o Te Wai local transport upgrades stage 3			Exclude	Covered by local and safety items	
	Aorere - Local neighbourhood roading asset renewal and upgrades			Exclude	Covered by local and safety items	

B

Appendix B – Generic Beneficiary/Causation Assessment Methodology

Generic Transport Causation/Beneficiary Assessment Methodology

Development Contributions Policy

Prepared for Auckland Council
Prepared by Beca Limited

27 June 2024

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Revision History

Revision N°	Prepared By	Description	Date
1.0	Joshua Hafoka and Michael Sewell	Draft	14/06/2024
2.0	Michael Sewell	Updated draft following client feedback	21/06/2024
3.0	Michael Sewell	Finalised draft for consultation	27/06/2024

Document Acceptance

Action	Name	Signed	Date
Prepared by	Joshua Hafoka and Michael Sewell	[redacted]	27/06/2024
Reviewed by	Andrew Murray	[redacted]	27/06/2024
Approved by	Rob Mason	[redacted]	27/06/2024
on behalf of	Beca Limited		

1 Introduction

The purpose of this report is to describe the Causation/Beneficiary Assessment (the Assessment) of transportation infrastructure for ongoing and future Development Contributions (DC) assessments, and how this assessment fits into the overall DC approach. The Assessment defines how the cost for transport infrastructure should be allocated to those who cause the need, and those who benefit.

This report is intended to provide guidance for ongoing and future DC workstreams. The methodology in this report has been represented generically to allow application to greenfield and brownfield environments.

This report has been developed in collaboration with Auckland Council (Council) and Auckland Transport (AT).

2 Development Contributions Methodology Development

The Assessment is a series of steps within the overall DC methodology. The DC methodology was previously developed for the Drury DC Policy within Te Tupu Ngātahi Supporting Growth Alliance (SGA), with Drury being a primarily greenfield/rural environment. However, the DC methodology has been adapted for applicability to greenfield and brownfield environments to support ongoing and future DC workstreams. This was adapted through a series of technical workshops held with staff from AT and Council. The purpose of those workshops was to:

- Agree the specific outputs of the assessment; and
- Provide guidance on the general approach to assessing DC inputs, particularly regarding assessment of renewal elements, growth components and Causation/Beneficiary Assessment

3 Key Assessment Steps

The overall DC methodology applied (as guided by AT and Council) includes the key steps shown in **Figure 3-1**. The DC methodology is for the cost allocation of transport infrastructure. As such, inputs, such as growth forecasts, and further steps, such as developer mitigation and third-party funding, are provided and determined by Council.

Key modifications from the previous Drury DC methodology to suit application to all area types are demonstrated in **Figure 3-1**.

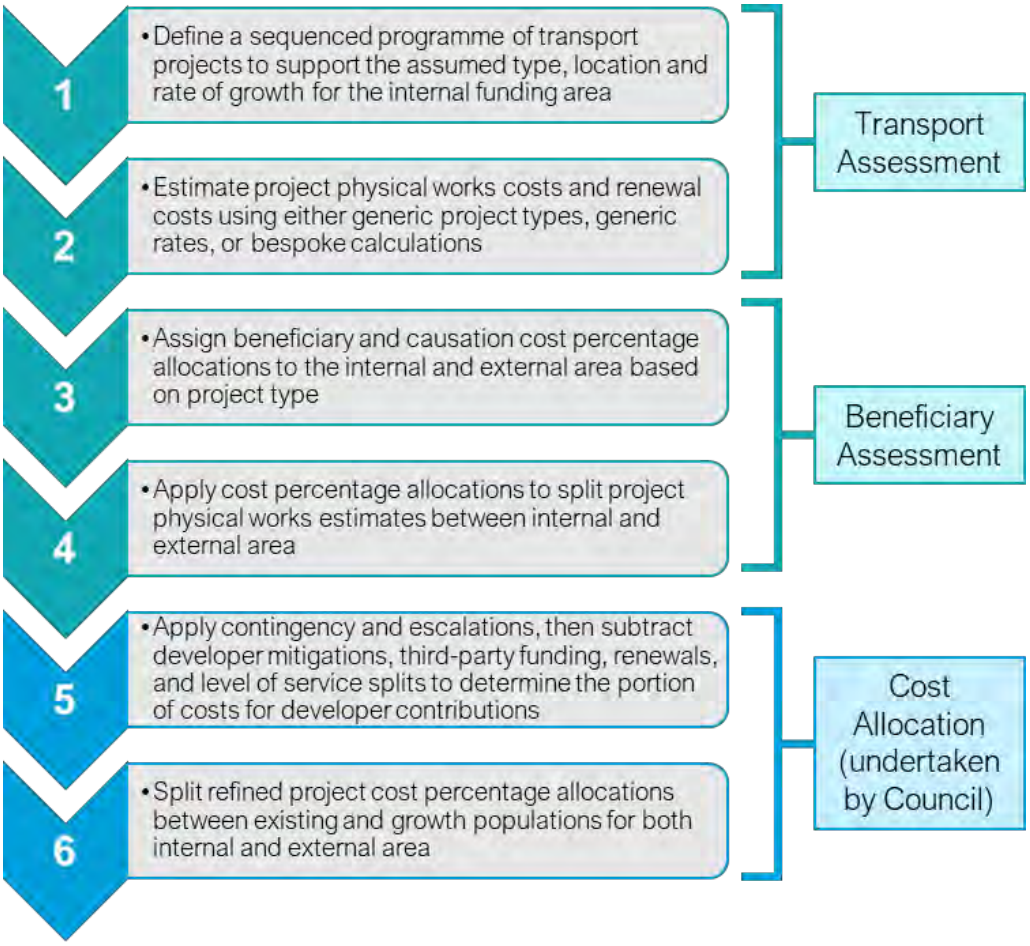

Figure 3-1: Development Contributions assessment methodology

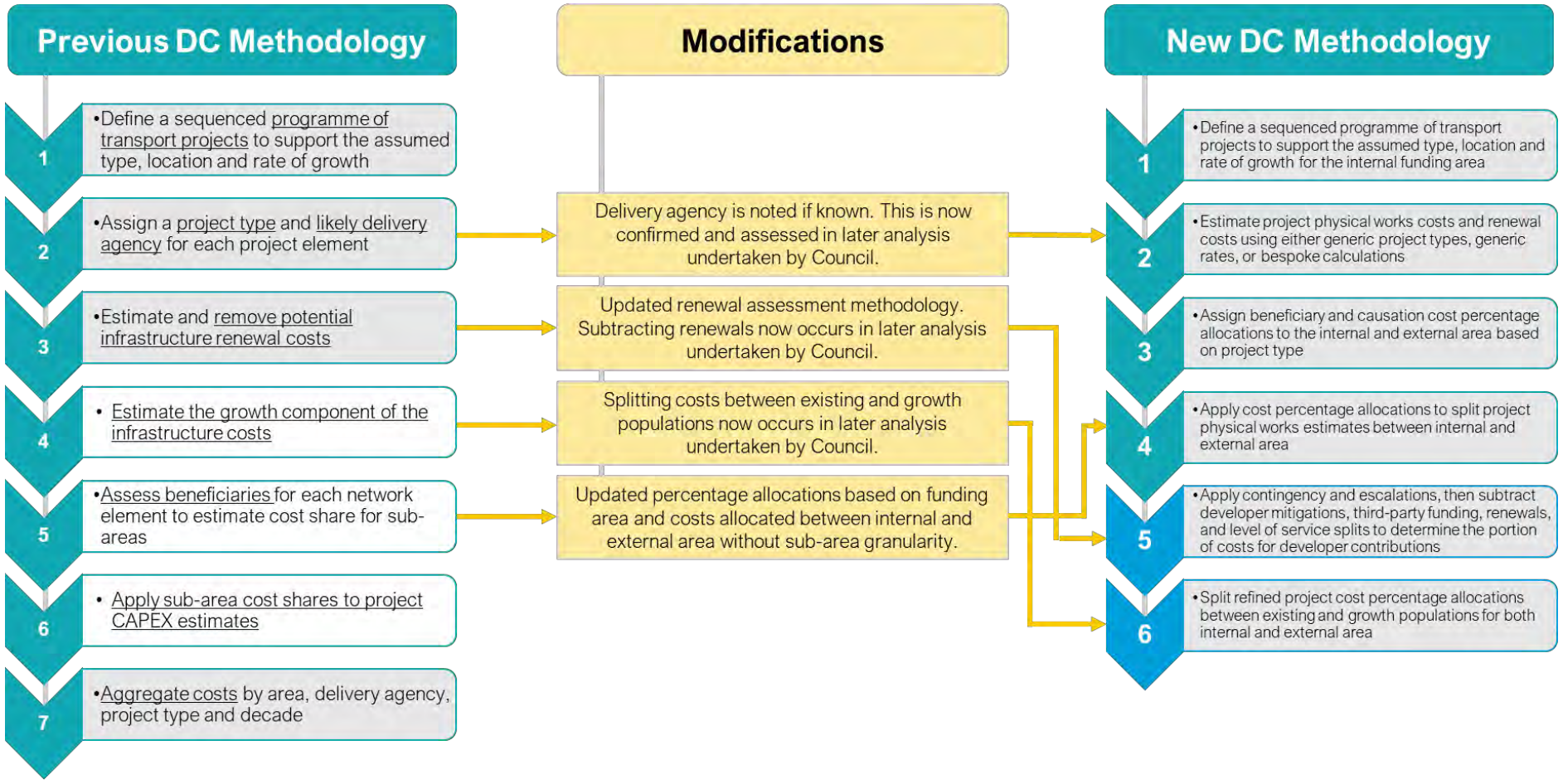

Figure 3-2: Illustration of key modifications from previous Drury development contributions assessment methodology

3.1 Areas of Assessment

A full transport system has been planned for each funding area and adjacent areas that integrate into the existing system. This full network is considered necessary for those local communities to be connected and integrated. As such, the proposed network helps enable the function of the wider community rather than solely individual developments. This connected-network approach implies that smaller sub-areas would not be appropriate. For the ongoing DC workstreams, the funding area is defined by Council, as is assumed in this report.

Live-zoned areas will often have precinct plan provisions staging development until specific transport infrastructure is provided. This means that developers will often agree with the road controlling authority to directly fund or physically deliver infrastructure as part of mitigation and/or development of their site. This is addressed this by discounting the costs included in the DC policy by excluding components that are likely to be provided by developers (see **Section 3.2** below).

3.2 Cost to be Included

The Council DC Policy 2022 notes specific asset costs that should not be included in the DC assessment:

> 28. Within these activities, development contributions will not be required to fund:
>
> a. operating and maintenance costs
> b. any part of capital expenditure projects that is funded from another source
> c. costs incurred by the council to fund renewal of assets and/or to increase existing levels of service that are below the stated service standard.

Only infrastructure base physical works (PW) costs are included in the DC assessments, without consideration of operating and maintenance costs. The level of discounting of costs for typical components likely to be provided by developers vary for each DC workstream as they are dependent on each project type. The DC Policy requires exclusion of asset renewal, which is outlined in **Section 3.3**.

3.3 Renewal Costs

As noted in the Council DC Policy 2022, costs associated with renewal of existing infrastructure should not be included in the DC assessments. The existing local transport network in the funding areas comprises of urban and/or rural roads, of which many of the roads will be upgraded or converted to a different form. Unlike the Drury DC, which was primarily a greenfield environment, brownfield environments typically do not involve rural or new roads. Therefore, renewal elements are especially relevant to brownfield environments.

The PW cost estimates for the projects often assume re-construction of the existing road to provide the appropriate urban streets. As such, it is likely that those re-construction costs would replace or remove the need for renewal of those roads if they are not reconstructed. An estimate of renewal costs is therefore made and removed from the PW cost estimates. This implies that a proportion of the reconstruction PW cost estimates should apply to existing rate payers rather than to new urban development.

Renewal rates are determined under advisement from AT and vary for each DC workstream depending on the project type and are applied by Council after the beneficiary assessment stage.

4 Causation/Beneficiary Assessment

4.1 Causation/Beneficiary Assessment between areas

The use of a Causation/Beneficiary Assessment is based on the principle that the project should be funded by those who cause the need for the project and those who benefit from the project. As noted in the Council DC Policy 2022, the DCs are levied in accordance with the Local Government Act (2002). Clause 197AB (1)(c) of the Act specifically notes the following in this regard:

> (c) cost allocations used to establish development contributions should be determined according to, and be proportional to, the persons who will benefit from the assets to be provided (including the community as a whole) as well as those who create the need for those assets:

This notes that DCs should be allocated both to those who cause the need for the project as well as those who benefit from it. Based on this directive and the guidance from AT based on other DC policy applications, the following approach was adopted:

1. Allocate PW costs based on those who cause the need for the project (causation analysis)
2. Allocate PW costs based on those who benefit from the operation of the project (beneficiary analysis)
3. The adopted allocations for the funding area are based on a 50:50 weighting of these two assessments.

The beneficiary analysis allocates spatially between the internal funding area and the external area (see

Figure 4-1). Shares are proportionally allocated based on an assessment of the areas, communities or movements that would gain improved transport outcomes.[1] This assessment may also be informed by regional transport model trip proportions relative to the internal area, assuming that benefits gained are proportional to usage. The spatial allocation shares are determined individually for each funding area.

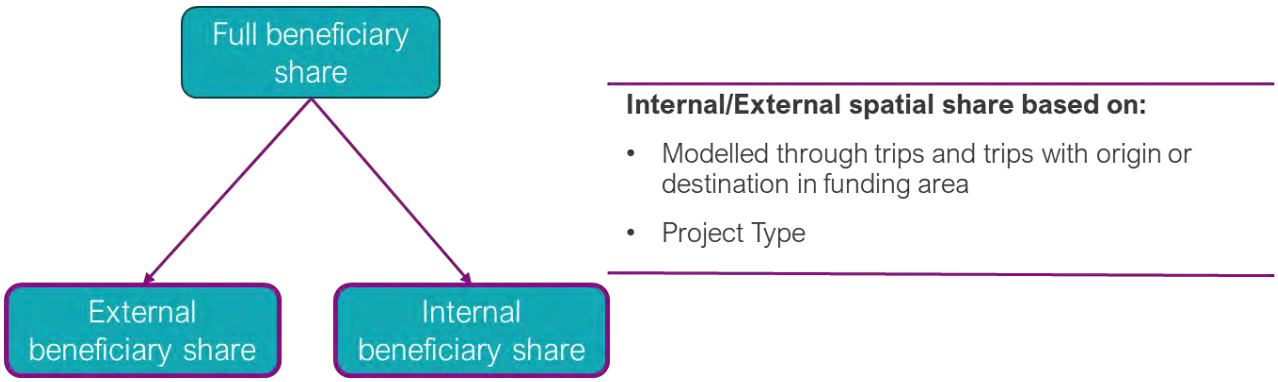

Figure 4-1: Breakdown of causation/beneficiary share allocation

The causation analysis follows a similar process, but instead considers whether the projects are likely to provide capacity or outcomes directly needed to support the planned urban development. As such, the causation spatial allocation is typically weighted further towards the funding area than the beneficiary allocation. The weighting of the causation can differ based on the project type, purpose, and role for internal or external growth purposes.

[1] This includes improved accessibility, safety, travel choice, and network resilience.

The type and scale of benefit will vary significantly between areas and between projects. For example, transport benefits could include:

- Local or wider-area travellers who benefit from direct usage of the new facility or service (e.g., via greater accessibility or safety).
- Local or wider-area travellers who benefit from having additional transport choices available.
- Local or wider-area travellers who derive a benefit through an improved overall transport system, even if they don't directly use the facility (e.g., indirect benefits through reduced congestion or improved network resilience).
- Local or wider-area communities that benefit from reduced vehicle movement through their neighbourhoods (e.g., through improved safety and amenity).
- Local or regional communities who benefit from the projects helping imbed changes in general travel behaviours (e.g., a shift to more sustainable travel modes).

Beneficiaries could be either people who gain direct and regular benefits (e.g., improved accessibility between communities), or less direct and less frequent benefits (e.g., improved travel choices or a more resilient network). Additionally, the scale and timing of benefits for some project elements will be dependent on the timing of other elements in the network. For example, the improved accessibility benefits of a new link could be different depending on if another proposed new link is assumed to be in place at that time horizon.

Some benefits are estimated analytically (via traffic model predictions). However, this is less feasible for benefits such as improved travel choices and network resilience. It can also become complex and require judgement to explicitly weight the different types of benefits to a single result. As such, analytical estimation of benefits is treated as supplementary information to inform judgement on the distribution of benefits. Additionally, analytical results from transport models are also much more sensitive to the assumptions used in the model, such as the level of growth and inter-dependency with the presence of other projects.

4.2 Further Causation/Beneficiary Assessment

The process described in **Section 4.1** allocates project PW costs between internal and external areas only. Further DC analysis, including escalation, mitigation adjustments, and further splitting of external causation and beneficiary shares between existing and growth populations, is conducted by Council. See Council's supporting information for the Development Contributions policy for more information.

5 Illustrative Example of Causation/Beneficiary Assessment

This section outlines an example to illustrate the application of the Causation/Beneficiary Assessment methodology. The inputs are not representative of any project and are provided to support the demonstration of the example.

5.1 Inputs

- Project X involves an upgrade of an existing urban arterial road to a strategic facility. Its primary role included both supporting adjacent local urban development and providing improved regional multi-modal connections and network resilience.
- The indicative PW to fully redevelop the corridor into the proposed new form is $150 million.

5.2 Worked Example

1. The external share for this project was set at 40% for causation, being a strategic project needed in response to both local and external purposes. Therefore, the internal causation share is 60%.
2. The beneficiary external share for this project is set at 50%, being a strategic project supporting trips with local and external purposes. Therefore, the internal beneficiary share is 50%.
3. The average of the causation and beneficiary assessments gives 45% for the external area and 55% for the internal area.
4. Applying the shares to the $150 million PW gives an external PW share of $67.5 million, and an internal PW share of $82.5 million for Project X.

Table 5-1: Illustrative example of physical works allocation

Step	Value	Calculation
1	**Internal causation** share from external share	100% - 40% = 60%
2	**Internal beneficiary** share from external share	100% - 50% = 50%
3	**External** share	(40% + 50%) / 2 = 45%
	Internal share	(60% + 50%) / 2 = 55%
4	**External** PW share	$150M x 45% = $67.5M
	Internal PW share	$150M x 55% = $82.5M

6 Consideration of Uncertainties

As noted in the discussions above, there are uncertainties in most of the key inputs and assumptions required for this assessment. **Figure 6-1** indicates several of the inputs, assumptions and methods that are required for this assessment. These kinds of uncertainties are inherent given the scale and timeframes for programmes of these kinds involving major urban expansion, especially in a greenfield setting. The approach adopted recognises these uncertainties, enabling DC workstreams to:

- Use simplifying methodologies where suitable,
- Build up the assessment from specific project elements that would allow Council to update the assessments as new information becomes available,
- Aggregate the assessment at a larger, programme level that could be more resilient to changes in specific individual items; and,
- Undertake high-level sensitivity testing using different assumptions.

Each funding area for which this assessment is applied should consider and discuss the key uncertainties relevant to the area.

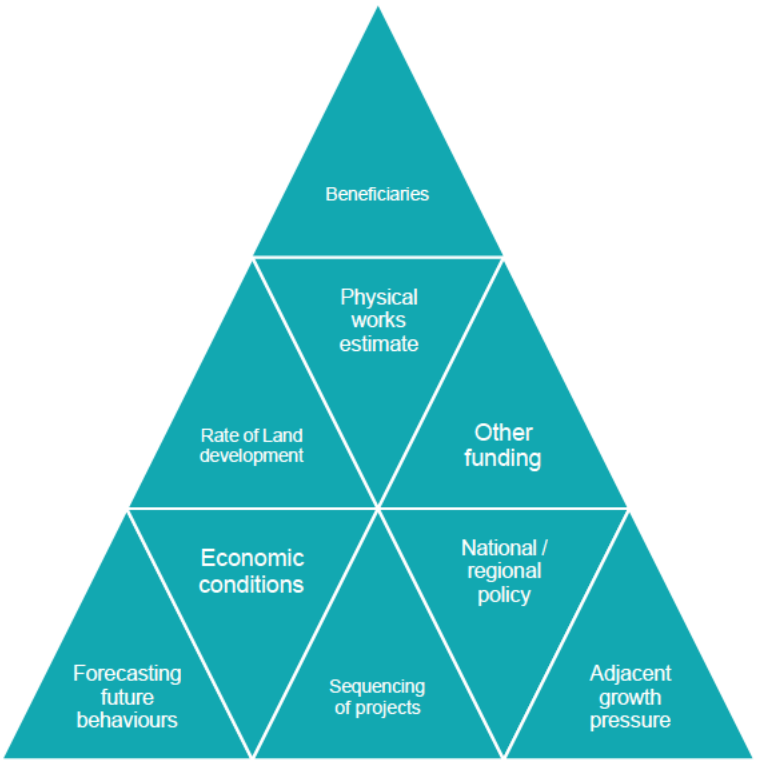

Figure 6-1: Illustrative Combination of Key Risks and Uncertainties

C

Appendix C – Local and safety assessment

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TAMAKI - SAFETY AND LOCAL IMPROVEMENTS BY NEIGHBOURHOOD

Date: 13/06/2024 Version: 1.1

This memo outlines an approach to the assessment of local areas for local upgrades and road safety interventions as a response to brownfields intensification.

1 METHODOLOGY USED

The methodology used for this assessment follows the following steps:

The area context includes gathering of information including road network typology, zoning, and public land holdings. The potential for growth is identified through consideration of KO growth in the zone, anticipated changes in the MSM model and consideration of a full build out scenario. The growth is then considered in the context of changes in travel demand extended over time. This takes into account future changes in mode share in the future.

The underlying intention of this approach is to account for the additional population (and associated travel) and recognise that with these additional future demands, there will be an increase in the expected exposure to transport safety risks compared to the current situation.

The safety performance of the network looks at historic data in each area against national averages and highlights parts of the network which have higher safety risk. The Future Connect database includes a layer highlighting priority safety deficiencies in the transport network for the next 10 years. This is considered along with crash data. The Future Connect database also highlights deficiencies in the walking network.

A professional assessment is made on the network given the current performance and anticipated changes in demand. A framework of changes in transport demand to types of interventions is outlined in Table 1-1. This forms a basis on which interventions are identified in each area.

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Table 1-1: Framework of growth change thresholds vs intervention matrix

GROWTH CHANGE THRESHOLDS			
	LOW LEVEL	MEDIUM LEVEL	HIGH LEVEL
Vehicle volume (AADT) - increased	0 – 500	500 – 1,000	>1,000
Active modes (cyclists and pedestrian) volume - increased	0 – 50 people/ day	50 -100 people/day	>100 people/day
INTERVENTION MATRIX OPTIONS			
Midblock	• Footpath widening	• Kerb buildouts & pedestrian refuge islands • Speed calming device	• Raised crossing e.g. zebra crossing • Speed calming device
Intersection	• Kerb crossing / pram ramp & tactile pavers (where not existing)	• Threshold treatment e.g. flush treatment • Upgrade priority control e.g. where existing uncontrolled	• Threshold treatment e.g. raised pedestrian crossing

The final step is a stocktake of the existing network and identification of necessary interventions and investment to respond to the future safety risk based on estimated changes in the levels of future travel demand.

The network response for each area is included in Attachment A.

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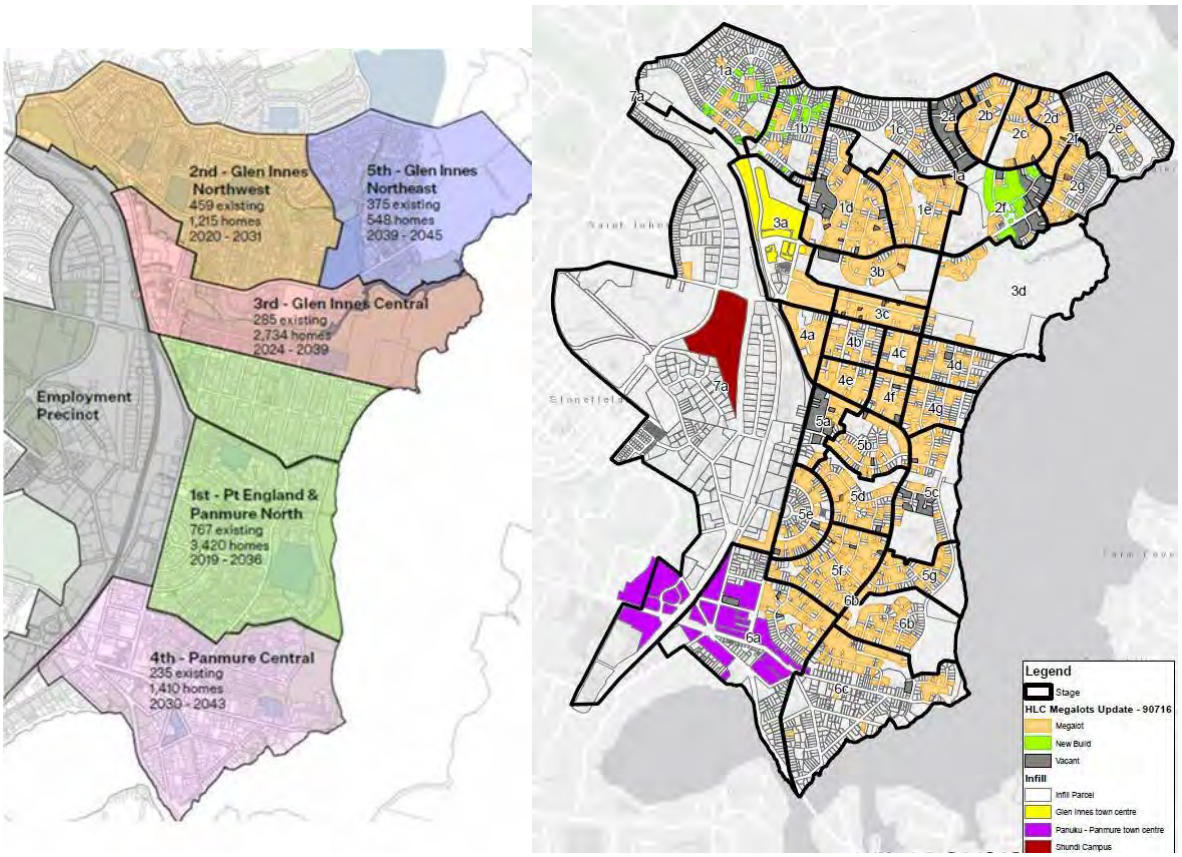
2 TAMAKI PRECINCT

Figure 2-1 sets out the Tamaki AHP area broken down into neighbourhoods which Kainga Ora (KO) have identified. The Tamaki precinct includes Tamaki Regeneration Company (TRC) land holdings and developments. Reference to KO land includes both KO and TRC land.

Figure 2-1: Auckland Housing Programme Boundary and Kainga Ora Land Holdings



The funding area for developer contributions varies slightly from the AHP area due to the fact MSM zones / Census area units do not line up with the AHP boundary. In the Tamaki area, some additional area is included in the study area to reflect the balance of several MSM zones and some small portions of land within the AHP are excluded. Figure 2-2 shows the MSM zones in the AHP area (pink), MSM area included in the study area but outside the AHP (purple colour) and land within the AHP but excluded (peach colour).

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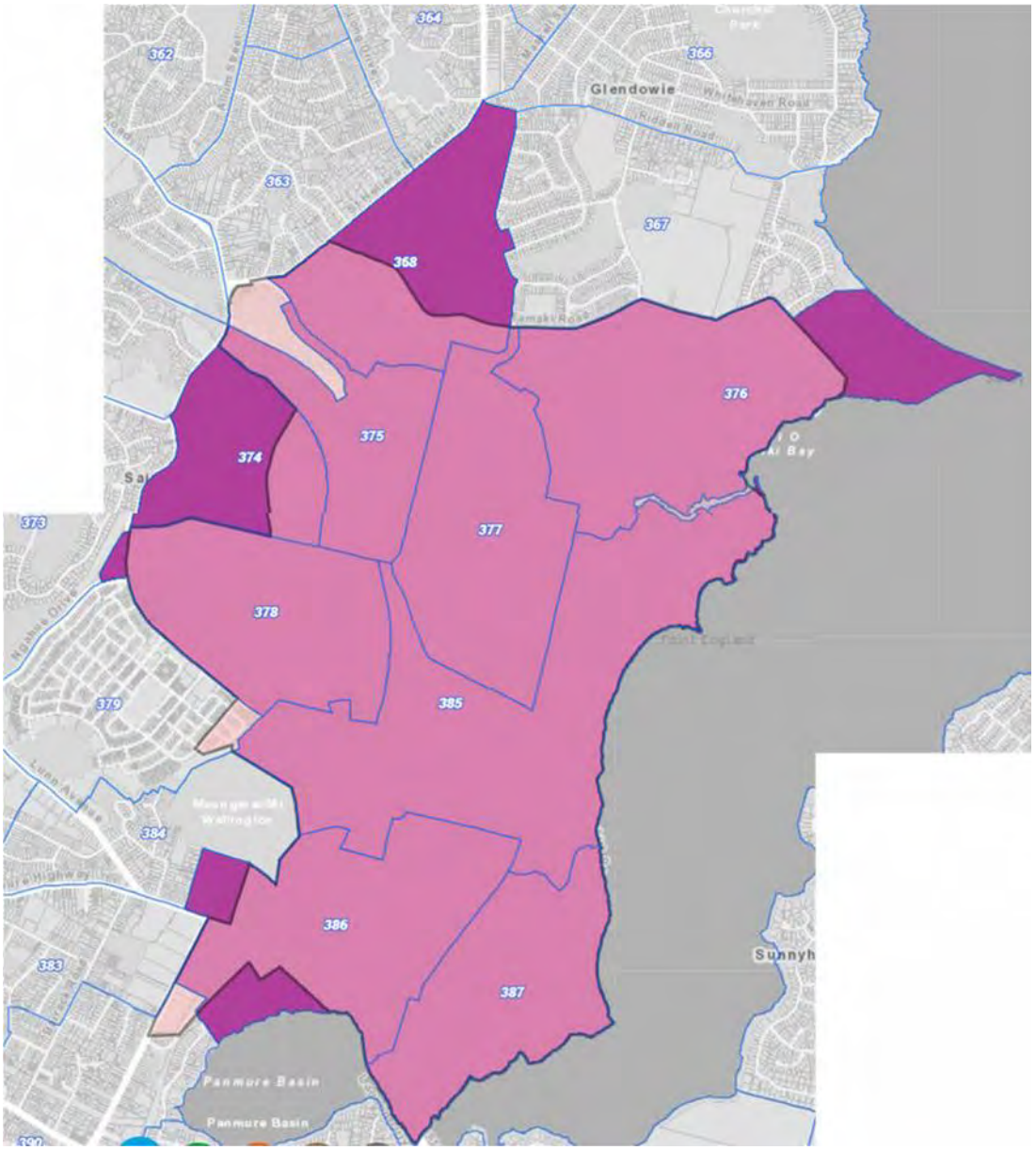
Figure 2-2: AHP Neighbourhoods vs MSM Zones



The Tamaki AHP area has a mix of land use including a concentration of higher density residential zoning around the Glen Innes Centre, industrial land to the west of the rail corridor and higher density residential development around Panmure as outlined in Figure 2-3.

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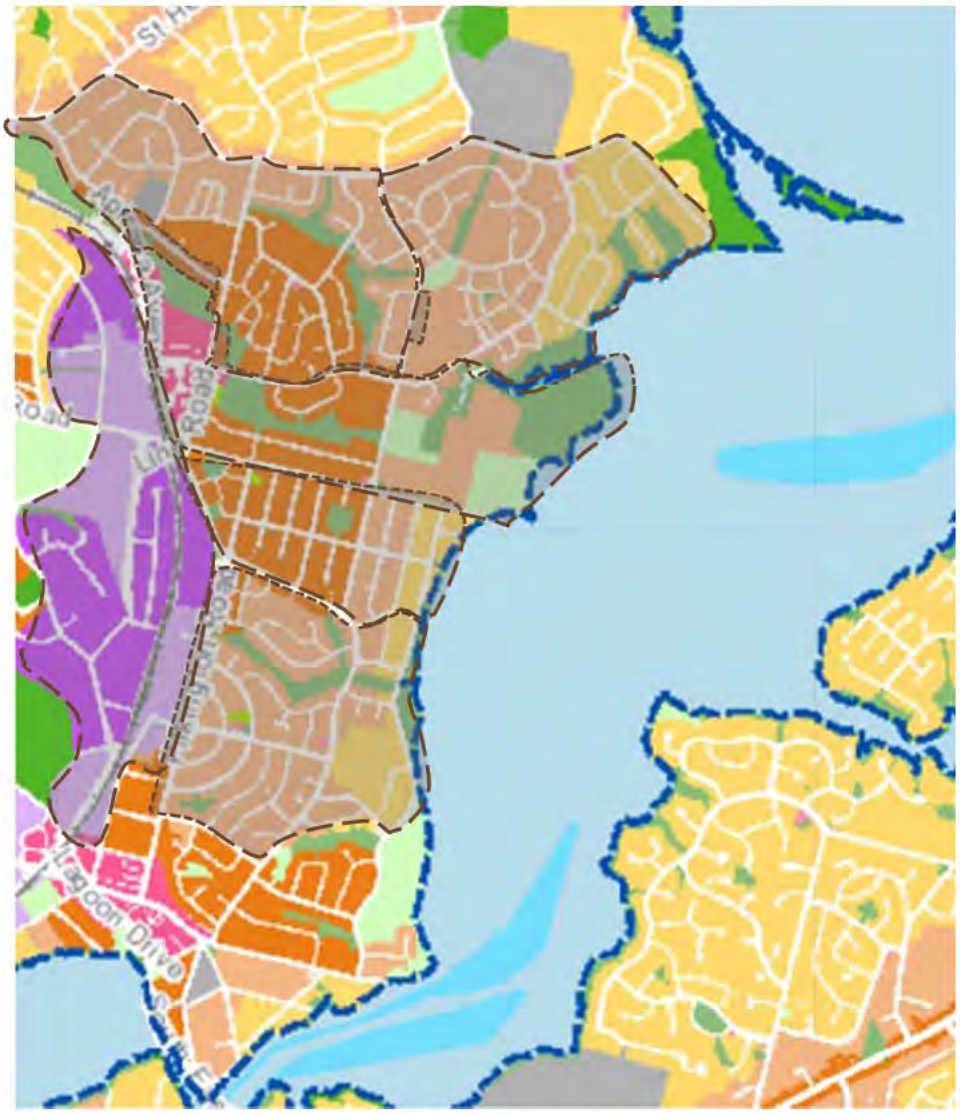
Figure 2-3: Auckland Unitary Plan Zoning



The potential for change has been considered for each zone through consideration of the existing household numbers, and anticipated growth in each zone. In terms of future forecasts, both the AGS scenario and the Modified AGS test (As described in the Transport report) have been considered.

For context in each of the areas, rough order changes in trips have been assessed based on the anticipated additional dwellings in each zone and application of an assumed mode spilt[1]. This provides a high-level quantum of additional peak hour car trips, PT passengers and active mode users. This information has been used as context for the identification of local and safety upgrades in each area.

[1] A Future mode split of 60% private vehicle, 20% public transport and 20% active mode has been assumed for this assessment. Private vehicle travel assumes a vehicle occupancy of 1.4.

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Table 2-1 highlights the changes in households by zone according to the AGS and Greenline growth scenarios. Table 2-2 shows rough changes in peak hour trips by mode for each zone.

Table 2-1: Changes in Household numbers in each area

Area	Zone	2024 households	AGS 2052 Households	Modified AGS 2052	AGS change in dwellings	Modified AGS change in dwellings
Tamaki	363	0	0	0	0	0
	368	1684	2062	2452	379	768
	374	1125	1199	1071	75	-54
	375	334	792	708	458	374
	376	1369	3128	2512	1759	1143
	377	1913	4664	5016	2751	3103
	378	161	2417	133	2256	-28
	379	0	0	0	0	0
	385	1200	2671	2507	1472	1307
	386	1561	2537	2634	977	1073
	387	1177	2154	2571	977	1394
	390	0	0	0	0	0

There is a big discrepancy in the MSM zone 378 between the AGS and Modified AGS scenario. This comes about as the zone is largely not zoned currently for residential development therefore the methodology used in the Modified AGS scenario does not identify development potential. The AGS scenario recognises the Shundi Development capacity. This context was considered in assessing the local and safety improvements in this area.

Table 2-2: Changes in rough order trips based on changes in dwellings for AGS scenario

Area	Zone	Estimated change in daily trips	Estimated change in Peak hour trips	AGS Rough order additional Car trips (assumed 60% of future trips)	AGS Rough order additional PT trips (assumed 20% of future trips)	AGS Rough order additional active mode trips (Assumed 20% of future trips)
Tamaki	363	0	0	0	0	0
	368	4167	379	162	76	76
	374	821	75	32	15	15
	375	5034	458	196	92	92
	376	19349	1759	754	352	352
	377	30261	2751	1179	550	550
	378	24818	2256	967	451	451
	379	0	0	0	0	0
	385	16187	1472	631	294	294

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	386	10742	977	419	195	195
	387	10752	977	419	195	195
	390	0	0	0	0	0

2.1 GLEN INNES NORTHWEST

2.1.1 CONTEXT

Tamaki Regeneration Company (TRC) has a significant land holding in the Glen Innes Northwest area. The Glen Innes NW area is predominantly zoned as mixed housing suburban and Mixed housing urban. The majority of TRC land holdings are located in the eastern portion of the study area.

Figure 2-4: Neighbourhood Boundary and Study Area

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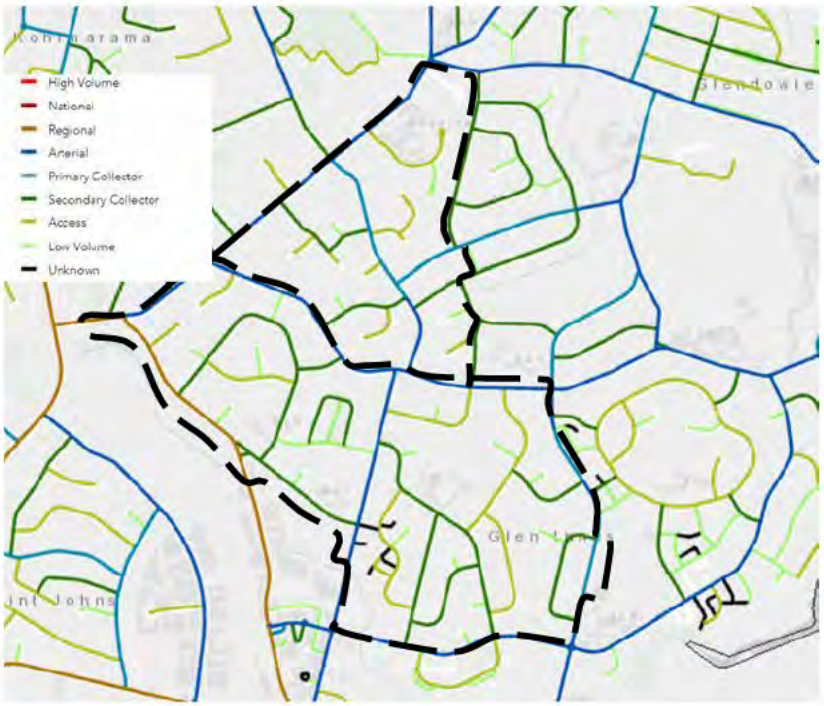
Figure 2-5: One Network Road Classification (Top Left)



2.1.2 POTENTIAL FOR GROWTH

The MSM model forecasts the expected change in dwellings is outlined in Table 2-1 and Table 2-2 above. Within this neighbourhood, the applicable zones are 368, 375 and 377.

2.1.3 SAFETY PERFORMANCE OF THE AREA

The safety performance of the existing network has been assessed using the NZTA Megamaps data base which obtains crash information from the CAS database and provides collective risk maps[2], maps of fatal and serious injuries and an assessment of high-risk intersections[3].

[2] Collective risk as defined by Kiwirap: Crash density on a road
[3] High risk intersections as defined by the NZTA High risk intersections guide 2013.

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Figure 2-6: Collective Safety Risk for the Area (Source NZTA MegaMaps)

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Figure 2-7: Fatal and Serious Crashes (NZTA Open Data Platform)

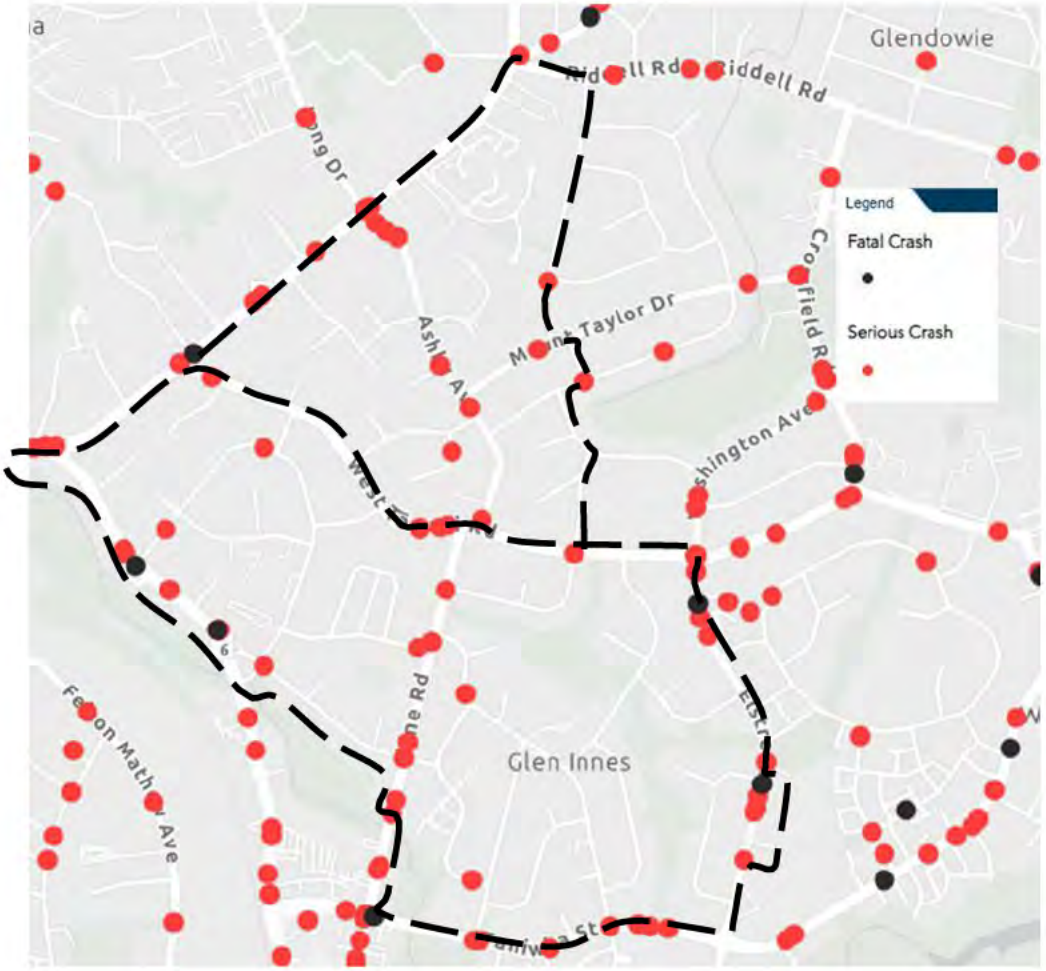

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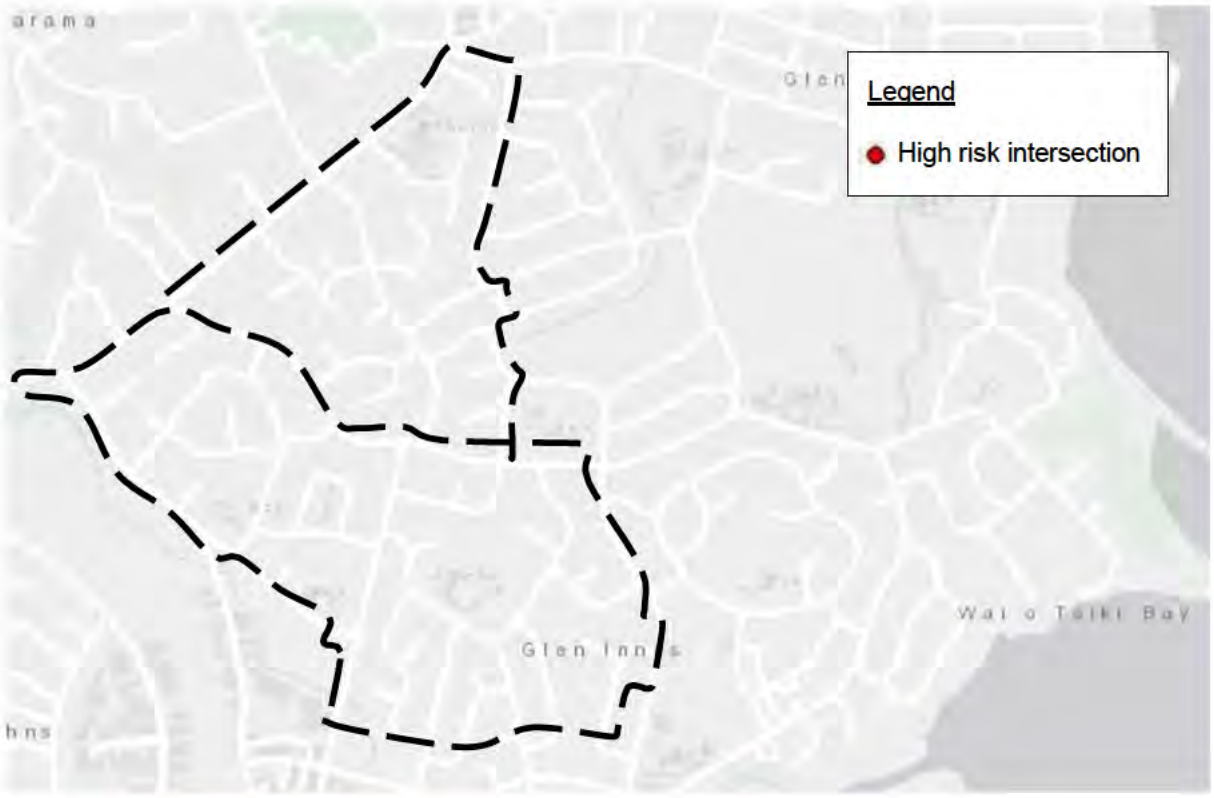
Figure 2-8: High Risk Intersections (NZTA MegaMaps)



2.1.4 CHANGE IN SAFETY RISK

An assessment of changes in safety risk considers the expected changes in demand as set out in Table 2-1 and Table 2-2 along with the existing demands on roads in the area and framework set out in Table 1-1. In addition to this information consideration has been given to ATs Future Connect walking deficiency assessment and safety assessment for the first decade to identify safety concerns.

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Figure 2-9: Walking Deficiencies for First Decade (Source Future Connect)

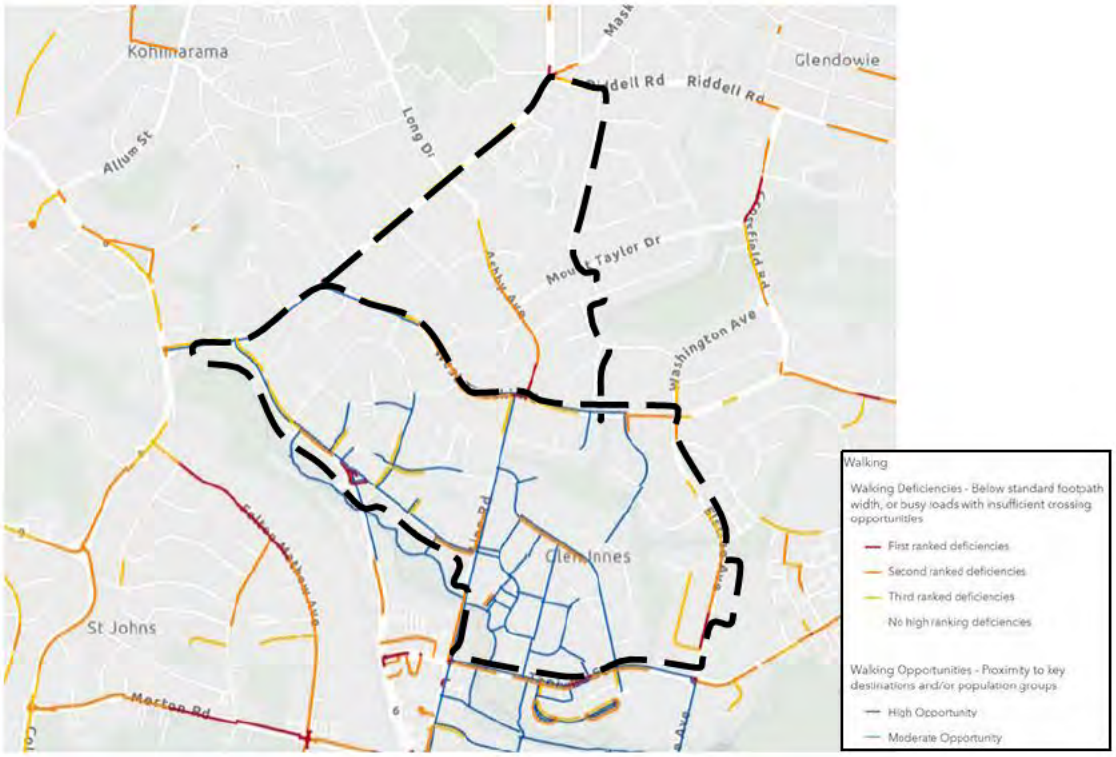
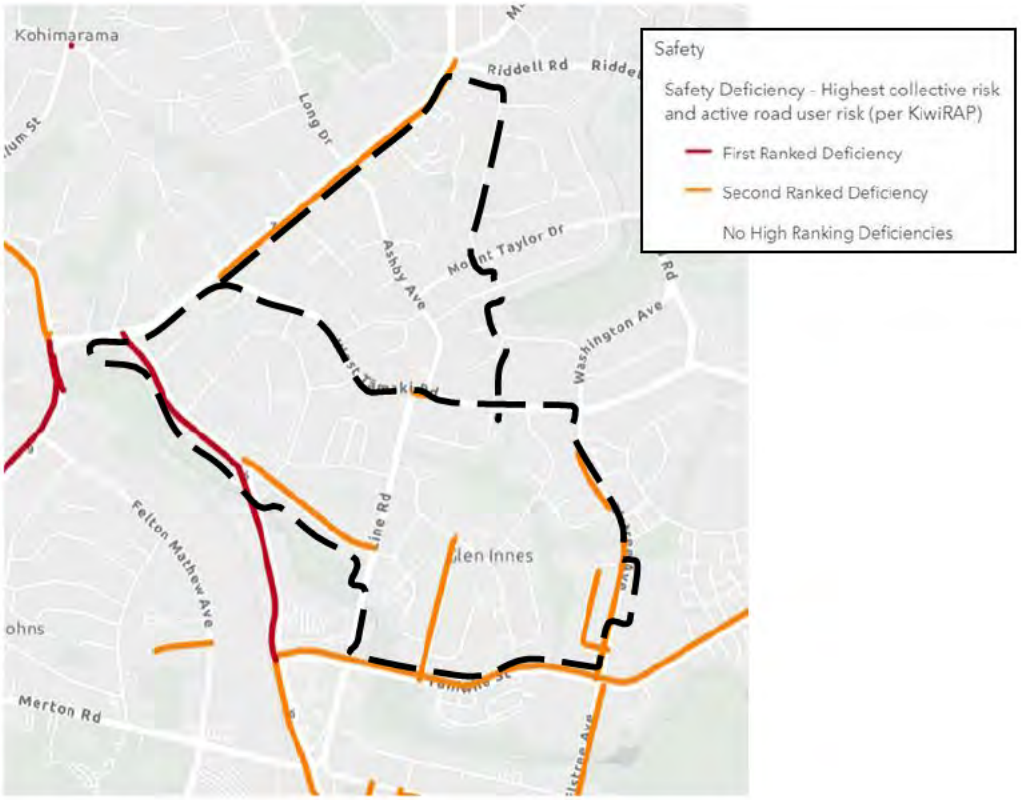


Figure 2-10: Safety Assessment – First Decade (Source Future Connect)



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2.2 GLEN INNES NORTHEAST

2.2.1 CONTEXT

Kainga Ora has a significant land holding in the Glen Innes Northeast area with almost all of the land lying within either the 'Residential – mixed housing urban zone or the 'Residential – Mixed Housing Suburban' zone. Kainga Ora land holdings are predominantly in the western portion of this area.

Figure 2-11: Neighbourhood Boundary and Study Area

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Figure 2-12: One Network Road Classification

2.2.2 POTENTIAL FOR GROWTH

The MSM model forecasts the expected change in dwellings is outlined in Table 2-1 and Table 2-2 above. Within this neighbourhood, the applicable zone is 376.

2.2.3 SAFETY PERFORMANCE OF THE AREA

The safety performance of the existing network has been assessed using the NZTA Megamaps data base which obtains crash information from the CAS database and provides collective risk maps[4], maps of fatal and serious injuries and an assessment of high-risk intersections[5].

[4] Collective risk as defined by Kiwirap: Crash density on a road
[5] High risk intersections as defined by the NZTA High risk intersections guide 2013.

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Figure 2-13: Collective Safety Risk for the Area (Source NZTA MegaMaps)

Figure 2-14: Fatal and Serious Crashes (NZTA Open Data Platform)

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Figure 2-15: High Risk Intersections (NZTA MegaMaps)

2.2.4 CHANGE IN SAFETY RISK

An assessment of changes in safety risk considers the expected changes in demand as set out in Table 2-1 and Table 2-2 along with the existing demands on roads in the area and framework set out in Table 1-1. In addition to this information consideration has been given to ATs Future Connect walking deficiency assessment and safety assessment for the first decade to identify safety concerns.

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Figure 2-16: Walking Deficiencies for First Decade (Source Future Connect)

Figure 2-17: Safety Assessment – First Decade (Source Future Connect)

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2.3 GLEN INNES CENTRAL

2.3.1 CONTEXT

Kainga Ora has a relatively low land holding in the Glen Innes Central area. Approximately half the land in this area is in the 'Open Space – Informal Recreation' zone and the 'Open Space – Sport and Active Recreation' zone. The other half is mainly in the 'Residential – Terraced Housing and Apartment Building' zone with some part of the land to the northeast in the 'Business – Town Centre' zone. Kainga Ora owns a high proportion of the residential land.

Figure 2-18: Neighbourhood Boundary and Study Area

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Figure 2-19: One Network Road Classification

2.3.2 POTENTIAL FOR GROWTH

The MSM model forecasts the expected change in dwellings is outlined in Table 2-1 and Table 2-2 above. Within this neighbourhood, the applicable zones are 375 and 377.

2.3.3 SAFETY PERFORMANCE OF THE AREA

The safety performance of the existing network has been assessed using the NZTA Megamaps data base which obtains crash information from the CAS database and provides collective risk maps[6], maps of fatal and serious injuries and an assessment of high-risk intersections[7].

[6] Collective risk as defined by Kiwirap: Crash density on a road
[7] High risk intersections as defined by the NZTA High risk intersections guide 2013.

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Figure 2-20: Collective Safety Risk for the Area (Source NZTA MegaMaps)

Figure 2-21: Fatal and Serious Crashes (NZTA Open Data Platform)

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Figure 2-22: High Risk Intersections (NZTA MegaMaps)

2.3.4 CHANGE IN SAFETY RISK

An assessment of changes in safety risk considers the expected changes in demand as set out in Table 2-1 and Table 2-2 along with the existing demands on roads in the area and framework set out in Table 1-1. In addition to this information consideration has been given to ATs Future Connect walking deficiency assessment and safety assessment for the first decade to identify safety concerns.

Figure 2-23: Walking Deficiencies for First Decade (Source Future Connect)

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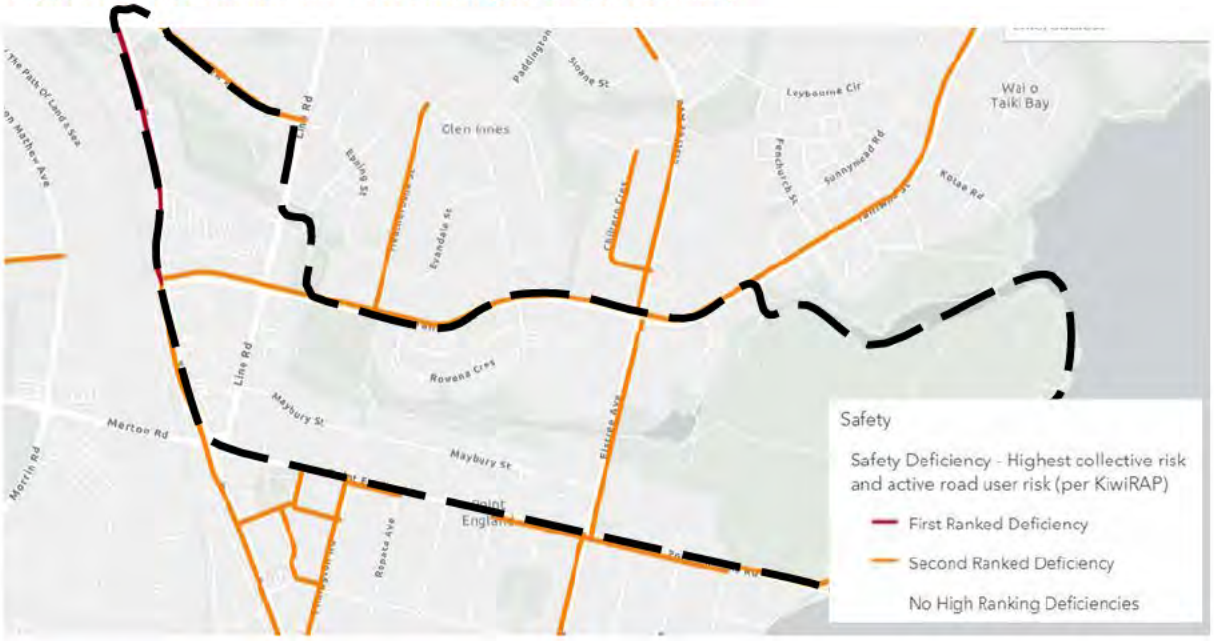
Figure 2-24: Safety Assessment – First Decade (Source Future Connect)



2.4 EMPLOYMENT PRECINCT

Kainga Ora has a relatively low land holding in the employment precinct. The land is predominantly zoned as light industry or business mixed use hence allows for a range of employment activities with some capacity for residential development in the mixed use area.

2.4.1 CONTEXT

Figure 2-25: Neighbourhood Boundary and Study Area

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Figure 2-26: One Network Road Classification

2.4.2 POTENTIAL FOR GROWTH

The MSM model forecasts the expected change in dwellings is outlined in Table 2-1 and Table 2-2 above. Within this neighbourhood, the applicable zones are 374, 378, 379 and 385.

2.4.3 SAFETY PERFORMANCE OF THE AREA

The safety performance of the existing network has been assessed using the NZTA Megamaps data base which obtains crash information from the CAS database and provides collective risk maps[8], maps of fatal and serious injuries and an assessment of high-risk intersections[9].

[8] Collective risk as defined by Kiwirap: Crash density on a road
[9] High risk intersections as defined by the NZTA High risk intersections guide 2013.

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Figure 2-27: Collective Safety Risk for the Area (Source NZTA MegaMaps)

Figure 2-28: Fatal and Serious Crashes (NZTA Open Data Platform)

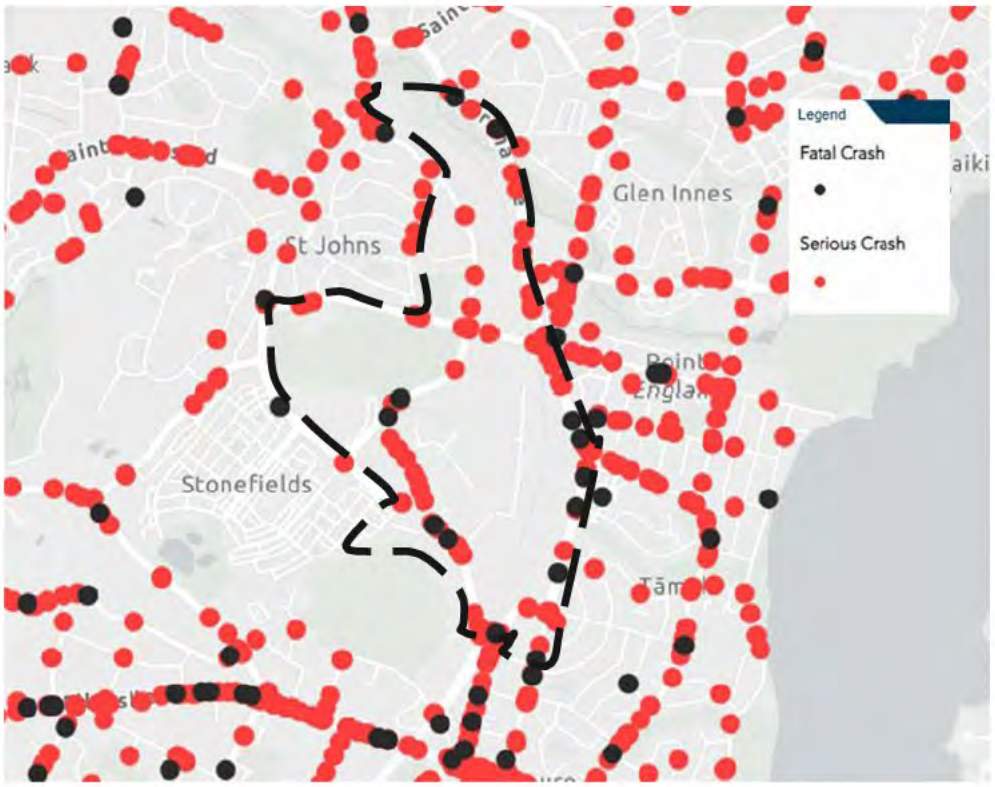

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Figure 2-29: High Risk Intersections (NZTA MegaMaps)

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2.4.4 CHANGE IN SAFETY RISK

An assessment of changes in safety risk considers the expected changes in demand as set out in Table 2-1 and Table 2-2 along with the existing demands on roads in the area and framework set out in Table 1-1. In addition to this information consideration has been given to ATs Future Connect walking deficiency assessment and safety assessment for the first decade to identify safety concerns.

Figure 2-30: Walking Deficiencies for First Decade (Source Future Connect)

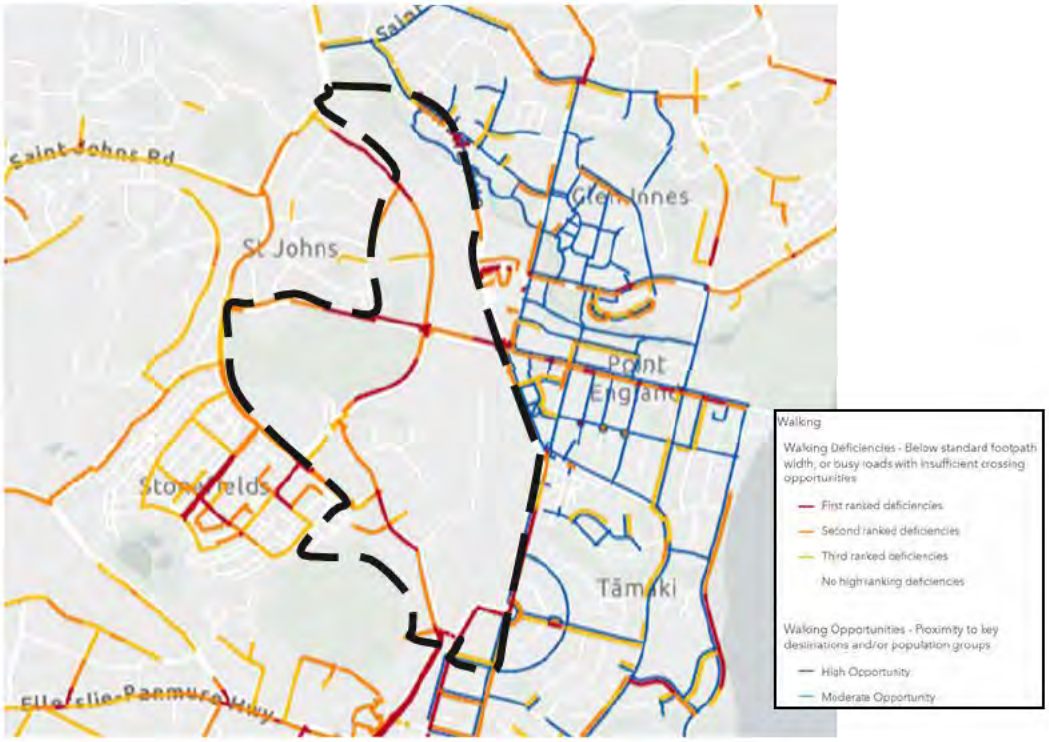

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Figure 2-31: Safety Assessment – First Decade (Source Future Connect)

2.5 POINT ENGLAND AND PANMURE NORTH

2.5.1 CONTEXT

Kainga Ora has a high land holding in the Point England and Panmure North areas. Most of the land is located within the 'Residential – Mixed Housing Urban' zone, with the remaining land being located in either the 'Residential – Mixed Housing Suburban' zone or the 'Residential – Terraced Housing and Apartment Building' zone.

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Figure 2-32: Neighbourhood Boundary and Study Area

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Figure 2-33: One Network Road Classification

2.5.2 POTENTIAL FOR GROWTH

The MSM model forecasts the expected change in dwellings is outlined in Table 2-1 and Table 2-2above. Within this neighbourhood, the applicable zone is 385.

2.5.3 SAFETY PERFORMANCE OF THE AREA

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The safety performance of the existing network has been assessed using the NZTA Megamaps data base which obtains crash information from the CAS database and provides collective risk maps[10], maps of fatal and serious injuries and an assessment of high-risk intersections[11].

Figure 2-34: Collective **Safety Risk for the Area (Source NZTA MegaMaps)**

[10] Collective risk as defined by Kiwirap: Crash density on a road
[11] High risk intersections as defined by the NZTA High risk intersections guide 2013.

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Figure 2-35: Fatal and Serious Crashes (NZTA Open Data Platform)

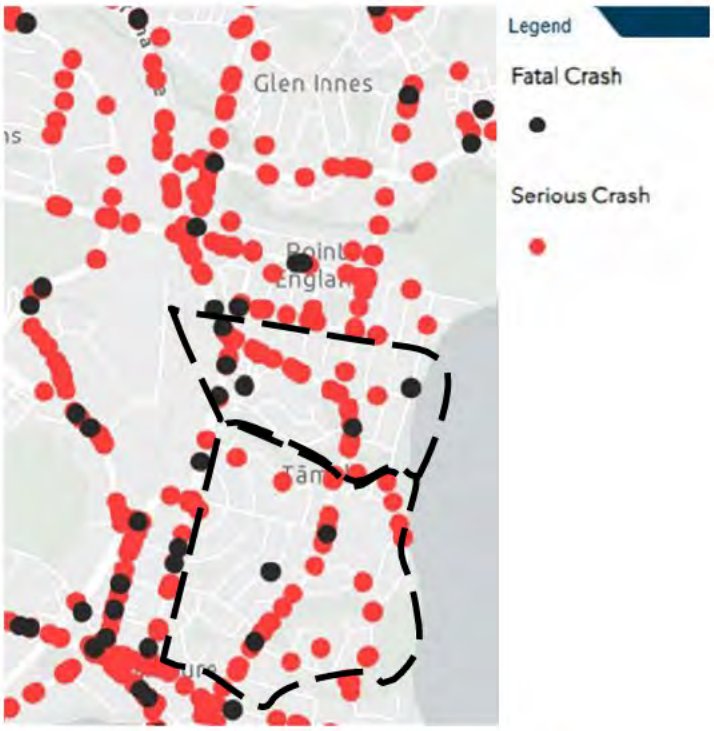

Figure 2-36: High Risk Intersections (NZTA MegaMaps)

2.5.4 CHANGE IN SAFETY RISK

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An assessment of changes in safety risk considers the expected changes in demand as set out in Table 2-1 and Table 2-2 along with the existing demands on roads in the area and framework set out in Table 1-1. In addition to this information consideration has been given to ATs Future Connect walking deficiency assessment and safety assessment for the first decade to identify safety concerns.

Figure 2-37: Walking Deficiencies for First Decade (Source Future Connect)

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Figure 2-38: Safety Assessment – First Decade (Source Future Connect)

2.6 PANMURE CENTRAL

2.6.1 CONTEXT

Kainga Ora has a relatively low land holding in the Panmure Central area. There are a number of zones in this area. Majority of the land is in the 'Residential – Terraced Housing and Apartment Building' zone, with some land to the west being in the 'Open Space – Sport and Active Recreation' zone and some land to the east being in the 'Business – Mixed Use' zone and 'Business – Town Centre' zone. Some of the land is also in the 'Residential – Mixed Housing Suburban' zone and the 'Residential – Single House' zone.

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Figure 2-39: Neighbourhood Boundary and Study Area

Figure 2-40: One Network Road Classification

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2.6.2 POTENTIAL FOR GROWTH

The MSM model forecasts the expected change in dwellings is outlined in Table 2-1 and Table 2-2 above. Within this neighbourhood, the applicable zones are 386 and 387.

2.6.3 SAFETY PERFORMANCE OF THE AREA

The safety performance of the existing network has been assessed using the NZTA Megamaps data base which obtains crash information from the CAS database and provides collective risk maps[12], maps of fatal and serious injuries and an assessment of high-risk intersections[13].

Figure 2-41: Collective Safety Risk for the Area (Source NZTA MegaMaps)

[12] Collective risk as defined by Kiwirap: Crash density on a road
[13] High risk intersections as defined by the NZTA High risk intersections guide 2013.

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Figure 2-42: Fatal and Serious Crashes (NZTA Open Data Platform)

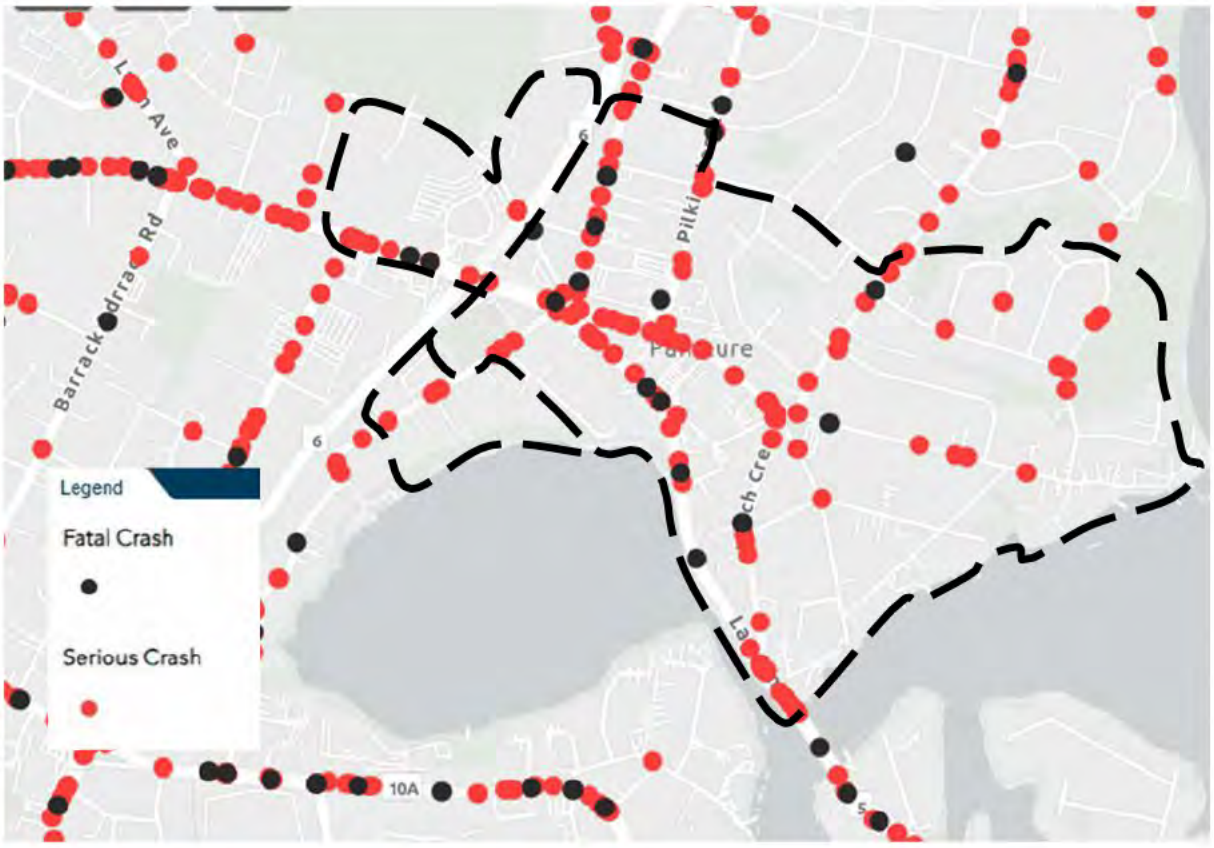

Figure 2-43: High Risk Intersections (NZTA MegaMaps)

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2.6.4 CHANGE IN SAFETY RISK

An assessment of changes in safety risk considers the expected changes in demand as set out in Table 2-1 and Table 2-2 along with the existing demands on roads in the area and framework set out in Table 1-1. In addition to this information consideration has been given to ATs Future Connect walking deficiency assessment and safety assessment for the first decade to identify safety concerns.

Figure 2-44: Walking Deficiencies for First Decade (Source Future Connect)

Figure 2-45: Safety Assessment – First Decade (Source Future Connect)

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ATTACHMENT A: NETWORK RESPONSE IN EACH AREA

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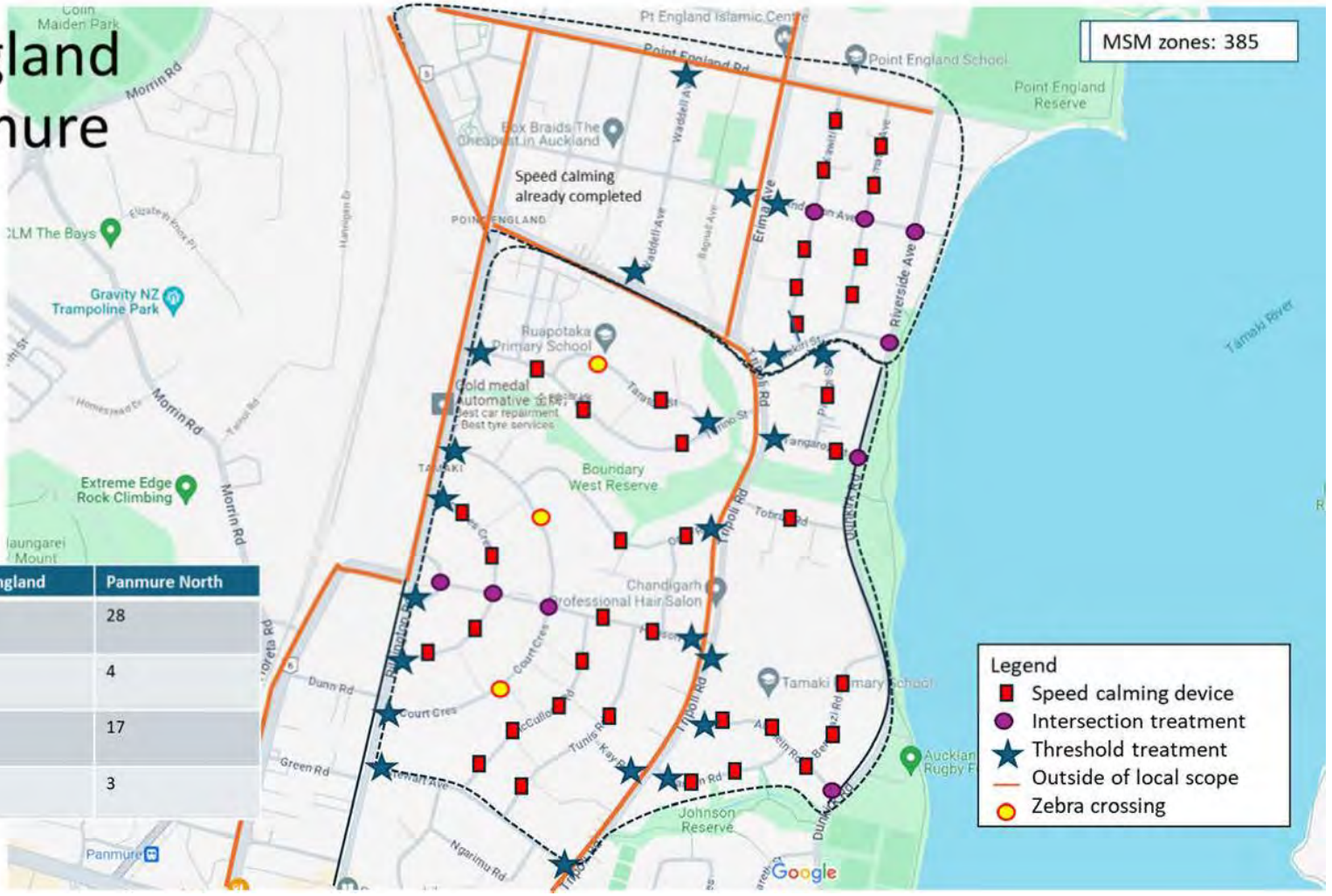
Point England and Panmure North

Item	Point England	Panmure North
Speed calming devices	9	28
Intersection treatments	5	4
Threshold treatments	5	17
Zebra crossing	0	3



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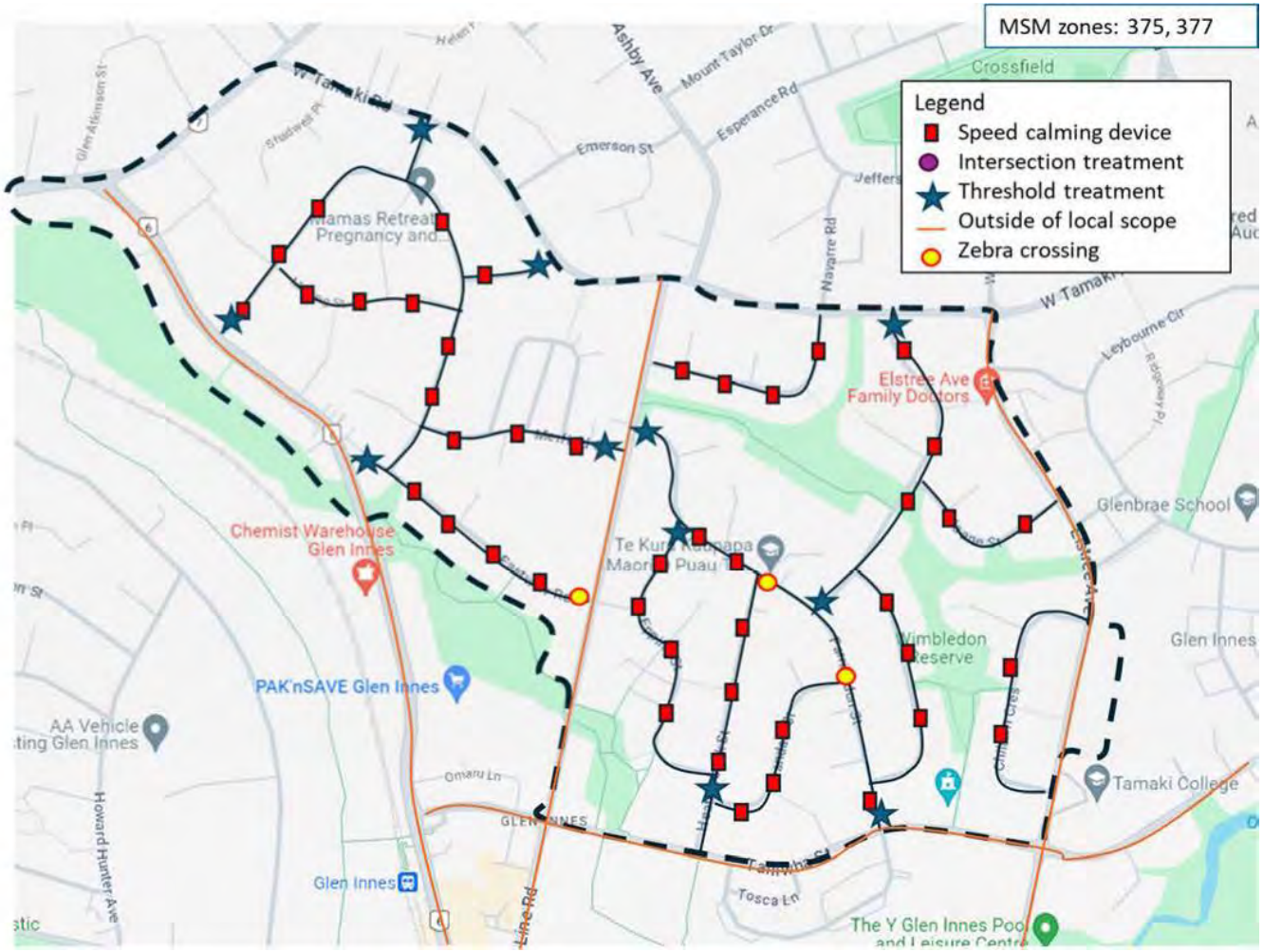
Glen Innes Northwest

Item	Glen Innes NW
Speed calming devices	44
Intersection treatments	0
Thresholds	12
Zebra crossing	3



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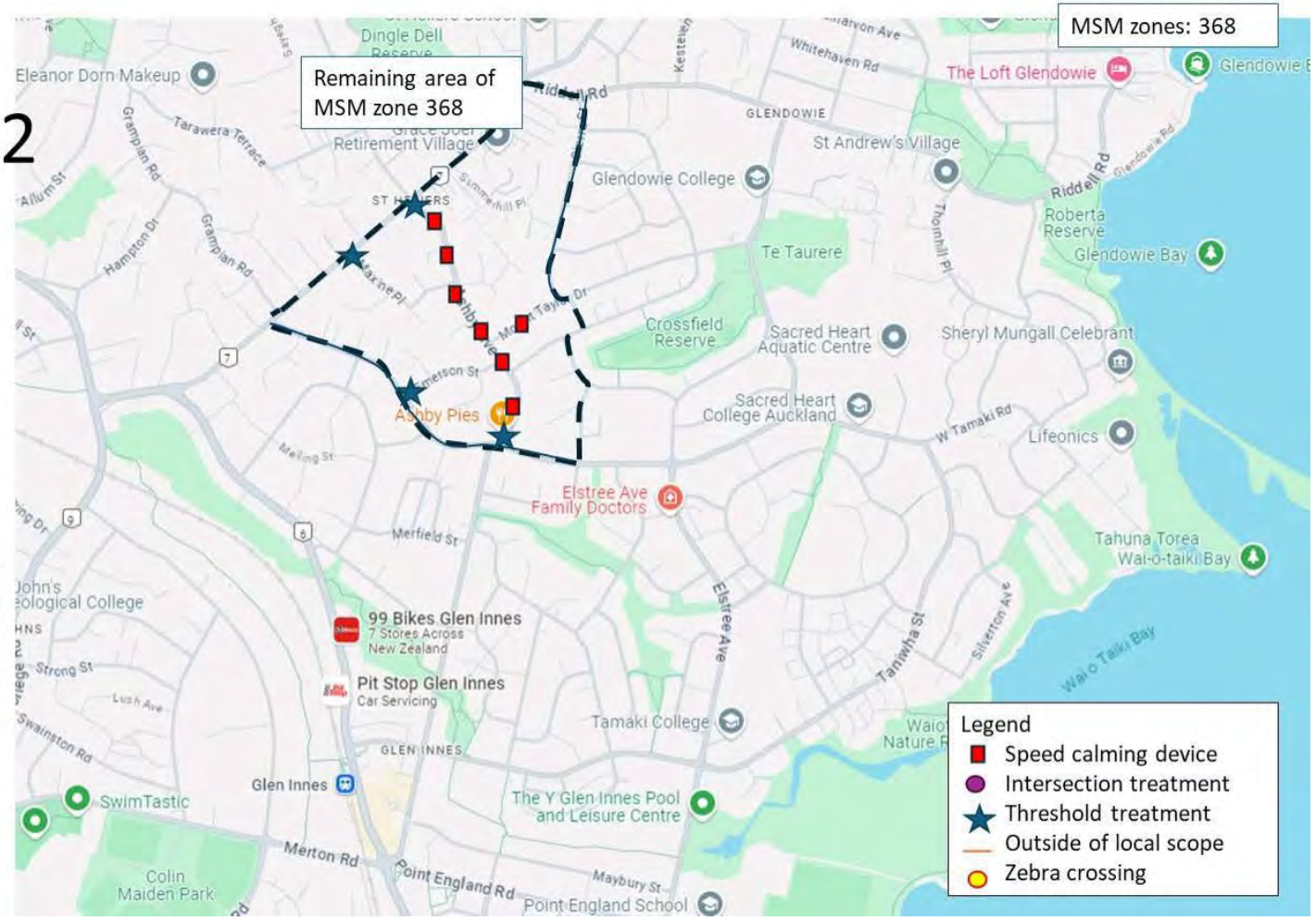
Glen Innes Northwest 2

Item	Glen Innes NW 2
Speed calming devices	7
Intersection treatments	0
Thresholds	4
Zebra crossings	0



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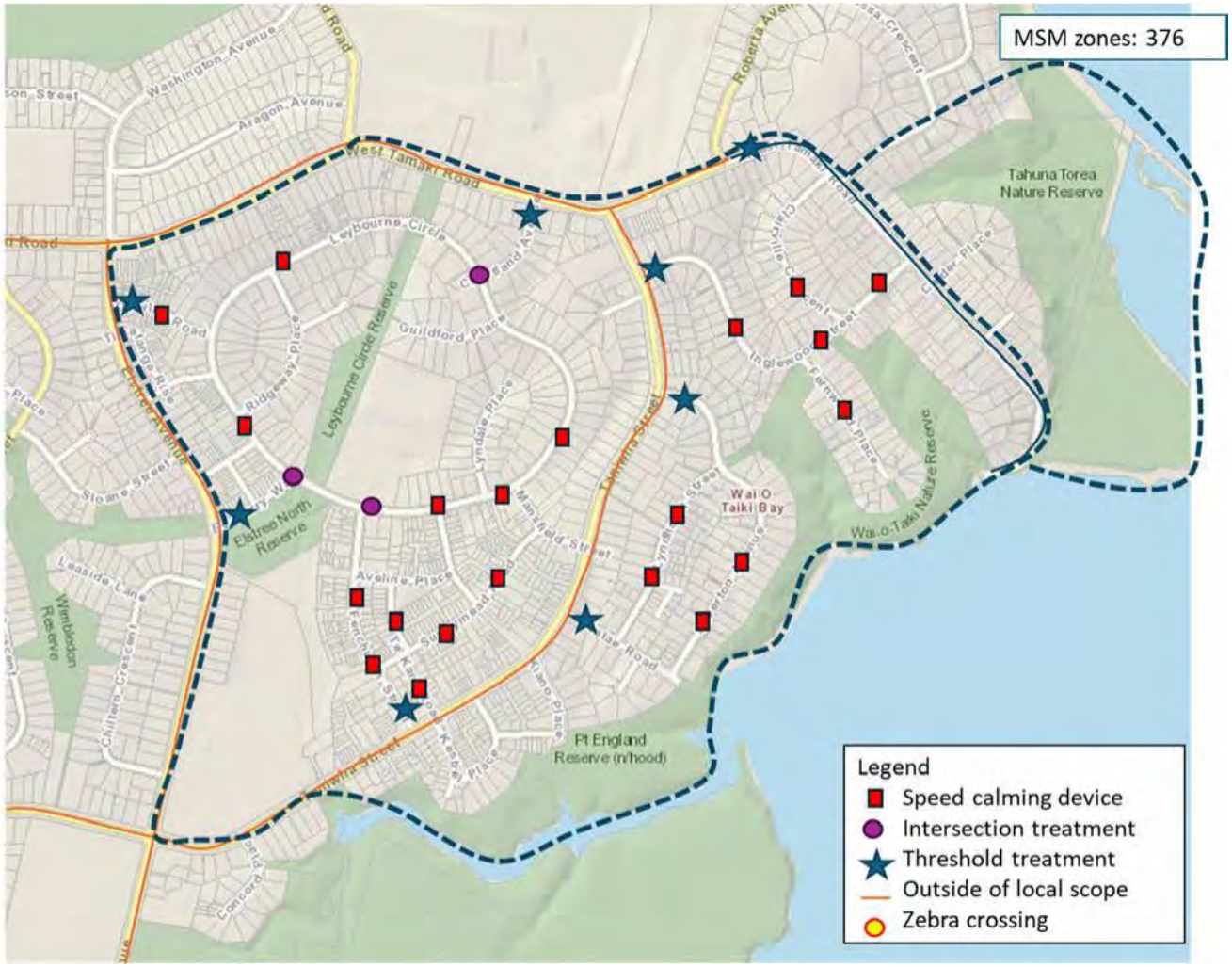
Glen Innes Northeast

Item	Glen Innes NE
Speed calming devices	21
Intersection treatments	3
Threshold treatments	8
Zebra crossing	0



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Glen Innes Central

MSM zones: 377,375

Item	Glen Innes Central
Speed calming devices	2
Intersection treatments	0
Threshold treatments	5

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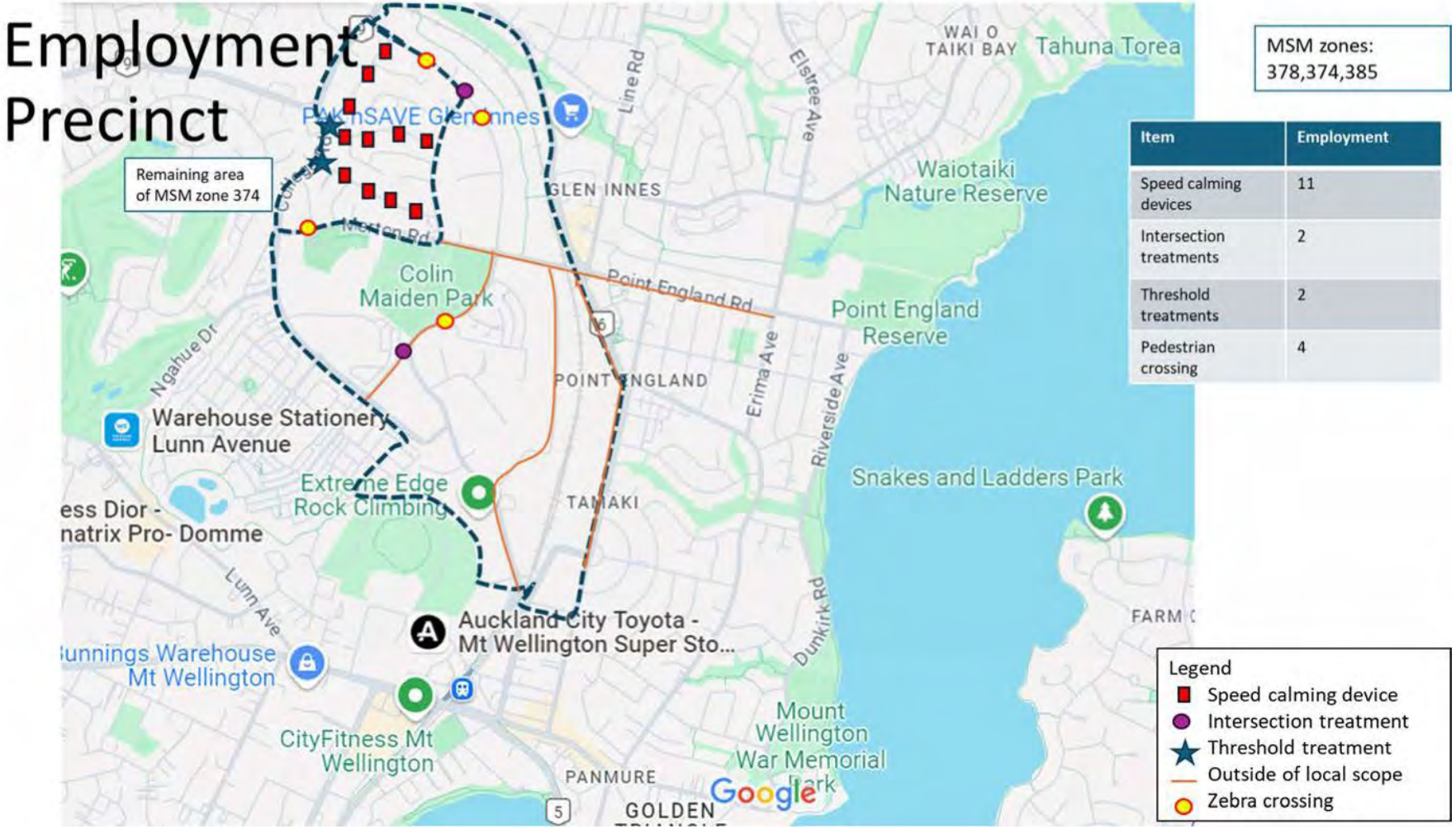
Employment Precinct



MSM zones: 378,374,385

Item	Employment
Speed calming devices	11
Intersection treatments	2
Threshold treatments	2
Pedestrian crossing	4

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MT ROSKILL - SAFETY AND LOCAL IMPROVEMENTS BY NEIGHBOURHOOD

Date: 13/06/2024 Version: 1.1

This memo outlines an approach to the assessment of local areas for local upgrades and road safety interventions as a response to brownfields intensification.

1 METHODOLOGY USED

The methodology used for this assessment follows the following steps:

The area context includes gathering of information including road network typology, zoning, and public land holdings. The potential for growth is identified through consideration of KO growth in the zone, anticipated changes in the MSM model and consideration of a full build out scenario. The growth is then considered in the context of changes in travel demand extended over time. This takes into account future changes in mode share in the future.

The underlying intention of this approach is to account for the additional population (and associated travel) and recognise that with these additional future demands, there will be an increase in the expected exposure to transport safety risks compared to the current situation.

The safety performance of the network looks at historic data in each area against national averages and highlights parts of the network which have higher safety risk. The Future Connect database includes a layer highlighting priority safety deficiencies in the transport network for the next 10 years. This is considered along with crash data. The Future Connect database also highlights deficiencies in the walking network.

A professional assessment is made on the network given the current performance and anticipated changes in demand. A framework of changes in transport demand to types of interventions is outlined in Table 1-1. This forms a basis on which interventions are identified in each area.

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Table 1-1: Framework of growth change thresholds vs intervention matrix

GROWTH CHANGE THRESHOLDS			
	LOW LEVEL	MEDIUM LEVEL	HIGH LEVEL
Vehicle volume (AADT) - increased	0 – 500	500 – 1,000	>1,000
Active modes (cyclists and pedestrian) volume - increased	0 – 50 people/ day	50 -100 people/day	>100 people/day
INTERVENTION MATRIX OPTIONS			
Midblock	• Footpath widening	• Kerb buildouts & pedestrian refuge islands • Speed calming device	• Raised crossing e.g. zebra crossing • Speed calming device
Intersection	• Kerb crossing / pram ramp & tactile pavers (where not existing)	• Threshold treatment e.g. flush treatment • Upgrade priority control e.g. where existing uncontrolled	• Threshold treatment e.g. raised pedestrian crossing

The final step is a stocktake of the existing network and identification of necessary interventions and investment to respond to the future safety risk based on estimated changes in the levels of future travel demand.

The network response for each area is included in Attachment A.

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2 MT ROSKILL PRECINCT

The Auckland Housing Programme boundary is outlined below for the Mt Roskill Precinct including grey shapes where land is currently held by Kainga Ora.

Figure 2-1: Auckland Housing Programme Boundary and Kainga Ora Land Holdings

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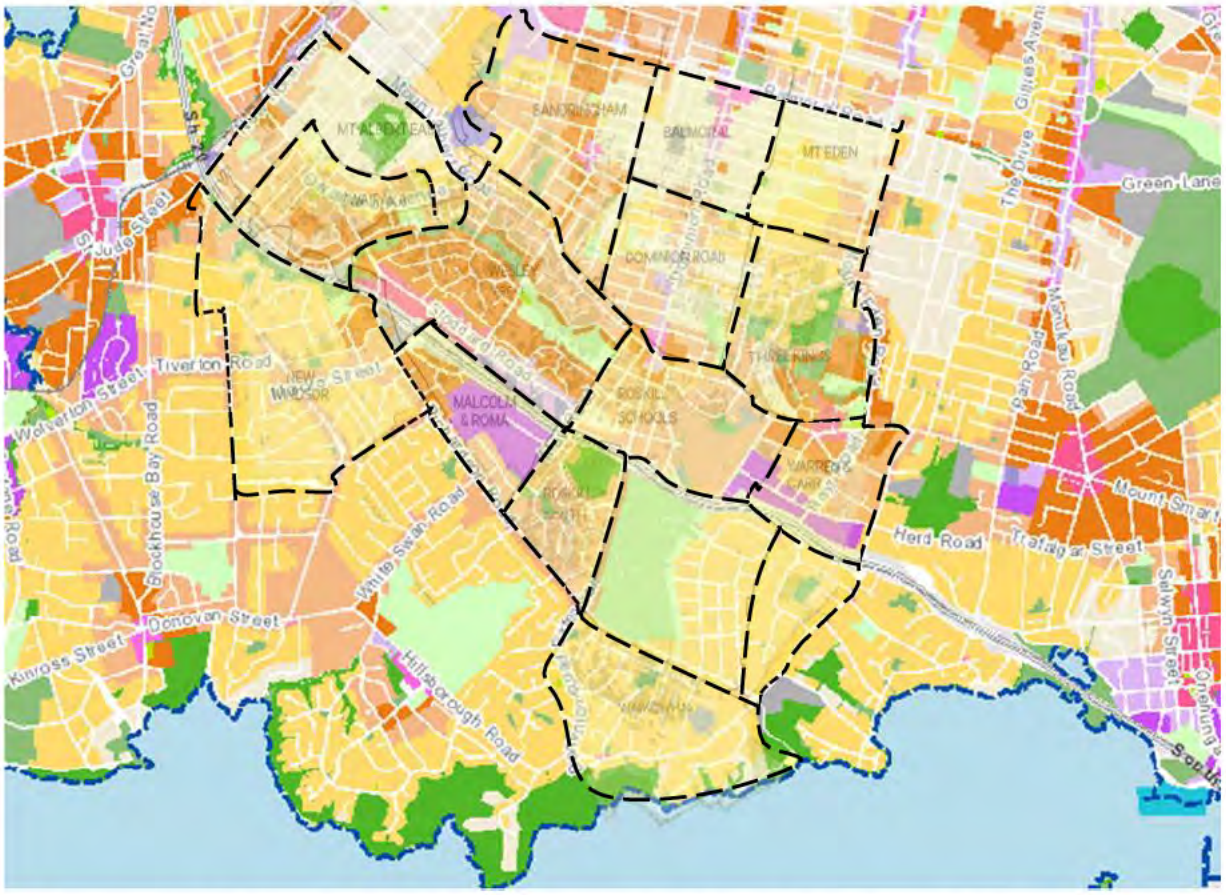
Figure 2-2: Auckland Unitary Plan Zoning



The funding area for developer contributions varies slightly from the AHP area due to the fact MSM zones / Census area units do not line up with the AHP boundary. In the Mt Roskill area, some additional area is included in the study area to reflect the balance of several MSM zones. Figure 2-3 shows the MSM zones in the AHP area (brown colour) and MSM area included in the study area but outside the AHP (Green Colour).

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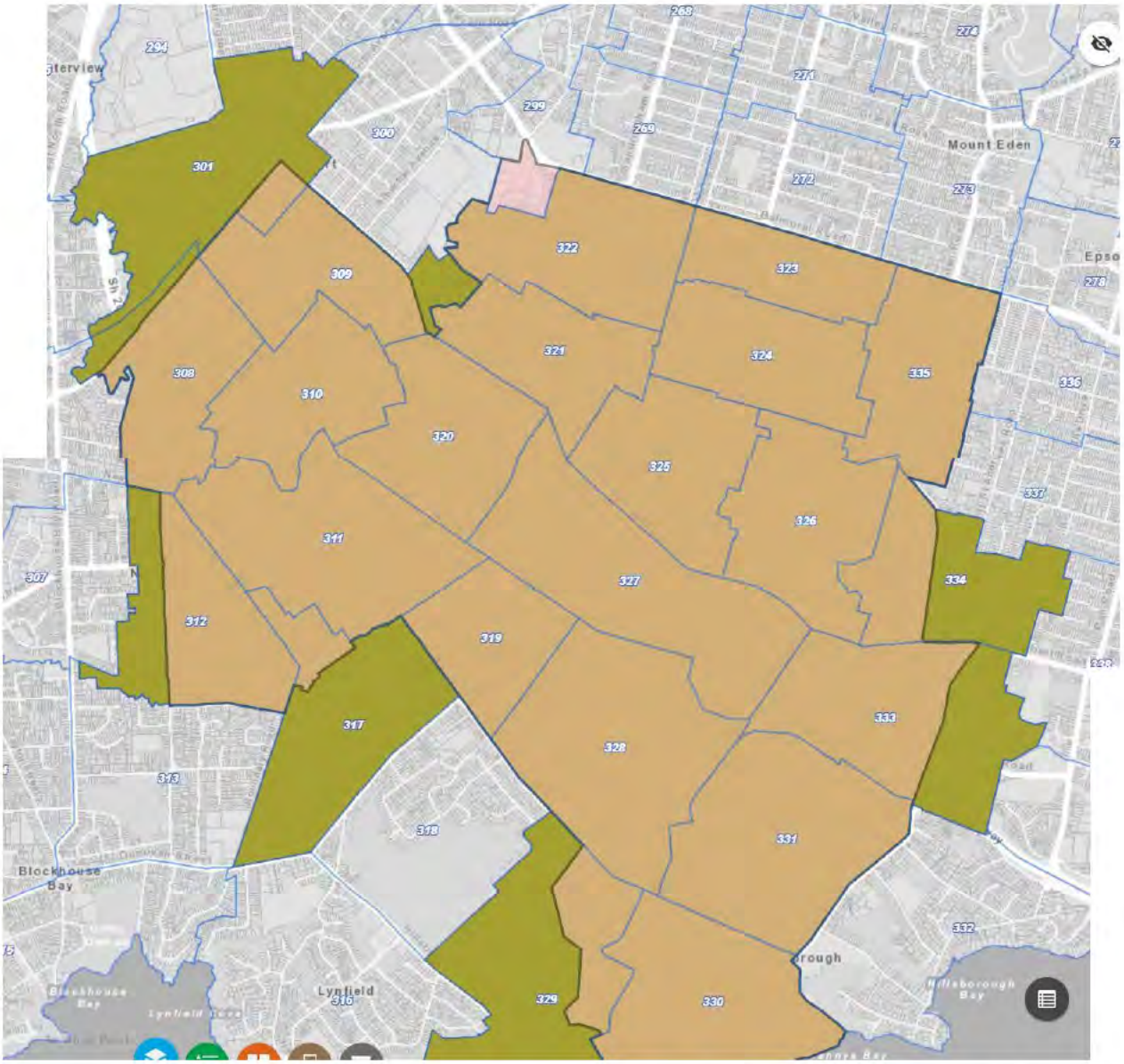
Figure 2-3: AHP Areas Compared with MSM Zones



The potential for change has been considered for each zone through consideration of the existing household numbers, and anticipated growth in each zone. In terms of future forecasts, both the AGS scenario and the green line test (As described in the Transport report) have been considered.

For context in each of the areas, rough order changes in trips have been assessed based on the anticipated additional dwellings in each zone and application of an assumed mode spilt[1]. This provides a high-level quantum of additional peak hour car trips, PT passengers and active mode users. This information has been used as context for the identification of local and safety upgrades in each area.

[1] A Future mode split of 60% private vehicle, 20% public transport and 20% active mode has been assumed for this assessment. Private vehicle travel assumes a vehicle occupancy of 1.4.

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Table 2-1 highlights the changes in households by zone according to the AGS and Greenline growth scenarios. Within selected zones (i.e. 323 and 324) the Modified AGS scenario shows a reduction in household numbers compared to the 2024 household numbers. This comes as a result of the methodology used for the Modified AGS scenario. In these zones, the AGS scenarios appear to provide a reasonable level of growth. This context was considered in assessing the local and safety improvements in this area.

Table 2-2 shows rough changes in peak hour trips by mode for each zone.

Table 2-1: Changes in Household numbers in each area

Area	Zone	2024 households	AGS 2052 Households	Modified AGS 2052	AGS change in dwellings	Modified AGS change in dwellings
Mt Roskill	299	0	0	0	0	0
	301	1568	1963	2776	395	1208
	308	1098	1562	2008	464	910
	309	721	1149	661	428	-59
	310	809	1107	1732	299	923
	311	1252	1385	2476	132	1223
	312	1255	1239	1977	-16	722
	317	1370	1415	2195	44	825
	319	275	547	453	272	177
	320	1183	3293	3071	2109	1888
	321	1117	1317	1706	200	589
	322	1750	1935	2342	186	592
	323	710	963	484	252	-226
	324	1150	1551	1051	400	-100
	325	1263	1906	1437	643	175
	326	1169	1676	1421	507	252
	327	1661	2620	3136	960	1476
	328	916	1660	1332	744	416
	329	1675	2236	2152	561	477
	330	1099	1337	1605	238	506
	331	1768	2236	2151	468	383
	333	1231	1693	2192	461	960
	334	810	2119	1494	1309	683
	335	1147	1566	1275	419	127

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Within selected zones (i.e. 323 and 324) the Modified AGS scenario shows a reduction in household numbers compared to the 2024 household numbers. This comes as a result of the methodology used for the Modified AGS scenario. In these zones, the AGS scenarios appear to provide a reasonable level of growth. This context was considered in assessing the local and safety improvements in this area.

Table 2-2: Changes in rough order trips based on changes in dwellings for AGS scenario

Area	Zone	Estimated change in daily trips	Estimated change in Peak hour trips	AGS Rough order additional Car trips (assumed 60% of future trips)	AGS Rough order additional PT trips (assumed 20% of future trips)	AGS Rough order additional active mode trips (Assumed 20% of future trips)
Mt Roskill	299	0	0	0	0	0
	301	4344	395	169	79	79
	308	5106	464	199	93	93
	309	4710	428	183	86	86
	310	3288	299	128	60	60
	311	1455	132	57	26	26
	312	-175	-16	-7	-3	-3
	317	489	44	19	9	9
	319	2990	272	116	54	54
	320	23201	2109	904	422	422
	321	2205	200	86	40	40
	322	2043	186	80	37	37
	323	2775	252	108	50	50
	324	4405	400	172	80	80
	325	7070	643	275	129	129
	326	5576	507	217	101	101
	327	10555	960	411	192	192
	328	8183	744	319	149	149
	329	6168	561	240	112	112
	330	2618	238	102	48	48
	331	5149	468	201	94	94
	333	5076	461	198	92	92
	334	14397	1309	561	262	262
	335	4609	419	180	84	84

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2.1 MT ALBERT EAST

2.1.1 CONTEXT

Kainga Ora has limited land holdings within the Mt Albert East area. Land zoning predominantly consists of residential with a large portion of the land around the Mt Albert rail station zoned as terraced housing and apartments, some areas in 'Mixed Housing Urban Zone' and large areas of 'Single House Zone'. A small portion of the land is zoned 'Special Purpose Zone' for Mount Albert Grammar School.

Figure 2-4: Neighbourhood Boundary and Study Area

Figure 2-5 provides an overview of the existing road hierarchy in the area.

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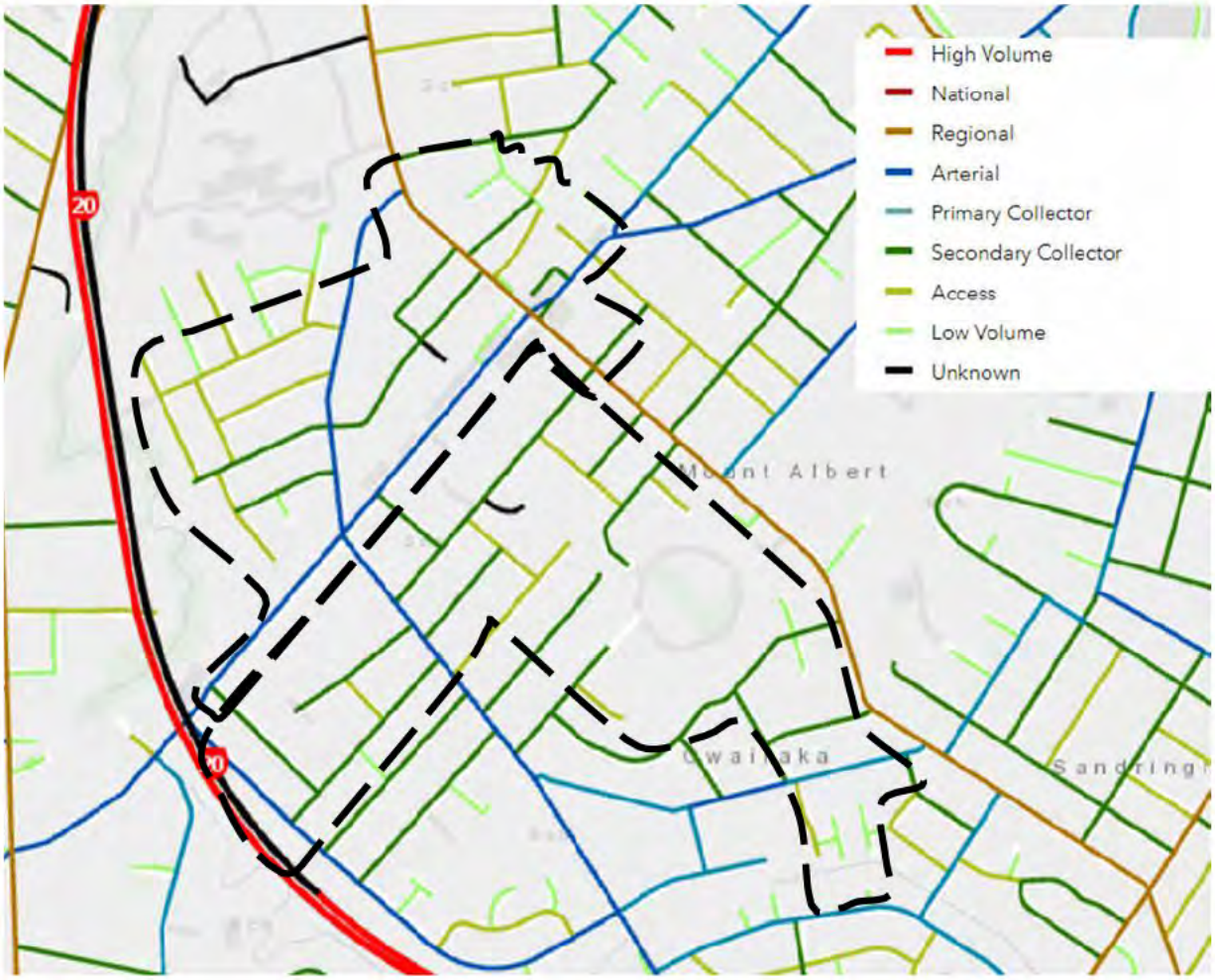
Figure 2-5: One Network Road Classification



2.1.2 POTENTIAL FOR GROWTH

The MSM model forecasts the expected change in dwellings is outlined in Table 2-1 and Within selected zones (i.e. 323 and 324) the Modified AGS scenario shows a reduction in household numbers compared to the 2024 household numbers. This comes as a result of the methodology used for the Modified AGS scenario. In these zones, the AGS scenarios appear to provide a reasonable level of growth. This context was considered in assessing the local and safety improvements in this area.

Table 2-2 above. Within this neighbourhood, the applicable zones are 301, 309.

2.1.3 SAFETY PERFORMANCE OF THE AREA

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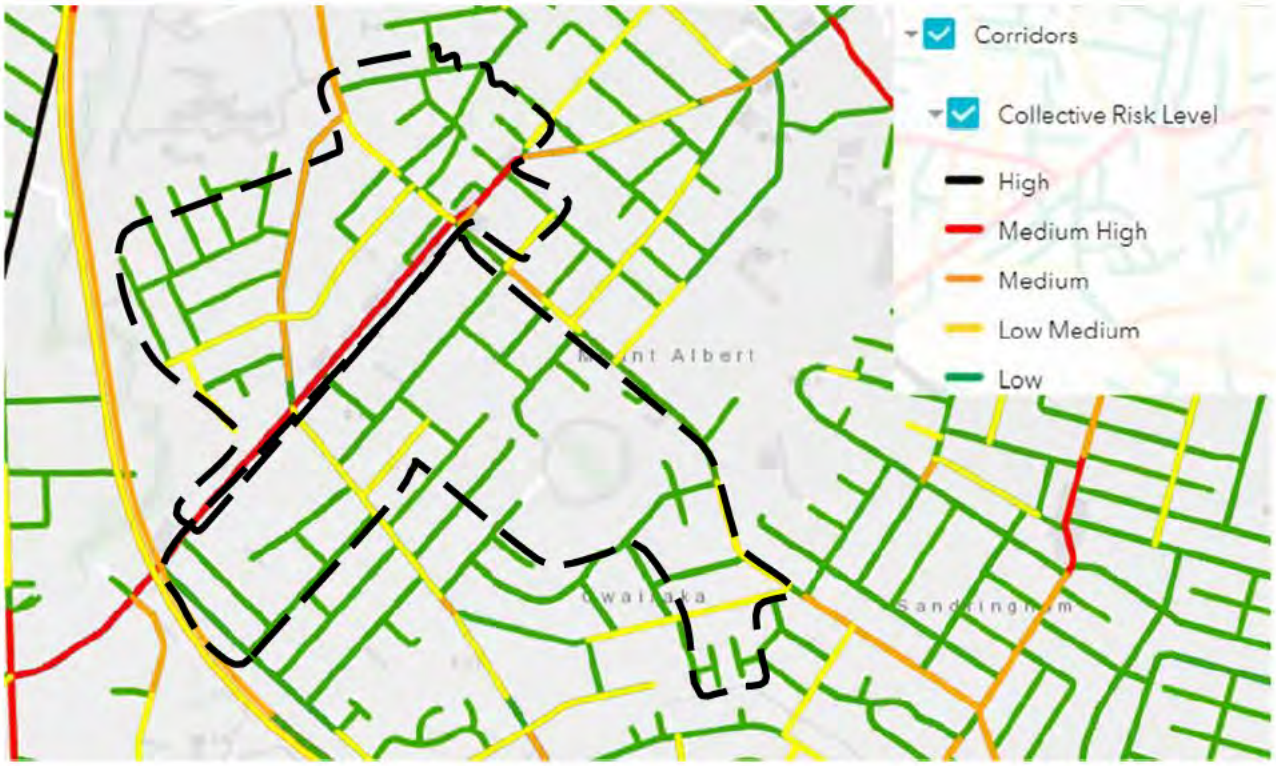
The safety performance of the existing network has been assessed using the NZTA Megamaps data base which obtains crash information from the CAS database and provides collective risk maps[2], maps of fatal and serious injuries and an assessment of high-risk intersections[3].

Figure 2-6: Collective Safety Risk for the Area (Source NZTA MegaMaps)



[2] Collective risk as defined by Kiwirap: Crash density on a road
[3] High risk intersections as defined by the NZTA High risk intersections guide 2013.

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Figure 2-7: Fatal and Serious Crashes (NZTA Open Data Platform)

Figure 2-8: High Risk Intersections (NZTA MegaMaps)

2.1.4 CHANGE IN SAFETY RISK

An assessment of changes in safety risk considers the expected changes in demand as set out in Table 2-1and Table 2-2 along with the existing demands on roads in the area and framework set out in Table 1-1. In addition to this information consideration has been given to ATs Future Connect walking deficiency assessment and safety assessment for the first decade to identify safety concerns.

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Figure 2-9: Walking Deficiencies for First Decade (Source Future Connect)

Figure 2-10: Safety Assessment – First Decade (Source Future Connect)

2.2 NEW WINDSOR

2.2.1 CONTEXT

Kainga Ora has a very limited number of land holdings within the New Windsor area. Land zoning is predominantly residential with majority of the land lying in the 'Residential – Mixed Housing Suburban' zone and some areas lying in the 'Residential – Mixed Housing Urban' and 'Residential – Terrace Housing and Apartment Buildings' zones.

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Figure 2-11: Neighbourhood Boundary and Study Area

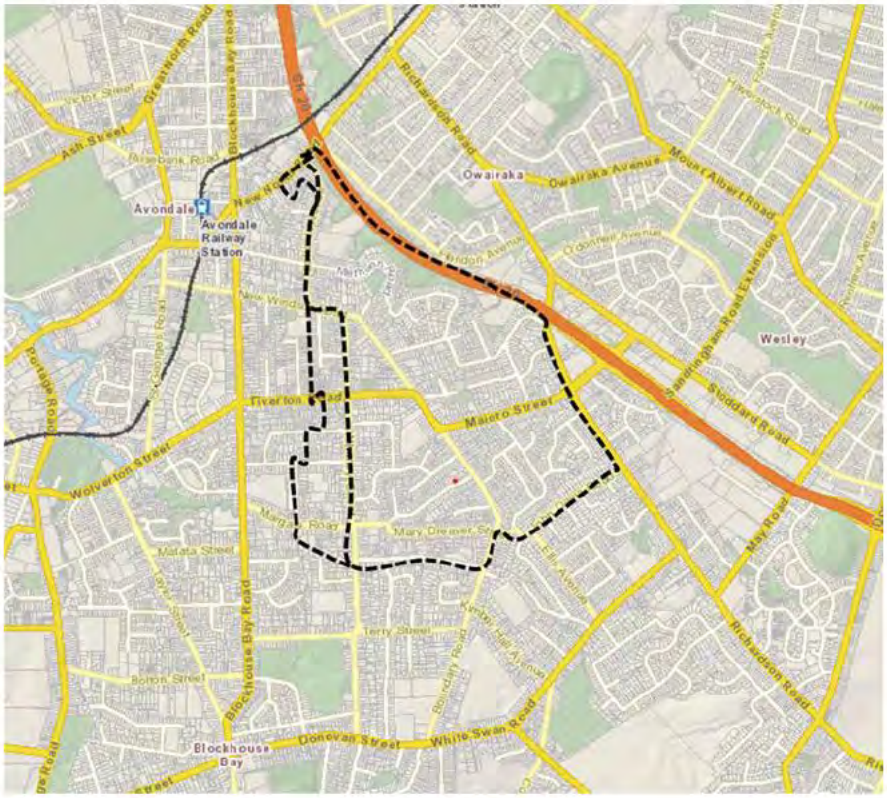

Figure 2-12: One Network Road Classification

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2.2.2 POTENTIAL FOR GROWTH

The MSM model forecasts the expected change in dwellings is outlined in Table 2-1 and Within selected zones (i.e. 323 and 324) the Modified AGS scenario shows a reduction in household numbers compared to the 2024 household numbers. This comes as a result of the methodology used for the Modified AGS scenario. In these zones, the AGS scenarios appear to provide a reasonable level of growth. This context was considered in assessing the local and safety improvements in this area.

Table 2-2 above. Within this neighbourhood, the applicable zones are 308, 310, 311, 312 and 317.

2.2.3 SAFETY PERFORMANCE OF THE AREA

The safety performance of the existing network has been assessed using the NZTA Megamaps data base which obtains crash information from the CAS database and provides collective risk maps[4], maps of fatal and serious injuries and an assessment of high-risk intersections[5].

Figure 2-13: Collective Safety Risk for the Area (Source NZTA MegaMaps)

[4] Collective risk as defined by Kiwirap: Crash density on a road
[5] High risk intersections as defined by the NZTA High risk intersections guide 2013.

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Figure 2-14: Fatal and Serious Crashes (NZTA Open Data Platform)

Figure 2-15: High Risk Intersections (NZTA MegaMaps)

2.2.4 CHANGE IN SAFETY RISK

An assessment of changes in safety risk considers the expected changes in demand as set out in Table 2-1and Table 2-2 along with the existing demands on roads in the area and framework set out in Table 1-1. In addition to this information consideration has been given to ATs Future Connect walking deficiency assessment and safety assessment for the first decade to identify safety concerns.

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Figure 2-16: Walking Deficiencies for First Decade (Source Future Connect)

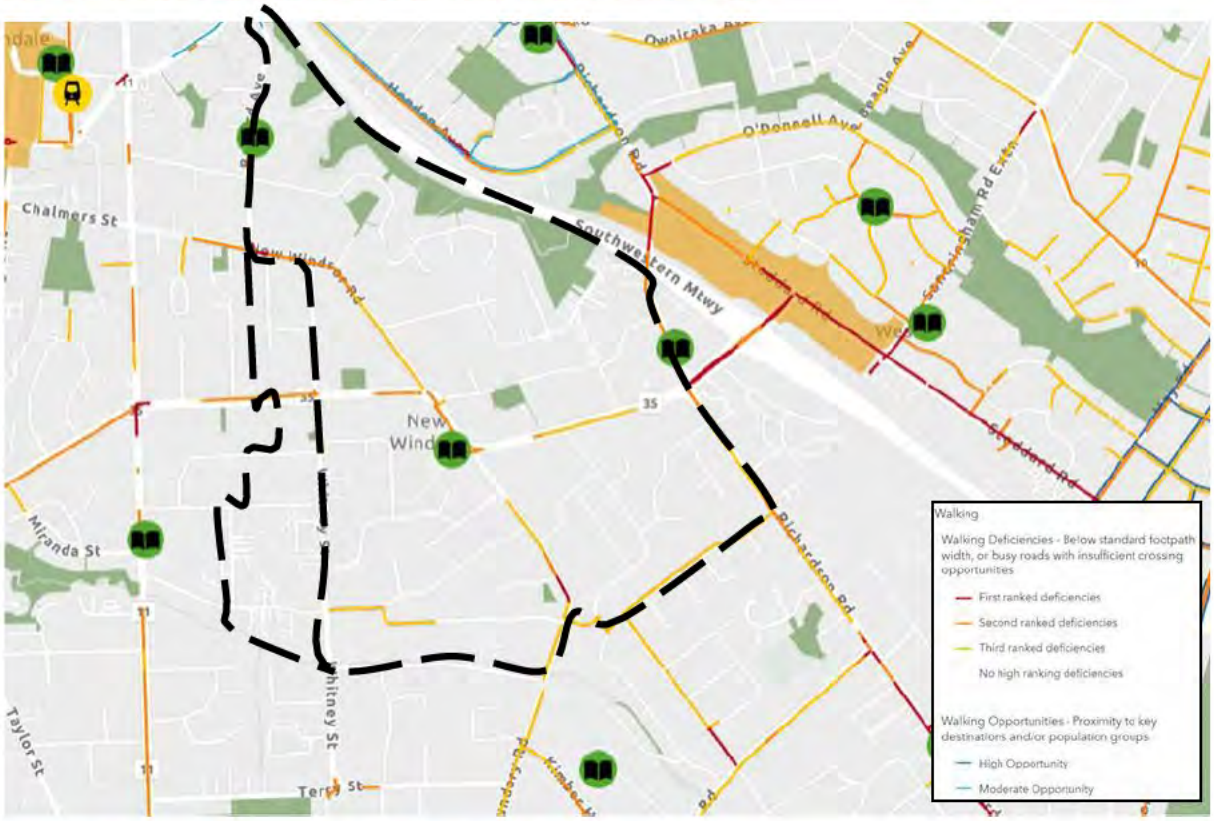
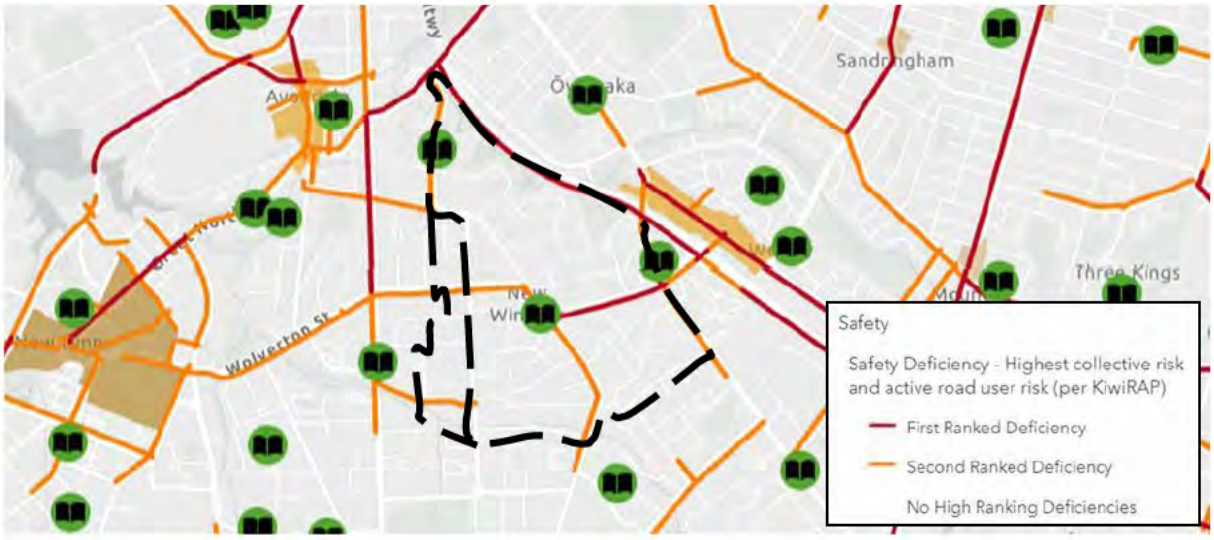


Figure 2-17: Safety Assessment – First Decade (Source Future Connect)



2.3 OWAIRAKA

2.3.1 CONTEXT

Kainga Ora has a relatively high number of holdings within Owairaka, mainly scattered around the centre of the area. Land zoning is predominantly residential with a mix of 'Residential – Mixed

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Housing Urban' and 'Residential – Mixed Housing Suburban' zoning and 'Residential – Terrace Housing - Terrace Housing and Apartment Building' zone around the eastern end of Hendon Avenue.

Figure 2-18: Neighbourhood Boundary and Study Area

Figure 2-19: One Network Road Classification

2.3.2 POTENTIAL FOR GROWTH

The MSM model forecasts the expected change in dwellings is outlined in Table 2-1 and Within selected zones (i.e. 323 and 324) the Modified AGS scenario shows a reduction in household numbers compared to the 2024 household numbers. This comes as a result of the methodology used

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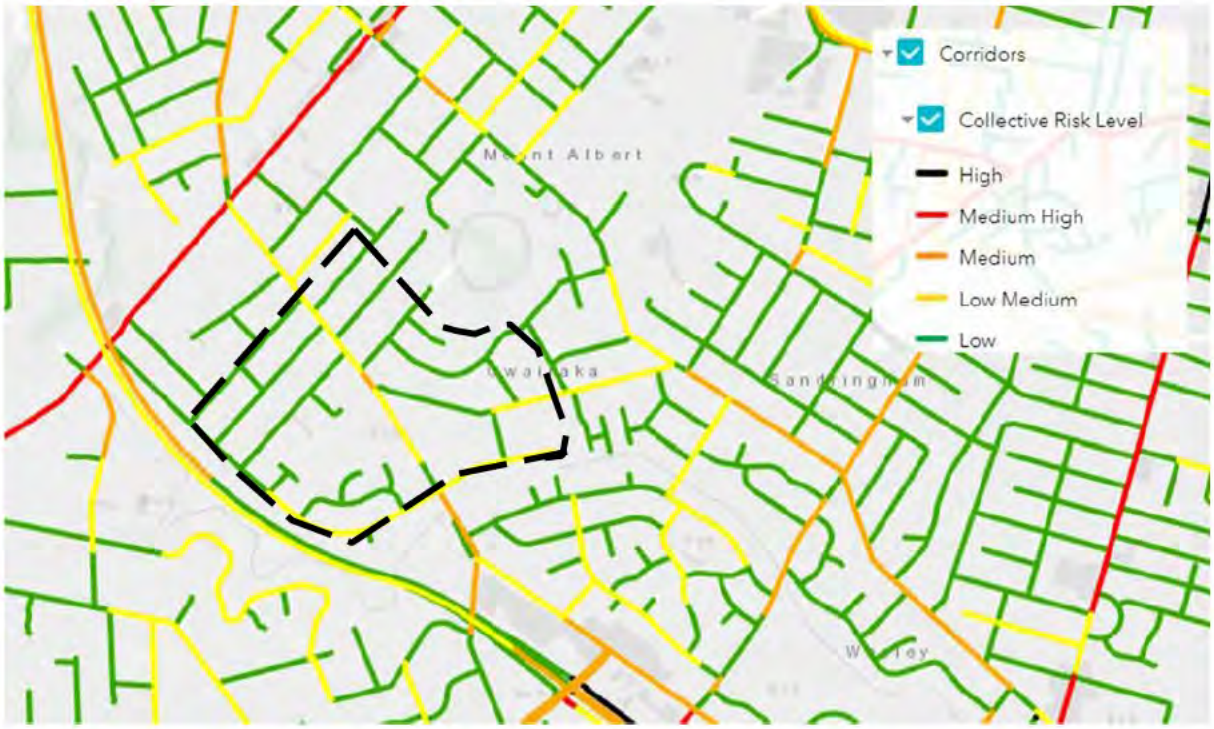
for the Modified AGS scenario. In these zones, the AGS scenarios appear to provide a reasonable level of growth. This context was considered in assessing the local and safety improvements in this area.

Table 2-2 above. Within this neighbourhood, the applicable zones are 310.

2.3.3 SAFETY PERFORMANCE OF THE AREA

The safety performance of the existing network has been assessed using the NZTA Megamaps data base which obtains crash information from the CAS database and provides collective risk maps[6], maps of fatal and serious injuries and an assessment of high-risk intersections[7].

Figure 2-20: Collective Safety Risk for the Area (Source NZTA MegaMaps)



[6] Collective risk as defined by Kiwirap: Crash density on a road
[7] High risk intersections as defined by the NZTA High risk intersections guide 2013.

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Figure 2-21: Fatal and Serious Crashes (NZTA Open Data Platform)

Figure 2-22: High Risk Intersections (NZTA MegaMaps)

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2.3.4 CHANGE IN SAFETY RISK

An assessment of changes in safety risk considers the expected changes in demand as set out in Table 2-1and Table 2-2 along with the existing demands on roads in the area and framework set out in Table 1-1. In addition to this information consideration has been given to ATs Future Connect walking deficiency assessment and safety assessment for the first decade to identify safety concerns.

Figure 2-23: Walking Deficiencies for First Decade (Source Future Connect)

Figure 2-24 :Safety Assessment – First Decade (Source Future Connect)

2.4 WESLEY MALCOM AND ROMA

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2.4.1 CONTEXT

Kainga Ora has a large number of land holdings within the Wesley area and a limited number of land holdings in the Malcom and Roma area, with these land holdings being primarily in the northwestern side of the Malcom and Roma boundary. Land zoning in the Wesley area is predominantly 'Residential - Terrace Housing and Apartment Building' and 'Residential – Mixed Housing Urban', zone with 'Business - Town Centre' zone along Stoddard Road. In the Malcom and Roma area, majority of the land lies within the 'Business – Light Industry' zone with the balance 'Residential – Mixed Housing Urban' and 'Residential – Terrace Housing and Apartment Building' zones.

Figure 2-25: Neighbourhood Boundary and Study Area

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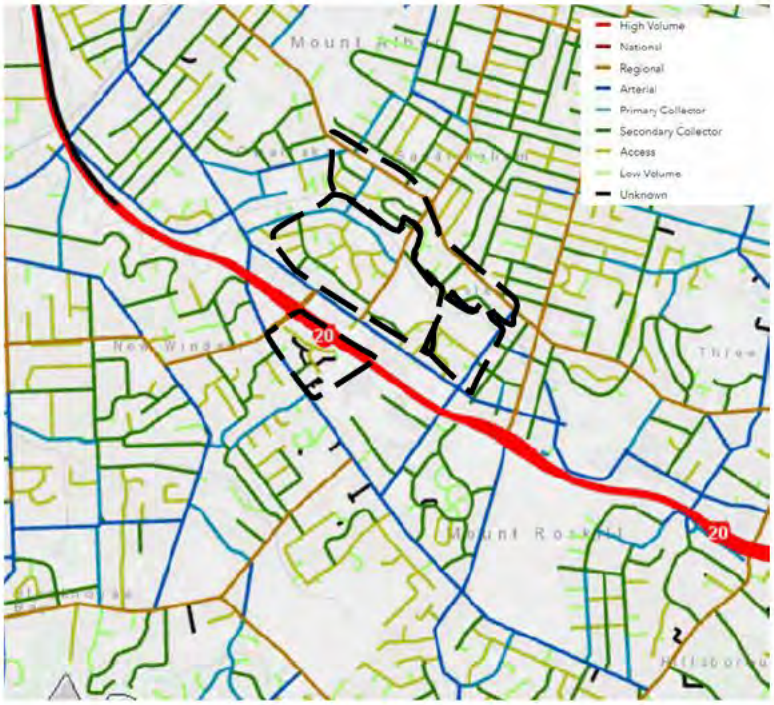
Figure 2-26: One Network Road Classification



2.4.2 POTENTIAL FOR GROWTH

The MSM model forecasts the expected change in dwellings is outlined in Table 2-1 and Within selected zones (i.e. 323 and 324) the Modified AGS scenario shows a reduction in household numbers compared to the 2024 household numbers. This comes as a result of the methodology used for the Modified AGS scenario. In these zones, the AGS scenarios appear to provide a reasonable level of growth. This context was considered in assessing the local and safety improvements in this area.

Table 2-2 above. Within this neighbourhood, the applicable zones are 319, 320 and 327.

2.4.3 SAFETY PERFORMANCE OF THE AREA

The safety performance of the existing network has been assessed using the NZTA Megamaps data base which obtains crash information from the CAS database and provides collective risk maps[8], maps of fatal and serious injuries and an assessment of high-risk intersections[9].

[8] Collective risk as defined by Kiwirap: Crash density on a road
[9] High risk intersections as defined by the NZTA High risk intersections guide 2013.

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Figure 2-27: Collective Safety Risk for the Area (Source NZTA MegaMaps)

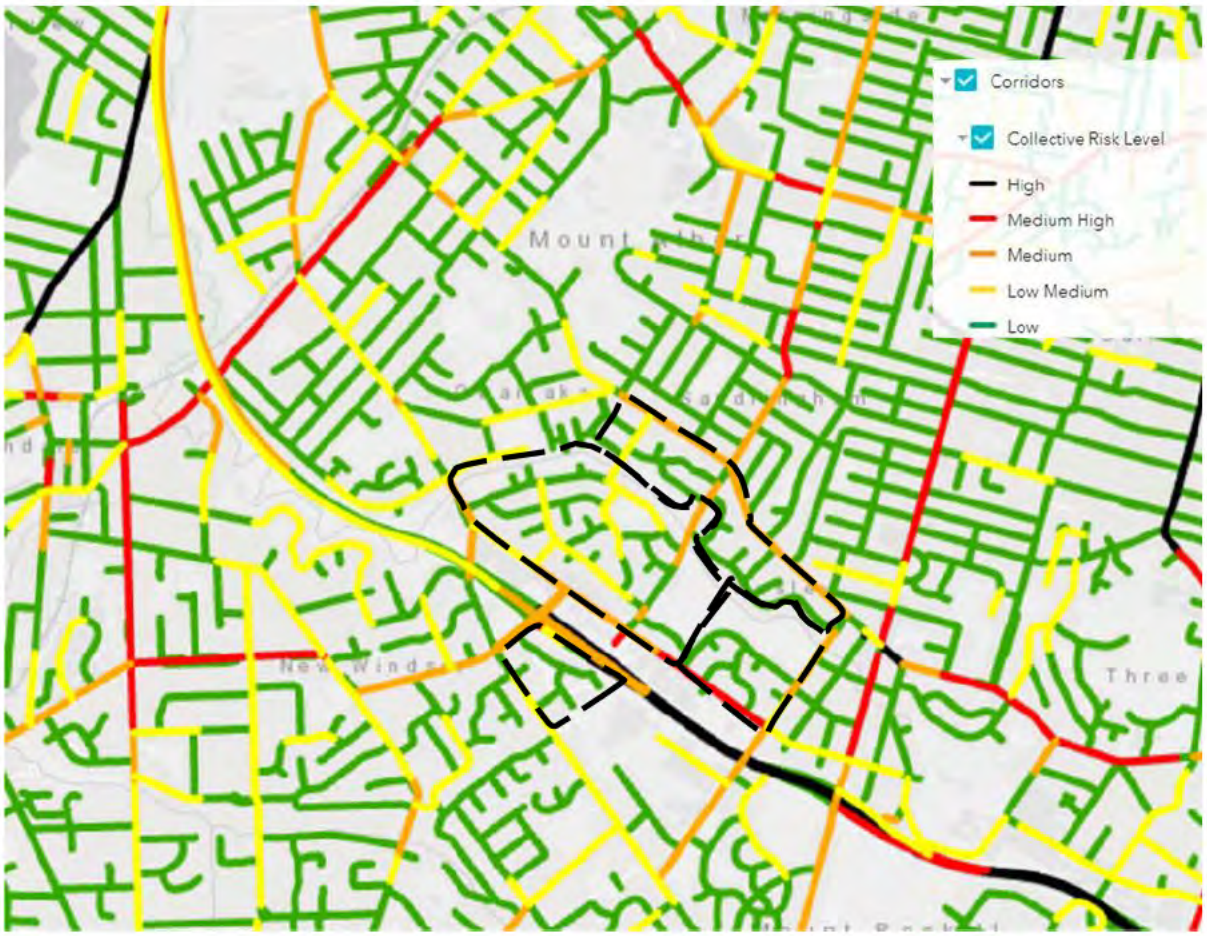

Figure 2-28: Fatal and Serious Crashes (NZTA Open Data Platform)

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Figure 2-29: High Risk Intersections (NZTA MegaMaps)

2.4.4 CHANGE IN SAFETY RISK

An assessment of changes in safety risk considers the expected changes in demand as set out in Table 2-1and Table 2-2 along with the existing demands on roads in the area and framework set out in Table 1-1. In addition to this information consideration has been given to ATs Future Connect walking deficiency assessment and safety assessment for the first decade to identify safety concerns.

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Figure 2-30: Walking Deficiencies for First Decade (Source Future Connect)

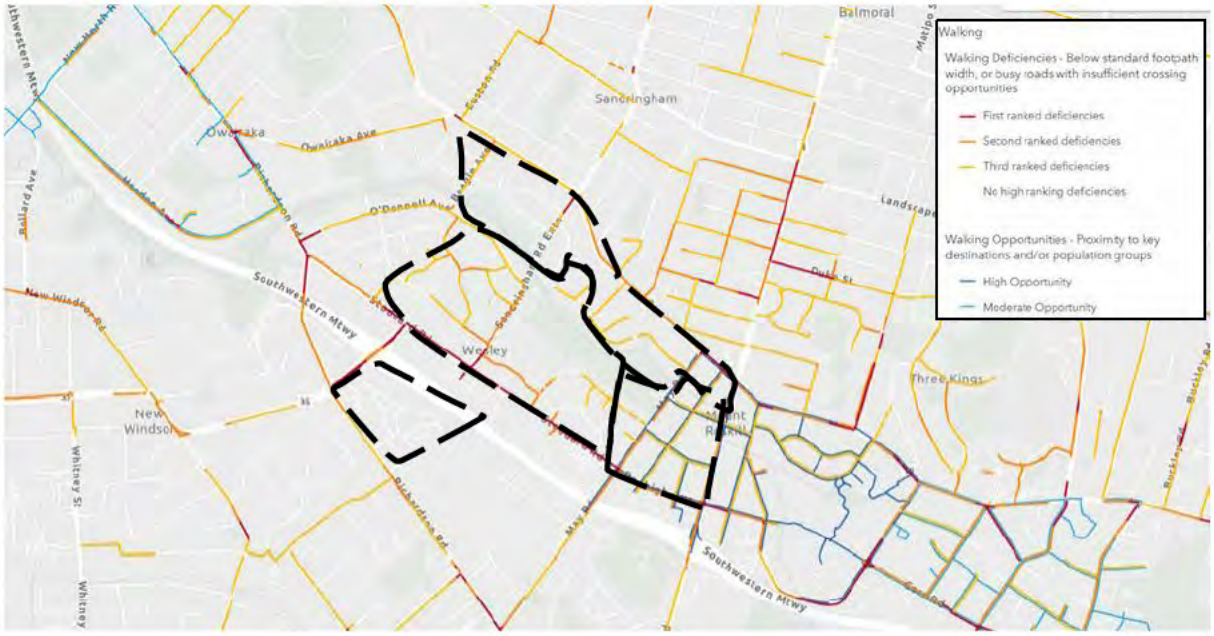
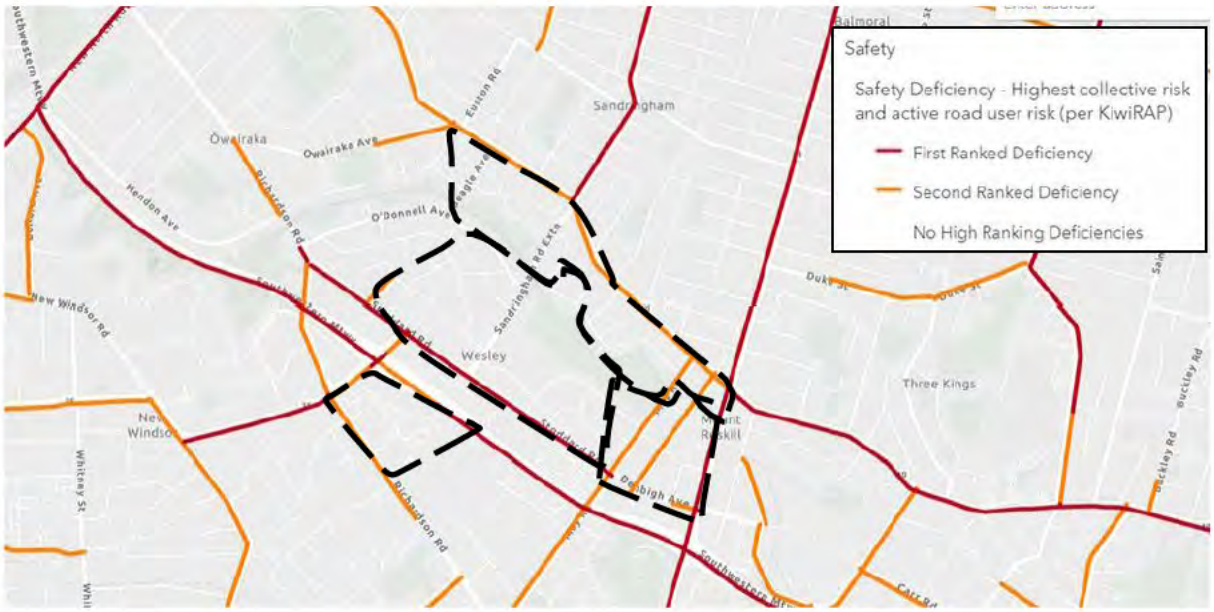


Figure 2-31: Safety Assessment – First Decade (Source Future Connect)



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2.5 SANDRINGHAM

2.5.1 CONTEXT

Kainga Ora has a limited number of land holdings within the Sandringham area. Most of the land holdings Kainga Ora do have are located around the south-eastern boundary of Sandringham. Land zoning consists of a number of zones including 'Residential – Terraced Housing and Apartment Buildings', 'Business – Mixed Use', 'Business – Light Industry', 'Residential – Single House', 'Residential Mixed Housing Suburban', 'Residential – Mixed Housing Urban', and 'Business – Town Centre'.

Figure 2-32 : Neighbourhood Boundary and Study Area

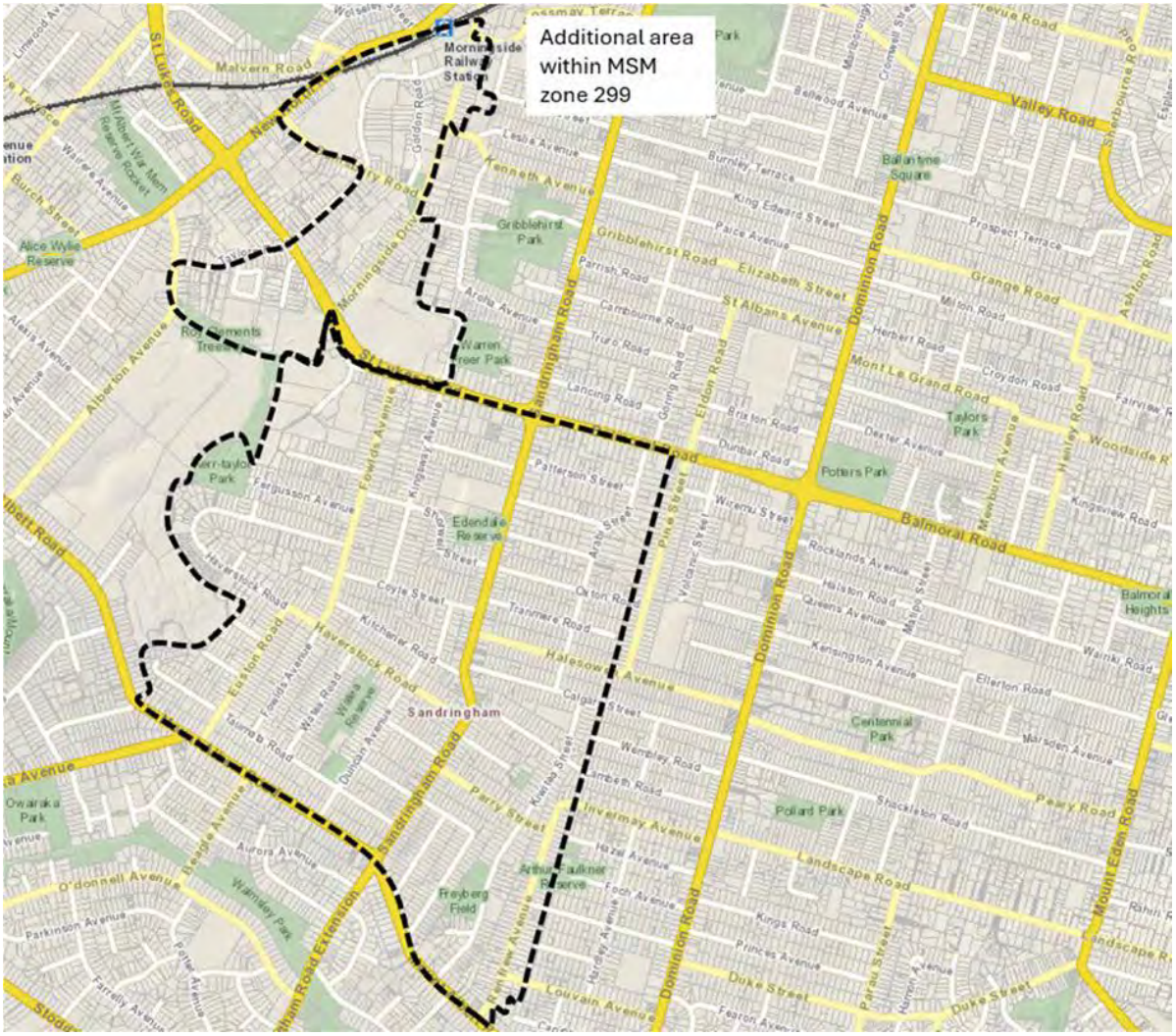

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Figure 2-33: One Network Road Classification

2.5.2 POTENTIAL FOR GROWTH

The MSM model forecasts the expected change in dwellings is outlined in Table 2-1 and Within selected zones (i.e. 323 and 324) the Modified AGS scenario shows a reduction in household numbers compared to the 2024 household numbers. This comes as a result of the methodology used for the Modified AGS scenario. In these zones, the AGS scenarios appear to provide a reasonable level of growth. This context was considered in assessing the local and safety improvements in this area.

Table 2-2 above. Within this neighbourhood, the applicable zones are 299, 321, 322.

2.5.3 SAFETY PERFORMANCE OF THE AREA

The safety performance of the existing network has been assessed using the NZTA Megamaps data base which obtains crash information from the CAS database and provides collective risk maps[10], maps of fatal and serious injuries and an assessment of high-risk intersections[11].

[10] Collective risk as defined by Kiwirap: Crash density on a road
[11] High risk intersections as defined by the NZTA High risk intersections guide 2013.

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Figure 2-34: Collective Safety Risk for the Area (Source NZTA MegaMaps)

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Figure 2-35: Fatal and Serious Crashes (NZTA Open Data Platform)

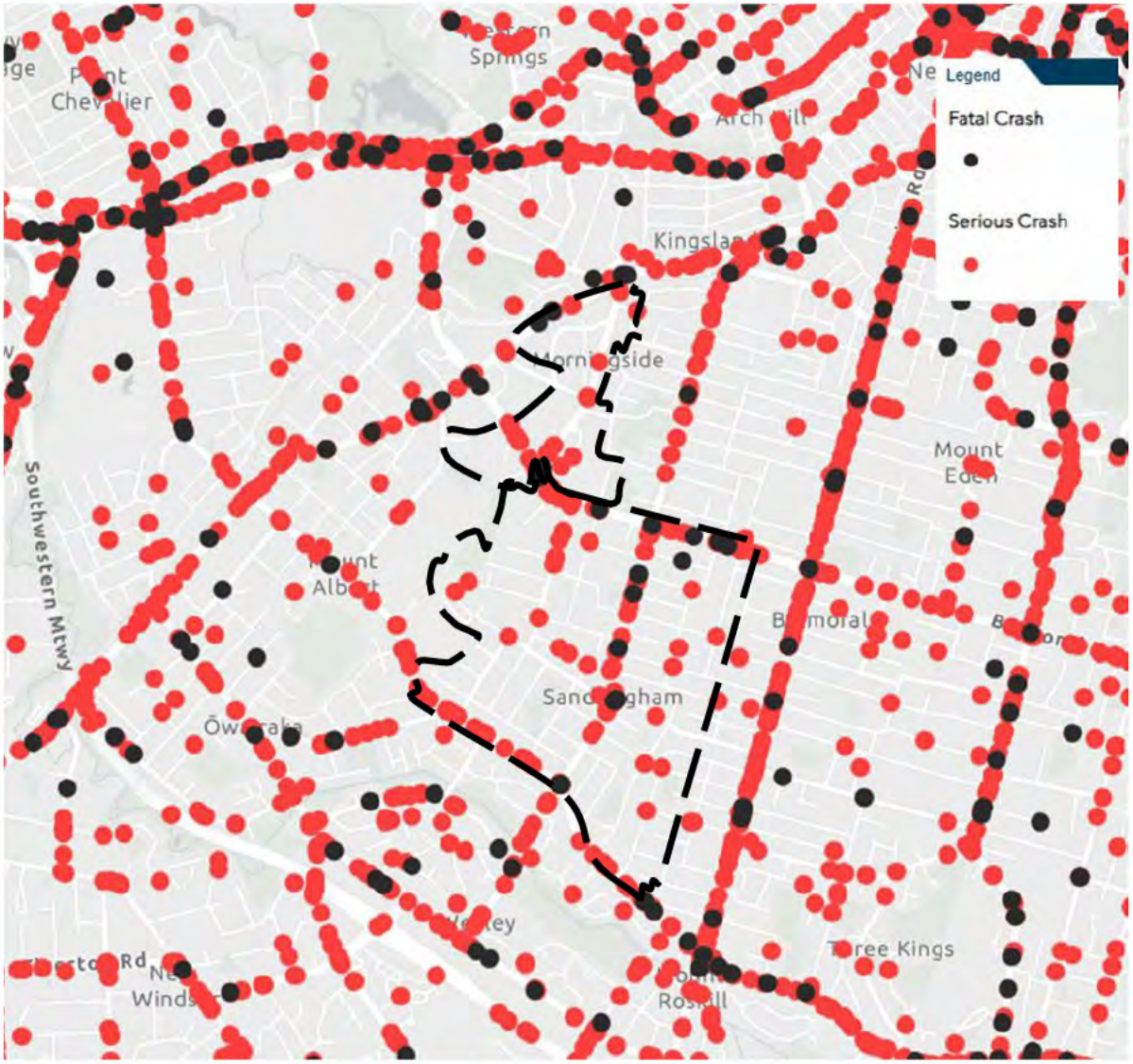

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Figure 2-36: High Risk Intersections (NZTA MegaMaps)

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2.5.4 CHANGE IN SAFETY RISK

An assessment of changes in safety risk considers the expected changes in demand as set out in Table 2-1and Table 2-2 along with the existing demands on roads in the area and framework set out in Table 1-1. In addition to this information consideration has been given to ATs Future Connect walking deficiency assessment and safety assessment for the first decade to identify safety concerns.

Figure 2-37: Walking Deficiencies for First Decade (Source Future Connect)

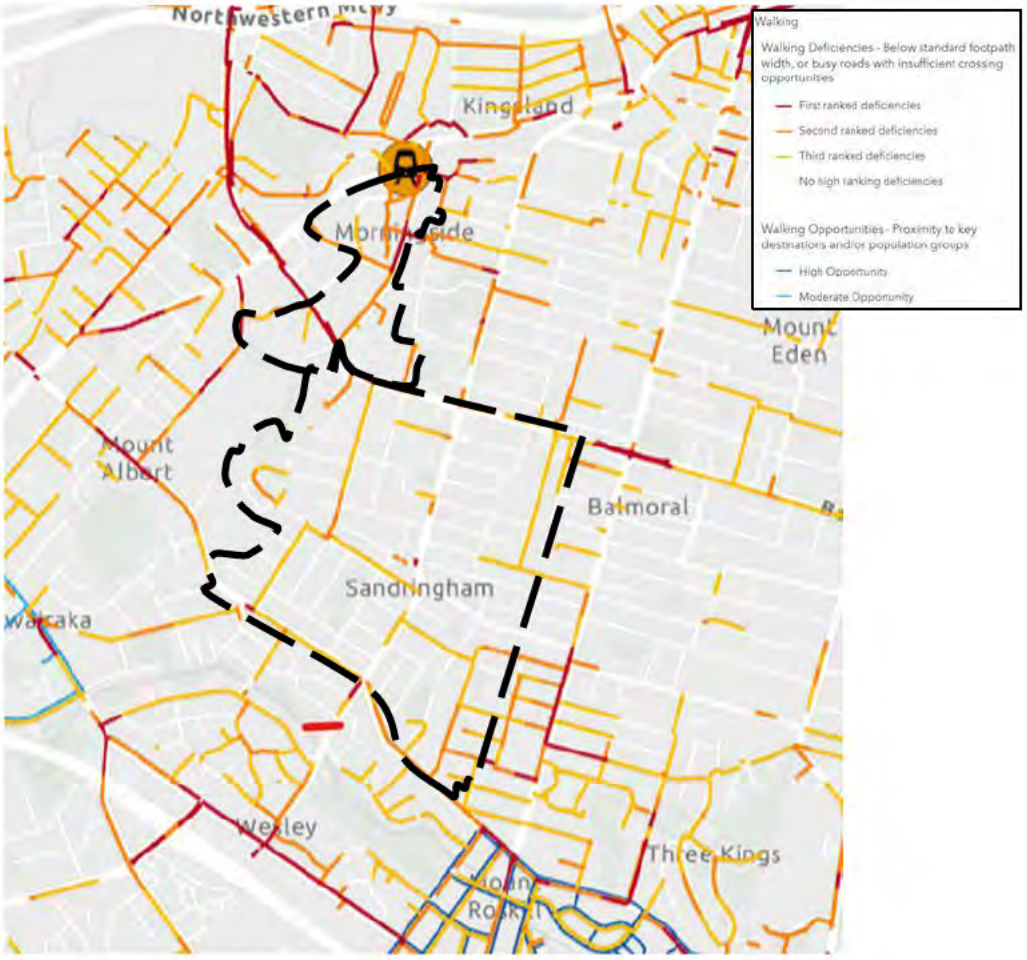

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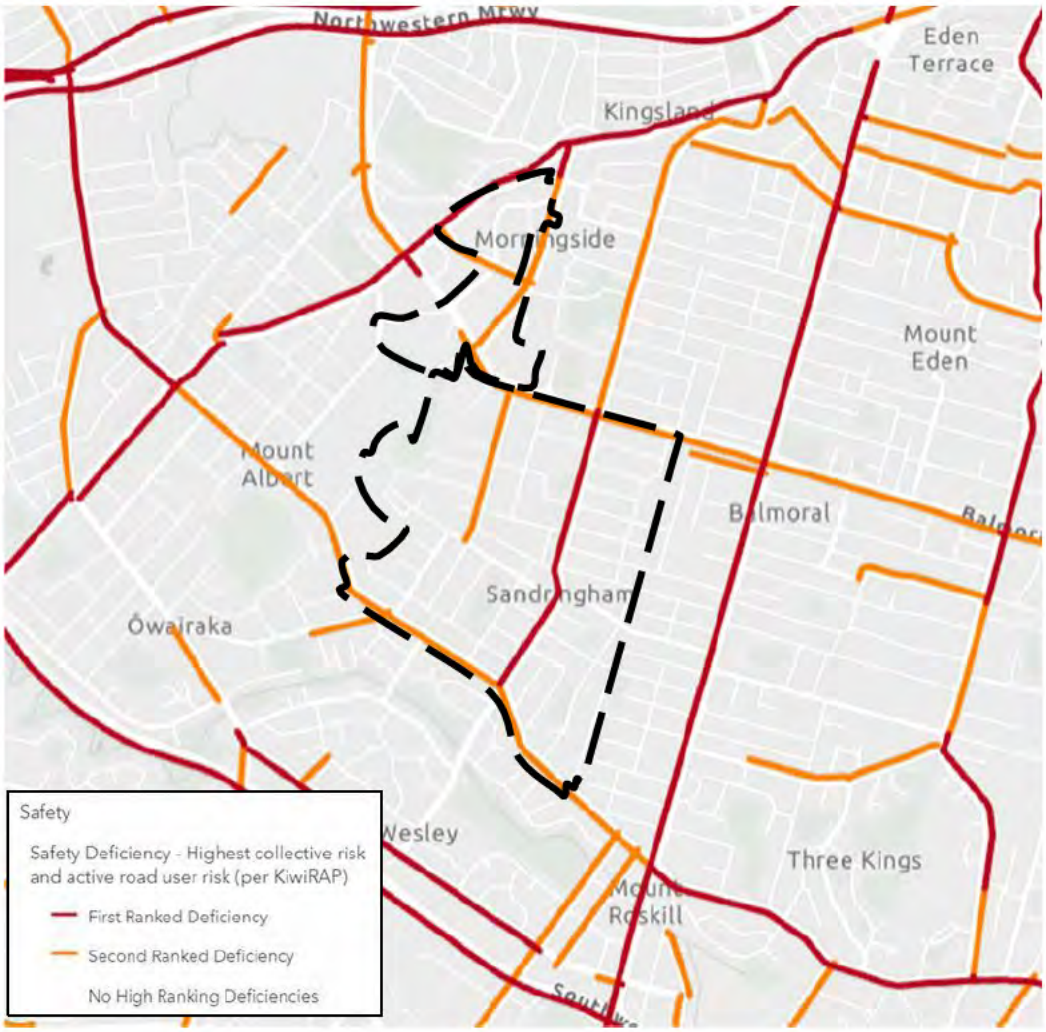
Figure 2-38: Safety Assessment – First Decade (Source Future Connect)



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2.6 THREE KINGS

2.6.1 CONTEXT

Kainga Ora has a large number of land holdings within the Three Kings area. Land zoning consists of a number of zones of almost equal proportions. The zones consist of 'Residential – Mixed Housing Suburban', 'Residential – Mixed Housing Urban Zone', 'Residential – Terrace Housing and Apartment Buildings Zone', 'Residential – Single House Zone', and 'Open Space – Conservation Zone'. There is also a small area on the eastern side of the area, off Mount Eden Road zoned 'Business – General Business Zone'.

Figure 2-39: Neighbourhood Boundary and Study Area

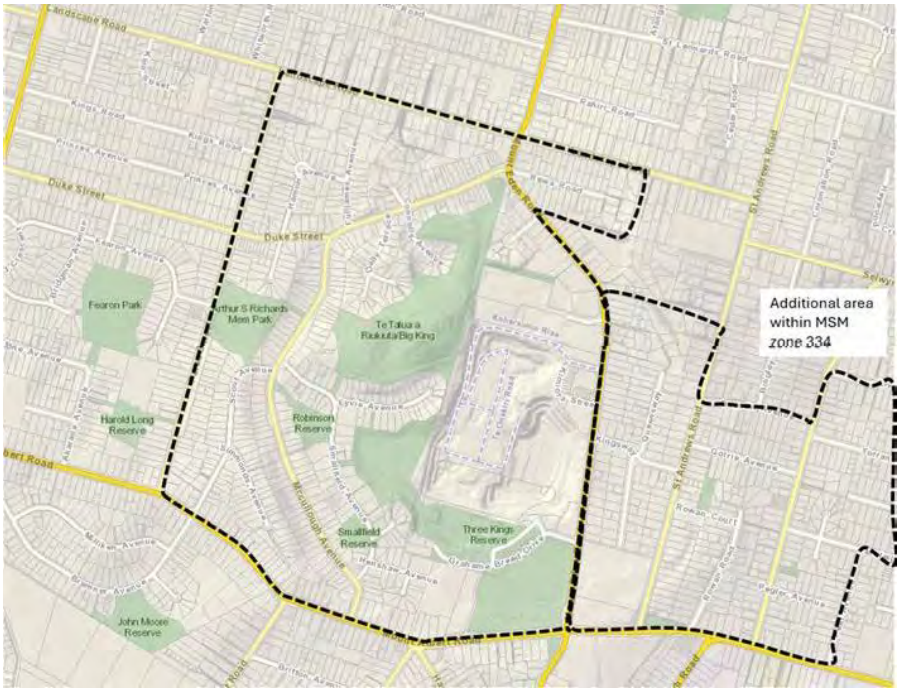

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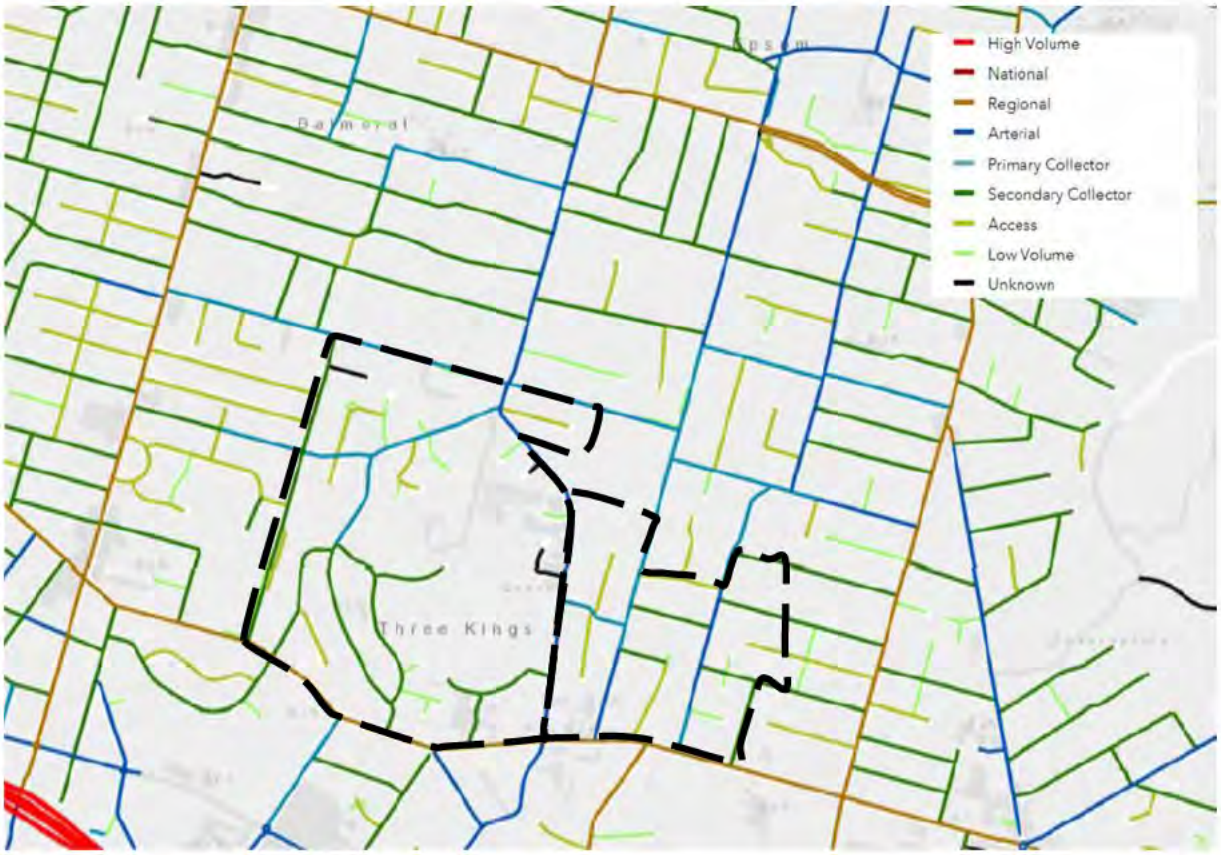
Figure 2-40: One Network Road Classification



2.6.2 POTENTIAL FOR GROWTH

The MSM model forecasts the expected change in dwellings is outlined in Table 2-1 and Within selected zones (i.e. 323 and 324) the Modified AGS scenario shows a reduction in household numbers compared to the 2024 household numbers. This comes as a result of the methodology used for the Modified AGS scenario. In these zones, the AGS scenarios appear to provide a reasonable level of growth. This context was considered in assessing the local and safety improvements in this area.

Table 2-2 above. Within this neighbourhood, the applicable zones are 326 and 334.

2.6.3 SAFETY PERFORMANCE OF THE AREA

The safety performance of the existing network has been assessed using the NZTA Megamaps data base which obtains crash information from the CAS database and provides collective risk maps[12], maps of fatal and serious injuries and an assessment of high-risk intersections[13].

[12] Collective risk as defined by Kiwirap: Crash density on a road
[13] High risk intersections as defined by the NZTA High risk intersections guide 2013.

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Figure 2-41: Collective Safety Risk for the Area (Source NZTA MegaMaps)

Figure 2-42: Fatal and Serious Crashes (NZTA Open Data Platform)

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Figure 2-43: High Risk Intersections (NZTA MegaMaps)

2.6.4 CHANGE IN SAFETY RISK

An assessment of changes in safety risk considers the expected changes in demand as set out in Table 2-1and Table 2-2 along with the existing demands on roads in the area and framework set out in Table 1-1. In addition to this information consideration has been given to ATs Future Connect walking deficiency assessment and safety assessment for the first decade to identify safety concerns.

Figure 2-44: Walking Deficiencies for First Decade (Source Future Connect)

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Figure 2-45: Safety Assessment – First Decade (Source Future Connect)

2.7 DOMINION ROAD

2.7.1 CONTEXT

Kainga Ora has a relatively low number of land holdings within the Dominion Road area. Land zoning is predominantly residential with a mix of 'Residential – Mixed Housing Suburban' and 'Residential – Mixed Housing Urban' zoning with a pocket of Terraced housing and apartment zoning around the Local centre. The Dominion Road corridor has a local centre and business land on either side of it.

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Figure 2-46: Neighbourhood Boundary and Study Area

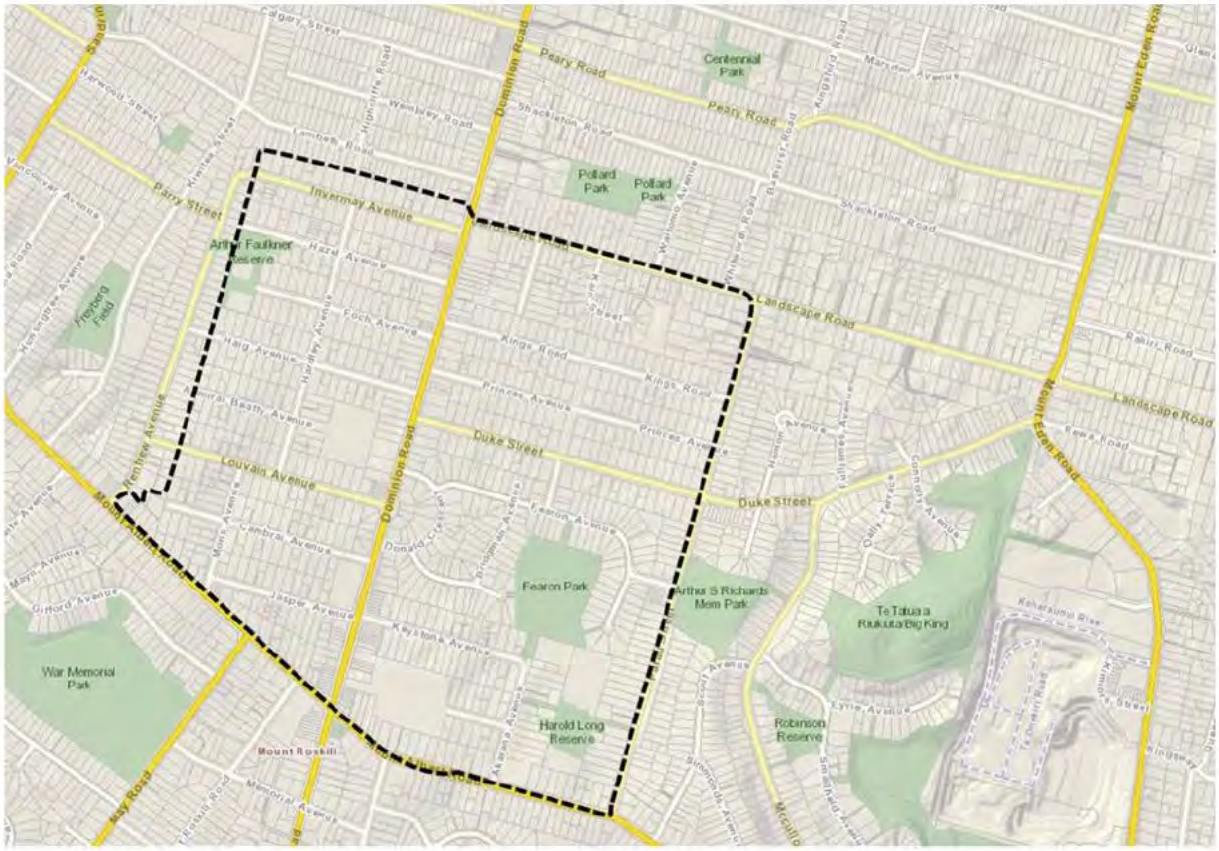

Figure 2-47: One Network Road Classification

2.7.2 POTENTIAL FOR GROWTH

The MSM model forecasts the expected change in dwellings is outlined in Table 2-1 and Within selected zones (i.e. 323 and 324) the Modified AGS scenario shows a reduction in household

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numbers compared to the 2024 household numbers. This comes as a result of the methodology used for the Modified AGS scenario. In these zones, the AGS scenarios appear to provide a reasonable level of growth. This context was considered in assessing the local and safety improvements in this area.

Table 2-2 above. Within this neighbourhood, the applicable zones are 325.

2.7.3 SAFETY PERFORMANCE OF THE AREA

The safety performance of the existing network has been assessed using the NZTA Megamaps data base which obtains crash information from the CAS database and provides collective risk maps[14], maps of fatal and serious injuries and an assessment of high-risk intersections[15].

Figure 2-48: Collective Safety Risk for the Area (Source NZTA MegaMaps)

[14] Collective risk as defined by Kiwirap: Crash density on a road
[15] High risk intersections as defined by the NZTA High risk intersections guide 2013.

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Figure 2-49: Fatal and Serious Crashes (NZTA Open Data Platform)

Figure 2-50: High Risk Intersections (NZTA MegaMaps)

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2.7.4 CHANGE IN SAFETY RISK

An assessment of changes in safety risk considers the expected changes in demand as set out in Table 2-1and Table 2-2 along with the existing demands on roads in the area and framework set out in Table 1-1. In addition to this information consideration has been given to ATs Future Connect walking deficiency assessment and safety assessment for the first decade to identify safety concerns.

Figure 2-51: Walking Deficiencies for First Decade (Source Future Connect)

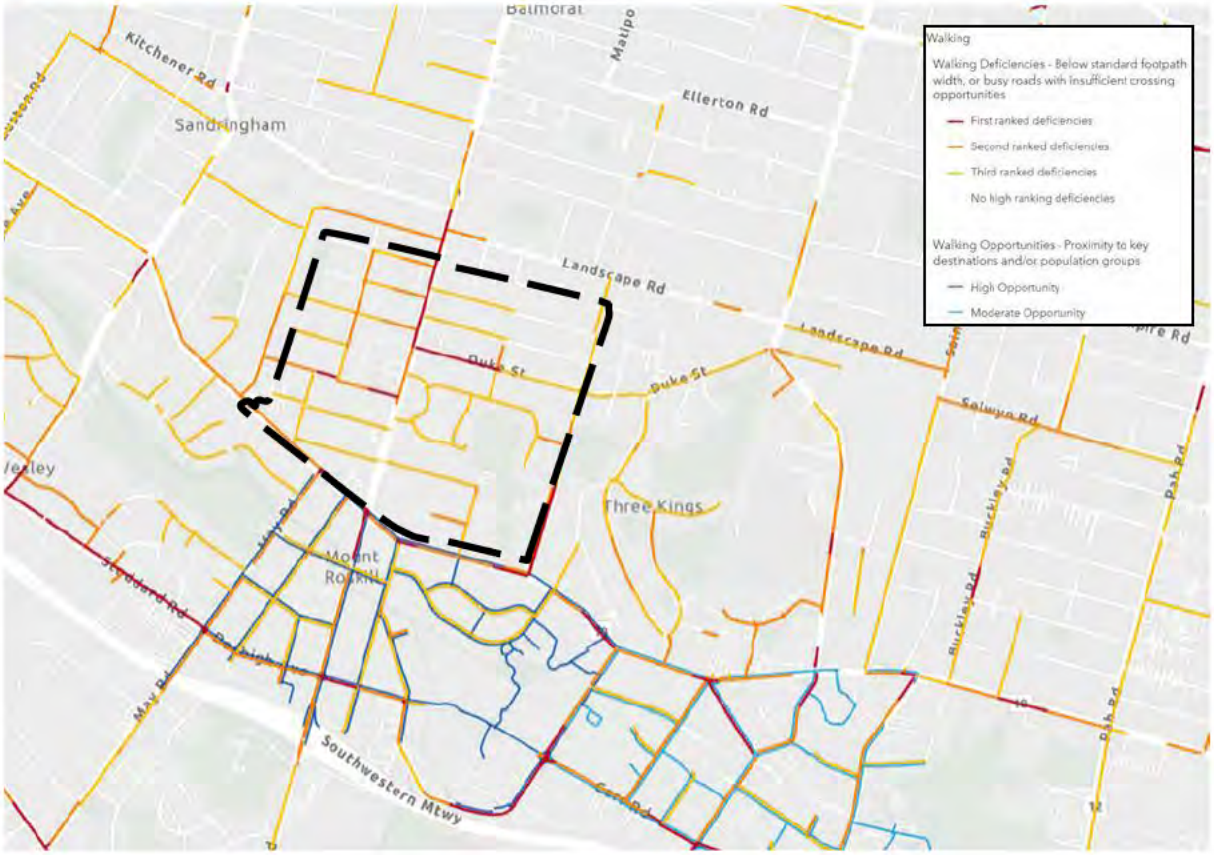

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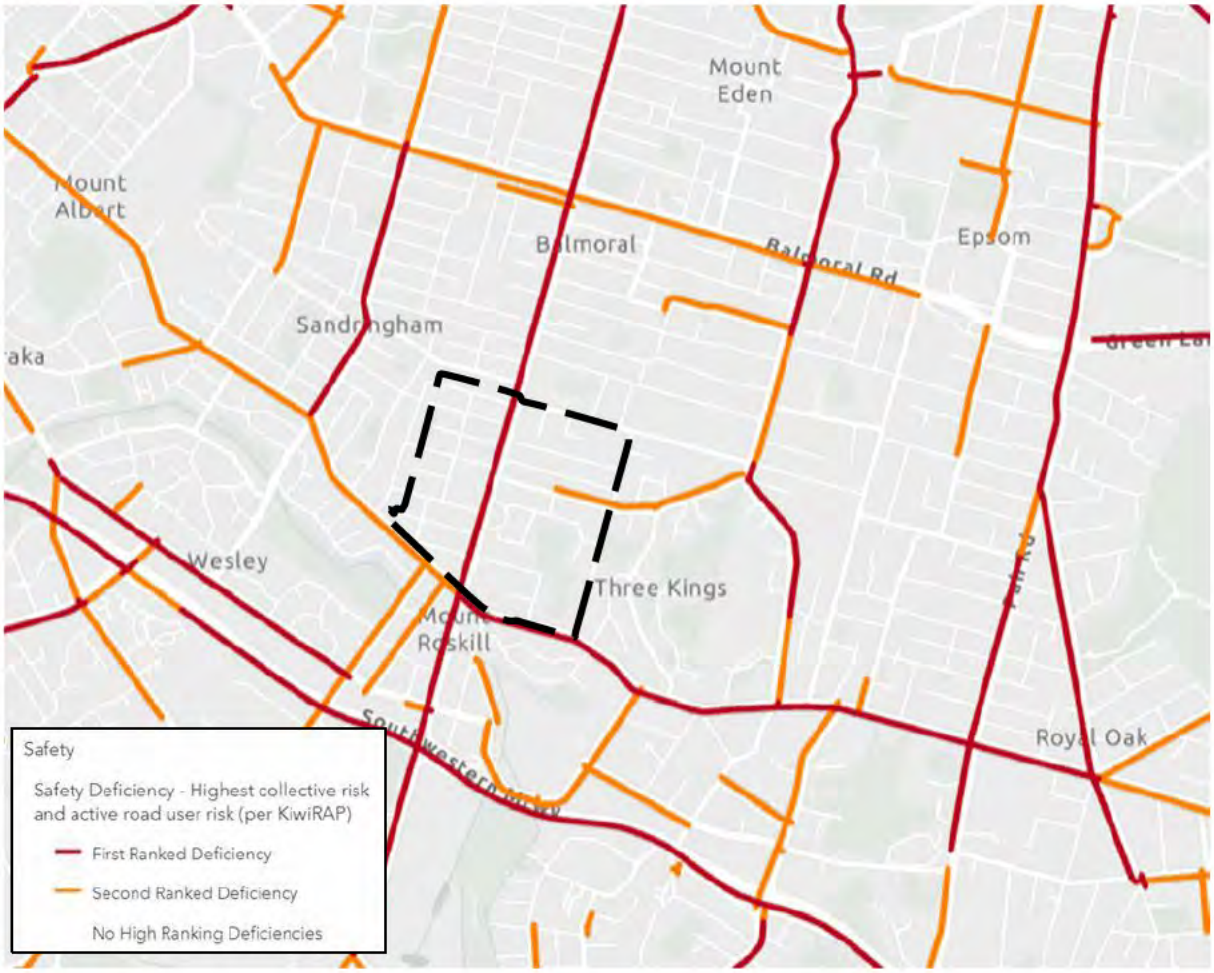
Figure 2-52: Safety Assessment – First Decade (Source Future Connect)



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2.8 ROSKILL SCHOOLS AND WAREN AND CARR

2.8.1 CONTEXT

Kainga Ora has a relatively low number of land holdings within the Mt Roskill Schools area and the Warren and Carr area. Most of the land in the two areas lies in the 'Residential – Mixed Housing Urban' zone with some areas in the 'Business – Light Industry' zone and the 'Residential – Terraced Housing and Apartment Buildings' zone. This area also includes the school cluster of Mount Roskill Grammar School, Mt Roskill Intermediate School and Mt Roskill Primary School.

Figure 2-53: Neighbourhood Boundary and Study Area

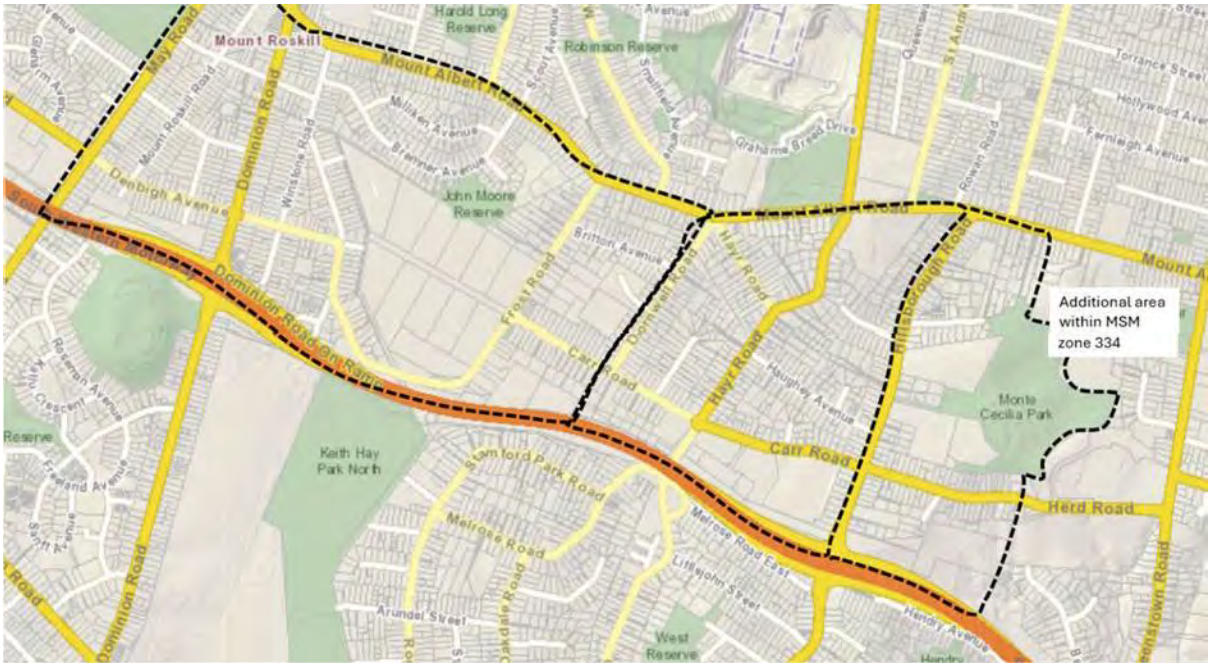

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Figure 2-54: One Network Road Classification

2.8.2 POTENTIAL FOR GROWTH

The MSM model forecasts the expected change in dwellings is outlined in Table 2-1 and Within selected zones (i.e. 323 and 324) the Modified AGS scenario shows a reduction in household numbers compared to the 2024 household numbers. This comes as a result of the methodology used for the Modified AGS scenario. In these zones, the AGS scenarios appear to provide a reasonable level of growth. This context was considered in assessing the local and safety improvements in this area.

Table 2-2 above. Within this neighbourhood, the applicable zones are 327,333.

2.8.3 SAFETY PERFORMANCE OF THE AREA

The safety performance of the existing network has been assessed using the NZTA Megamaps data base which obtains crash information from the CAS database and provides collective risk maps[16], maps of fatal and serious injuries and an assessment of high-risk intersections[17].

[16] Collective risk as defined by Kiwirap: Crash density on a road
[17] High risk intersections as defined by the NZTA High risk intersections guide 2013.

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Figure 2-55: Collective Safety Risk for the Area (Source NZTA MegaMaps)

Figure 2-56: Fatal and Serious Crashes (NZTA Open Data Platform)

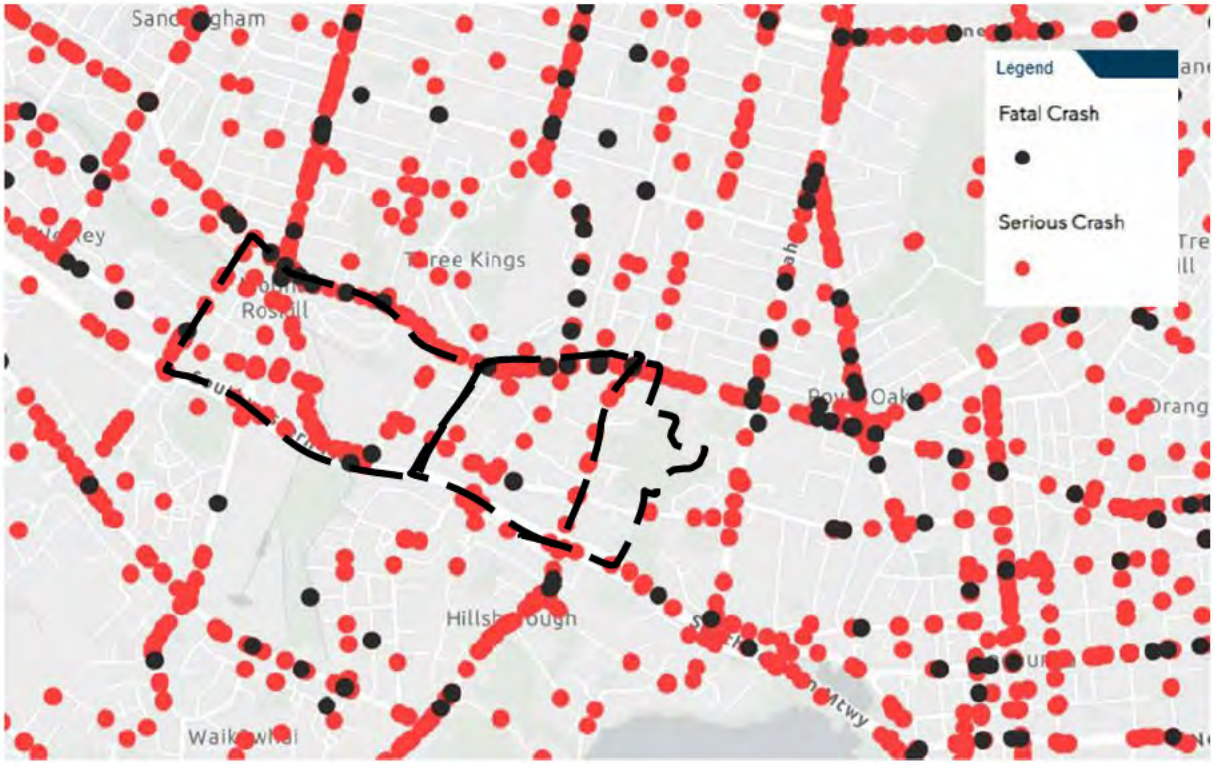

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Figure 2-57: High Risk Intersections (NZTA MegaMaps)

2.8.4 CHANGE IN SAFETY RISK

An assessment of changes in safety risk considers the expected changes in demand as set out in Table 2-1and Table 2-2 along with the existing demands on roads in the area and framework set out in Table 1-1. In addition to this information consideration has been given to ATs Future Connect walking deficiency assessment and safety assessment for the first decade to identify safety concerns.

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Figure 2-58: Walking Deficiencies for First Decade (Source Future Connect)

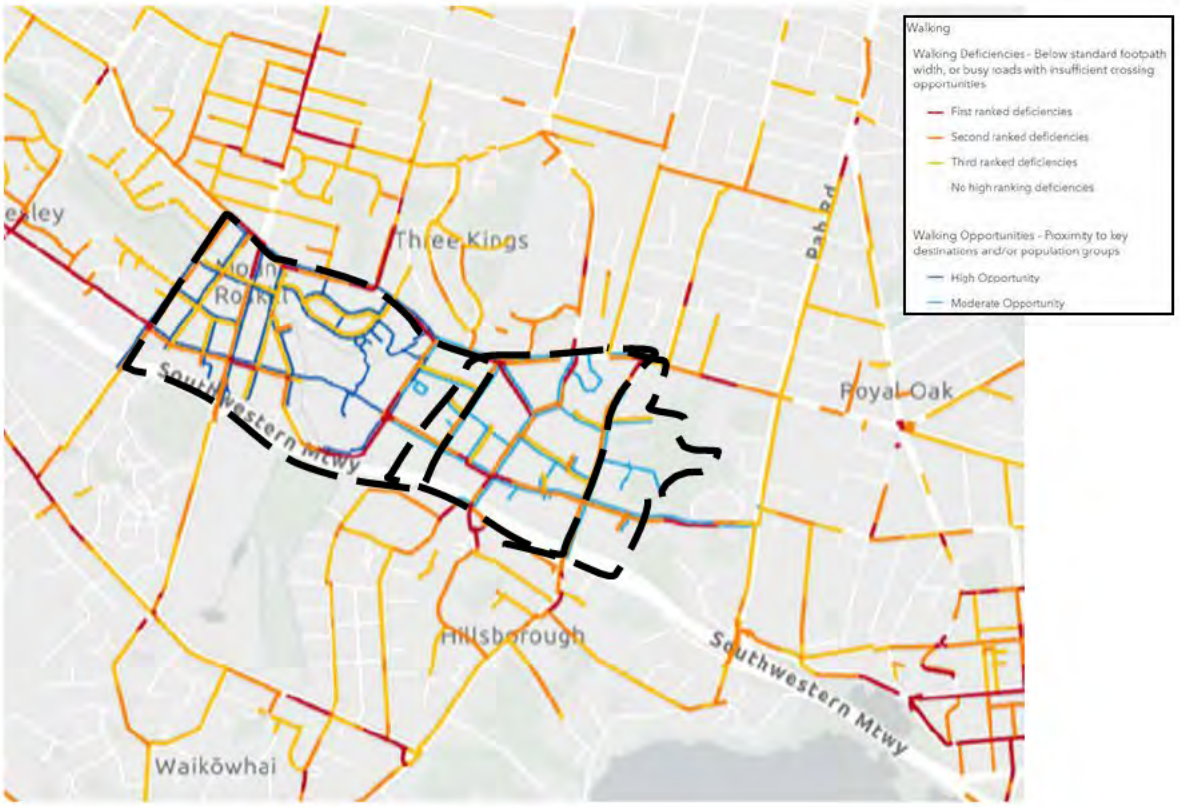

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Figure 2-59: Safety Assessment – First Decade (Source Future Connect)

2.9 BALMORAL & MT EDEN NEIGHBOURHOODS

2.9.1 CONTEXT

Kainga Ora has limited land holdings within the Mt Eden area and limited holding in the Balmoral area with the exception of the southwestern corner. Land zoning is predominantly residential with a large portion of single house zone and Mixed housing suburban. The Dominion Road corridor has a local centre and associated business land around it.

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Figure 2-60: Neighbourhood Boundary and Study Area

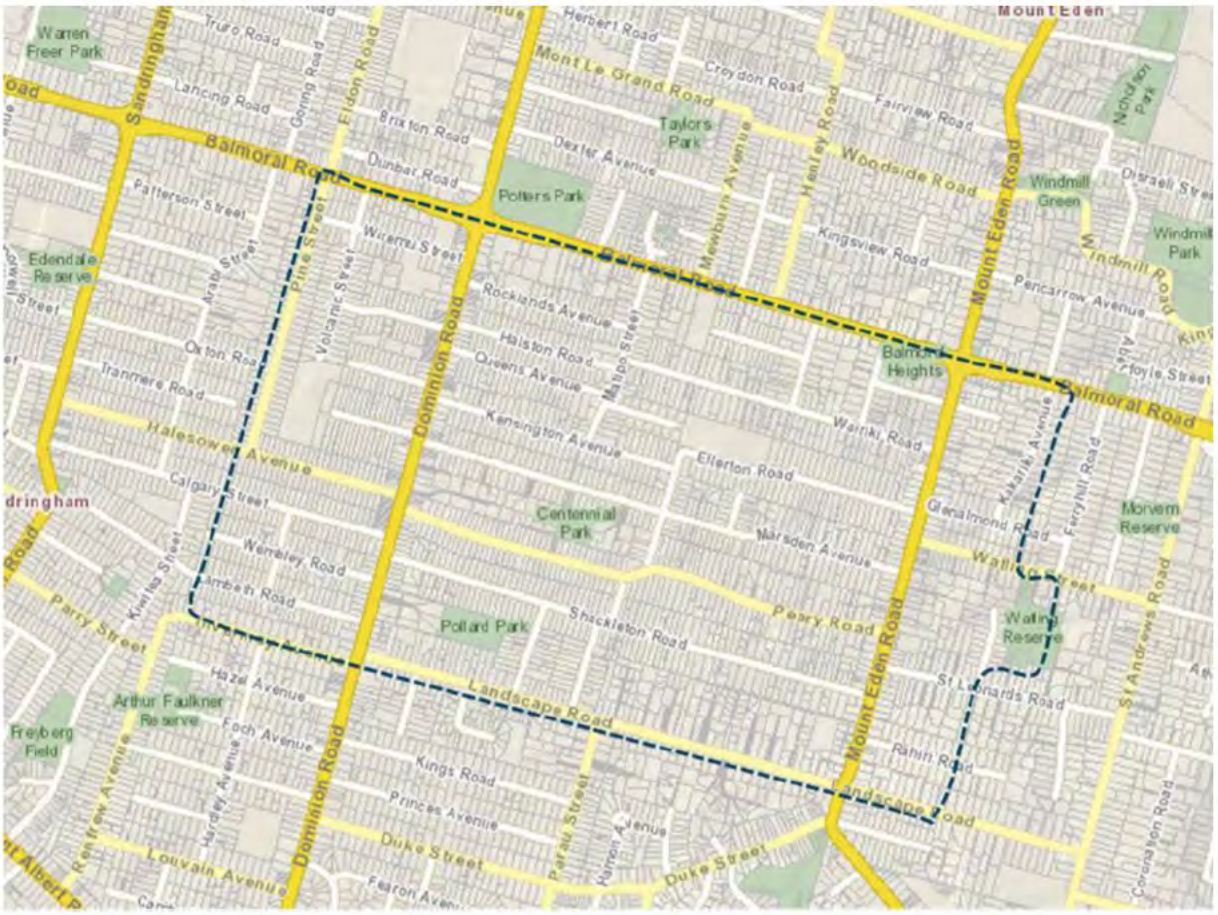

Figure 2-61: One Network Road Classification

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2.9.2 POTENTIAL FOR GROWTH

The MSM model forecasts the expected change in dwellings is outlined in Table 2-1 and Within selected zones (i.e. 323 and 324) the Modified AGS scenario shows a reduction in household numbers compared to the 2024 household numbers. This comes as a result of the methodology used for the Modified AGS scenario. In these zones, the AGS scenarios appear to provide a reasonable level of growth. This context was considered in assessing the local and safety improvements in this area.

Table 2-2 above. Within this neighbourhood, the applicable zones are 324.

2.9.3 SAFETY PERFORMANCE OF THE AREA

The safety performance of the existing network has been assessed using the NZTA Megamaps data base which obtains crash information from the CAS database and provides collective risk maps[18], maps of fatal and serious injuries and an assessment of high-risk intersections[19].

[18] Collective risk as defined by Kiwirap: Crash density on a road
[19] High risk intersections as defined by the NZTA High risk intersections guide 2013.

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Figure 2-62: Collective Safety Risk for the Area (Source NZTA Mega Maps)

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Figure 2-63: Fatal and Serious Crashes (NZTA Open Data Platform)

Figure 2-64: High Risk Intersections (NZTA Mega Maps)

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2.9.4 CHANGE IN SAFETY RISK

An assessment of changes in safety risk considers the expected changes in demand as set out in Table 2-1and Table 2-2 along with the existing demands on roads in the area and framework set out in Table 1-1. In addition to this information consideration has been given to ATs Future Connect walking deficiency assessment and safety assessment for the first decade to identify safety concerns.

Figure 2-65: Walking Deficiencies for First Decade (Source Future Connect)

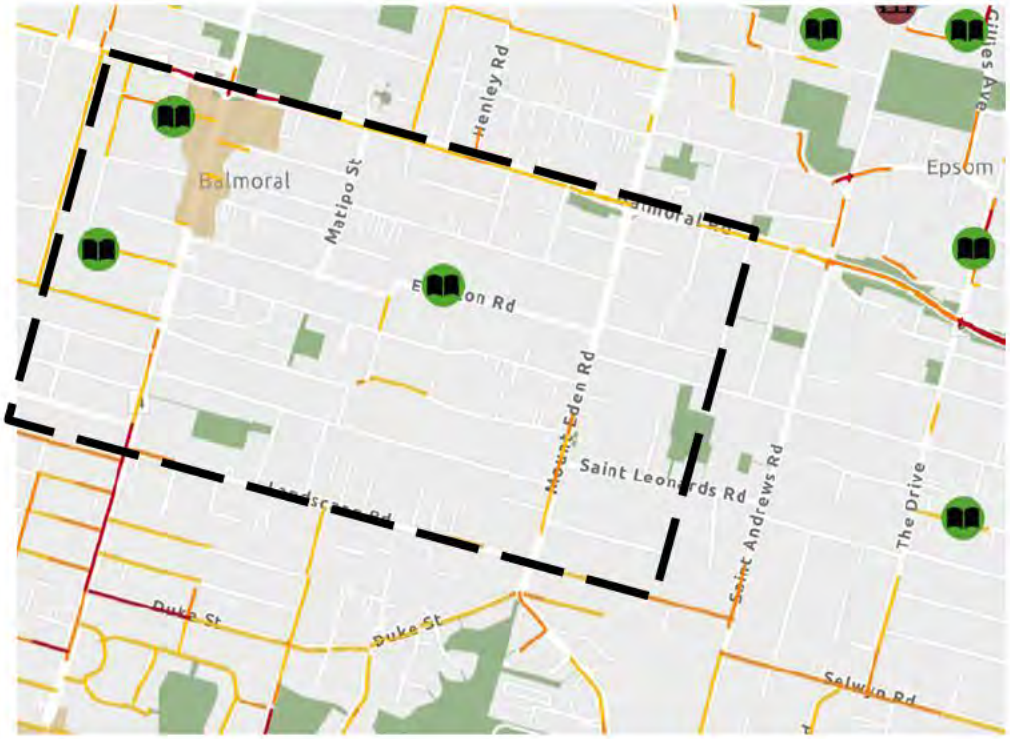

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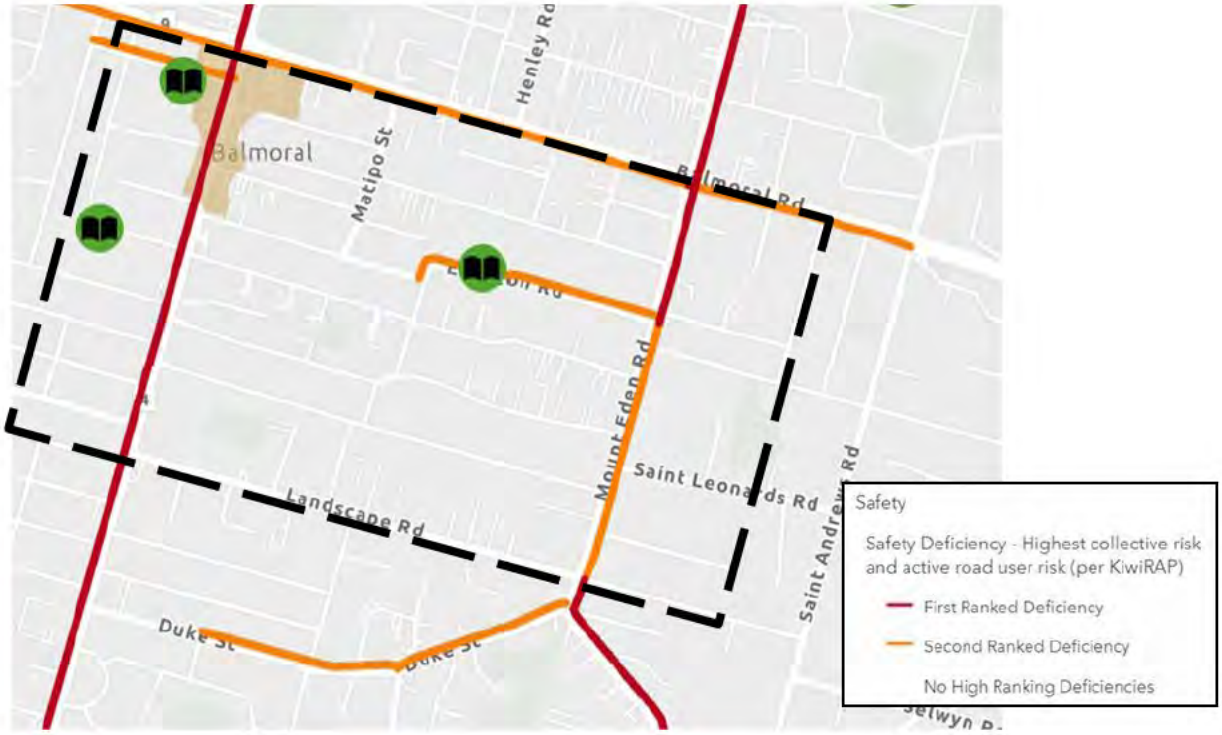
Figure 2-66: Safety Assessment – First Decade (Source Future Connect)



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2.10 WAIKOWHAI

2.10.1 CONTEXT

Kainga Ora has a significant portion of the land to the northwest of the area. The Waikowhai area with almost all of the land lying within the 'Residential - Mixed Housing Suburban' zone. The Dominion Road corridor has a local centre and associated business land around it. There is a small portion of land between Hillsborough Road and Whitmore Road used for a school and it is zoned 'Special Purpose Zone'.

Figure 2-67: Neighbourhood Boundary and Study Area

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Figure 2-68: One Network Road Classification

2.10.2 POTENTIAL FOR GROWTH

The MSM model forecasts the expected change in dwellings is outlined in Table 2-1 and Within selected zones (i.e. 323 and 324) the Modified AGS scenario shows a reduction in household numbers compared to the 2024 household numbers. This comes as a result of the methodology used for the Modified AGS scenario. In these zones, the AGS scenarios appear to provide a reasonable level of growth. This context was considered in assessing the local and safety improvements in this area.

Table 2-2 above. Within this neighbourhood, the applicable zones are 329 and 330.

2.10.3 SAFETY PERFORMANCE OF THE AREA

The safety performance of the existing network has been assessed using the NZTA Megamaps data base which obtains crash information from the CAS database and provides collective risk maps[20], maps of fatal and serious injuries and an assessment of high-risk intersections[21].

[20] Collective risk as defined by Kiwirap: Crash density on a road
[21] High risk intersections as defined by the NZTA High risk intersections guide 2013.

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Figure 2-69: Collective Safety Risk for the Area (Source NZTA MegaMaps)

Figure 2-70: Fatal and Serious Crashes (NZTA Open Data Platform)

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Figure 2-71: High Risk Intersections (NZTA MegaMaps)

2.10.4 CHANGE IN SAFETY RISK

An assessment of changes in safety risk considers the expected changes in demand as set out in Table 2-1and Table 2-2 along with the existing demands on roads in the area and framework set out in Table 1-1. In addition to this information consideration has been given to ATs Future Connect walking deficiency assessment and safety assessment for the first decade to identify safety concerns.

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Figure 2-72: Walking Deficiencies for First Decade (Source Future Connect)

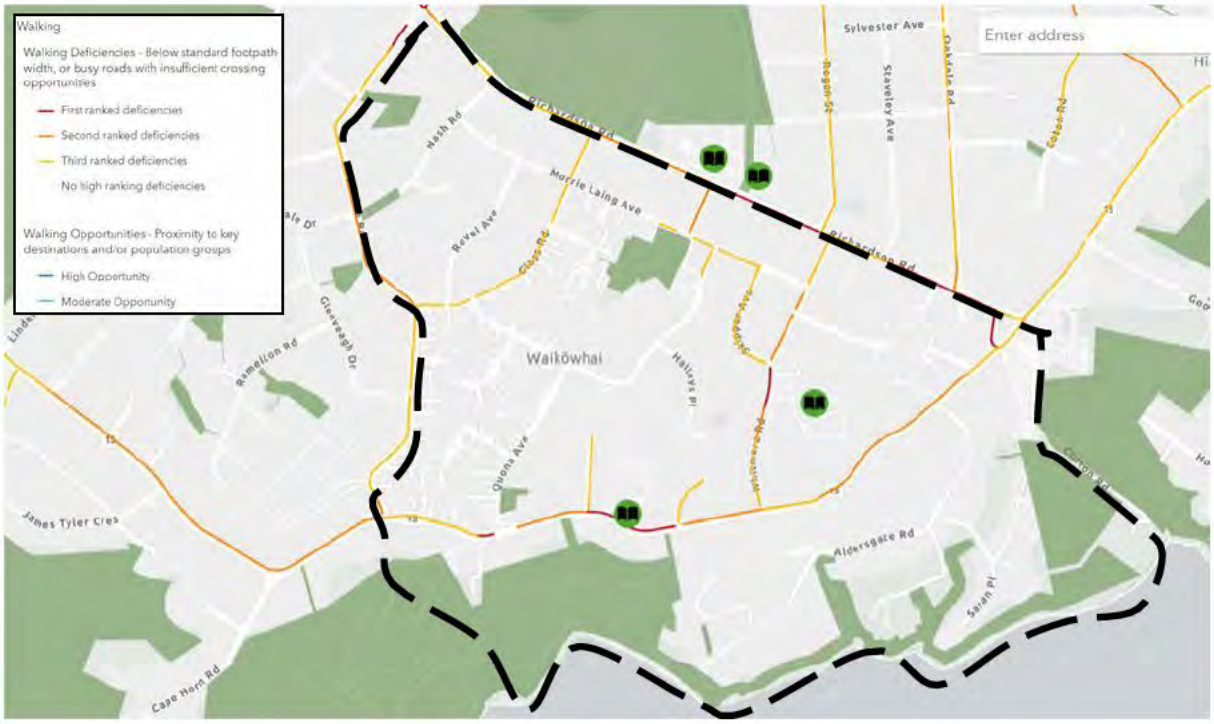

Figure 2-73: Safety Assessment – First Decade (Source Future Connect)

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ATTACHMENT A: NETWORK RESPONSES IN EACH NEIGHBOURHOOD

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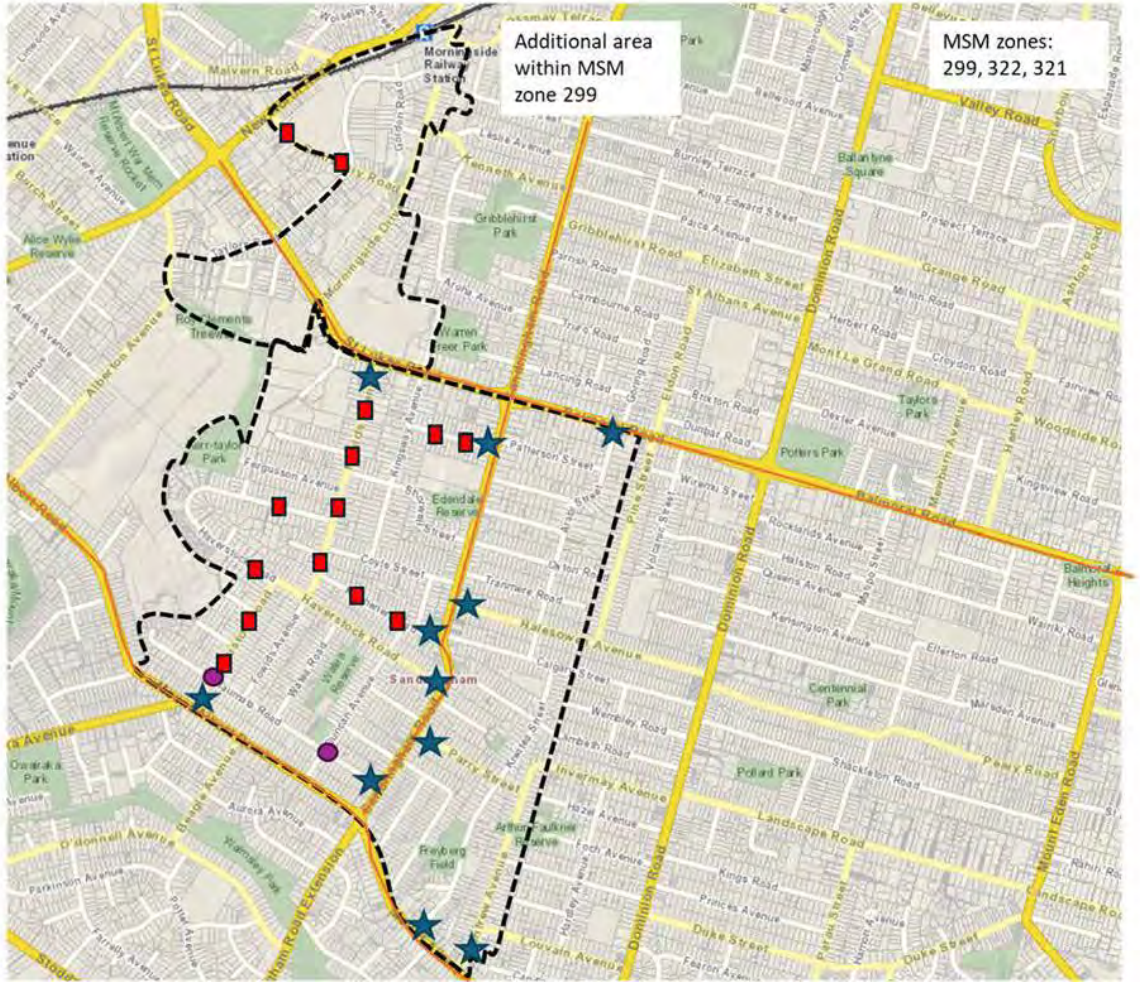
Sandringham

Legend
- Speed calming device
- Intersection treatment
- Threshold treatment
- Outside of local scope
- Zebra crossing

Item	Sandringham
Speed calming devices	14
Intersection treatments	2
Threshold treatments	11
Zebra Crossing	0



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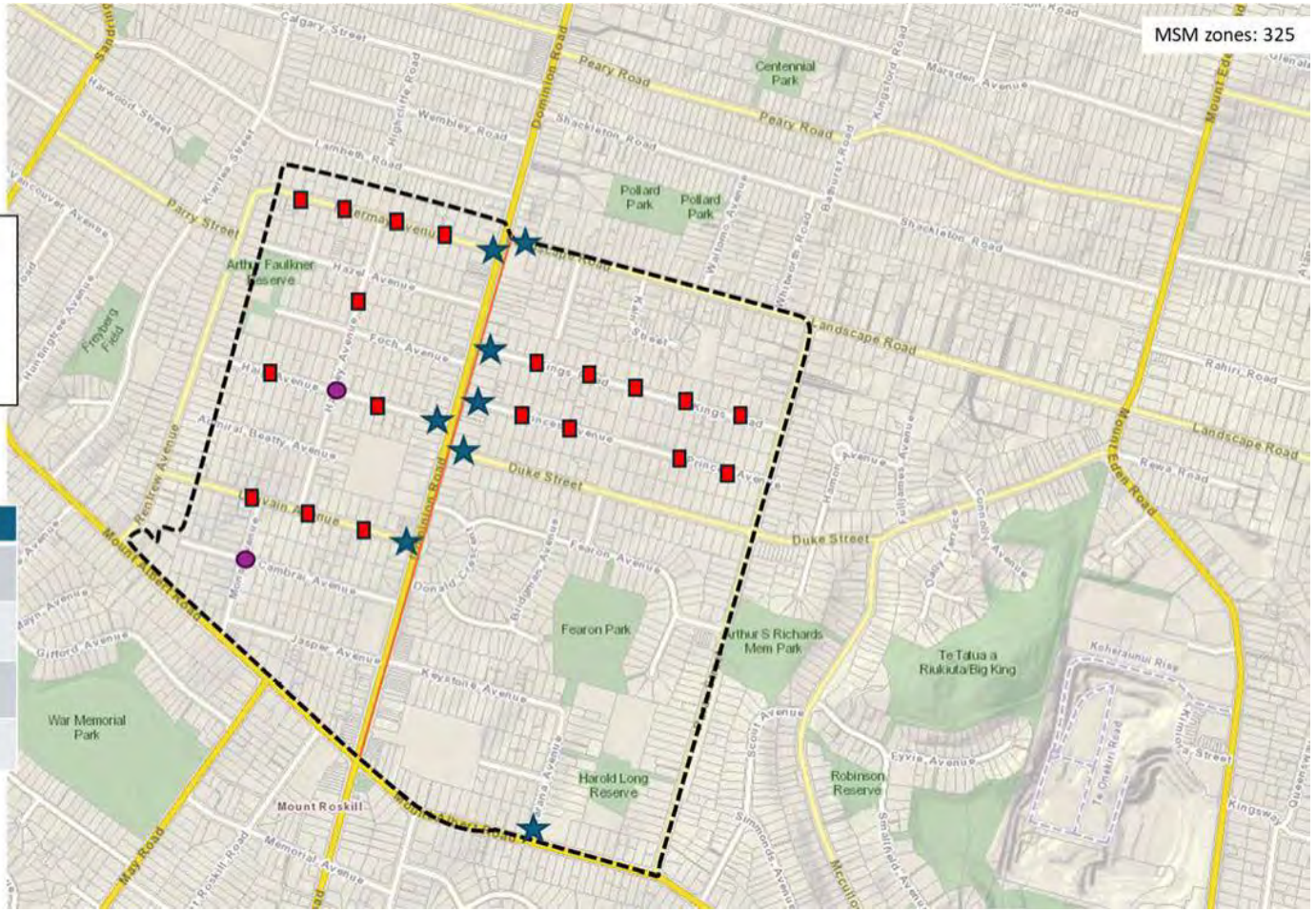
Dominion Road



Item	Dominion Road
Speed calming devices	19
Intersection treatments	2
Threshold treatments	8
Zebra Crossing	0

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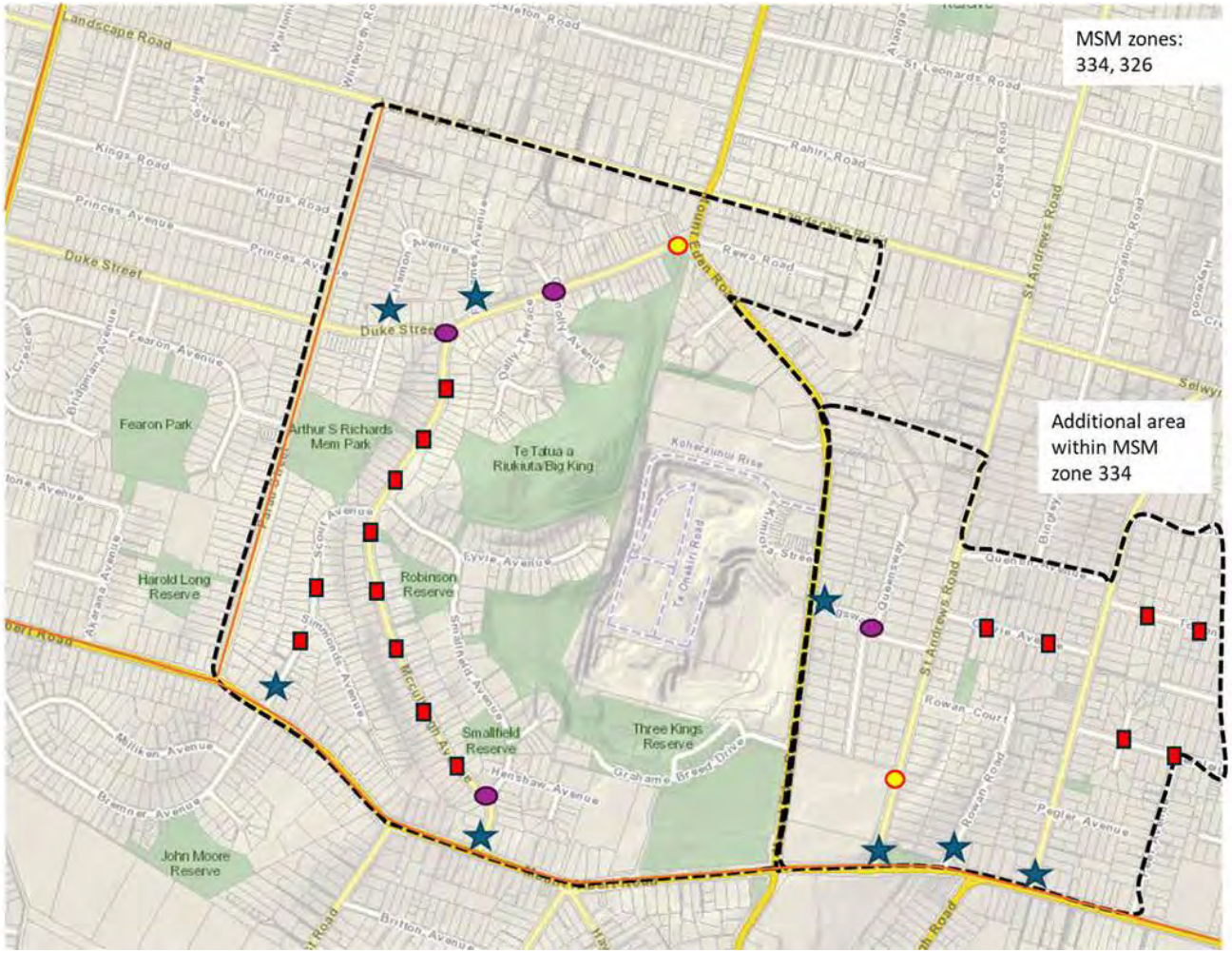
Three Kings

Legend
- Speed calming device
- Intersection treatment
- Threshold treatment
- Outside of local scope
- Zebra crossing

Item	Three Kings
Speed calming devices	16
Intersection treatments	4
Threshold treatments	8
Zebra Crossing	2



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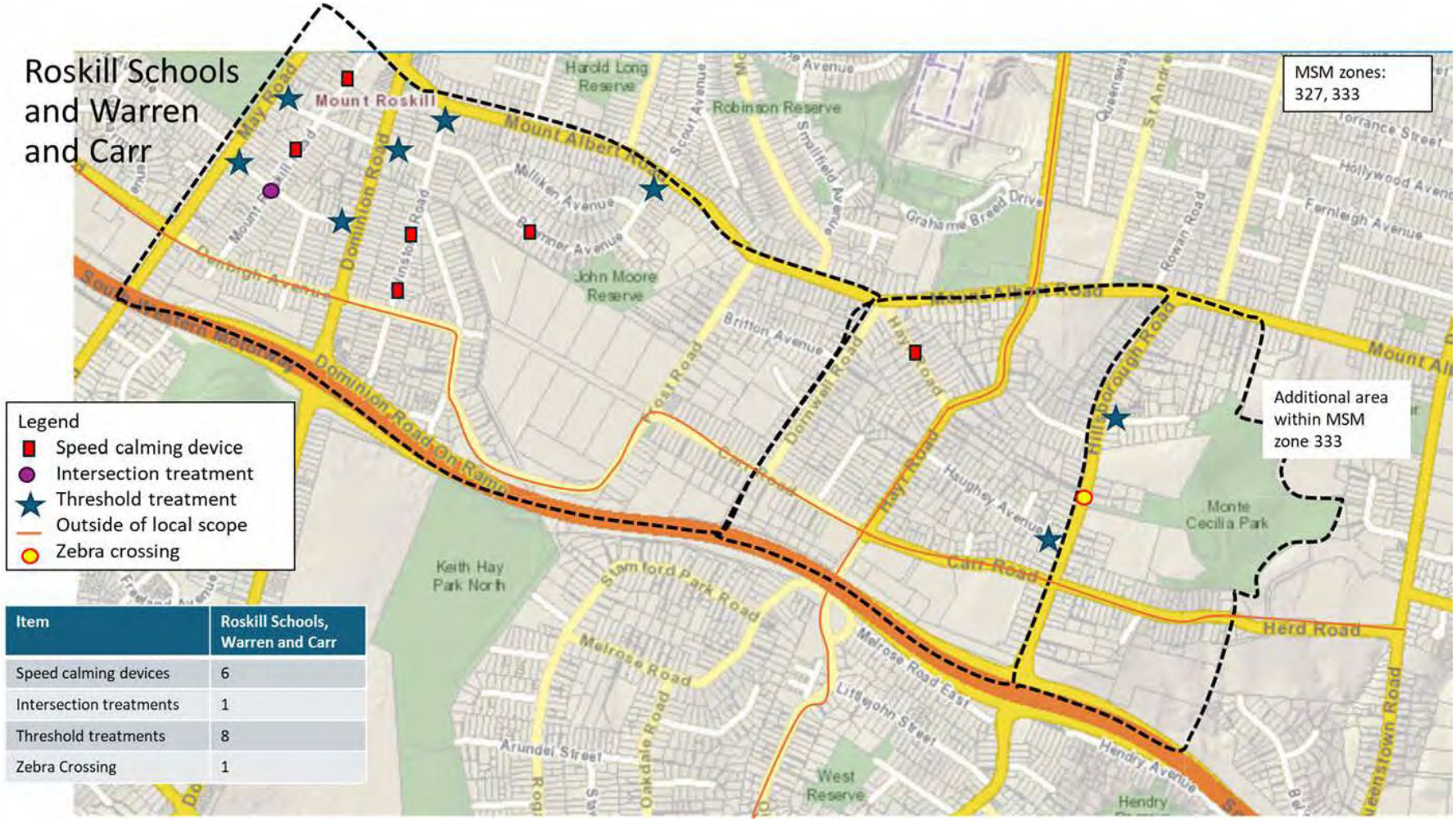
Roskill Schools and Warren and Carr



Item	Roskill Schools, Warren and Carr
Speed calming devices	6
Intersection treatments	1
Threshold treatments	8
Zebra Crossing	1

Sensitivity: General

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Mt Albert East

Item	Mt Albert East
Speed calming devices	9
Intersection treatments	0
Threshold treatments	15
Zebra Crossing	1

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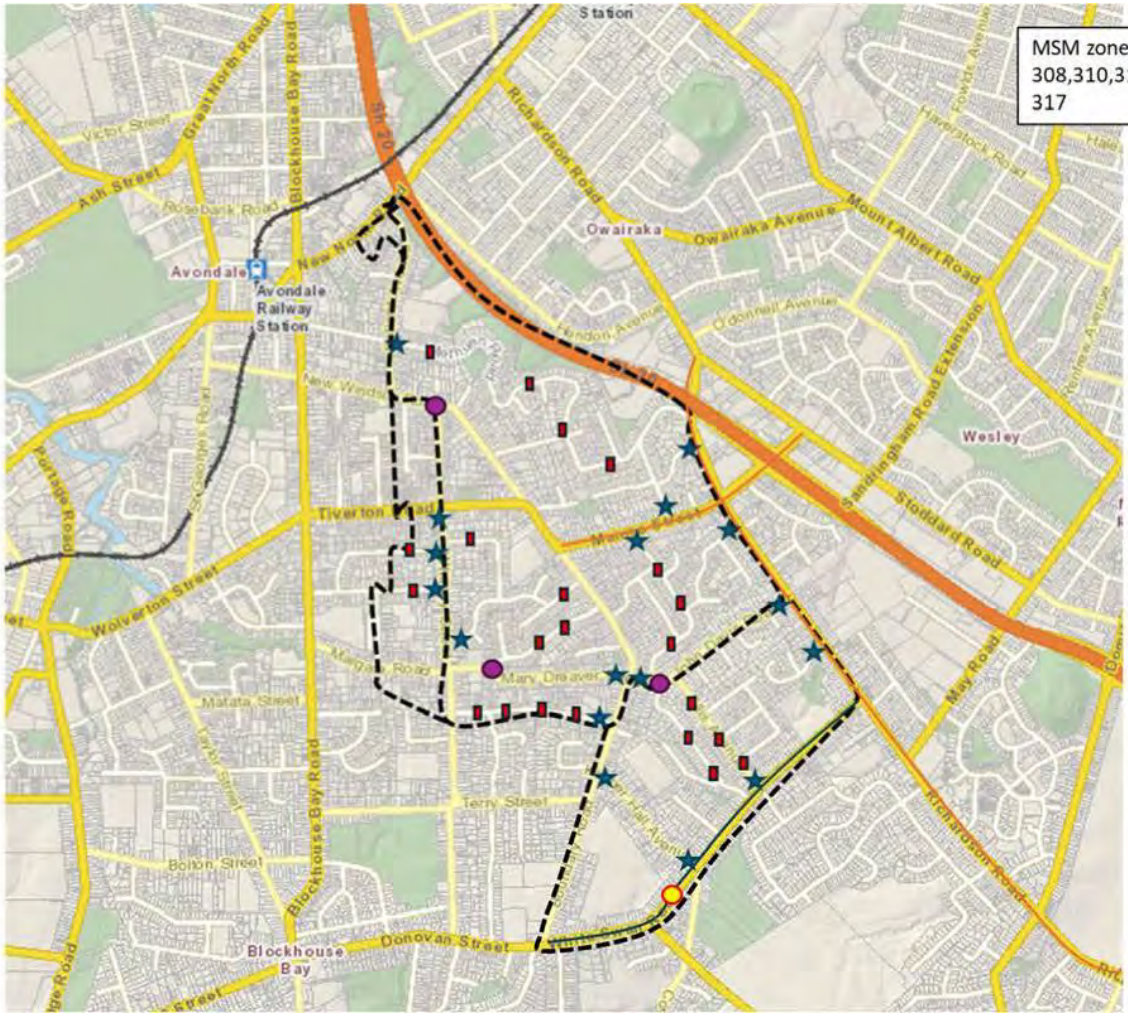
New Windsor

Legend
- Speed calming device
- Intersection treatment
- Threshold treatment
- Outside of local scope
- Zebra crossing

Item	New Windsor
Speed calming devices	23
Intersection treatments	3
Threshold treatments	17
Zebra Crossing	1



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Hillsborough

Item	Hillsborough
Speed calming devices	16
Intersection treatments	0
Threshold treatments	8
Zebra Crossing	0

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Mt Eden and Balmoral

Item	Mt Eden and Balmoral
Speed calming devices	3
Intersection treatments	2
Threshold treatments	8
Zebra Crossing	4

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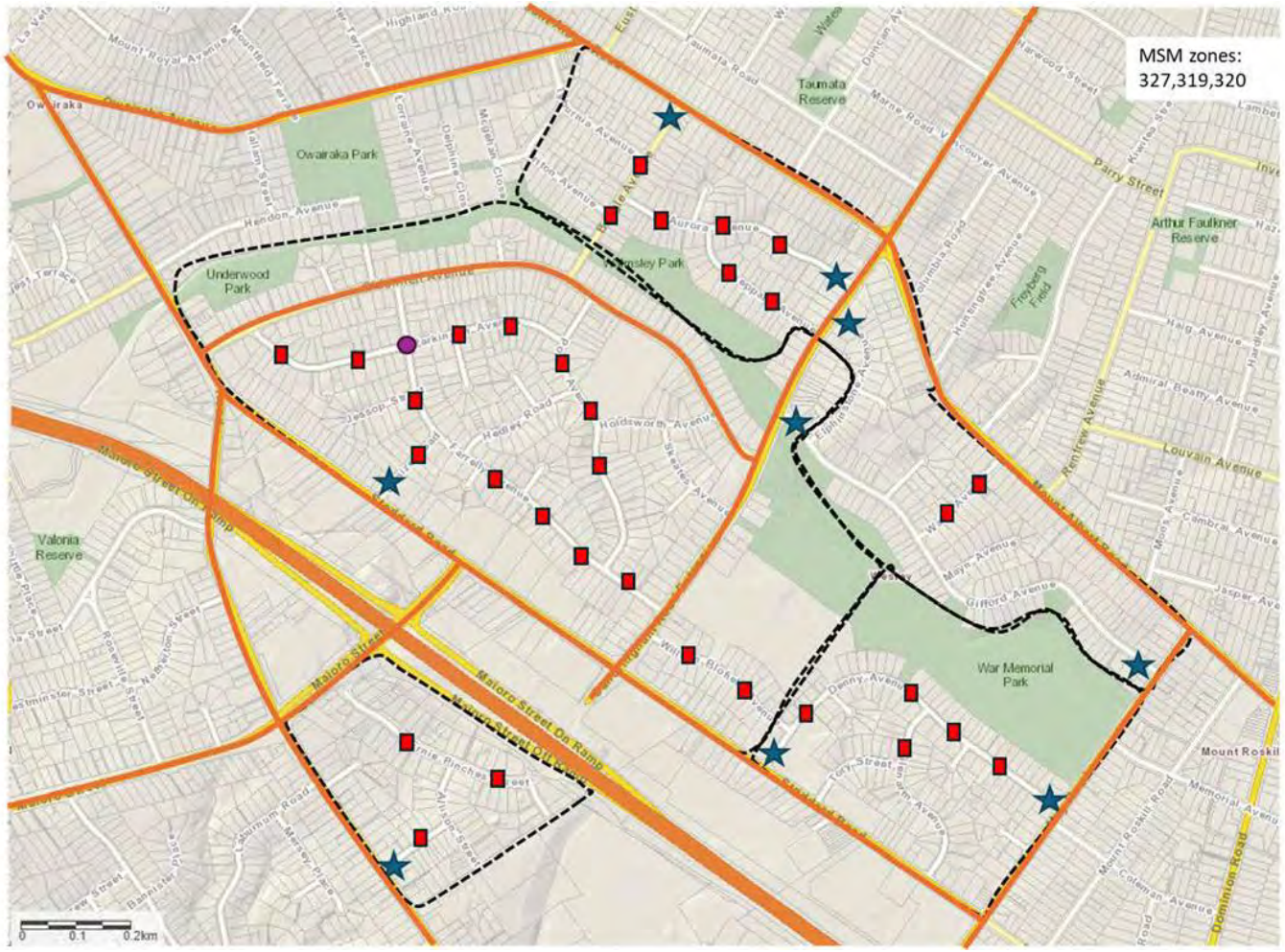
Wesley + Malcolm and Roma

Item	Wesley + MR
Speed calming devices	32
Intersection treatments	1
Threshold treatments	9
Zebra crossing	0



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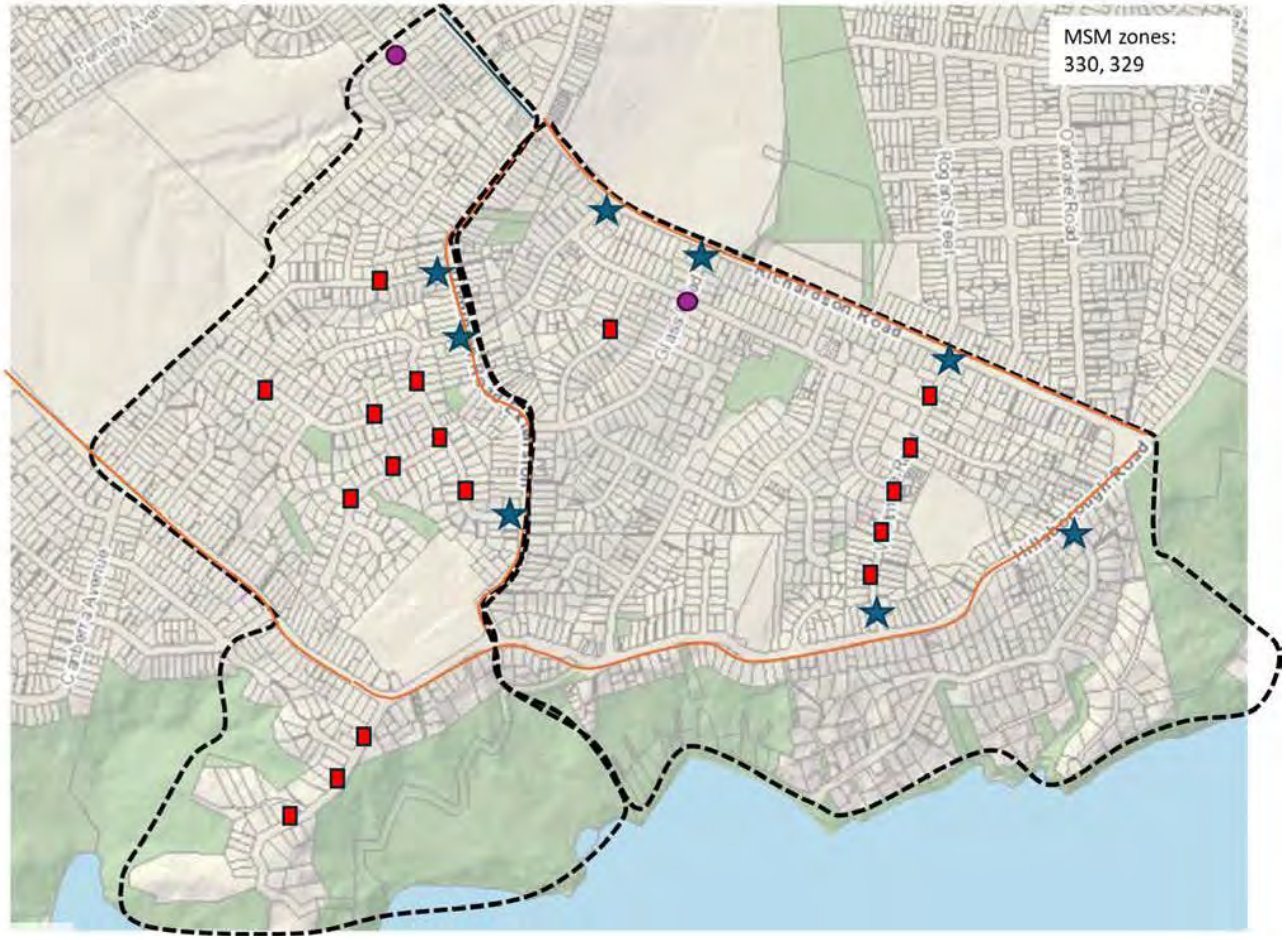
Waikowhai

Item	Waikowhai
Speed calming devices	17
Intersection treatments	2
Threshold treatments	8
Zebra crossing	0



Legend

- Speed calming device
- Intersection treatment
- Threshold treatment
- Outside of local scope

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Owairaka

Implementation of the Proposed upgrades appear to have been carried out.

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Mt Roskill South

Implementation of the proposed upgrades appear to have been carried out.

Figure 21: Proposed Traffic Calming Measures

MSM zones: 328

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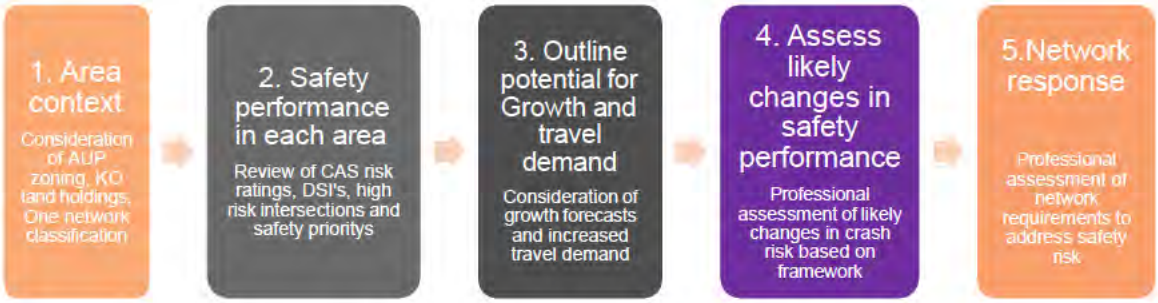
MANGERE - SAFETY AND LOCAL IMPROVEMENTS BY NEIGHBOURHOOD

Date: 13/06/2024 Version: 1.1

This memo outlines an approach to the assessment of local areas for local upgrades and road safety interventions as a response to brownfields intensification.

1 METHODOLOGY USED

The methodology used for this assessment follows the following steps:



The area context includes gathering of information including road network typology, zoning, and public land holdings. The potential for growth is identified through consideration of KO growth in the zone, anticipated changes in the MSM model and consideration of a full build out scenario. The growth is then considered in the context of changes in travel demand extended over time. This takes into account future changes in mode share in the future.

The underlying intention of this approach is to account for the additional population (and associated travel) and recognise that with these additional future demands, there will be an increase in the expected exposure to transport safety risks compared to the current situation.

The safety performance of the network looks at historic data in each area against national averages and highlights parts of the network which have higher safety risk. The Future Connect database includes a layer highlighting priority safety deficiencies in the transport network for the next 10 years. This is considered along with crash data. The Future Connect database also highlights deficiencies in the walking network.

A professional assessment is made on the network given the current performance and anticipated changes in demand. A framework of changes in transport demand to types of interventions is outlined in Table 1-1. This forms a basis on which interventions are identified in each area.

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Table 1-1: Framework of growth change thresholds vs intervention matrix

GROWTH CHANGE THRESHOLDS			
	LOW LEVEL	MEDIUM LEVEL	HIGH LEVEL
Vehicle volume (AADT) - increased	0 – 500	500 – 1,000	>1,000
Active modes (cyclists and pedestrian) volume - increased	0 – 50 people/ day	50 -100 people/day	>100 people/day
INTERVENTION MATRIX OPTIONS			
Midblock	• Footpath widening	• Kerb buildouts & pedestrian refuge islands • Speed calming device	• Raised crossing e.g. zebra crossing • Speed calming device
Intersection	• Kerb crossing / pram ramp & tactile pavers (where not existing)	• Threshold treatment e.g. flush treatment • Upgrade priority control e.g. where existing uncontrolled	• Threshold treatment e.g. raised pedestrian crossing

The final step is a stocktake of the existing network and identification of necessary interventions and investment to respond to the future safety risk based on estimated changes in the levels of future travel demand.

The network response for each area is included in Attachment A.

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2 MANGERE PRECINCT

Figure 2-1 sets out the extends of the AHP area and indicates where Kainga Ora hold land.

Figure 2-1: Auckland Housing Programme Boundary and Kainga Ora Land Holdings

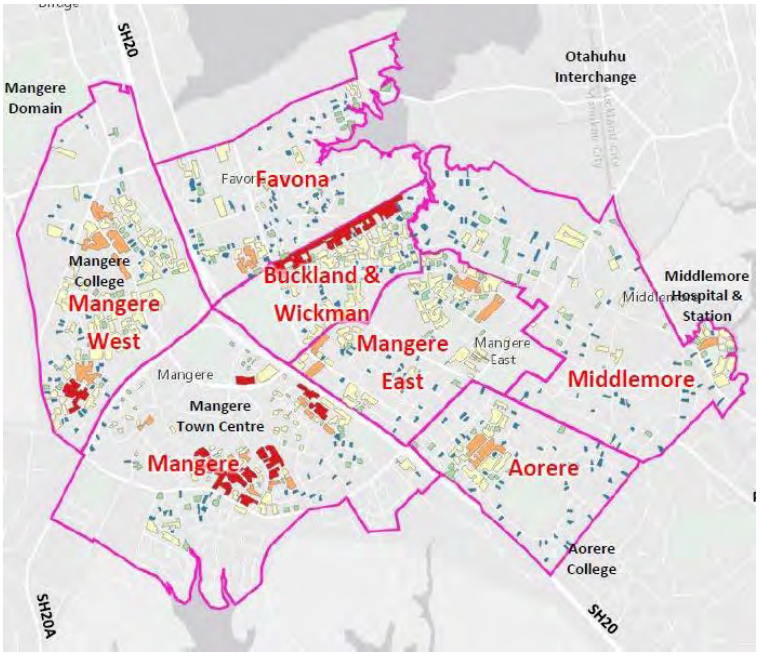

Figure 2-2 sets out the Auckland Unitary Plan zoning for the Mangere area. Much of the AHP is zoned with typical residential zoning (i.e. Mixed housing urban). Around the Mangere centre, there is a significant portion of terraced housing and apartment zone. Industrial zoning can be found north of Favona Road and west of Kirkbride.

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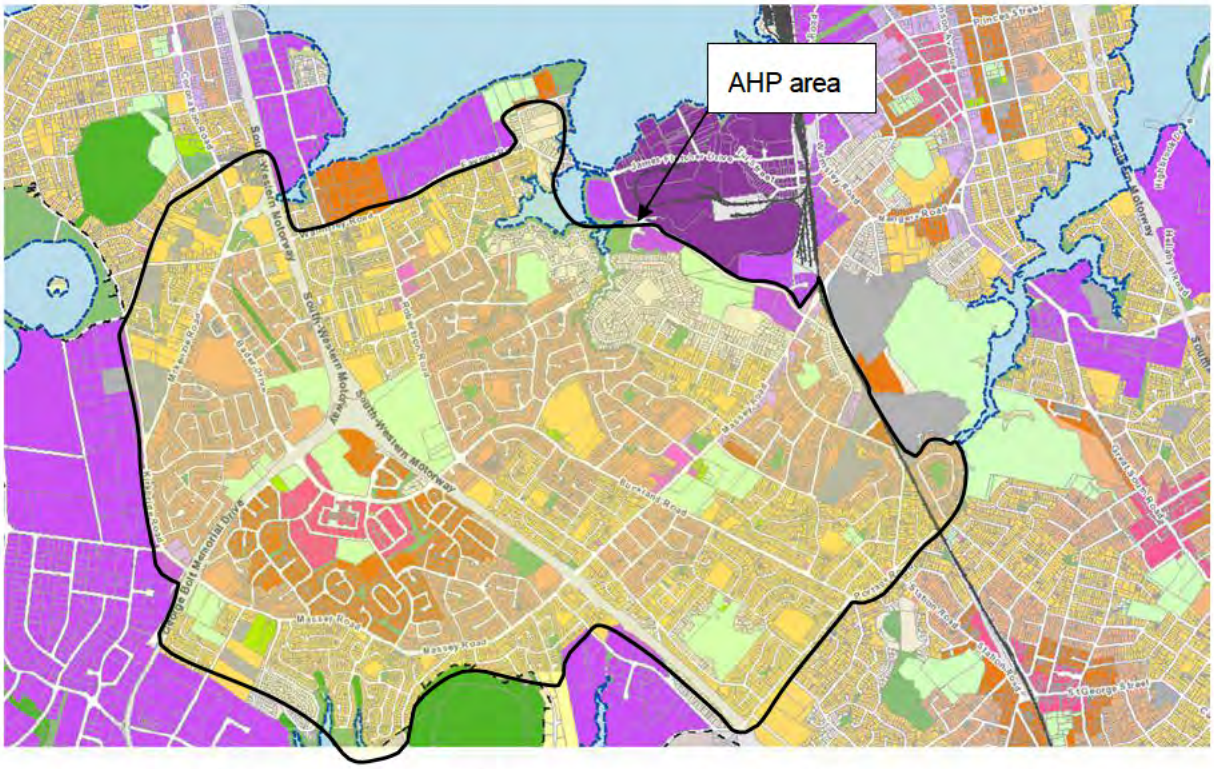
Figure 2-2: Auckland Unitary Plan Zoning



The funding area for developer contributions varies slightly from the AHP area due to the fact MSM zones / Census area units do not line up with the AHP boundary. In the Mangere area and some additional area is included in the study area to reflect the balance of several MSM zones. Figure 2-3 shows the MSM zones in the AHP area (light purple) and MSM area included in the study area but outside the AHP (dark purple).

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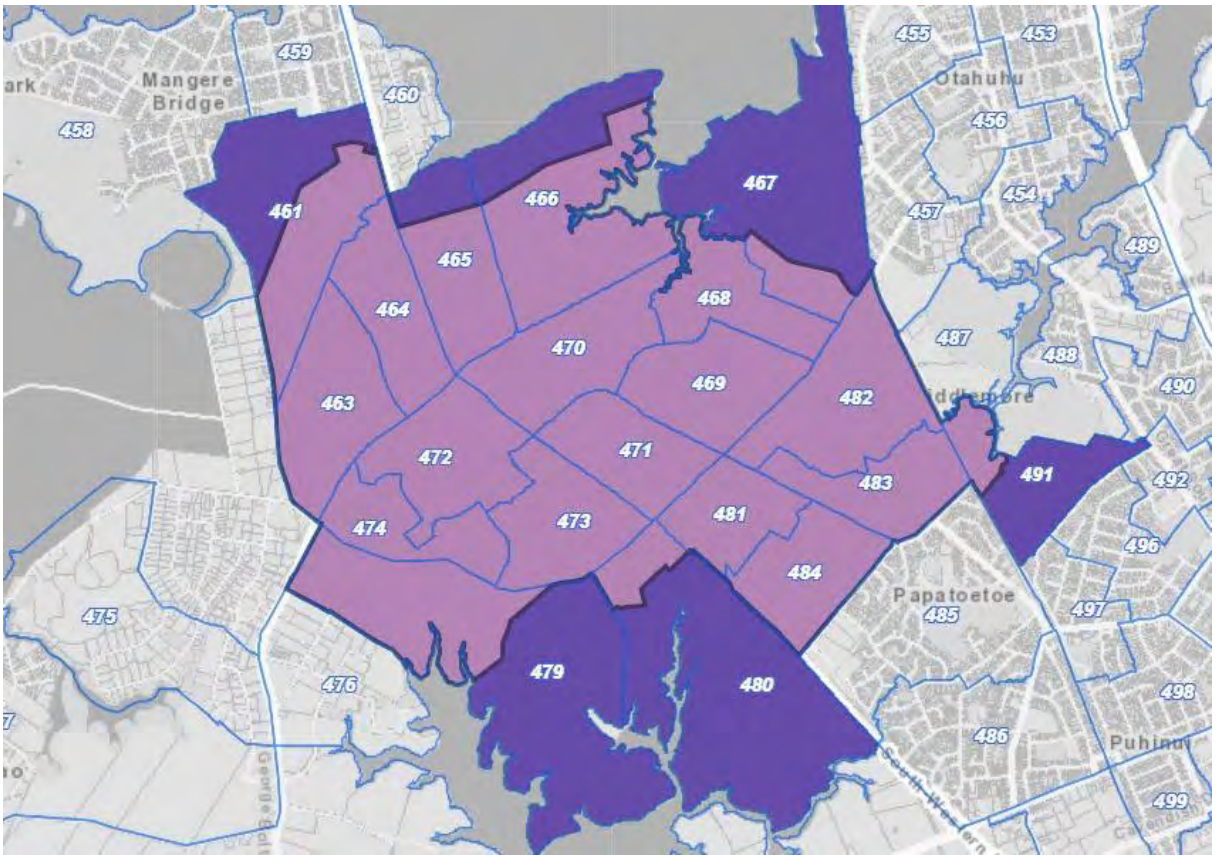
Figure 2-3: AHP Neighbourhoods vs MSM Zones



The potential for change has been considered for each zone through consideration of the existing household numbers, and anticipated growth in each zone. In terms of future forecasts, both the AGS scenario and the green line test (As described in the Transport report) have been considered.

For context in each of the areas, rough order changes in trips have been assessed based on the anticipated additional dwellings in each zone and application of an assumed mode spilt[1]. This provides a high-level quantum of additional peak hour car trips, PT passengers and active mode users. This information has been used as context for the identification of local and safety upgrades in each area.

Table 2-1 highlights the changes in households by zone according to the AGS and Greenline growth scenarios. Table 2-2 shows rough changes in peak hour trips by mode for each zone.

[1] A Future mode split of 60% private vehicle, 20% public transport and 20% active mode has been assumed for this assessment. Private vehicle travel assumes a vehicle occupancy of 1.4.

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Table 2-1: Changes in Household numbers in each area

Area	Zone	2024 households	AGS 2052 Households	Modified AGS 2052	AGS change in dwellings	Modified AGS change in dwellings
Mangere	461	1199	1854	1614	654	415
	463	1227	1818	2236	591	1009
	464	766	1360	1234	594	468
	465	892	1239	1667	347	775
	466	1770	2370	2167	599	396
	467	56	113	26	57	-30
	468	920	991	726	71	-193
	469	988	1468	1776	479	788
	470	995	2192	1836	1196	841
	471	1067	1547	1458	479	391
	472	300	945	1108	645	808
	473	1009	2326	2604	1317	1594
	474	737	2055	2605	1317	1868
	479	1464	1565	1505	101	41
	480	382	413	403	31	21
	481	761	947	1274	186	513
	482	1256	1398	1938	142	682
	483	930	1073	1266	143	336
	484	734	920	920	186	186
	491	1260	1471	1574	211	314

There are some minor discrepancies in MSM zone 467 and 468 where the household numbers decrease between 2024 values under the Modified AGS scenario. Within these zones, the land use is predominantly business or low-density residential areas. The methodology used for the modified AGS scenario has lead to low levels of residential units assumed in each of these zone. The AGS scenario assumes no significant growth in these two zones. This context was considered in assessing the local and safety improvements in this area.

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Table 2-2: Changes in rough order trips based on changes in dwellings for AGS scenario

Area	Zone	Estimated change in daily trips	Estimated change in Peak hour trips	AGS Rough order additional Car trips (assumed 60% of future trips)	AGS Rough order additional PT trips (assumed 20% of future trips)	AGS Rough order additional active mode trips (Assumed 20% of future trips)
Mangere	461	7198	654	280	131	131
	463	6502	591	253	118	118
	464	6537	594	255	119	119
	465	3818	347	149	69	69
	466	6591	599	257	120	120
	467	631	57	25	11	11
	468	776	71	30	14	14
	469	5273	479	205	96	96
	470	13161	1196	513	239	239
	471	5270	479	205	96	96
	472	7094	645	276	129	129
	473	14486	1317	564	263	263
	474	14491	1317	565	263	263
	479	1111	101	43	20	20
	480	338	31	13	6	6
	481	2050	186	80	37	37
	482	1566	142	61	28	28
	483	1570	143	61	29	29
	484	2050	186	80	37	37
	491	2323	211	91	42	42

2.1 TE ARARATA (MANGERE WEST) A

2.1.1 CONTEXT

Kainga Ora has a significant portion of the land in this area. The Mangere West area is mostly zoned within the Residential – Mixed housing urban zone. Myle Park is located directly south of the area and SH20 corridor bounds the area to the east.

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Figure 2-4: Neighbourhood Boundary and Study Area

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Figure 2-5: One Network Road Classification

2.1.2 POTENTIAL FOR GROWTH

The MSM model forecasts the expected change in dwellings is outlined in **Error! Reference source not found.** and **Error! Reference source not found.** above. Within this neighbourhood, the applicable zone is 464.

2.1.3 SAFETY PERFORMANCE OF THE AREA

The safety performance of the existing network has been assessed using the NZTA Megamaps data base which obtains crash information from the CAS database and provides collective risk maps[2], maps of fatal and serious injuries and an assessment of high-risk intersections[3].

[2] Collective risk as defined by Kiwirap: Crash density on a road
[3] High risk intersections as defined by the NZTA High risk intersections guide 2013.

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Figure 2-6: Collective Safety Risk for the Area (Source NZTA MegaMaps)

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Figure 2-7: Fatal and Serious Crashes (NZTA Open Data Platform)

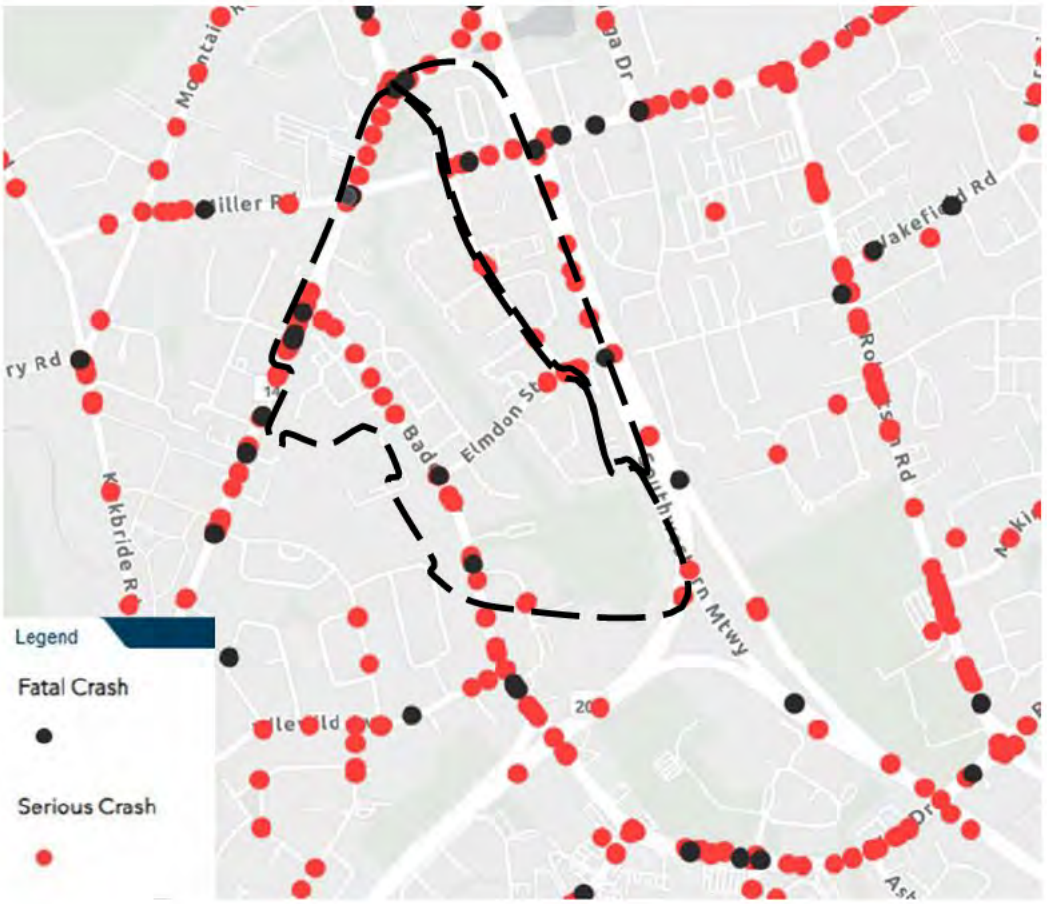

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Figure 2-8: High Risk Intersections (NZTA MegaMaps)

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2.1.4 CHANGE IN SAFETY RISK

An assessment of changes in safety risk considers the expected changes in demand as set out in Table 2-1 and Table 2-2 along with the existing demands on roads in the area and framework set out in Table 1-1Table 1-1. In addition to this information consideration has been given to ATs Future Connect walking deficiency assessment and safety assessment for the first decade to identify safety concerns.

Figure 2-9: Walking Deficiencies for First Decade (Source Future Connect)

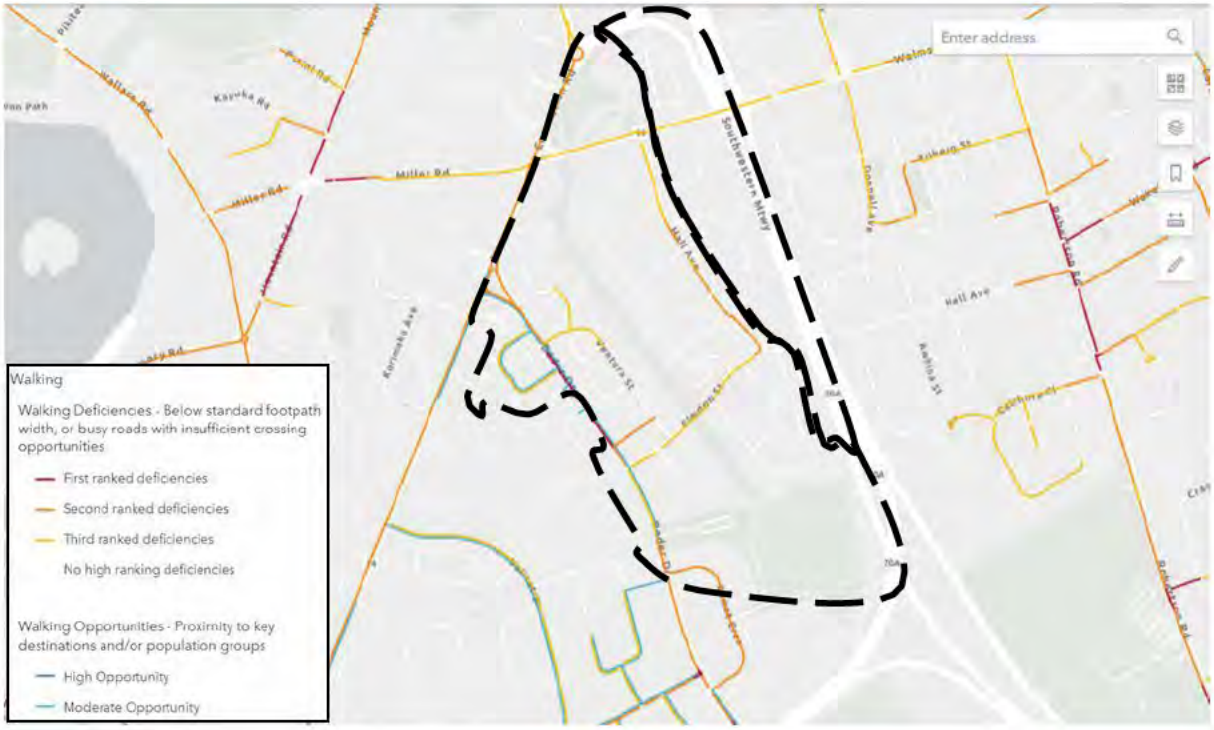

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Figure 2-10: Safety Assessment – First Decade (Source Future Connect)

2.2 TE ARARATA (MANGERE WEST) B

2.2.1 CONTEXT

The Te Ararata B is located to the north of SH20A and West of SH20. Kainga Ora has significant land holdings in this area. The land is predominantly zoned as residential mixed housing urban.

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Figure 2-11: Neighbourhood Boundary and Study Area

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Figure 2-12: One Network Road Classification

2.2.2 POTENTIAL FOR GROWTH

The MSM model forecasts the expected change in dwellings is outlined in **Error! Reference source not found.** and **Error! Reference source not found.** above. Within this neighbourhood, the applicable zone is 463.

2.2.3 SAFETY PERFORMANCE OF THE AREA

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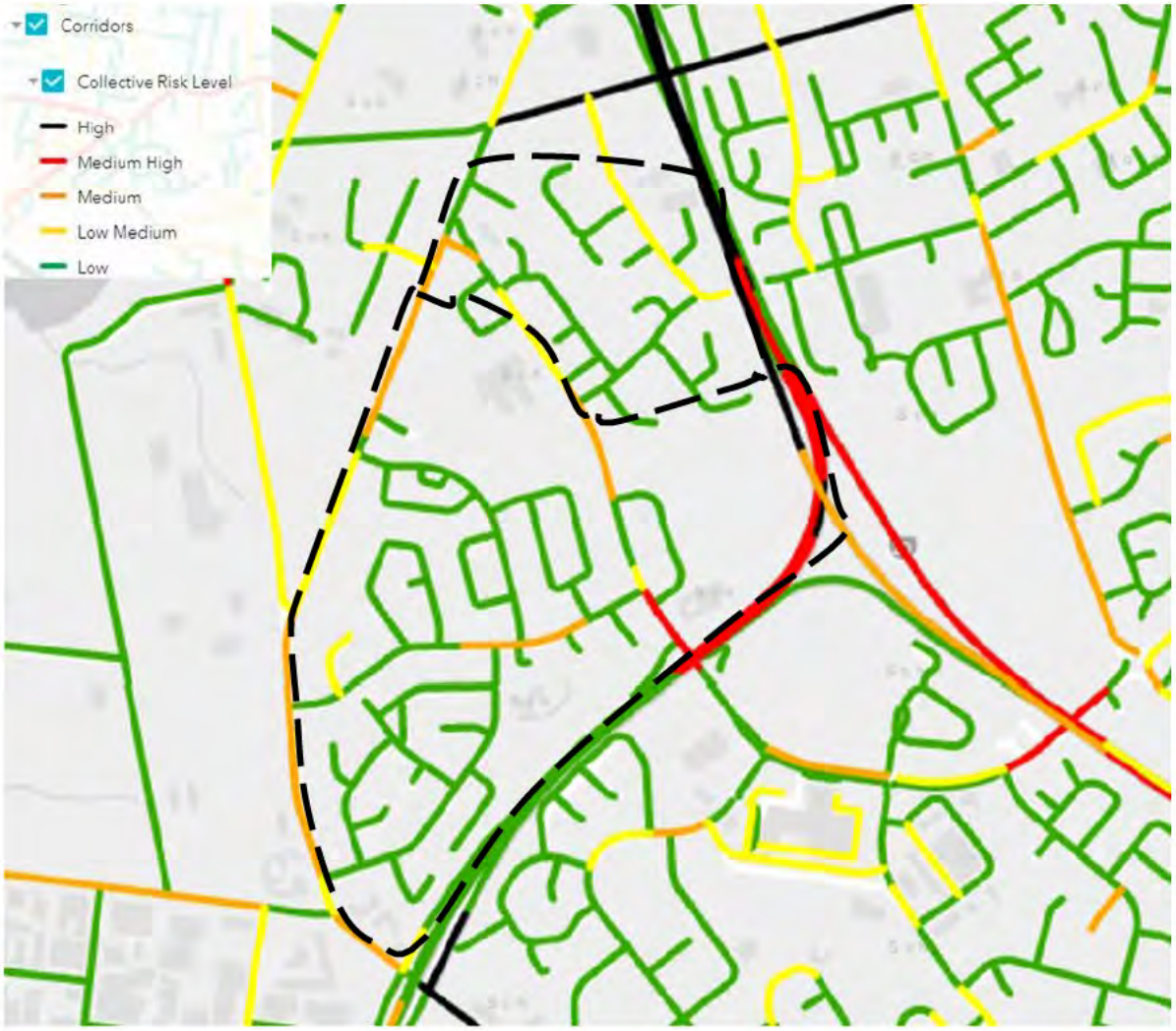
The safety performance of the existing network has been assessed using the NZTA Megamaps data base which obtains crash information from the CAS database and provides collective risk maps[4], maps of fatal and serious injuries and an assessment of high-risk intersections[5].

Figure 2-13: Collective Safety Risk for the Area (Source NZTA MegaMaps)



[4] Collective risk as defined by Kiwirap: Crash density on a road
[5] High risk intersections as defined by the NZTA High risk intersections guide 2013.

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Figure 2-14: Fatal and Serious Crashes (NZTA Open Data Platform)

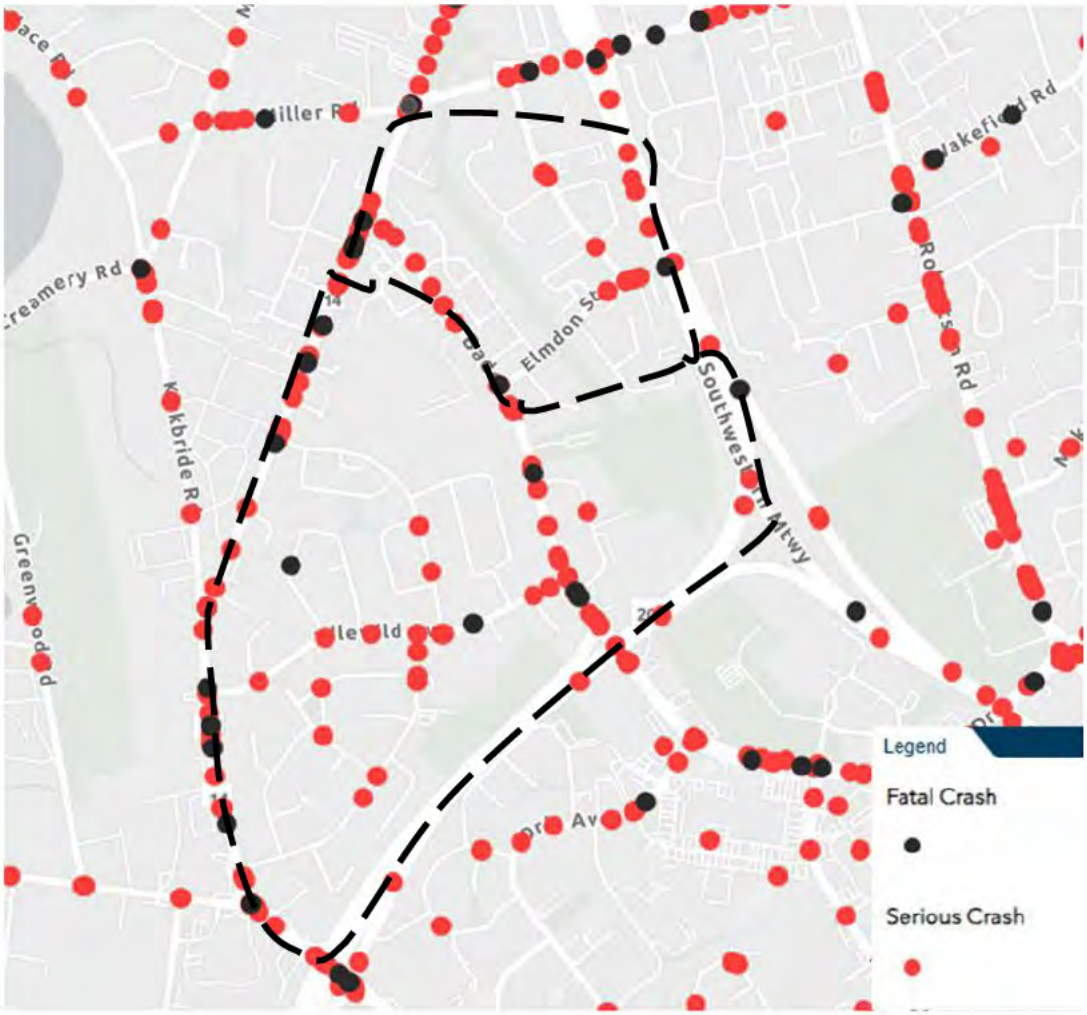

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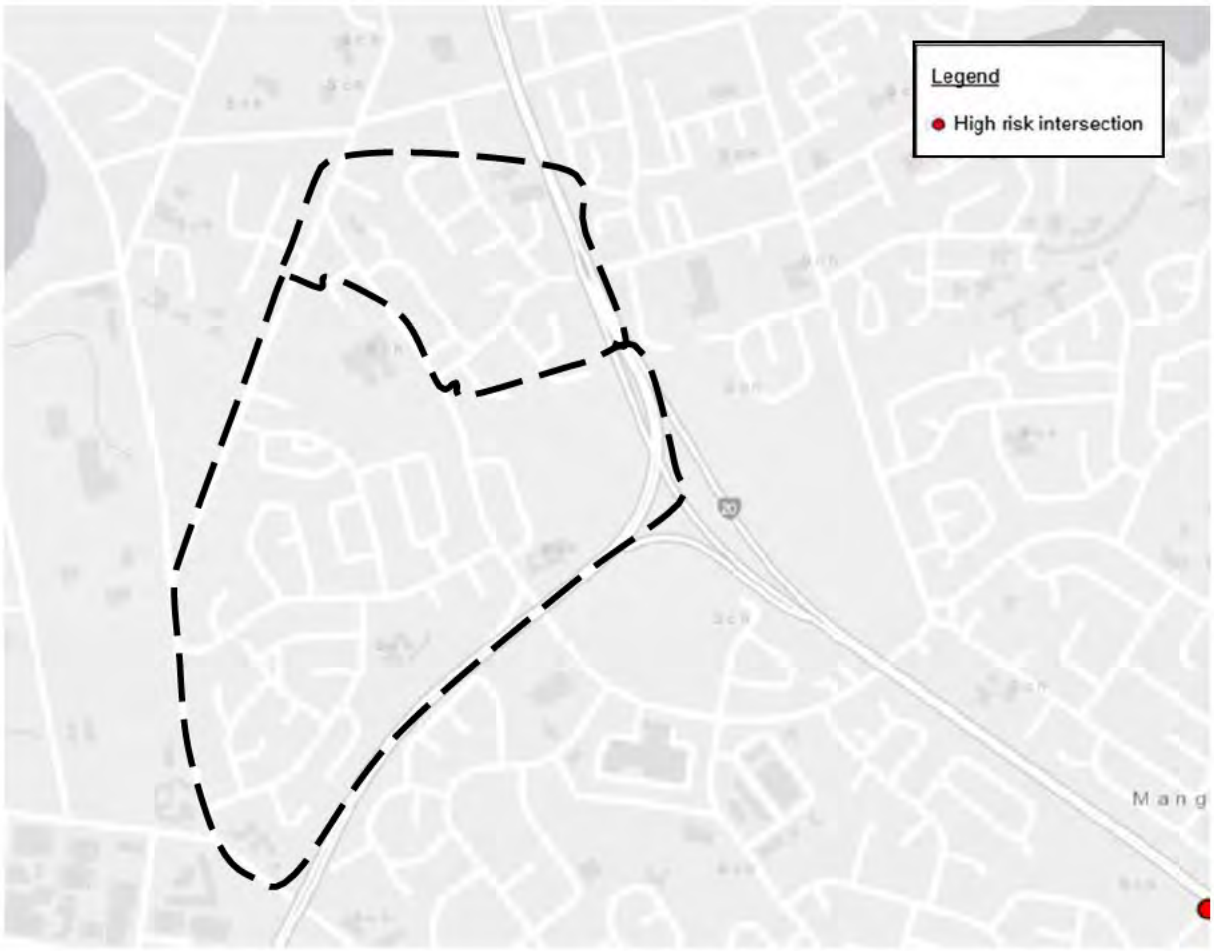
Figure 2-15: High Risk Intersections (NZTA MegaMaps)



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2.2.4 CHANGE IN SAFETY RISK

An assessment of changes in safety risk considers the expected changes in demand as set out in Table 2-1 and Table 2-2 along with the existing demands on roads in the area and framework set out in Table 1-1Table 1-1. In addition to this information consideration has been given to ATs Future Connect walking deficiency assessment and safety assessment for the first decade to identify safety concerns.

Figure 2-16: Walking Deficiencies for First Decade (Source Future Connect)

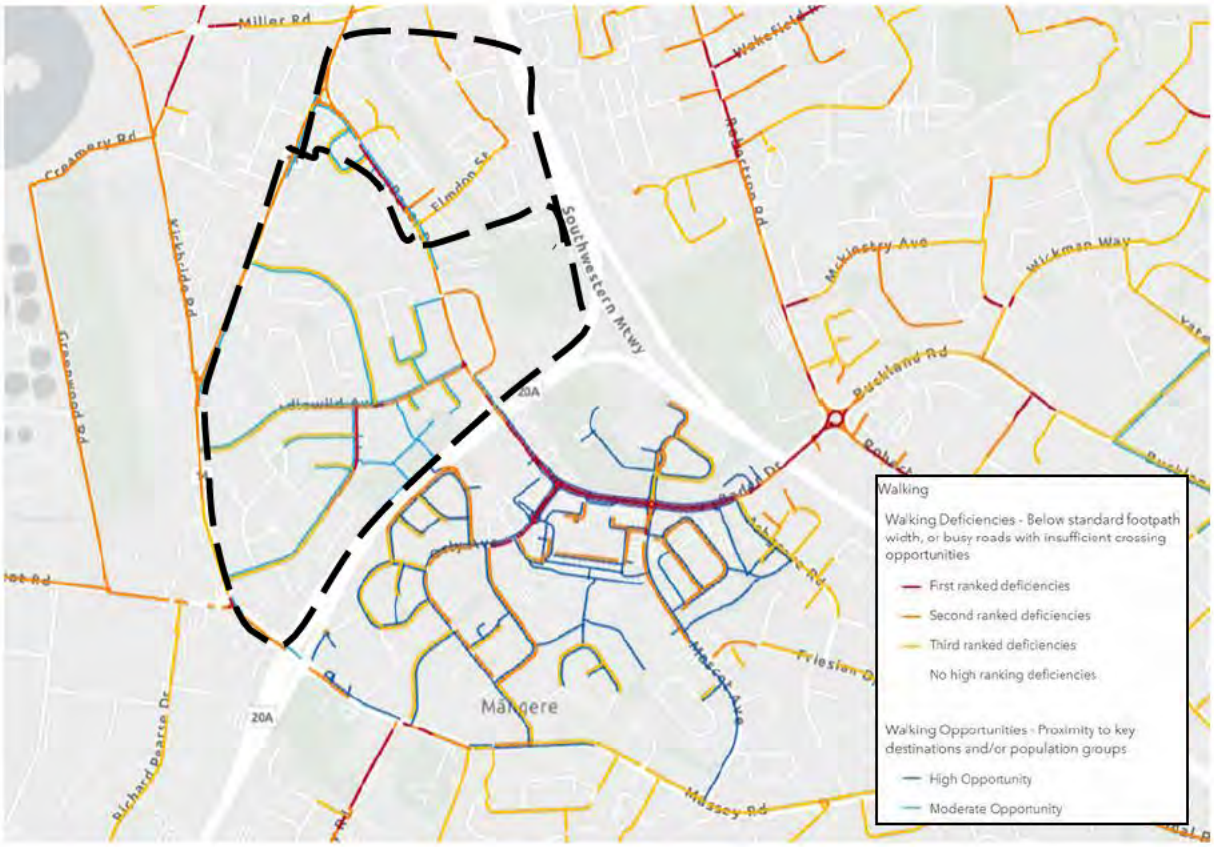

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Figure 2-17: Safety Assessment – First Decade (Source Future Connect)

2.3 MANGERE WEST C[6]

2.3.1 CONTEXT

The Mangere West C area is situated north of Mangere West A and B. Kainga Ora do not have significant land holdings in this area. Mangere Mountain is located in the centre of the area with residential land situated around the Mount. The land is predominantly zoned as Mixed Housing Suburban.

[6] Mangere West C is not an identified KO neighborhood and has been named as such for the purpose of this assessment only.

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Figure 2-18: Neighbourhood Boundary and Study Area

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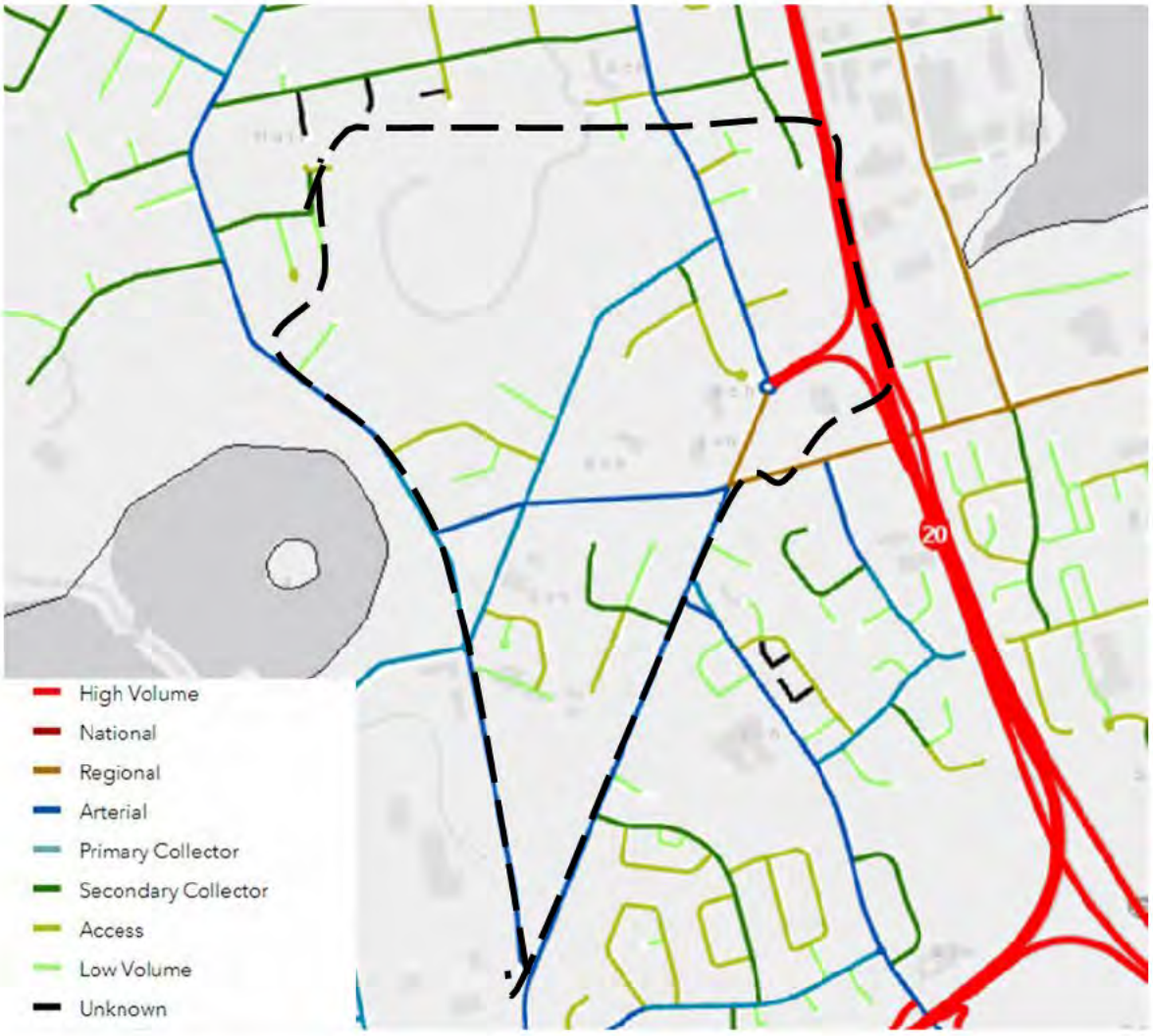
Figure 2-19: One Network Road Classification



2.3.2 POTENTIAL FOR GROWTH

The MSM model forecasts the expected change in dwellings is outlined in **Error! Reference source not found.** and **Error! Reference source not found.** above. Within this neighbourhood, the applicable zone is 461.

2.3.3 SAFETY PERFORMANCE OF THE AREA

The safety performance of the existing network has been assessed using the NZTA Megamaps data base which obtains crash information from the CAS database and provides collective risk maps[7], maps of fatal and serious injuries and an assessment of high-risk intersections[8].

[7] Collective risk as defined by Kiwirap: Crash density on a road
[8] High risk intersections as defined by the NZTA High risk intersections guide 2013.

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Figure 2-20: Collective Safety Risk for the Area (Source NZTA MegaMaps)

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Figure 2-21: Fatal and Serious Crashes (NZTA Open Data Platform)

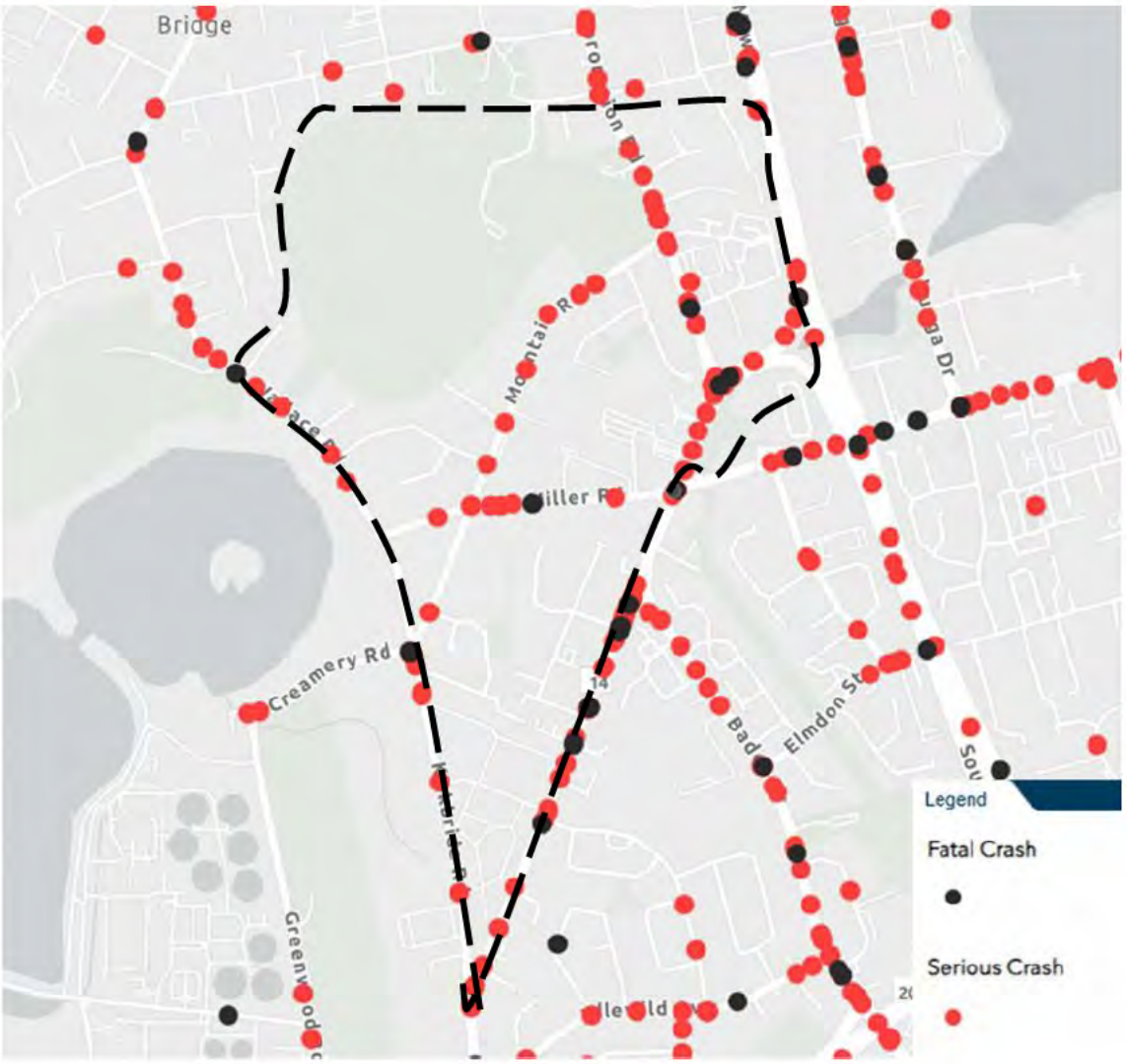

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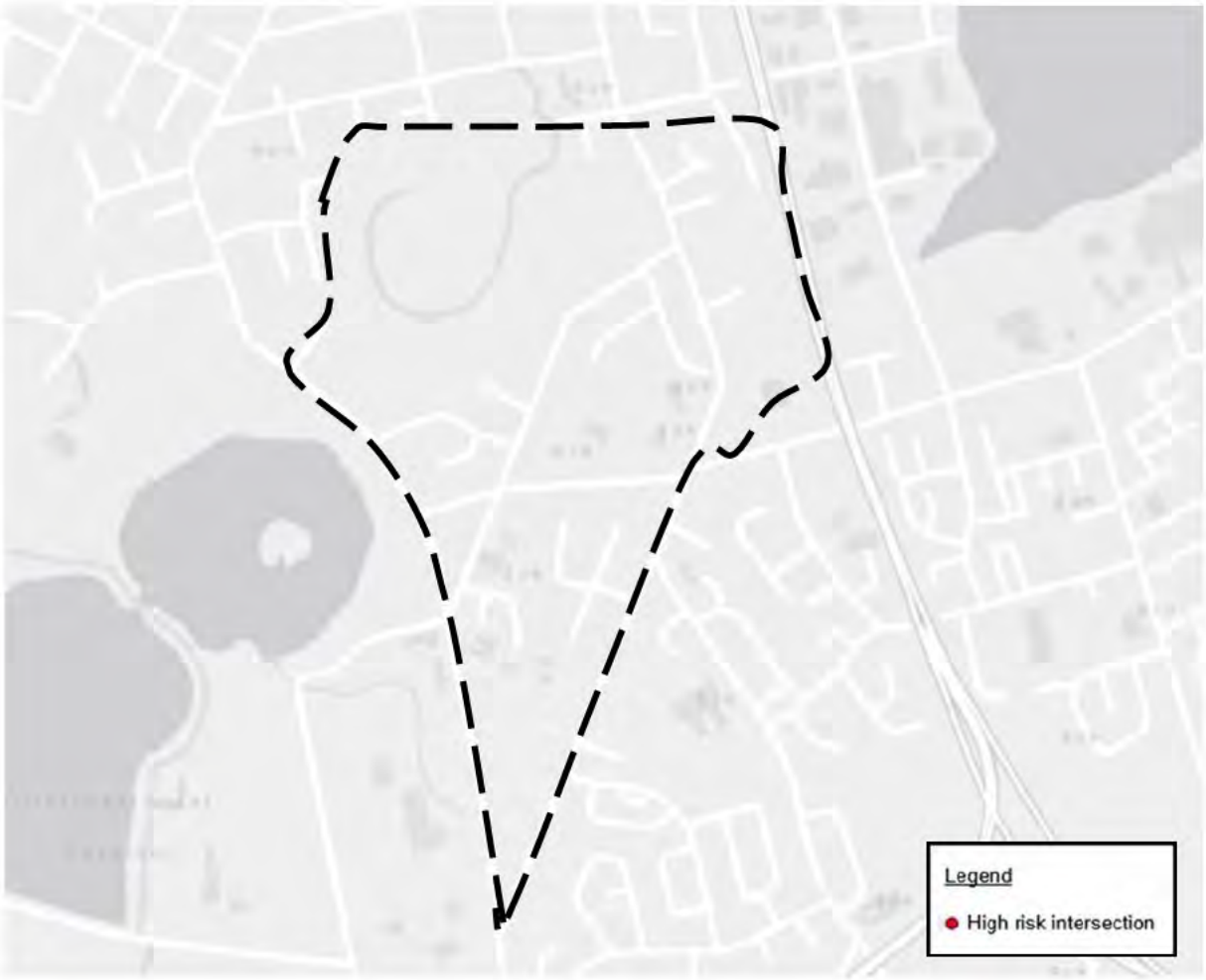
Figure 2-22: High Risk Intersections (NZTA MegaMaps)



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2.3.4 CHANGE IN SAFETY RISK

An assessment of changes in safety risk considers the expected changes in demand as set out in Table 2-1 and Table 2-2 along with the existing demands on roads in the area and framework set out in Table 1-1Table 1-1. In addition to this information consideration has been given to ATs Future Connect walking deficiency assessment and safety assessment for the first decade to identify safety concerns.

Figure 2-23: Walking Deficiencies for First Decade (Source Future Connect)

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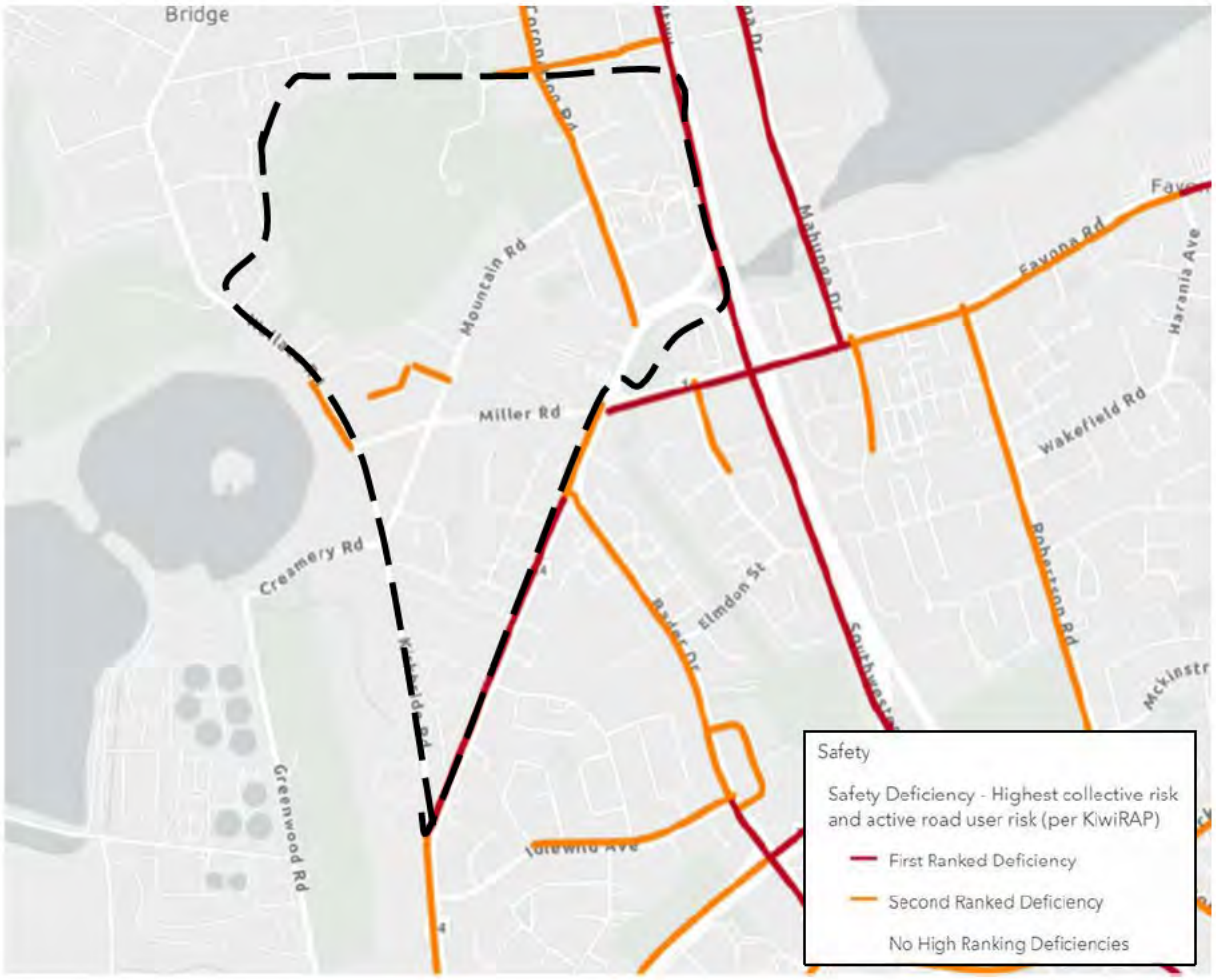
Figure 2-24: Safety Assessment – First Decade (Source Future Connect)



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2.4 MANGERE CENTRAL

2.4.1 CONTEXT

The Mangere central area includes the Mangere Town Centre and surrounding area. Much of the centre is zones as Business Town Centre, with high density land surrounding this. Mangere is bound by SH20A to the west, SH20 to the east and the Manukau harbour to the south. Kainga Ora hold significant portions of land in this area.

To the southeast of the Mangere centre, large portions of the land are zoned as Open space and industrial land.

Figure 2-25: Neighbourhood Boundary and Study Area

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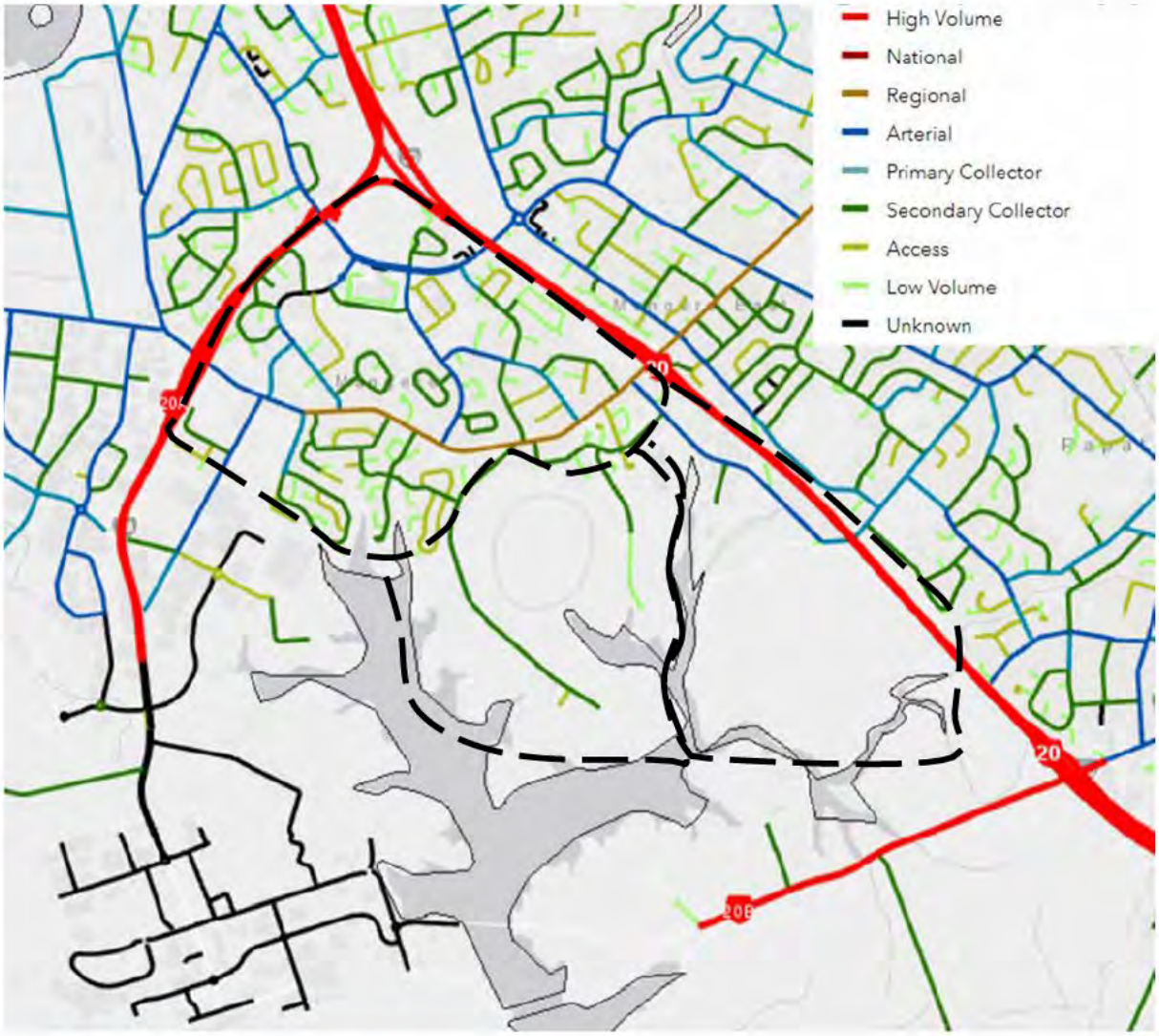
Figure 2-26: One Network Road Classification



2.4.2 POTENTIAL FOR GROWTH

The MSM model forecasts the expected change in dwellings is outlined in **Error! Reference source not found.** and **Error! Reference source not found.** above. Within this neighbourhood, the applicable zones are 472, 473, 474, 479, and 480.

2.4.3 SAFETY PERFORMANCE OF THE AREA

The safety performance of the existing network has been assessed using the NZTA Megamaps data base which obtains crash information from the CAS database and provides collective risk maps[9], maps of fatal and serious injuries and an assessment of high-risk intersections[10].

[9] Collective risk as defined by Kiwirap: Crash density on a road
[10] High risk intersections as defined by the NZTA High risk intersections guide 2013.

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Figure 2-27: Collective Safety Risk for the Area (Source NZTA MegaMaps)

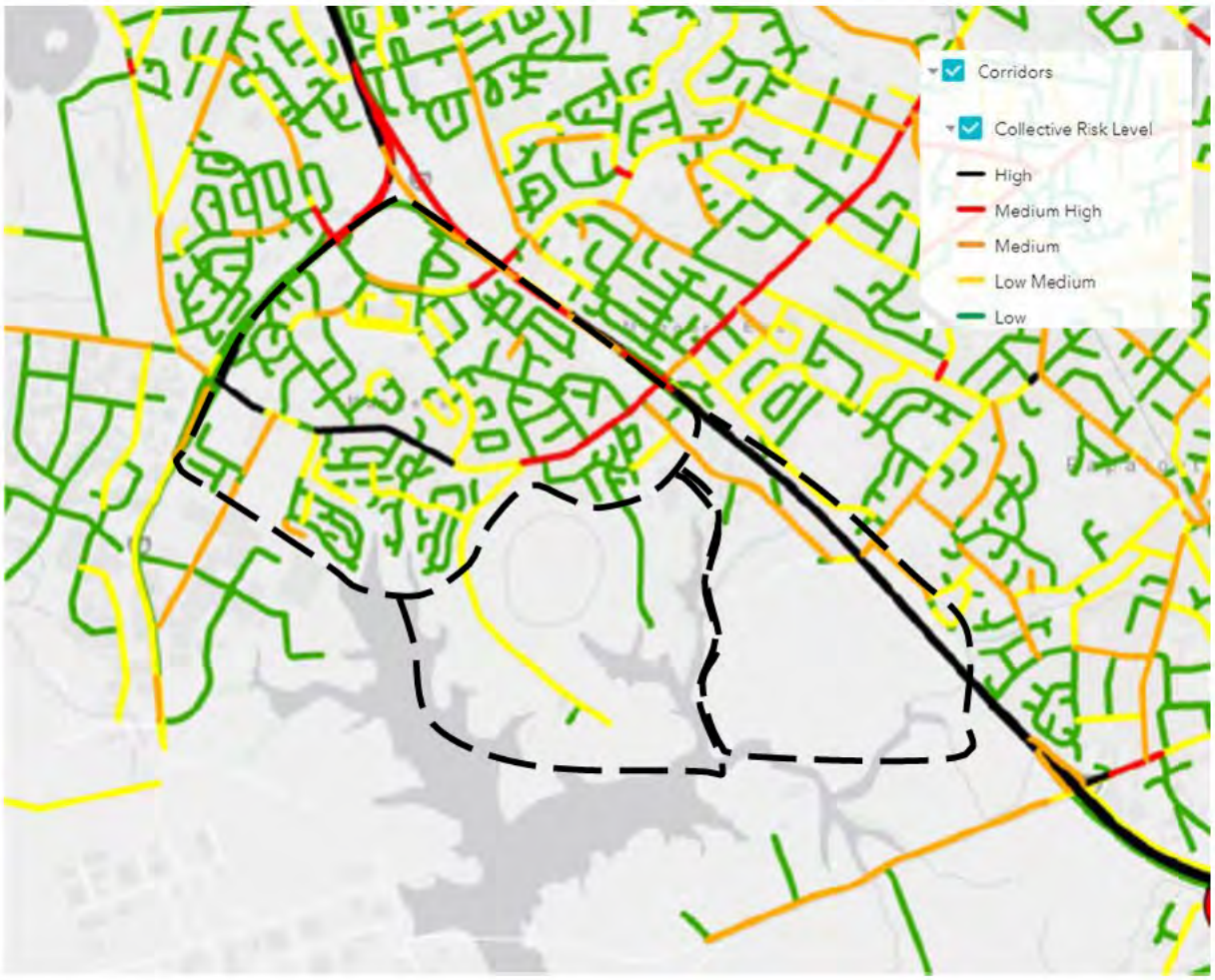

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Figure 2-28: Fatal and Serious Crashes (NZTA Open Data Platform)

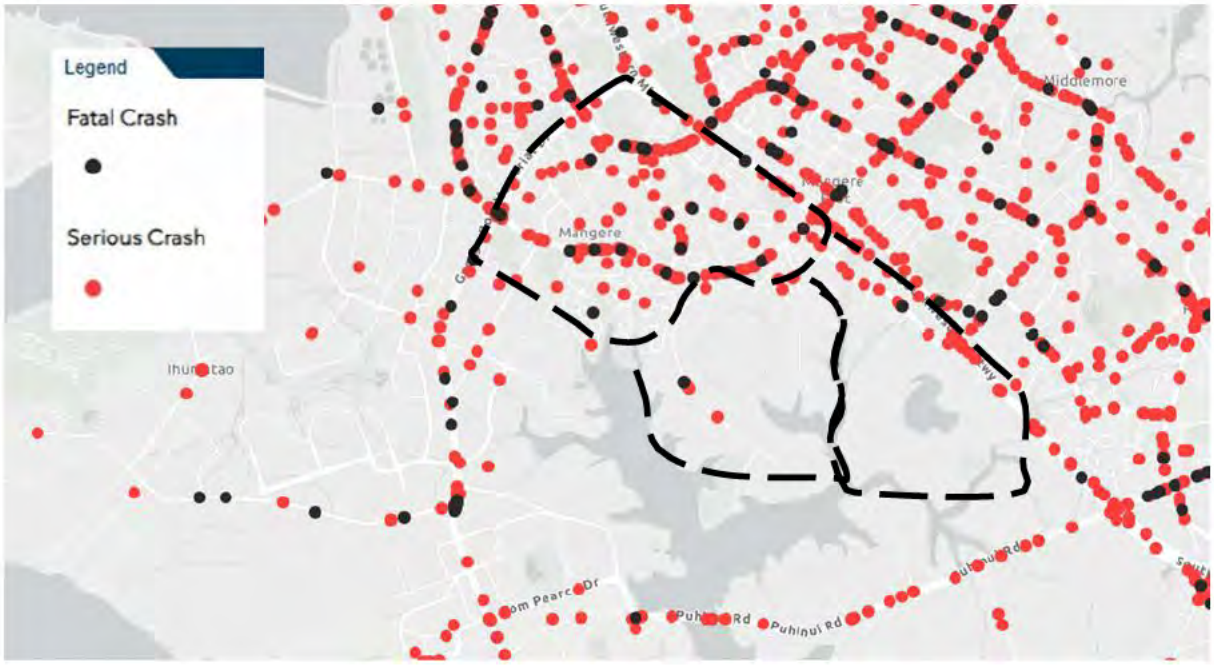

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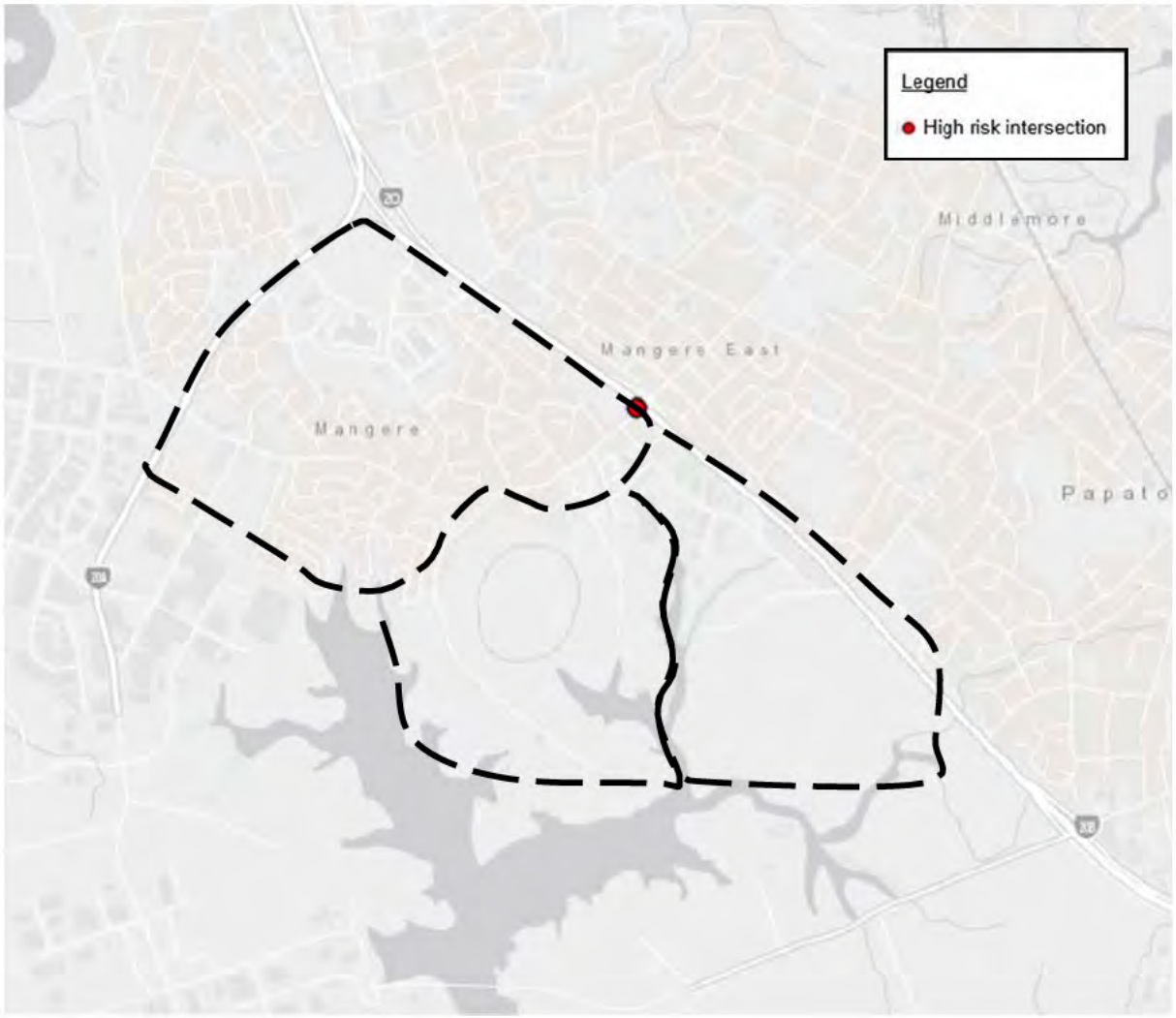
Figure 2-29: High Risk Intersections (NZTA MegaMaps)



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2.4.4 CHANGE IN SAFETY RISK

An assessment of changes in safety risk considers the expected changes in demand as set out in Table 2-1 and Table 2-2 along with the existing demands on roads in the area and framework set out in Table 1-1Table 1-1. In addition to this information consideration has been given to ATs Future Connect walking deficiency assessment and safety assessment for the first decade to identify safety concerns.

Figure 2-30: Walking Deficiencies for First Decade (Source Future Connect)

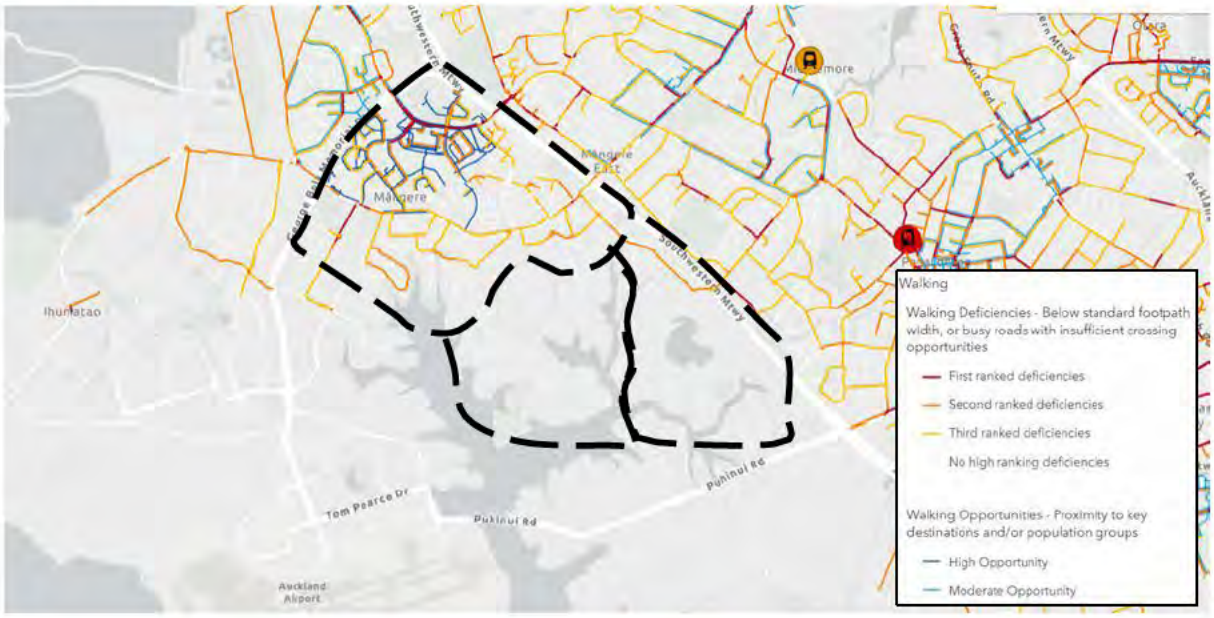
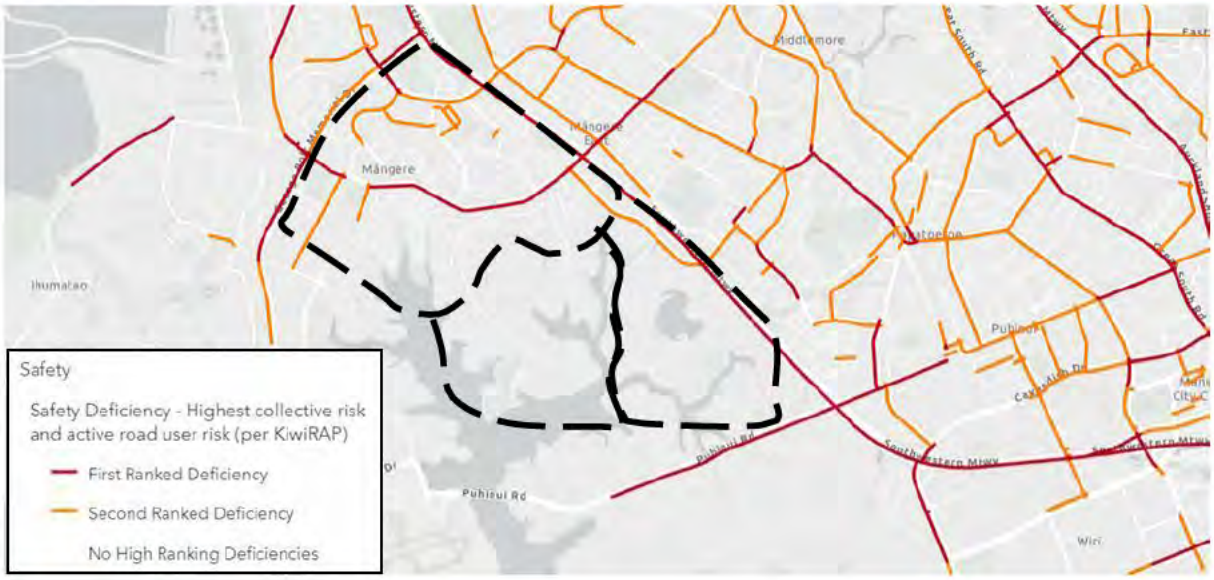


Figure 2-31: Safety Assessment – First Decade (Source Future Connect)



2.5 FAVONA

2.5.1 CONTEXT

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The Favona area has sporadic Kainga Ora land holdings. The area is predominantly zoned as Residential mixed housing suburban to the south of Favona Road. North of Favona Road, the land is generally zoned as industrial with a portion of terraced housing and apartment zone adjacent to SH20.

Figure 2-32: Neighbourhood Boundary and Study Area

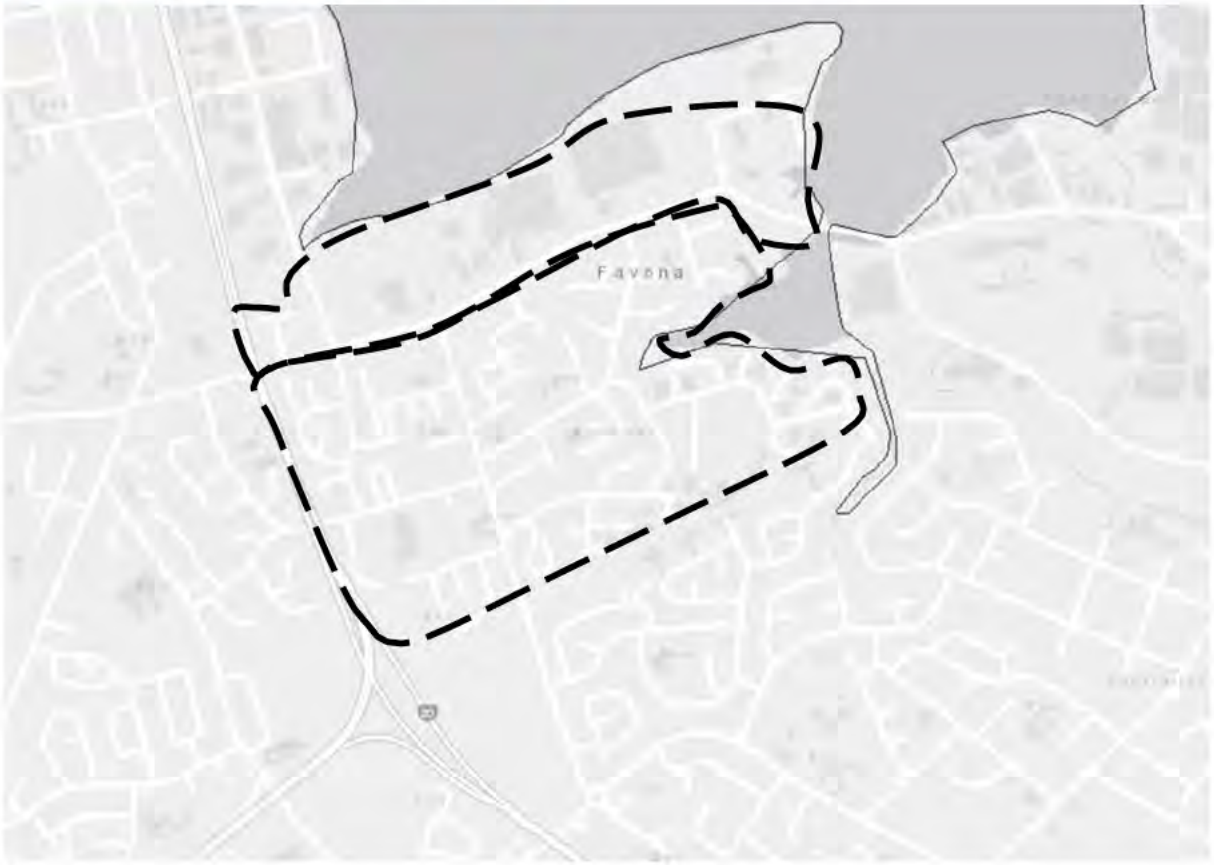

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Figure 2-33: One Network Road Classification

2.5.2 POTENTIAL FOR GROWTH

The MSM model forecasts the expected change in dwellings is outlined in **Error! Reference source not found.** and **Error! Reference source not found.** above. Within this neighbourhood, the applicable zones are 465 and 466.

2.5.3 SAFETY PERFORMANCE OF THE AREA

The safety performance of the existing network has been assessed using the NZTA Megamaps data base which obtains crash information from the CAS database and provides collective risk maps[11], maps of fatal and serious injuries and an assessment of high-risk intersections[12].

[11] Collective risk as defined by Kiwirap: Crash density on a road
[12] High risk intersections as defined by the NZTA High risk intersections guide 2013.

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Figure 2-34: Collective Safety Risk for the Area (Source NZTA MegaMaps)

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Figure 2-35: Fatal and Serious Crashes (NZTA Open Data Platform)

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Figure 2-36: High Risk Intersections (NZTA MegaMaps)

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2.5.4 CHANGE IN SAFETY RISK

An assessment of changes in safety risk considers the expected changes in demand as set out in Table 2-1 and Table 2-2 along with the existing demands on roads in the area and framework set out in Table 1-1Table 1-1. In addition to this information consideration has been given to ATs Future Connect walking deficiency assessment and safety assessment for the first decade to identify safety concerns.

Figure 2-37: Walking Deficiencies for First Decade (Source Future Connect)

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Figure 2-38: Safety Assessment – First Decade (Source Future Connect)

2.6 BUCKMAN AND WICKMAN

2.6.1 CONTEXT

Kainga Ora has a significant portion of the land to the north of the area. The Buckland and Wickman area is generally zoned as 'Residential - Mixed Housing Urban' zone. The area is bound to the north by a legacy designation which has meant the permeability of the transport network is limited in this location.

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Figure 2-39: Neighbourhood Boundary and Study Area

Figure 2-40: One Network Road Classification

2.6.2 POTENTIAL FOR GROWTH

The MSM model forecasts the expected change in dwellings is outlined in **Error! Reference source not found.** and **Error! Reference source not found.** above. Within this neighbourhood, the applicable zone is 470.

2.6.3 SAFETY PERFORMANCE OF THE AREA

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The safety performance of the existing network has been assessed using the NZTA Megamaps data base which obtains crash information from the CAS database and provides collective risk maps[13], maps of fatal and serious injuries and an assessment of high-risk intersections[14].

Figure 2-41: Collective Safety Risk for the Area (Source NZTA MegaMaps)

Figure 2-42: Fatal and Serious Crashes (NZTA Open Data Platform)

[13] Collective risk as defined by Kiwirap: Crash density on a road
[14] High risk intersections as defined by the NZTA High risk intersections guide 2013.

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Figure 2-43: High Risk Intersections (NZTA MegaMaps)

2.6.4 CHANGE IN SAFETY RISK

An assessment of changes in safety risk considers the expected changes in demand as set out in Table 2-1 and Table 2-2 along with the existing demands on roads in the area and framework set out in Table 1-1Table 1-1. In addition to this information consideration has been given to ATs Future Connect walking deficiency assessment and safety assessment for the first decade to identify safety concerns.

Figure 2-44: Walking Deficiencies for First Decade (Source Future Connect)

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Figure 2-45: Safety Assessment – First Decade (Source Future Connect)

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2.7 SUTTON PARK

2.7.1 CONTEXT

The Sutton Park area is a mixture of lower density residential land to the south and Industrial land to the north. Kainga Ora has limited land holdings in this area.

Figure 2-46: Neighbourhood Boundary and Study Area

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Figure 2-47: One Network Road Classification

2.7.2 POTENTIAL FOR GROWTH

The MSM model forecasts the expected change in dwellings is outlined in **Error! Reference source not found.** and **Error! Reference source not found.** above. Within this neighbourhood, the applicable zones are 467 and 468.

2.7.3 POTENTIAL FOR GROWTH

The MSM model forecasts the expected change in dwellings in the respective MSM zones as outlined in Table 45. (Zones).

2.7.4 SAFETY PERFORMANCE OF THE AREA

The safety performance of the existing network has been assessed using the NZTA Megamaps data base which obtains crash information from the CAS database and provides collective risk maps[15], maps of fatal and serious injuries and an assessment of high-risk intersections[16].

[15] Collective risk as defined by Kiwirap: Crash density on a road
[16] High risk intersections as defined by the NZTA High risk intersections guide 2013.

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Figure 2-48: Collective Safety Risk for the Area (Source NZTA MegaMaps)

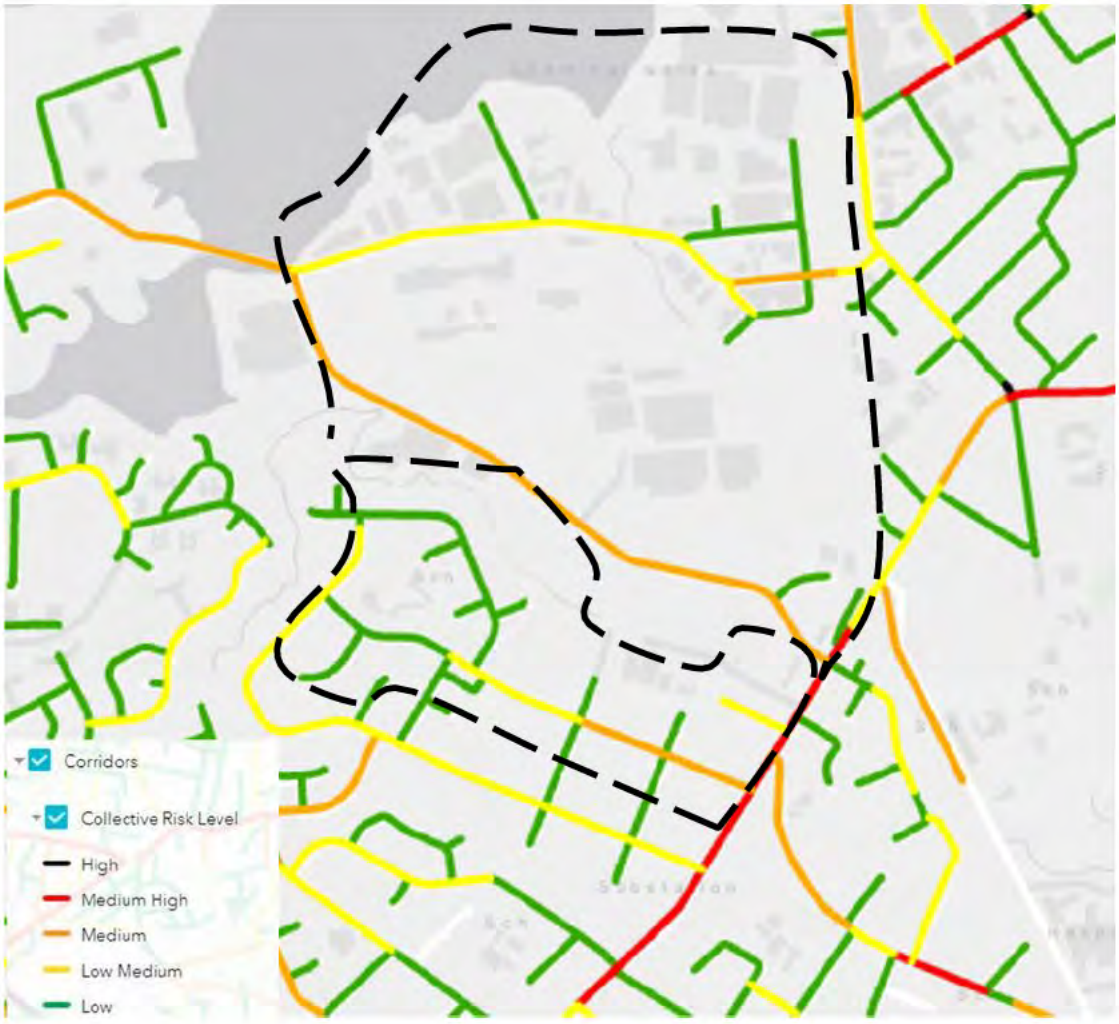

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Figure 2-49: Fatal and Serious Crashes (NZTA Open Data Platform)

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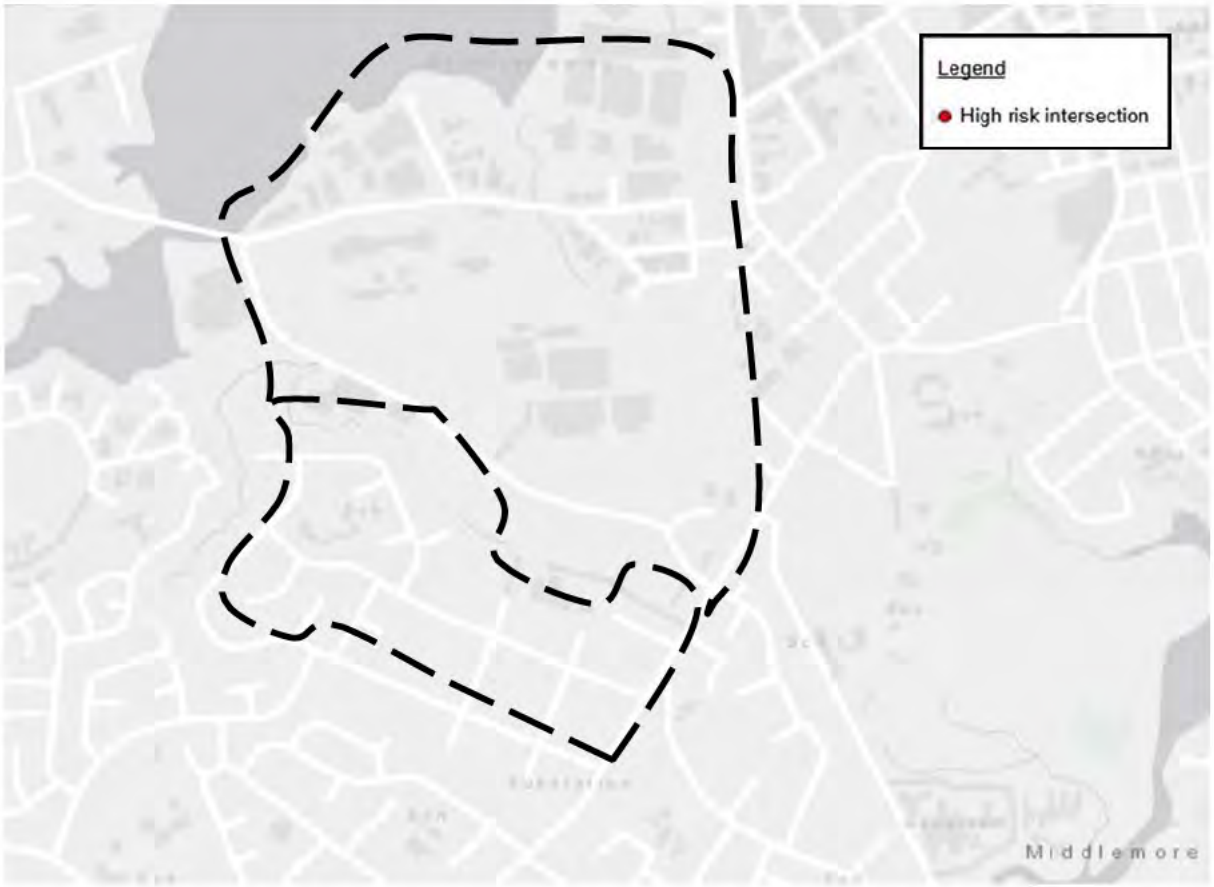
Figure 2-50: High Risk Intersections (NZTA MegaMaps)



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2.7.5 CHANGE IN SAFETY RISK

An assessment of changes in safety risk considers the expected changes in demand as set out in Table 2-1 and Table 2-2 along with the existing demands on roads in the area and framework set out in Table 1-1Table 1-1. In addition to this information consideration has been given to ATs Future Connect walking deficiency assessment and safety assessment for the first decade to identify safety concerns.

Figure 2-51: Walking Deficiencies for First Decade (Source Future Connect)

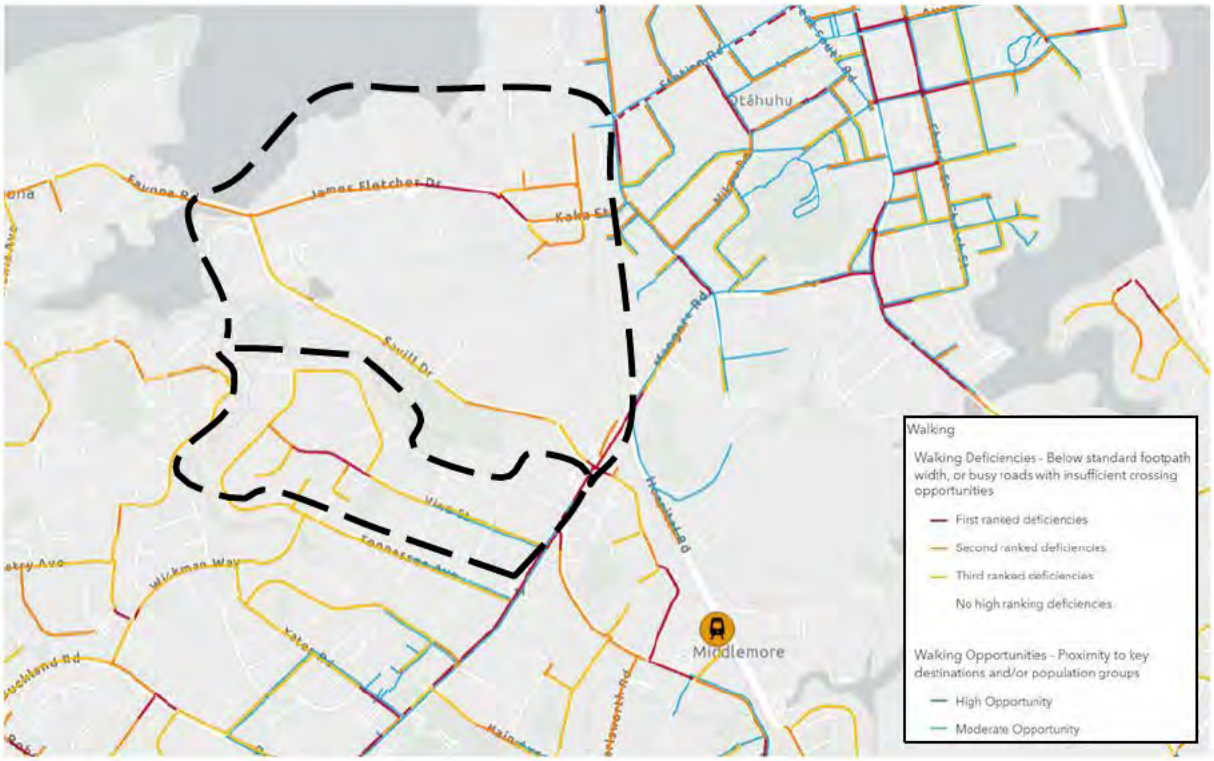

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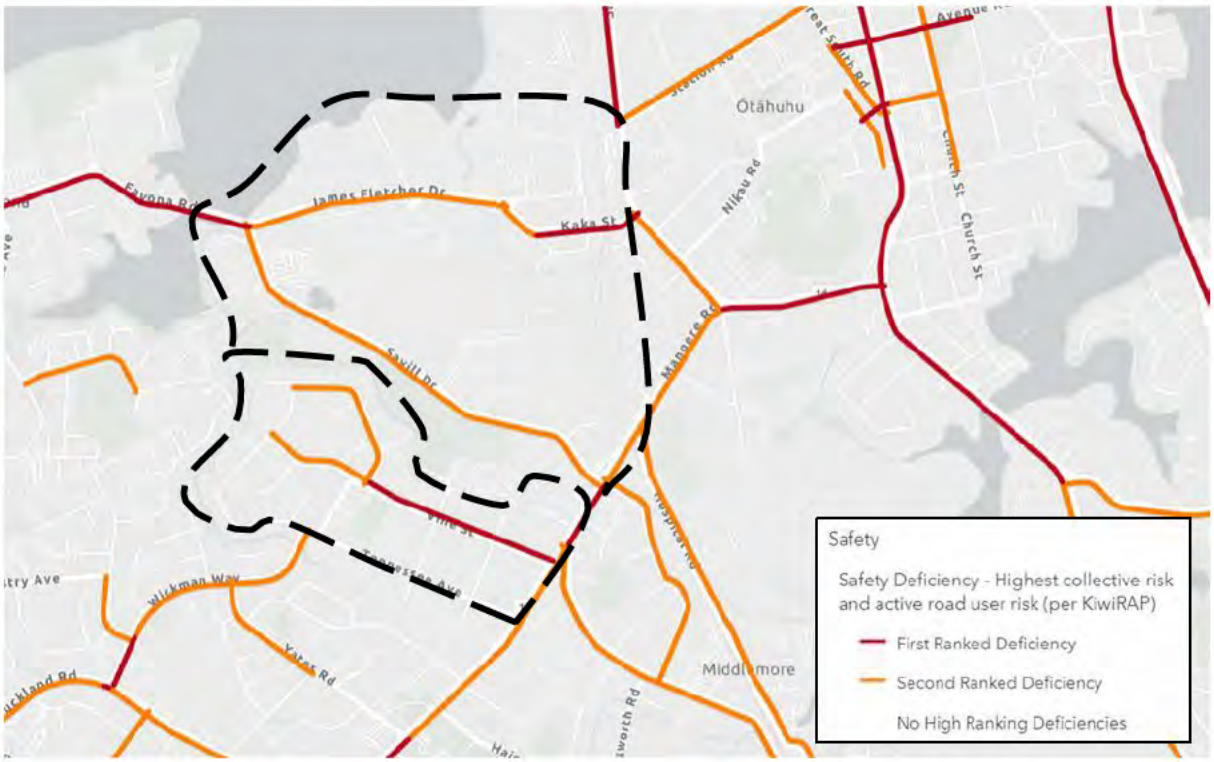
Figure 2-52: Safety Assessment – First Decade (Source Future Connect)



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2.8 MANGERE EAST

2.8.1 CONTEXT

Kainga Ora has sporadic land holdings within the Mangere east area with higher concentrations adjacent to Buckland Road. The area is mostly zoned as 'Residential - Mixed Housing Suburban' or 'Residential - Mixed Housing urban' zone.

Figure 2-53: Neighbourhood Boundary and Study Area

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Figure 2-54: One Network Road Classification

2.8.2 POTENTIAL FOR GROWTH

The MSM model forecasts the expected change in dwellings is outlined in **Error! Reference source not found.** and **Error! Reference source not found.** above. Within this neighbourhood, the applicable zones are 469 and 471.

2.8.3 SAFETY PERFORMANCE OF THE AREA

The safety performance of the existing network has been assessed using the NZTA Megamaps data base which obtains crash information from the CAS database and provides collective risk maps[17], maps of fatal and serious injuries and an assessment of high-risk intersections[18].

[17] Collective risk as defined by Kiwirap: Crash density on a road
[18] High risk intersections as defined by the NZTA High risk intersections guide 2013.

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Figure 2-55: Collective Safety Risk for the Area (Source NZTA MegaMaps)

Figure 2-56: Fatal and Serious Crashes (NZTA Open Data Platform)

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Figure 2-57: High Risk Intersections (NZTA MegaMaps)

2.8.4 CHANGE IN SAFETY RISK

An assessment of changes in safety risk considers the expected changes in demand as set out in Table 2-1 and Table 2-2 along with the existing demands on roads in the area and framework set out in Table 1-1Table 1-1. In addition to this information consideration has been given to ATs Future Connect walking deficiency assessment and safety assessment for the first decade to identify safety concerns.

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Figure 2-58: Walking Deficiencies for First Decade (Source Future Connect)

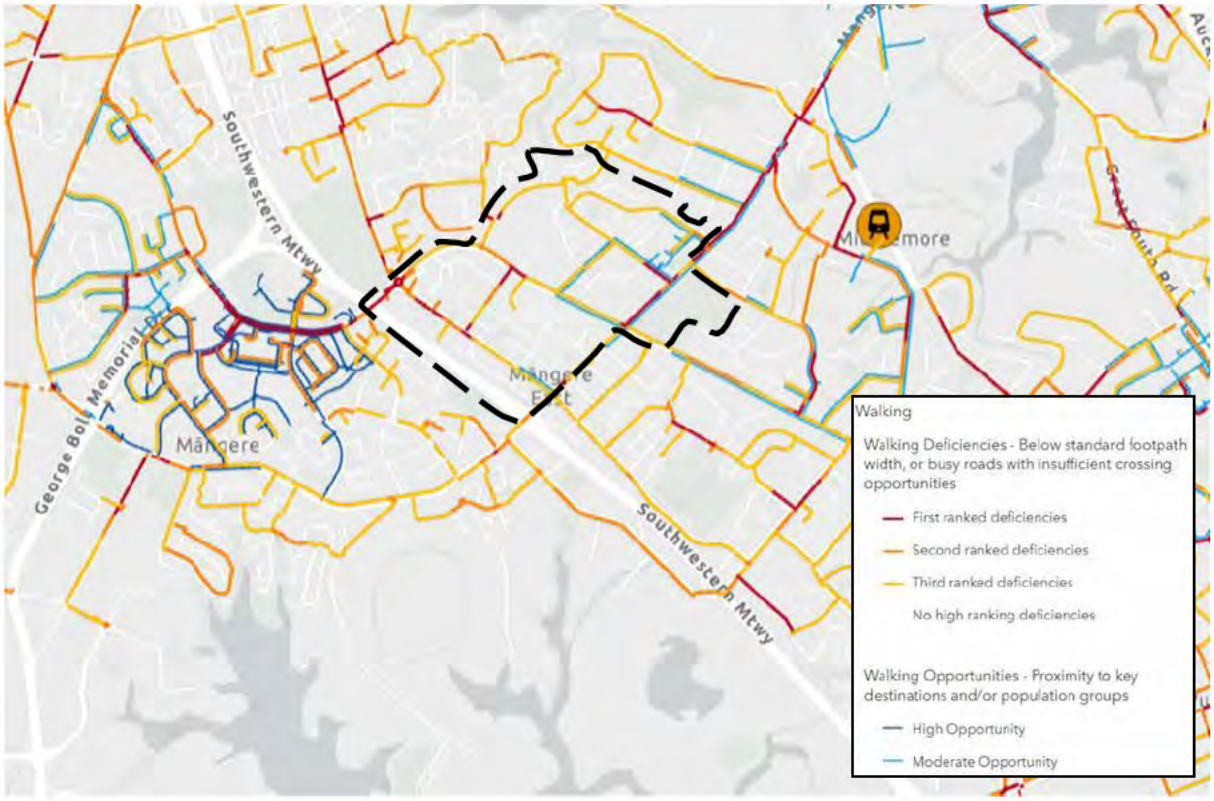

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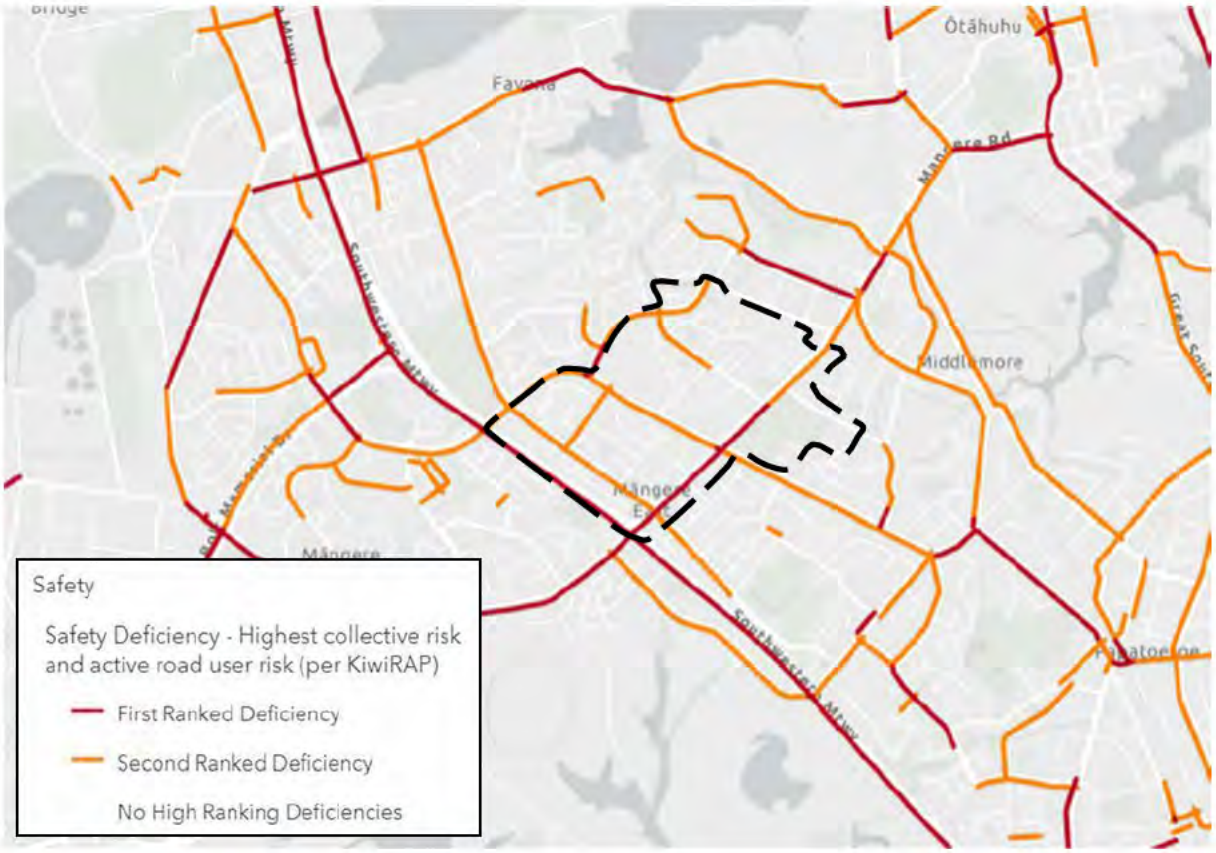
Figure 2-59: Safety Assessment – First Decade (Source Future Connect)



2.9 OTAKI O TE WHENUA

2.9.1 CONTEXT

The Otaki o Te Whenua includes a portion of 'Residential - Mixed Housing Suburban' zone and a portion of Residential - Mixed Housing urban' zone. The Walter Massey Park is situated to the Northwest of the area. Kainga Ora has sporadic land holdings in this area.

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Figure 2-60: Neighbourhood Boundary and Study Area

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Figure 2-61: One Network Road Classification

2.9.2 POTENTIAL FOR GROWTH

The MSM model forecasts the expected change in dwellings is outlined in **Error! Reference source not found.** and **Error! Reference source not found.** above. Within this neighbourhood, the applicable zones are 482 and 483

2.9.3 SAFETY PERFORMANCE OF THE AREA

The safety performance of the existing network has been assessed using the NZTA Megamaps data base which obtains crash information from the CAS database and provides collective risk maps[19], maps of fatal and serious injuries and an assessment of high-risk intersections[20].

[19] Collective risk as defined by Kiwirap: Crash density on a road
[20] High risk intersections as defined by the NZTA High risk intersections guide 2013.

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Figure 2-62: Collective Safety Risk for the Area (Source NZTA MegaMaps)

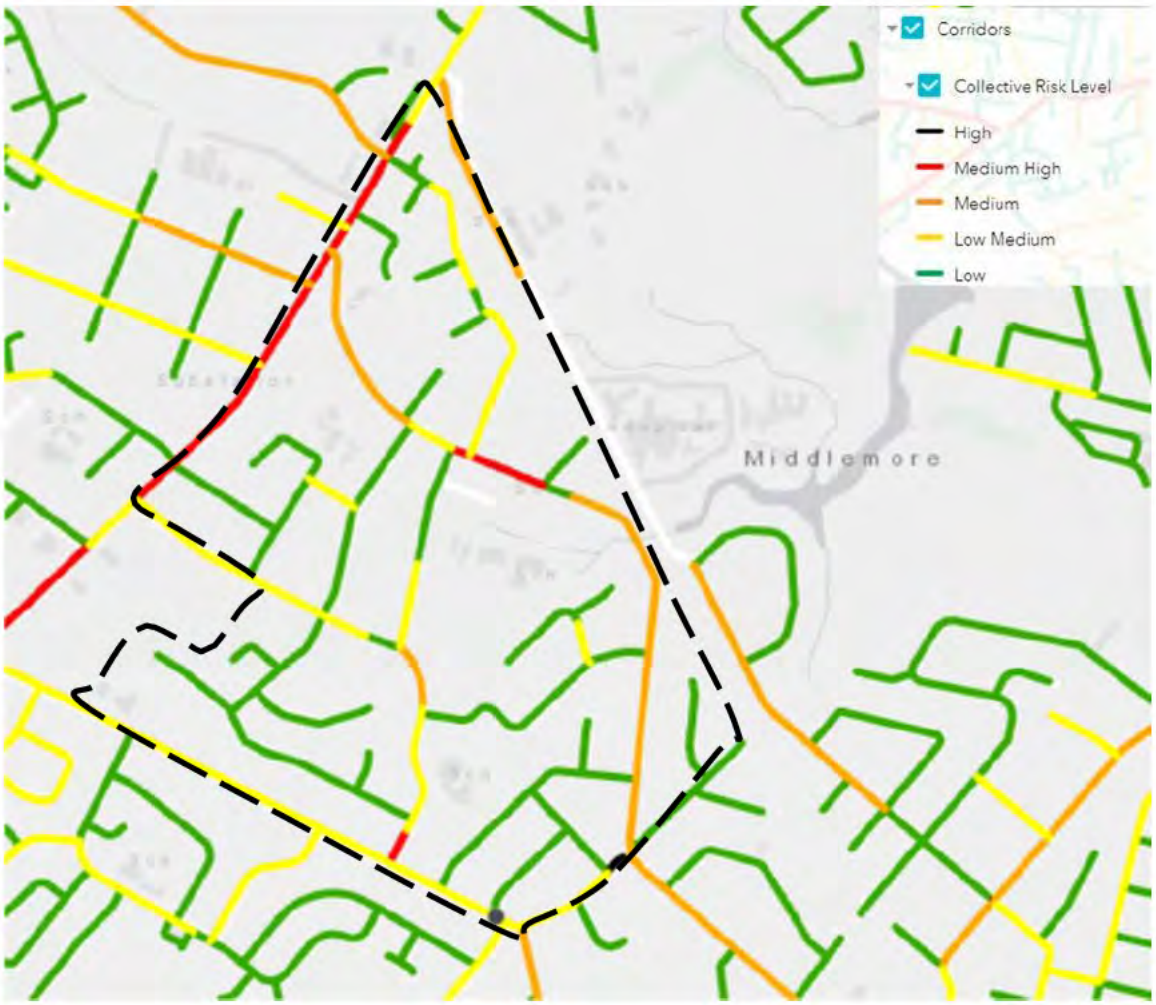

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Figure 2-63: Fatal and Serious Crashes (NZTA Open Data Platform)

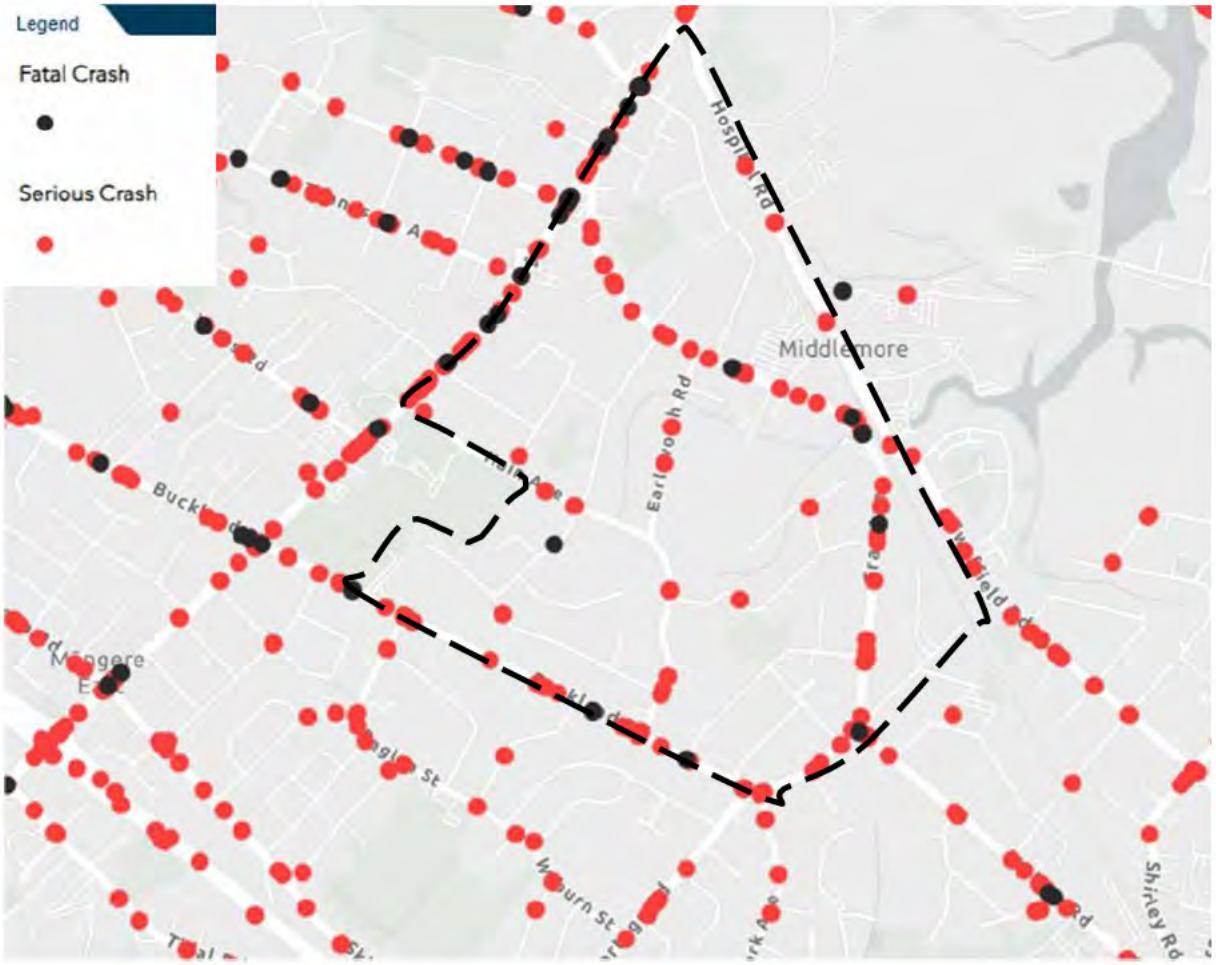

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Figure 2-64: High Risk Intersections (NZTA MegaMaps)

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2.9.4 CHANGE IN SAFETY RISK

An assessment of changes in safety risk considers the expected changes in demand as set out in Table 2-1 and Table 2-2 along with the existing demands on roads in the area and framework set out in Table 1-1Table 1-1. In addition to this information consideration has been given to ATs Future Connect walking deficiency assessment and safety assessment for the first decade to identify safety concerns.

Figure 2-65: Walking Deficiencies for First Decade (Source Future Connect)

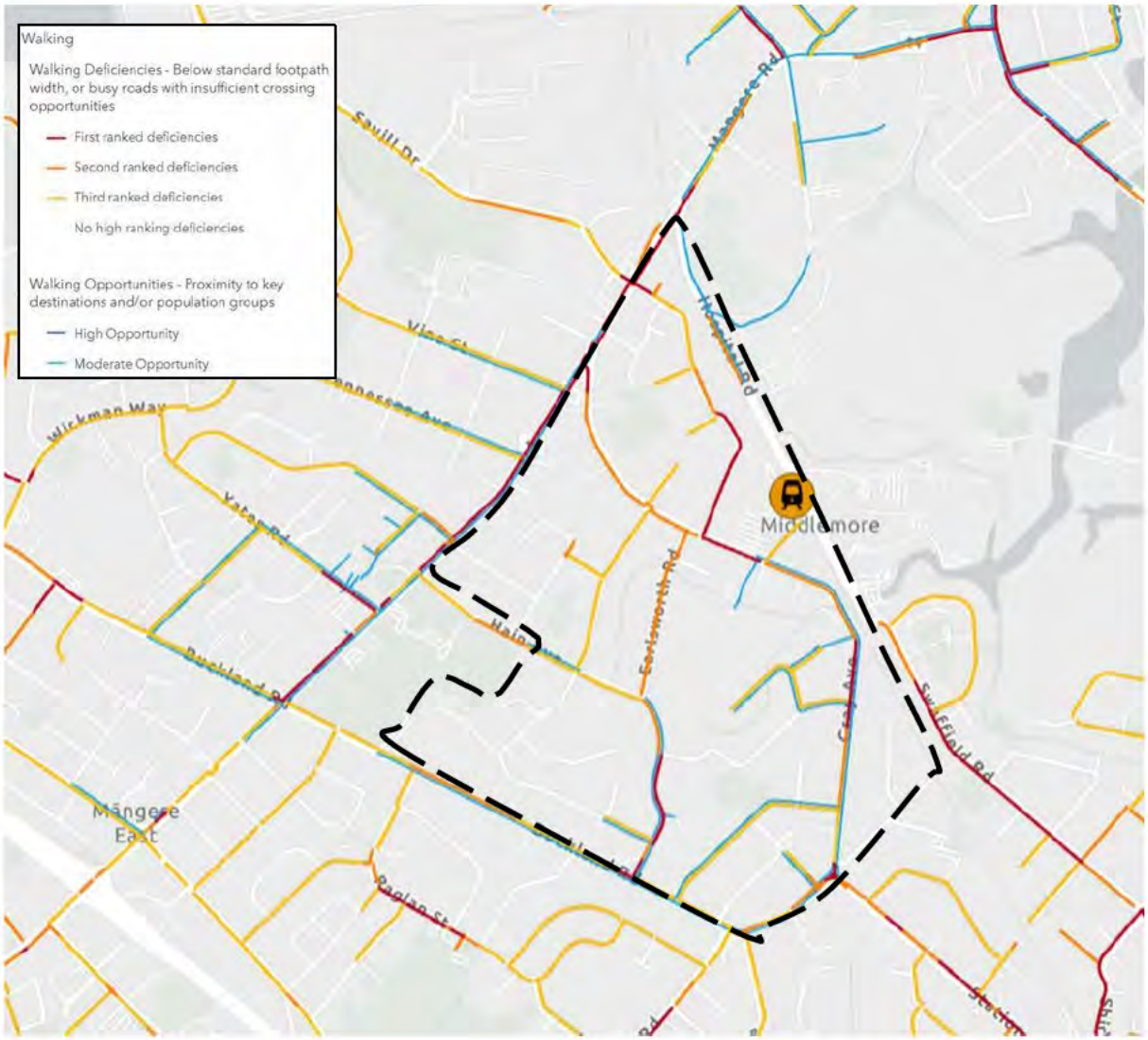

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Figure 2-66: Safety Assessment – First Decade (Source Future Connect)

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2.10 AORERE

2.10.1 CONTEXT

Kainga Ora has a significant portion of the land within the Aorere area. Land is mainly zoned as residential Mixed housing urban zone. Aorere Park is situated towards the south of the area.

Figure 2-67: Neighbourhood Boundary and Study Area

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Figure 2-68: One Network Road Classification

2.10.2 POTENTIAL FOR GROWTH

The MSM model forecasts the expected change in dwellings is outlined in **Error! Reference source not found.** and **Error! Reference source not found.** above. Within this neighbourhood, the applicable zones are 481 and 484.

2.10.3 SAFETY PERFORMANCE OF THE AREA

The safety performance of the existing network has been assessed using the NZTA Megamaps data base which obtains crash information from the CAS database and provides collective risk maps[21], maps of fatal and serious injuries and an assessment of high-risk intersections[22].

[21] Collective risk as defined by Kiwirap: Crash density on a road
[22] High risk intersections as defined by the NZTA High risk intersections guide 2013.

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Figure 2-69: Collective Safety Risk for the Area (Source NZTA MegaMaps)

Figure 2-70: Fatal and Serious Crashes (NZTA Open Data Platform)

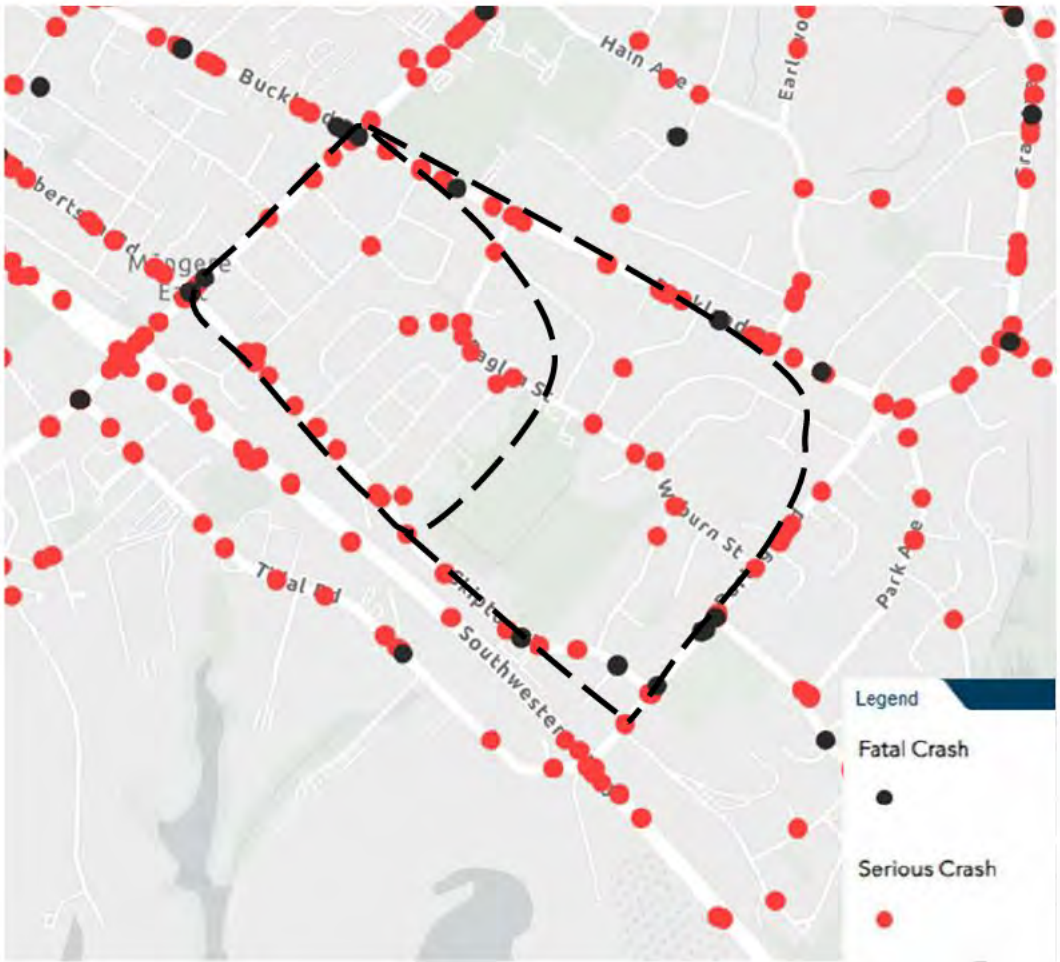

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Figure 2-71: High Risk Intersections (NZTA MegaMaps)

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2.10.4 CHANGE IN SAFETY RISK

An assessment of changes in safety risk considers the expected changes in demand as set out in Table 2-1 and Table 2-2 along with the existing demands on roads in the area and framework set out in Table 1-1Table 1-1. In addition to this information consideration has been given to ATs Future Connect walking deficiency assessment and safety assessment for the first decade to identify safety concerns.

Figure 2-72: Walking Deficiencies for First Decade (Source Future Connect)

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Figure 2-73: Safety Assessment – First Decade (Source Future Connect)

2.11 MIDDLEMORE PRECINCT

2.11.1 CONTEXT

Kainga Ora has a significant portion of the land in the northern portion of the area with limited land elsewhere. The zoning is predominantly mixed housing urban and mixed housing suburban.

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Figure 2-74: Neighbourhood Boundary and Study Area

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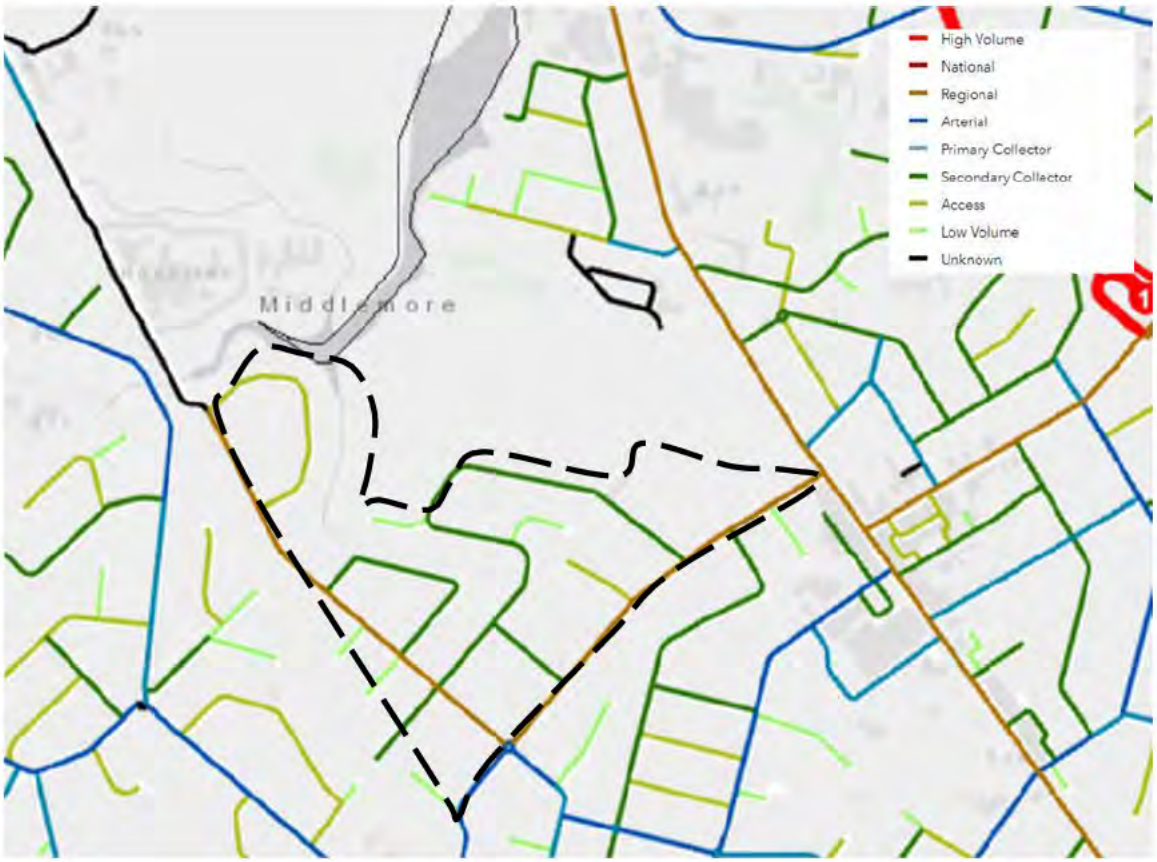
Figure 2-75: One Network Road Classification



2.11.2 POTENTIAL FOR GROWTH

The MSM model forecasts the expected change in dwellings is outlined in **Error! Reference source not found.** and **Error! Reference source not found.** above. Within this neighbourhood, the applicable zones are 491.

2.11.3 SAFETY PERFORMANCE OF THE AREA

The safety performance of the existing network has been assessed using the NZTA Megamaps data base which obtains crash information from the CAS database and provides collective risk maps[23], maps of fatal and serious injuries and an assessment of high-risk intersections[24].

[23] Collective risk as defined by Kiwirap: Crash density on a road
[24] High risk intersections as defined by the NZTA High risk intersections guide 2013.

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Figure 2-76: Collective Safety Risk for the Area (Source NZTA MegaMaps)

Figure 2-77: Fatal and Serious Crashes (NZTA Open Data Platform)

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Figure 2-78: High Risk Intersections (NZTA MegaMaps)

2.11.4 CHANGE IN SAFETY RISK

An assessment of changes in safety risk considers the expected changes in demand as set out in Table 2-1 and Table 2-2 along with the existing demands on roads in the area and framework set out in Table 1-1Table 1-1. In addition to this information consideration has been given to ATs Future Connect walking deficiency assessment and safety assessment for the first decade to identify safety concerns.

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Figure 2-79: Walking Deficiencies for First Decade (Source Future Connect)

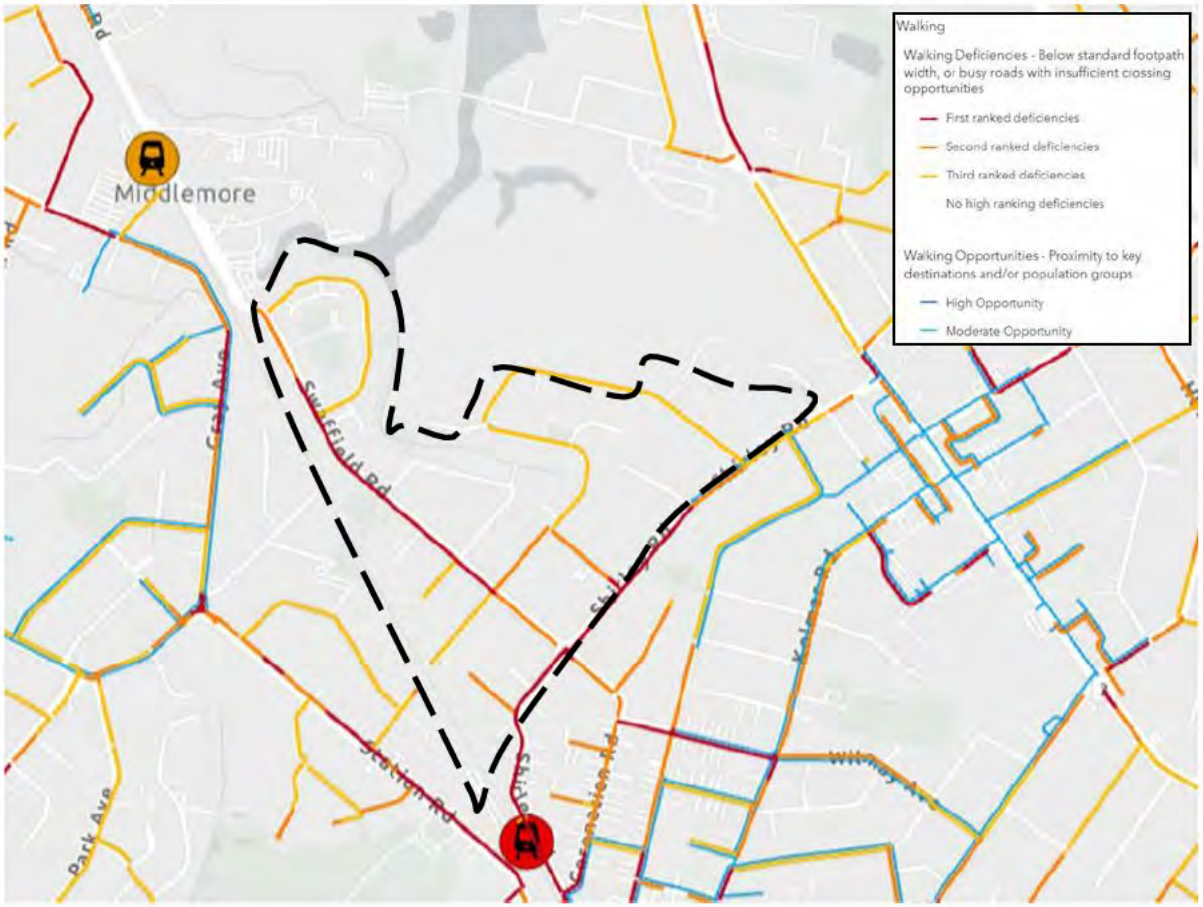

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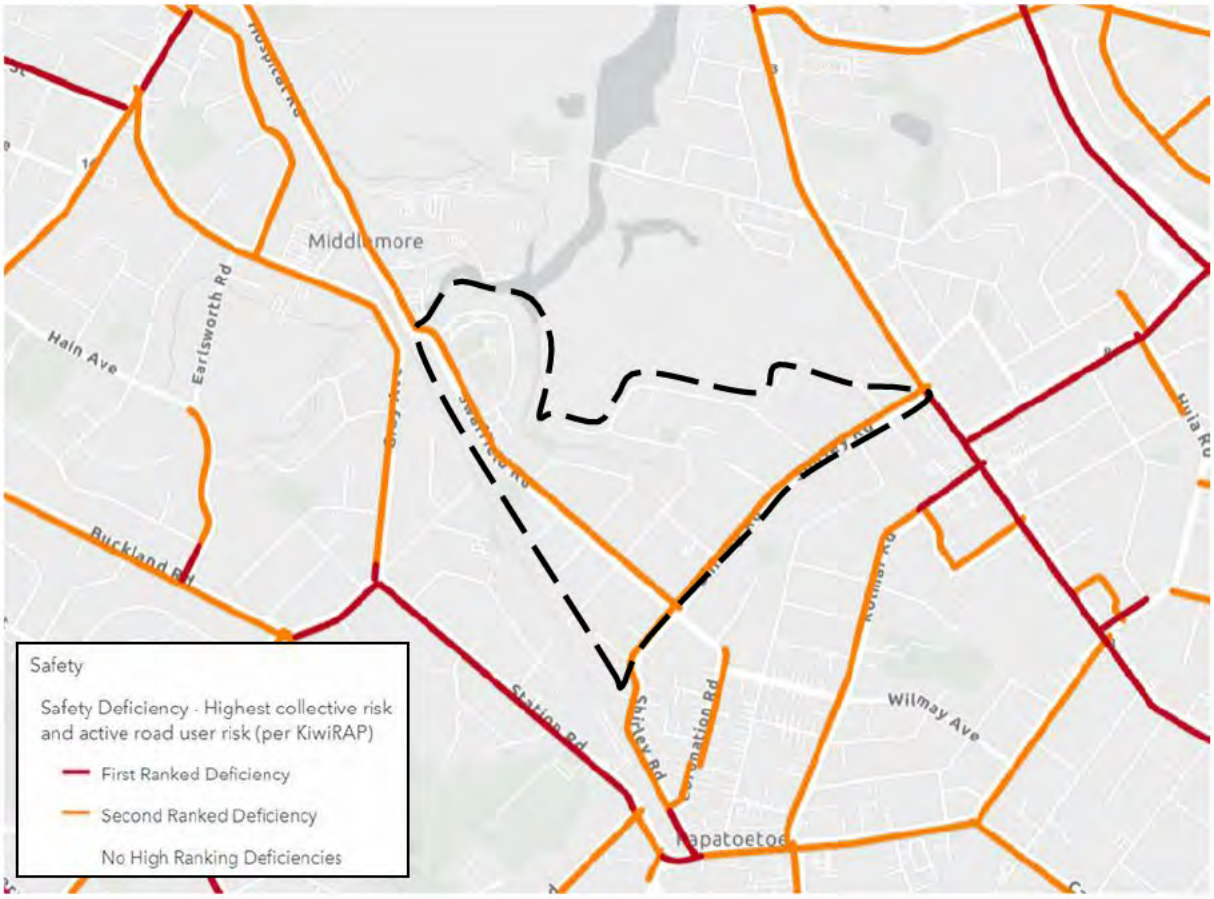
Figure 2-80: Safety Assessment – First Decade (Source Future Connect)



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ATTACHMENT A: NETWORK RESPONSE IN EACH NEIGHBOURHOOD

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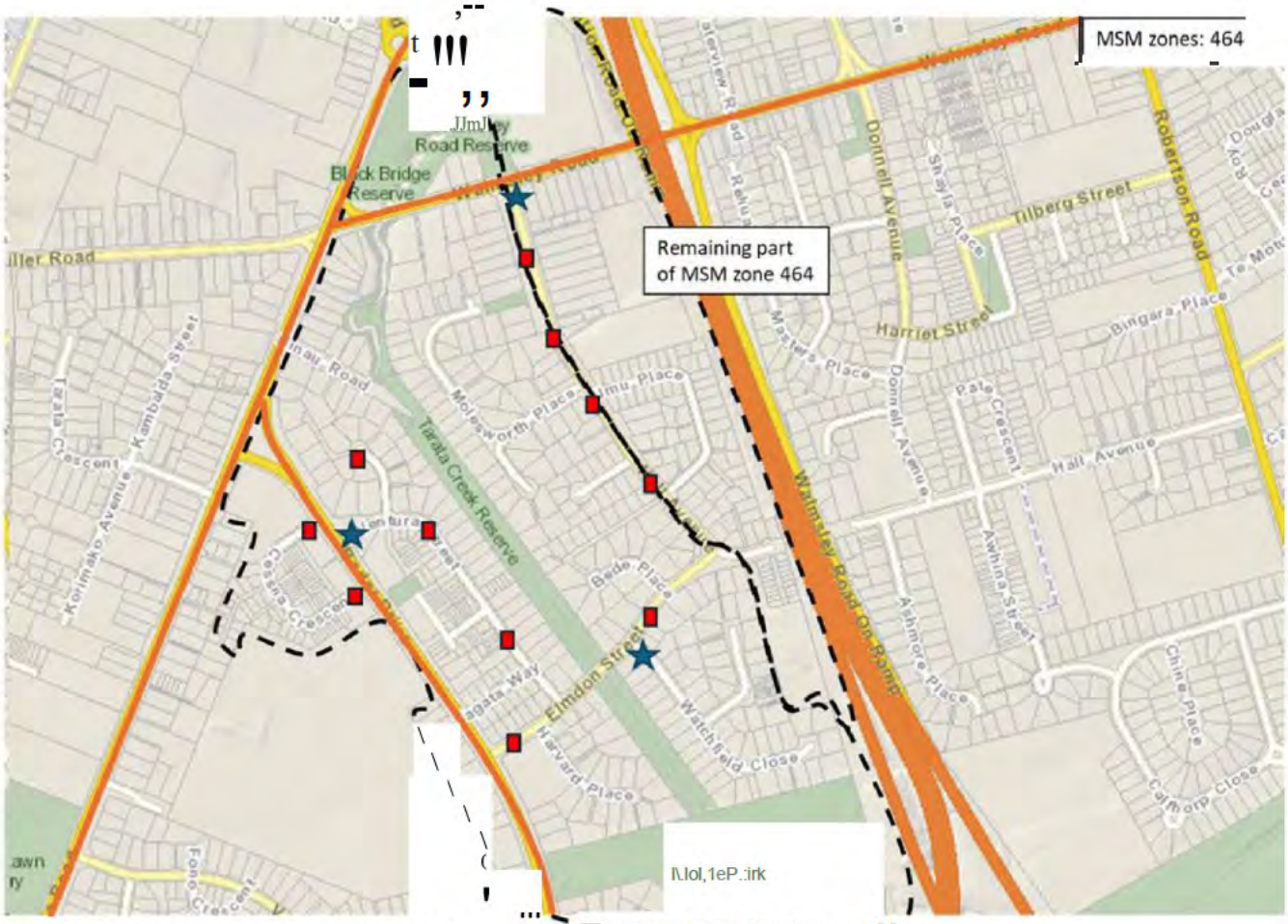
Te Ararata {Mangere West) A

Legend
- Speed calming device
- Intersection treatment
- Threshold treatment
- Outside of local scope
- Zebra crossing

Item	Mangere West
Speed calming devices	9
Intersection treatments	0
Threshold treatments	4
Zebra crossing	0



Consistent with Mangere West ITA

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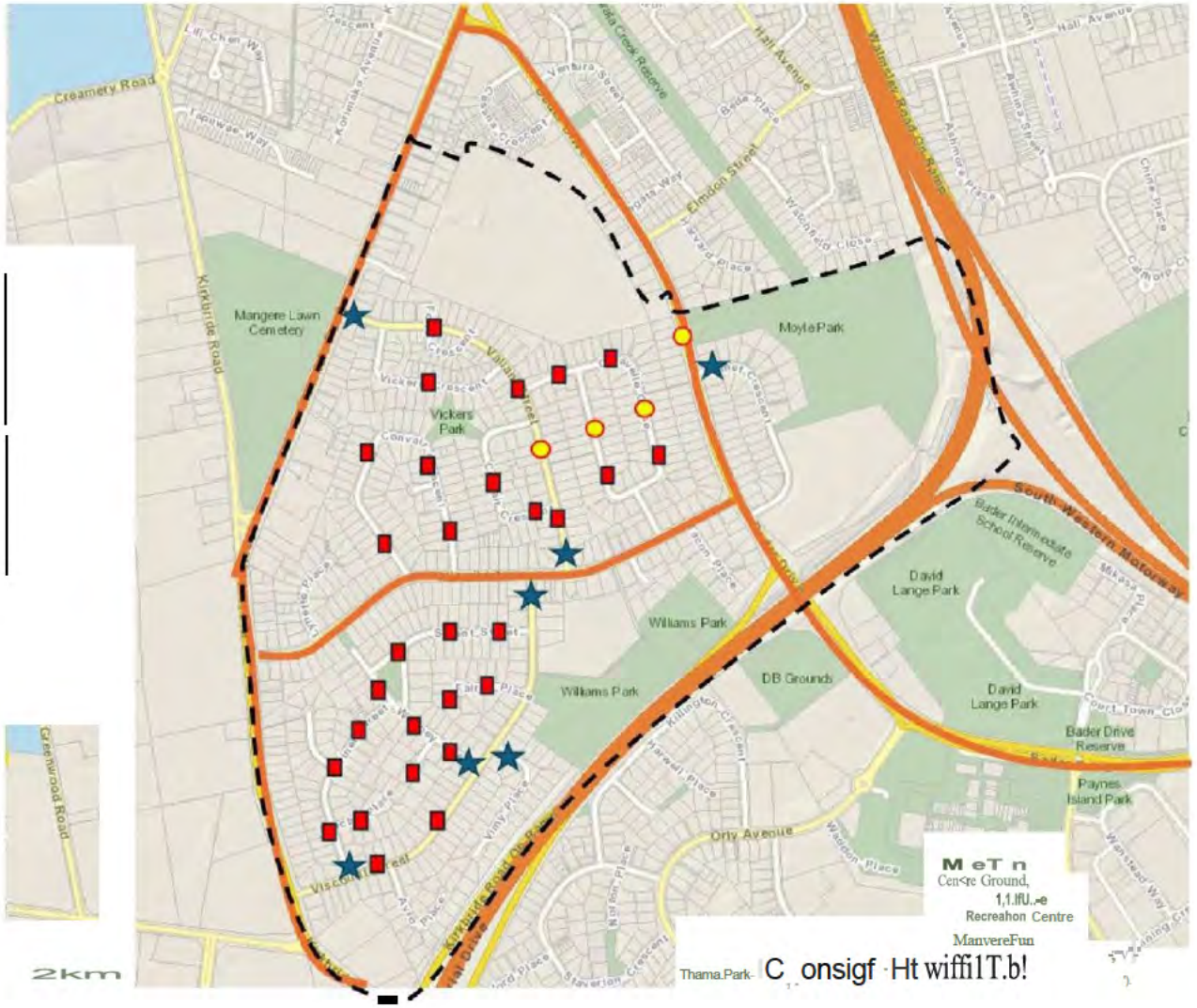
Te Ararata (Mangere West) B

Legend
- Speed calming device
- Intersection treatment
- Threshold treatment
- Outside of local scope
- Zebra crossing

Item	Mangere West
Speed calming devices	29
Intersection treatments	0
Threshold treatments	7
Zebra crossing	4



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Mangere West C

Legend

- Speed calming device
- Intersection treatment
- Threshold treatment
- Outside of local scope
- Zebra crossing

Item	Mangere West
Speed calming devices	0
Intersection treatments	0
Threshold treatments	3
Zebra crossing	0

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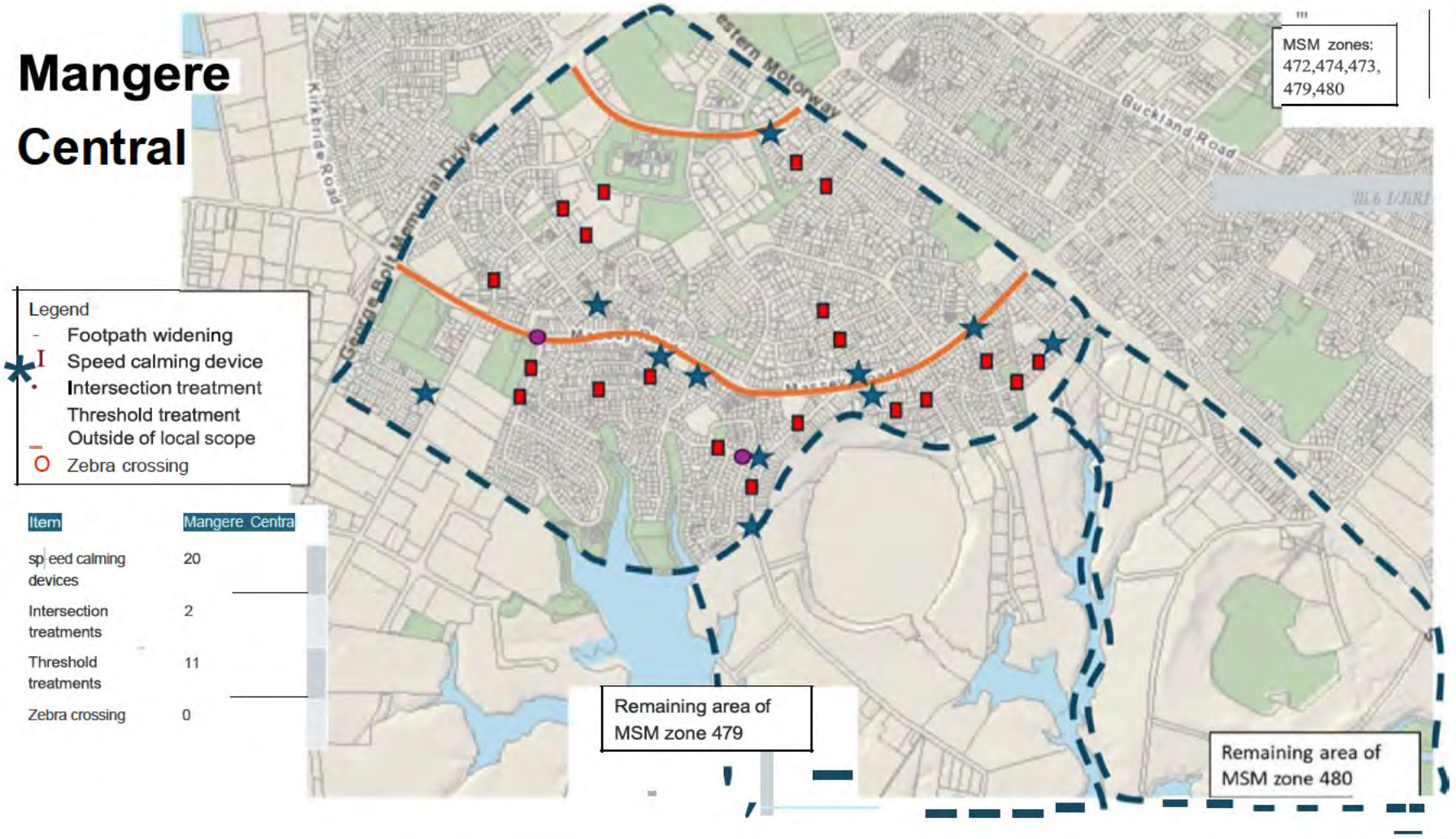
Mangere Central



Item	Mangere Centra
speed calming devices	20
Intersection treatments	2
Threshold treatments	11
Zebra crossing	0

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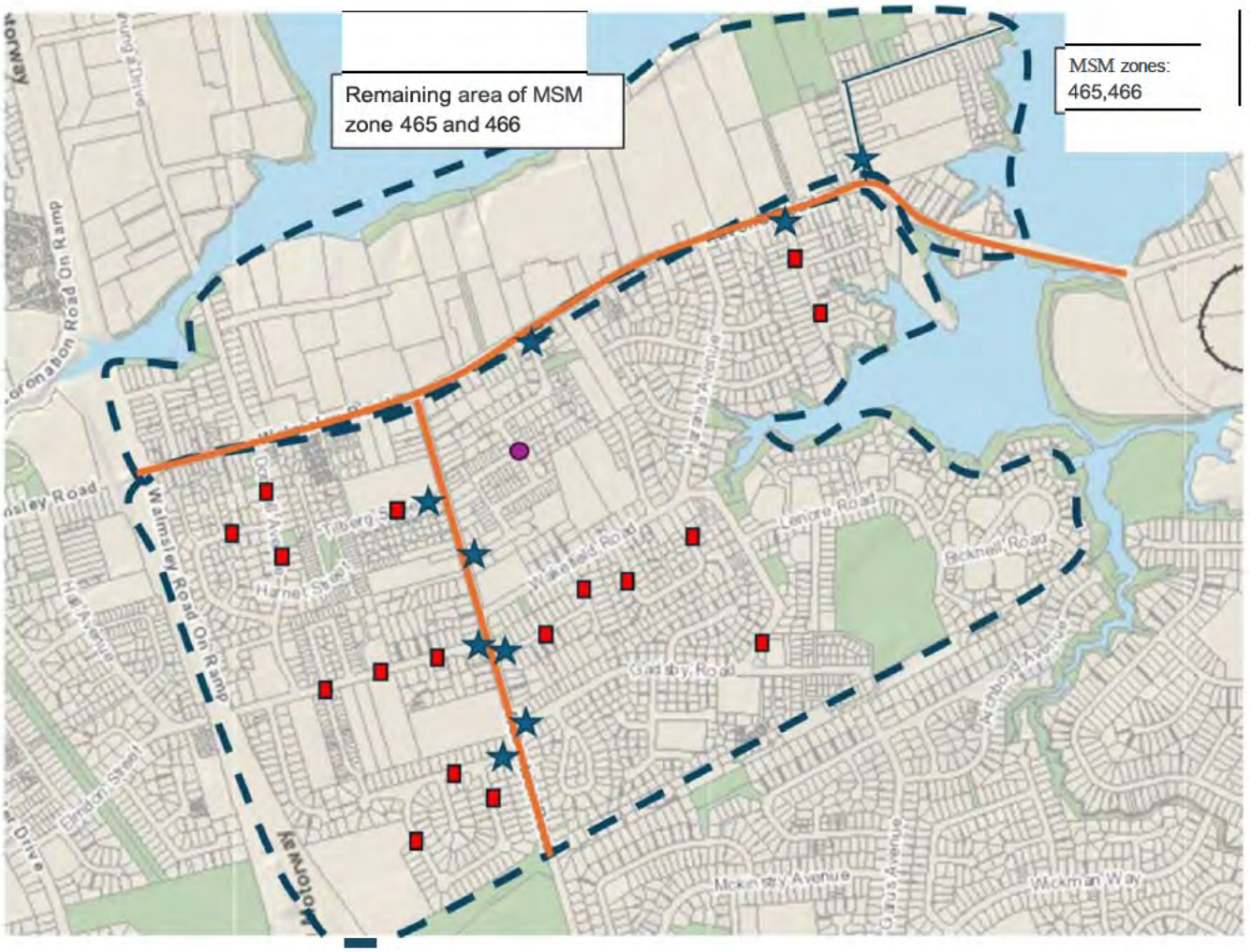
Favona

Legend
- Speed calming device
- Intersection treatment
- Threshold treatment
- Outside of local scope
- Zebra crossing

Item	Favona
Speed calming devices	17
Intersection treatments	1
Threshold treatments	9
Zebra crossing	0



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Buckman and Wickman

MSM zones: 470

Legend
- Speed calming device
- Intersection treatment
- Threshold treatment
- Outside of local scope
- Zebra crossing

Item	Buckman and Wickman
Speed calming devices	11
Intersection treatments	0
Threshold treatments	7
Pedestrian crossing	1

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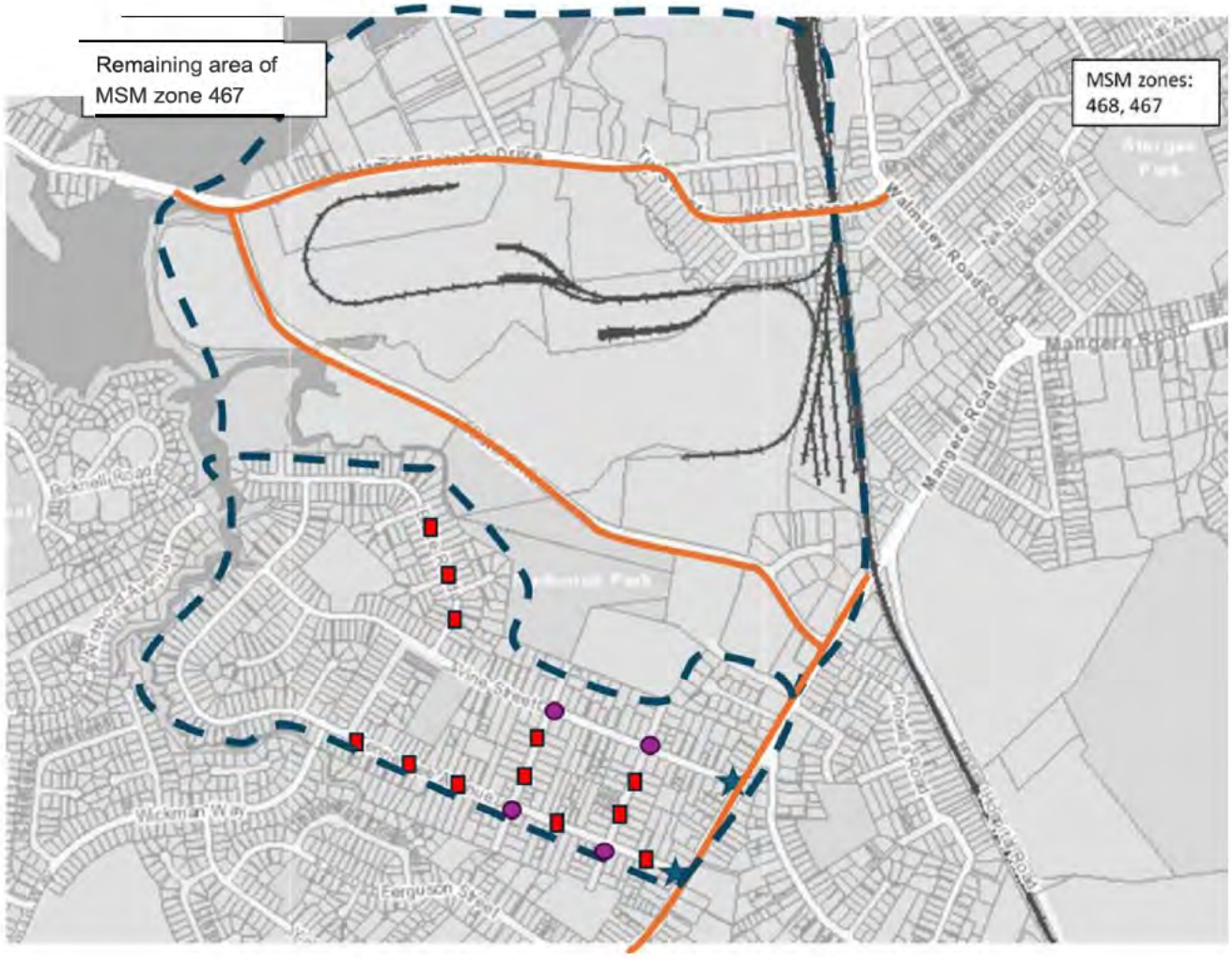
Sutton Park



Item	Sutton Park
Speed calming devices	12
Intersection treatments	4
Threshold treatments	2
Zebra crossing	0

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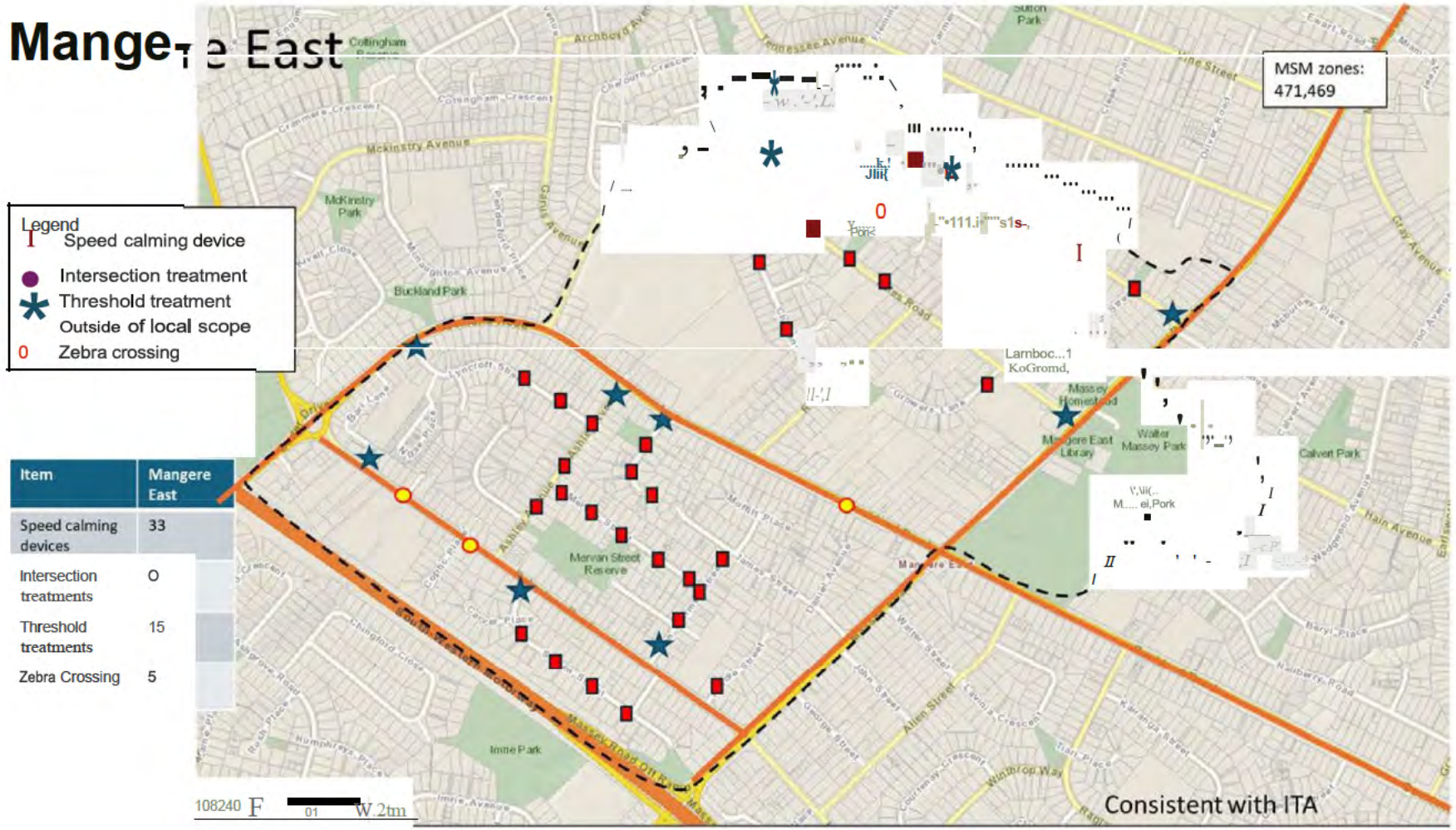
Mangere East



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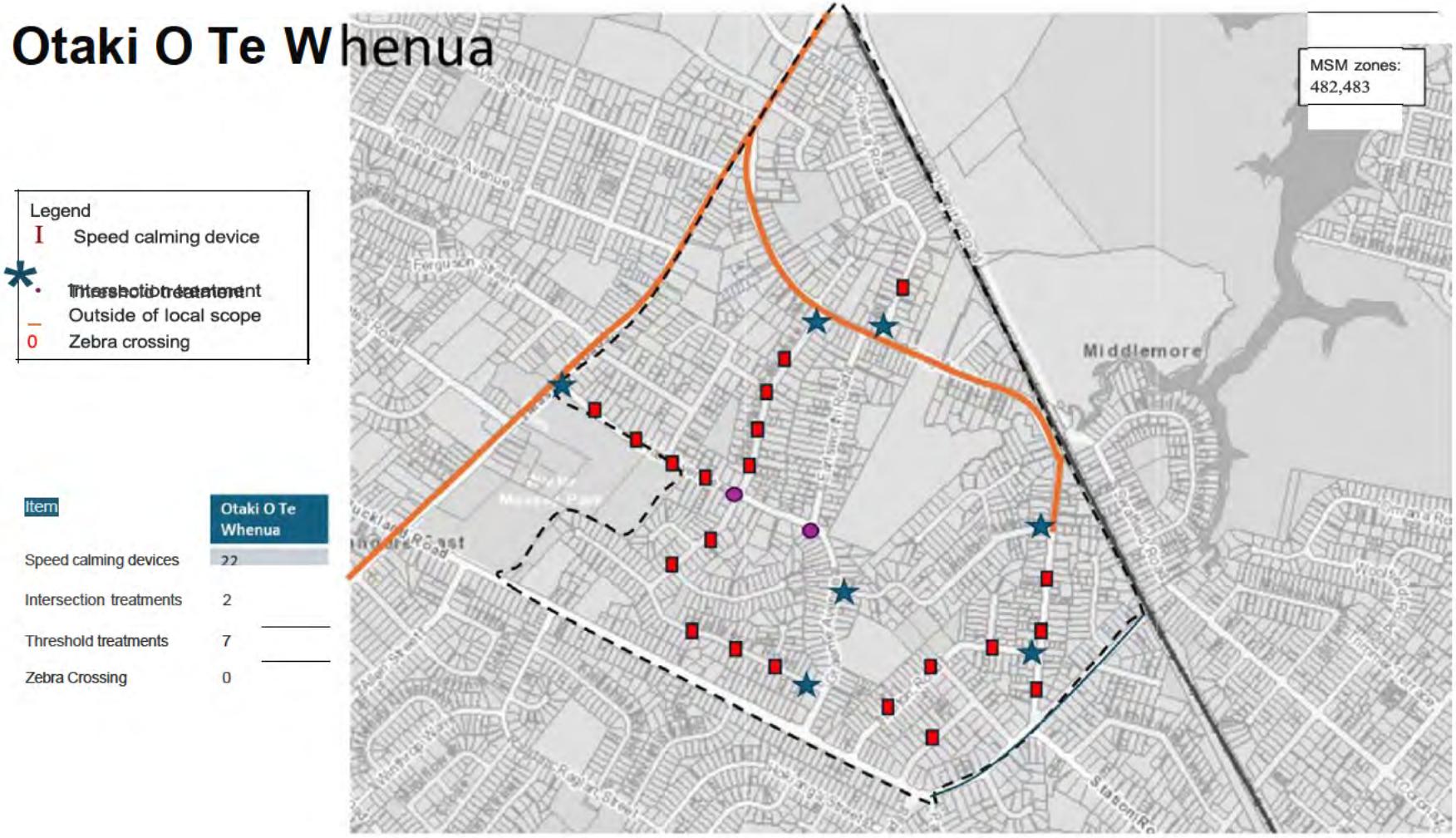
Otaki O Te Whenua



Item	Otaki O Te Whenua
Speed calming devices	22
Intersection treatments	2
Threshold treatments	7
Zebra Crossing	0

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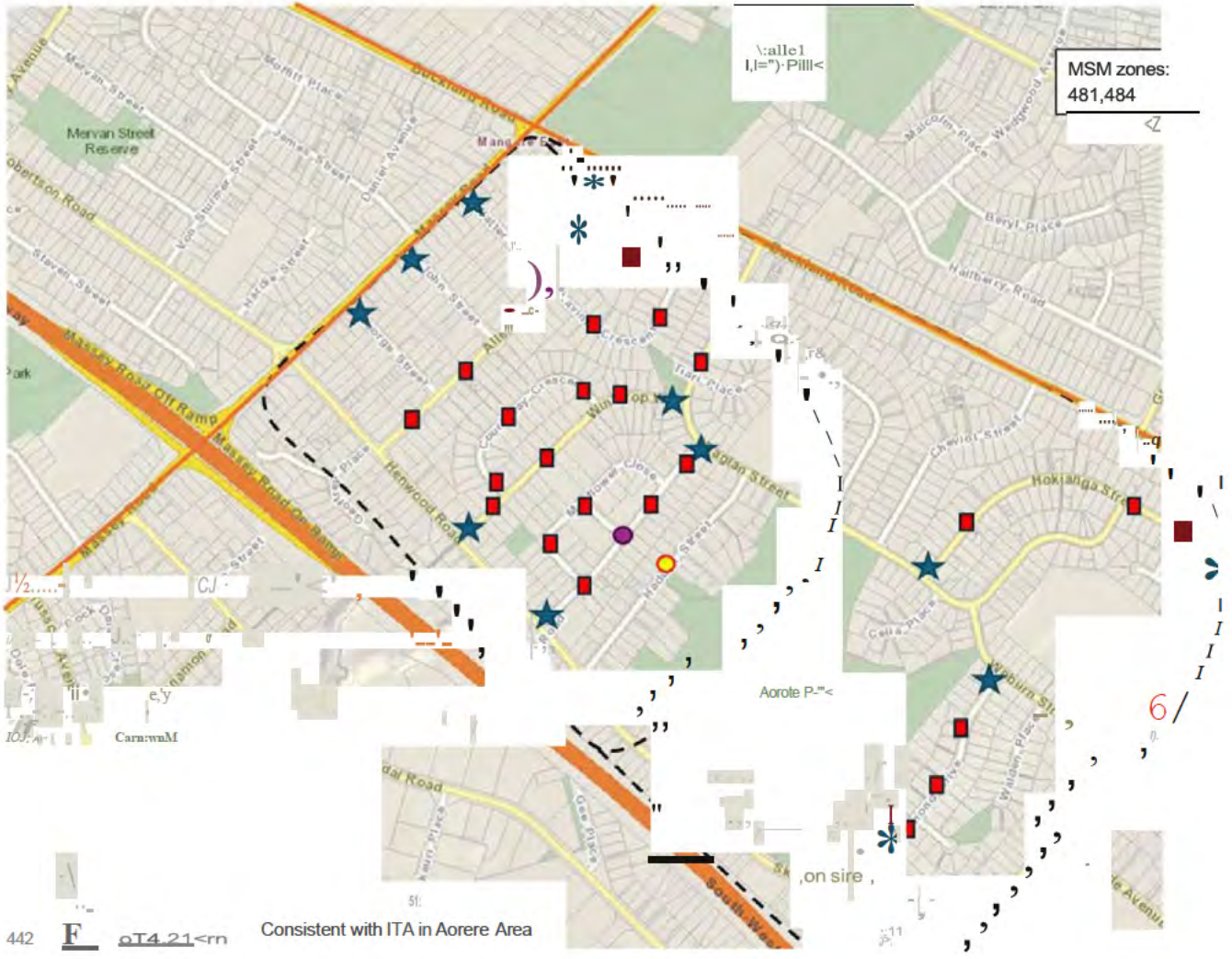
Aorere

Legend
- Speed calming device
- Intersection treatment / Threshold treatment
- Outside of local scope
- Zebra crossing

Item	
Speed calming devices	25
Intersection treatments	2
Threshold treatments	12
Zebra Crossing	1



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Middlemore

Legend
- Speed calming device
- Intersection treatment
- Threshold treatment
- Outside of local scope
- Zebra crossing

Item	
Speed calming devices	14
Intersection treatments	O
Threshold treatments	9
Zebra Crossing	3

D

Appendix D – Brownfields Business Case

Auckland Transport

An Auckland Council Organisation

Auckland Brownfields Growth Areas

Business Case

Version 4 24 February 2022

Change History and Approval

ROLE	NAME	SIGNATURE	DATE
Author(s)	Graham Norman Tony Innes		24 February 2022
Recommended by: Delivery Manager	Gavin Smith		24 February 2022
Independent Quality Assurance	Hilario Cachero		24 February 2022
Project Sponsor	Chris Morgan		24 February 2022

Revision Status

REVISION NUMBER:	IMPLEMENTATION DATE:	PHASE:	SUMMARY OF REVISION
Version 1	1 October 2021	Final report v1	Updated based on preliminary IQA review
Version 2	17 November 2021	Final report v2	Updates following IQA and peer review
Version 3	17 February 2022	Final Report v3	Minor consistency updates
Version 4	24 February 2022	Final Report v4	Update to project next steps

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Executive Summary

A significant increase in dwellings is forecast for Auckland over the next 30 years. The majority of this growth is expected in existing 'brownfields' areas. Kāinga Ora's Urban Development team is leading the largest urban regeneration ever undertaken in New Zealand, a multi-billion-dollar programme that will transform suburbs and communities across the Auckland region. The Auckland Housing Programme involves development of five Brownfield Growth areas including Oranga, Northcote, Tamaki, Mt Roskill and Mangere. Within these five areas, Kāinga Ora will provide in the order of 30,000 new houses. Development in these areas has already begun and this Business Case seeks to capitalise on the significant opportunity.

Figure 1: Brownfields Growth areas

This Business Case addresses the investment to the transport network required to cater for the Brownfield growth in these five areas and shape the travel patterns of existing and future residents.

Why the Brownfields?

Auckland is growing with the population expected to expand by 720,000 in the next 30 years. This means Auckland will need approximately 300,000 more dwellings. The Auckland Plans has a vision for Auckland to take a quality compact approach to growth and development. A compact Auckland means future development will be focused in existing and new urban areas within Auckland's urban footprint, limiting expansion into the rural hinterland.

Development anywhere requires investment in infrastructure that could include waste, stormwater, potable water pipes, and transport upgrades. But there are significant advantages to brownfield development namely:

- **Its cheaper** - Brownfields growth uses existing infrastructure capacity, providing better value for money.
- It delivers **better urban and transport outcomes** with immediate land use and transport integration.
- It has **less cumulative effects** reducing long distance trips and VKT
- It is **better for the environment** – Brownfields growth is more likely to lead to sustainable transport choices and reduce overall travel distance, helping to decarbonise the transport system.
- It **supports the public transport and active mode networks** - Brownfields growth increases the people within catchments for public transport and active modes making existing infrastructure more effective.

Problems faced

Notwithstanding the alignment with transport and urban policy and strategy, Brownfield's growth will place pressure on a transport system with existing issues and deficiencies. The Business Case identifies four key problems on which investment will be focused. These include:

- **Travel Choice -** Single occupancy vehicle mode share dominates in each of these areas, with relatively poor mode share for PT and active modes prevalent. A key focus of investment will be improvements to the Public Transport and active mode networks.

- **Road safety –** Existing road safety issues have been identified in all the Brownfield Growth areas to some extent. With intensification, existing safety problems are expected to be exacerbated. Significantly, the intensification of the brownfields area is anticipated to increase the volume of people walking and cycling in the areas. This is an area which experiences current deficiencies from a safety perspective with many of the areas having specific issues around active mode.
- **Accessibility –** Accessibility to jobs and economic opportunities is a key factor influencing the quality urban form. While the Brownfields areas generally provide a good level of access to opportunities, there is some deficiency in public transport and active mode access. In particular, there are a number of local barriers to accessibility arising from impermeable infrastructure corridors or geographic challenges which investment in the area seeks to improve.
- **Integration –** There is a significant level of growth forecast in the Brownfields areas. With this level of growth there is a risk that the transport infrastructure does not meet the needs of this growth, or that the required enhancements to the transport system are not realised at the right time to meet the growth aspirations. Investment in the transport network and urban development in an integrated manner will result in the best system outcomes.

Lastly, consideration of not investing in the transport network suggests significant negative impacts on people, communities and public funds and a lost opportunity to positively influence travel behaviour.

Investment response

Land use, non-infrastructure interventions and infrastructure interventions have been considered in each area. A number of programme options have been developed in each of the Brownfield Growth areas in response to the growth and challenges faced. A multiple criteria analysis has been used to assess options and a recommended programme option has been selected for each area.

A summary of the programme as a whole is provided on the following page. The subsequent pages summarise the recommended programme, outcomes, costs, risks and proposed next steps for each growth area.

Brownfields growth areas - Recommended Programme

g-g

:30,000newhouseholds e1elivcfed by 1<0 by 1045

+80,000ne residents

Problems facing these areas include:

1. A lack of **travel choice**
2. **Road safety** challenges
3. Deterioration in **Accessibility** to jobs and services
4. **Integration** between transport and land use

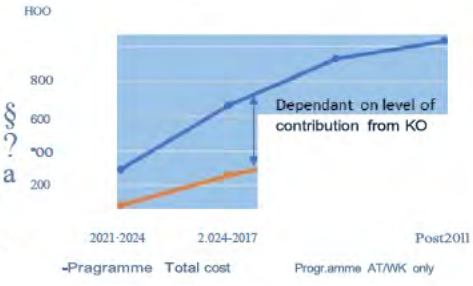
Recommended investment

$1.03B total capital cost (un-escalated, undiscounted)

$51M peryearannual operational cost

149 projects delivered by this programme over rhe next 20 years.

47 further projects which are part of other programmes



Programme comprises of:

73 km of separated cycle facilities
71 km of improved walking and cycling routes
23 km of Public transport priorit
73 intersection improvements

Outcomes of the investment

Safety

690 DSI's reduced over 30 years

Climate Change

50,000 ton of CO^2 reduced per year

Better travel options and accessibility

More People with access to High quality PT and cycling facilities:

+ 86,400 people

+138,500 people

As a result of the investment:

Within 15 minutes

+ 33,000 more people can cycle to healthcare

+ 52,000 can cycle to an employment centre

+ 42,000 can catch PT to healthcare

+ 11,500 can catch PT to work

Value for money

Total programme

BCR: 1.1

Benefit Cost Ratio by area:

1. Tamaki - 1.0
2. Roskill - 1.3
3. Oranga - 1.7
4. Mangere - 1.0
5. Northcote - 1.2

Excludes WEB and operational costs)

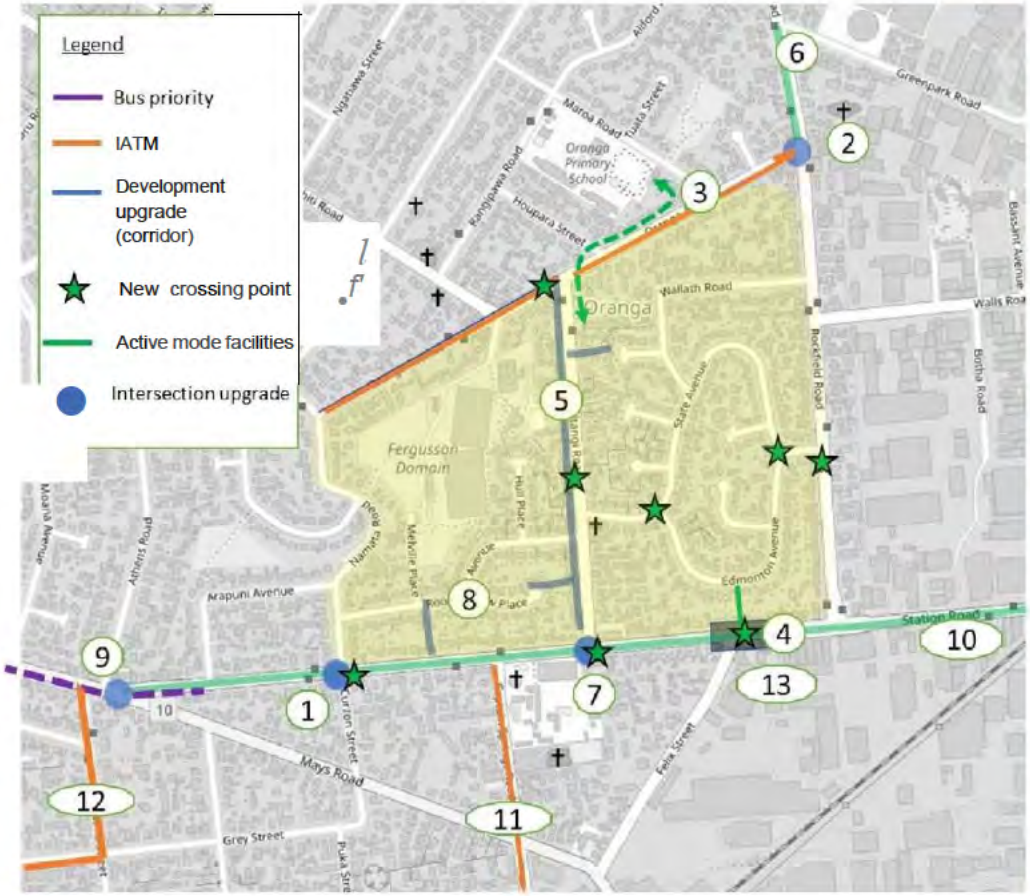
48 projects - further investigation through SSBC

101 projects - Straight to design and implementation

47 projects - part of other programmes

Oranga Recommended Programme

High level description: A hybrid programme including both active mode and public transport interventions with focus on value for money therefore favouring lower cost interventions on several corridors.



670 new households delivered by KO by 2028

1700 new residen

Joining the existing 1000 residents

Key Outcomes

54 DSI's reduced over 30 years

17 % mode share for active modes

10 % more jobs and social opportunities accessible by bike or PT

600 ton of CO^2 reduced per year

Total cost:
Capital: $34.2M
Opex: $6.2M per year
BCR: 1.7

Key Risks
- Funding priority
- Delays to investment create disruption and rework

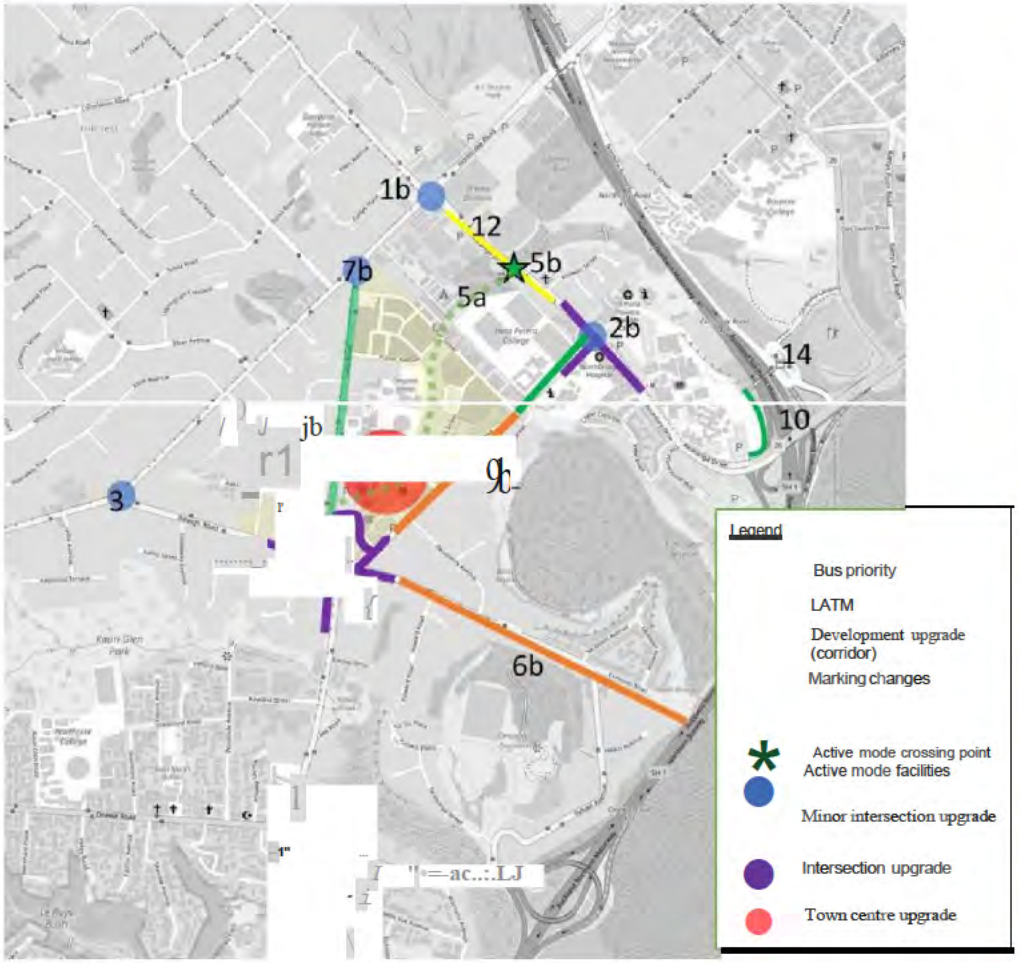
Next Steps:

3 projects to SSBC

12 projects progress straight to Implementation

Northcote Recommended Programme

High level description: A hybrid programme including both active mode and public transport interventions with focus on value for money therefore favouring lower cost interventions on several corridors.



1120 new households delivered by KO by 2028

2900 new residents

Joining the existing 1000 residents

Key Outcomes

32 DSI's reduced over 30 years

25 % mode share for active modes

10 % more jobs and social opportunities accessible by bike or PT

1900 ton of CO^2 reduced per year

Total cost:
Capital: $37M
Opex: $4.9M per year
BCR: 1.2

Key Risks

- Dependency on Northern Pathway
- Funding priority

Next Steps:

3 projects to SSBC

9 projects progress straight to implementation

Tamaki Recommended Programme

High level description: A focus on improvements for both active mode and bus services into centres / RTN stations at Glen Innes and Panmure and removal of general vehicle traffic from GI to provide opportunity for intensive development around the station.

Legend

- Bus priority
- LATM
- * Development requirement (corridor
- ITA crossing point
- Active mode facilities
- Intersection upgrade
- Station upgrade

11,500 new households delivered by KO by 2045

30,000 new residents

Joining the existing 1000 Kāinga Ora residents

Key Outcomes

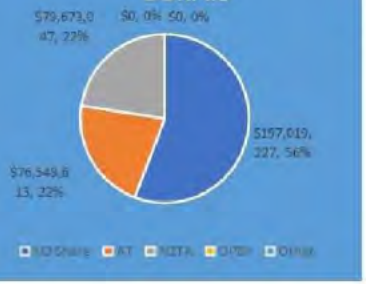
268 DSI's reduced over 30 years

22 % mode share for active modes

10 % more jobs and social opportunities accessible by bike or PT

7,600 ton of CO^2 reduced per year

Total cost:
Capital: $355M
Year 1-3 : $127M
Year 4-6: $129M
Year 7-10: $82M
Year 10+: $17M
Opex: $10M per year
BCR: 1.0



Key Risks

- Town centre revitalisation a key interdependency
- Reliance on other transport projects i.e. Te Horeta

Next Steps:

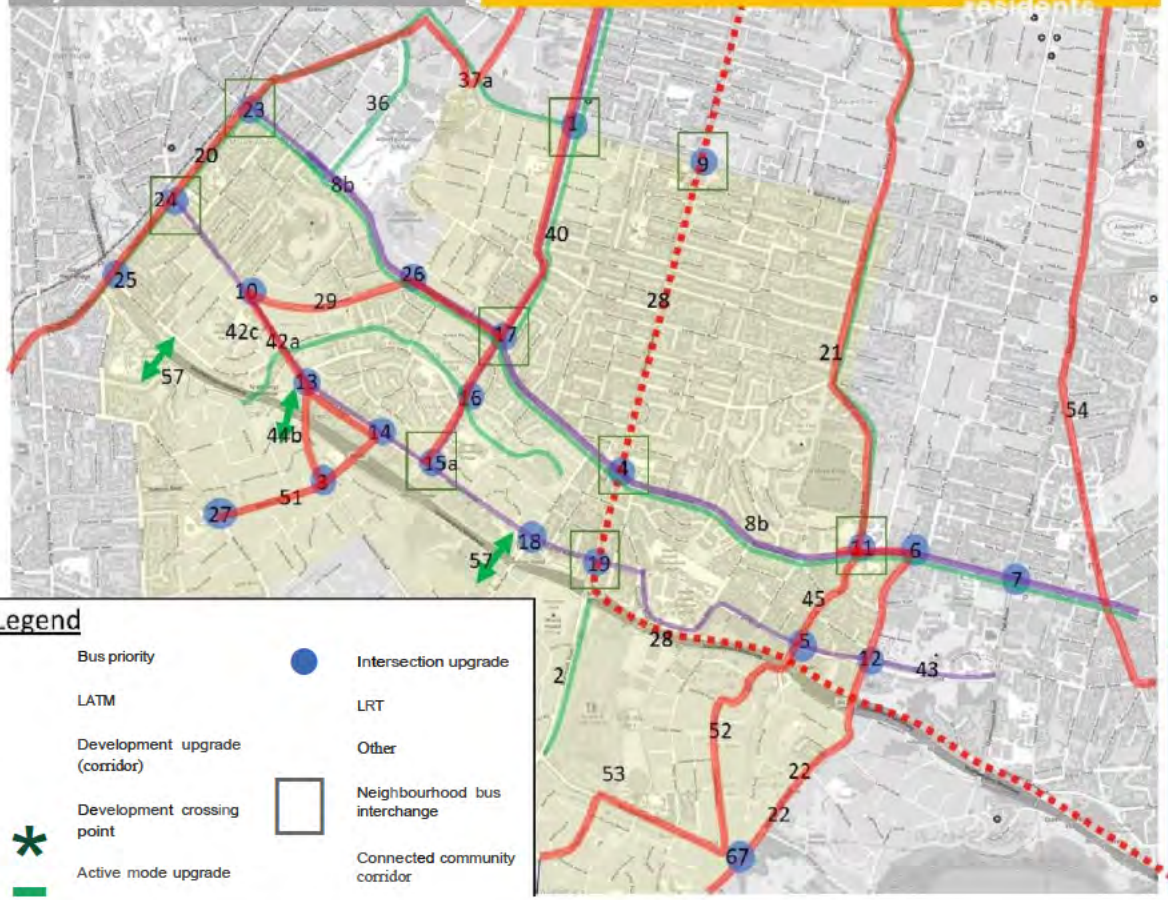
20 projects to SSBC
18 projects progress straight to implementation
15 Projects part of other programmes

Mt Roskill Recommended Programme

High **level description**: **A** geographic bias towards the areas which are intended to be more heavily developed by KO such as Wesley and Mt Roskill.

9,500 new households delivered by KO by 2045

25,000 new residents Joining the existing 7000 Kāinga Ora residents



Legend

- Bus priority
- LATM
- Development upgrade (corridor)
- Development crossing point
- Active mode upgrade
- Intersection upgrade
- LRT
- Other
- Neighbourhood bus interchange
- Connected community corridor

Key Outcomes

316 DSI's reduced over 30 years

22 % mode share for active modes

22,600 ton of CO^2 reduced per year

10 % more jobs and social opportunities accessible by bike or PT

Total cost:
Capital: $273M
Year 1-3 : $72M
Year 4-6: $73M
Year 7-10: $80M
Year 10+: $48M
Opex: $15M per year
BCR: 1.3

Key Risks

- LRT project effects land use and transport
- Reliance on other transport projects i.e. Connected communities

Next Steps:

8 projects to SSBC
36 projects progress straight to Implementation
20 Projects part of other programmes

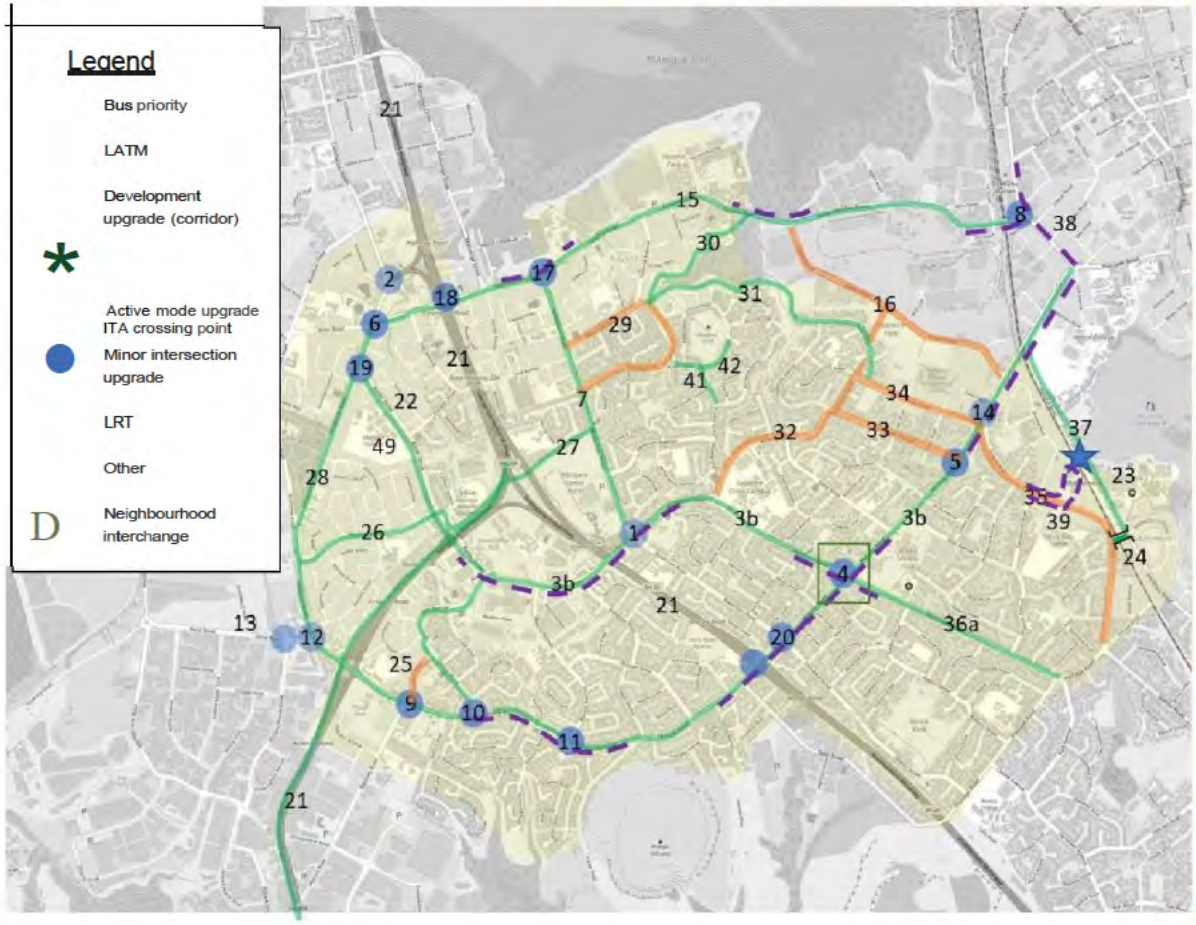
Mangere Recommended Programme

High level description: A focus on improvements providing access to the RTN via both active mode and bus services.

7,000new households delivered by KO by2045

18,000 new residents

Joining tt,e existing 8,500 Kaingo Ora



Key Outcomes

216 DSI's reduced over 30 years

18 % mode share for active modes

17,000 ton of CO^2 reduced per year

10 % more jobs and social opportunities accessible by bike or PT

Key Risks

- LRT project effects land use and transport
- Reliance on other transport projects i.e. Connected communities

Next Steps:

14 projects to SSBC
26 projects progress straight to Implementation
11 Projects part of other programmes

Affordability

The recommended programme for each of the recommended programmes involves significant capital and operational investment over the next 20 years. Kāinga Ora is likely to contribute to some of the capital cost of the programme, however agreement as to the proportion of contribution is not yet agreed between the various parties.

Currently, funding is constrained with the RLTP identifying $450M over the next 10 years for the AHP and Tamaki areas. With unconstrained funding the total capital cost for the programme within the 10-year timeframe is $931M. Operational cost increases could account for around $50m per annum which are not currently provided for in existing funding buckets.

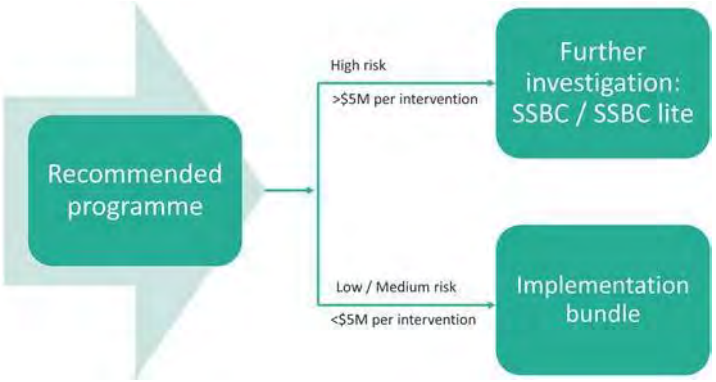
If no alternative funding sources are available, projects within the first 10 years will be prioritised to best use the available funding envelop. The projects which are funded would depend on the level of contribution from Kāinga Ora.

Next steps

The recommended programme across all areas includes 150 projects of varying scale and complexity, some of which are required urgently to respond to development of housing already underway.

In response to the scale, work done to date and relatively low level of complexity, a streamlined approach to progression projects has been proposed. This involves progression of less complex projects under $5m cost straight to design and implementation. Higher cost projects with higher risk profiles will progress to a single staged business case as per a typical process.

Figure 2: Project pathways



Checks and balances are proposed for implementation bundles to ensure the strategic objectives of the programme and overall bounds of benefits and costs are maintained.

A Joint governance group is considered critical to overseeing the programme as projects progress to implementation and manage prioritisation and co-ordination of projects.

This is a substantial programme of works and therefore, a dedicated team is required to deliver the programme and ensure co-ordination with development and other infrastructure providers.

1 Introduction

1.1 Purpose of this document

This document adopts a hybrid approach combining a Programme Business Case (PBC) with selected interventions developed in more detail in line with an Indicative Business Case (IBC) approach to provide increased cost certainty of the programme.

The five brownfields growth areas considered in this report are subject to significant and imminent development with Kāinga Ora having a significant interest in each area. Development of these areas will occur in a staged manner, but significant development is anticipated in the next few years. Kāinga Ora is actively planning for initial stages of development and from a transport perspective, has undertaken integrated transport assessments in a number of the growth areas to identify and mitigate the effects of development.

In order to adopt an integrated approach to transport and land planning, and consider the wider network effects of Brownfields growth, this PBC considers the condition of the existing transport network in each area and considers the future travel forecasts. The PBC takes a step backwards, looking at the transport system in each study area from a more holistic viewpoint considering wider transport demand rather than focusing on the effects of the localised development. The primary purpose of a PBC is to support the decision to invest in a programme of change that optimises potential value for money. Specifically, for the Brownfields programme this includes:

- confirms the strategic context and how the proposed investment fits within that strategic context.
- confirms the need to invest and the case for change.
- tests and builds on the suite of interventions recommended by the ITAs and recommends a preferred programme.
- identifies the key asset and non-asset based projects and activities that will support the programme outcomes.
- allows prioritisation of programme areas and interventions.
- Identifies the source of funding for each intervention.
- provides investment decision-makers with indicative costs by organisation to deliver the programme.
- recommends next steps to progress the programme.

The Brownfields Business case geographical scope is large and the programme includes many interventions. Given the amount of work already undertaken in each area and the relative level of complexity for each project, a programme business case approach has been adopted.

In order to provide decision makers with assurance, a select of projects within the programme have been developed further with additional design detail and costings. This serves to validate assumptions made as part of the programme assessment.

The Business Case seeks the following endorsements and funding:

- Endorsement of the Preferred Programme
- Endorsement of the proposed prioritisation of interventions
- Approval of $25M funding to progress 48 significant interventions to a SSBC.

- Approval of $385M of implementation funding for lower cost and risk projects within the RLTP period (10 years).
- Endorsement of establishment of a Brownfields Governance Group as set out in this Business Case.

1.2 Point of entry

A point of entry (POE) was completed and signed off by AT and Waka Kotahi in August 2020, setting out the strategic importance of the project and a recommended scope for the assessment. The POE defined the scope of the next phase as follows:

The scope of the IBC's will be to:

- *Confirm the problems and opportunities based on available evidence for each of the geographic areas;*
- *Rank and score the problems and opportunities based on available evidence for each of the geographic areas to provide the local flavour.*
- *Develop objectives, investment outcomes, KPIs and measures through the ILM and provide a local flavour based on that location;*
- *Demonstrate alignment with current strategic drivers and urgency/relevance of the indicative programme timeline;*
- *Use the IDMF tools to match the infrastructure to our outcomes and objectives as well as to the level of housing released.*
- *Land use futures have already been examined and assessed by KO through their business cases and their yield matches the optimal level of development in their view. We will test this at a high level and conduct a sensitivity based on the implications of the recently released NPS Urban Development.*
- *Develop a network of responses across a variety of modes with a temporal element and assess them against our investment objectives and the problem statements*
- *Further develop the network of responses that be identified as being either an AT or developer responsibility. This will include an assumed level of contribution by each party. These responses are expected to range from TDM measures to reduce trips, upgrading existing infrastructure to be more appropriate, and new infrastructure.*
- *Determine a preferred programme which identifies the scale and prioritisation / sequencing of transport investment required and the next steps / timings to progress project elements through the business case process.*

While the POE refers to provision of a number of Indicative business cases, a programme approach was identified as being required early in the business case approach. Using the programme approach allows prioritisation with the wider programme and between the various growth areas identified. The detail outlined above, has informed the scope of the assessment.

1.3 Geographic scope

This report focuses on development in five areas identified in Figure 1-1, namely:

- Oranga
- Northcote
- Tamaki
- Mt Roskill
- Mangere

Whilst there are many areas of Brownfields growth in the city, these areas have been chosen as they represent areas of significant growth with Kāinga Ora as the primary developer in the region which are being developed with urgency as part of Kāinga Ora's Auckland Housing Programme. Kāinga Ora are proposing in the order of 29,000 additional houses over the next 30 years in these areas, which represents approximately 68% of the total growth forecast in these areas.

Figure 1-1 : Study Area

The specific details for each area as summarised in the following sections of this report.

1.3.1 Oranga

The Oranga area has a regeneration over the area shown in Figure 1-2. The total growth proposed by Kāinga Ora is in the order of 650 additional homes in this area over the next 30 years. This Kāinga Ora growth represents approximately 95% of all the growth forecast in this area.

Figure 1-2 : Oranga Area

1.3.2 Northcote

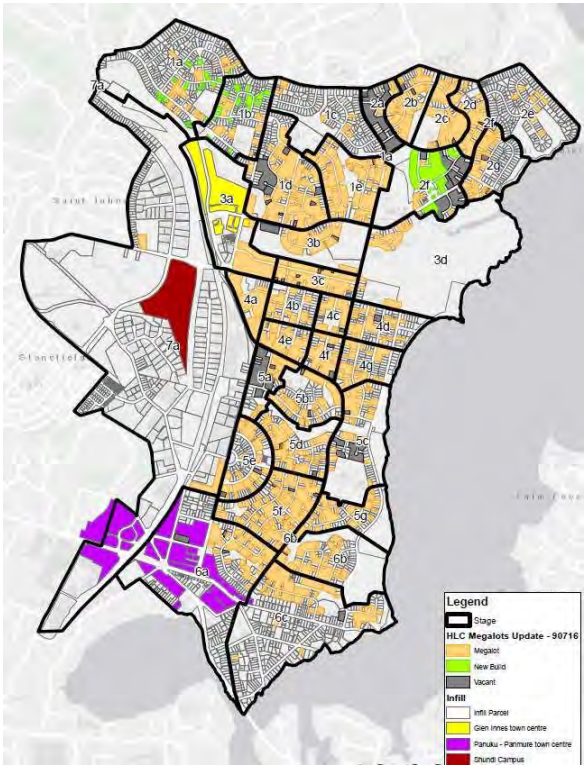
The Northcote area has considerable regeneration proposed as shown in Figure 1-3. The total growth proposed by Kāinga Ora in is the order of 1150 additional homes in this area over the next 30 years. This Kāinga Ora growth represents approximately 50% of all the growth forecast in this area.

Figure 1-3 : Northcote Area

1.3.3 Tamaki

The Tamaki area has a substantial regeneration over a large area as shown in Figure 1-4 across seven neighbourhoods. The total growth proposed by Kāinga Ora in is the order of 11,500 additional homes in this area over the next 30 years. This Kāinga Ora growth represents approximately 66% of all the growth forecast in this area.

Figure 1-4 : Tamaki Area



1.3.4 Mt Roskill

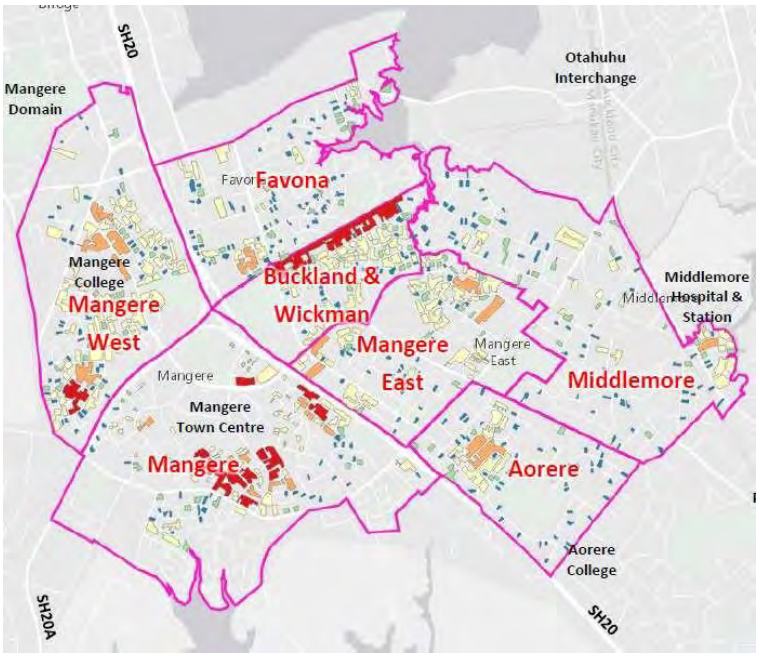
The Mt Roskill area has a substantial regeneration over a large area as shown in Figure 1-5 across 16 neighbourhoods. The total growth proposed by Kāinga Ora in is the order of 9,500 additional homes in this area (approximately 3,200 state houses currently in the area) over the next 30 years. This Kāinga Ora growth represents approximately 70% of all the growth forecast in this area.

Figure 1-5 : Mt Roskill Area

1.3.5 Mangere

The Mangere area has a substantial regeneration over a large area as shown in Figure 1-6 across seven neighbourhoods. The total growth proposed by Kāinga Ora in is the order of 7,000 additional homes in this area over the next 30 years. This Kāinga Ora growth represents approximately 75% of all the growth forecast in this area.

Figure 1-6 : Mangere Area



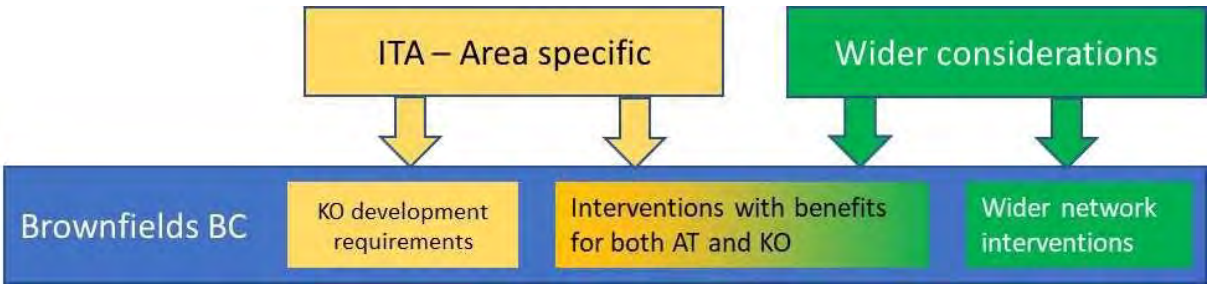
1.4 Work done to date

There is a significant amount of investigation already undertaken in a number of these areas by both the main developer (Kāinga Ora) in these areas and Auckland Transport. These include:

- Integrated Transport Assessments
- Sustainable Transport Strategies (Prepared on behalf of KO at area level)
- Future Connect Assessment
- Broader Auckland Housing Programme Transport Studies.

The Integrated Transport assessments consider the Transport effects of the proposal and suggest infrastructure changes required to mitigate the effects. This Business Case takes a broader look at the transport network and identifies what investment is required to address the problems faced in each of the areas. The ITAs and interventions identified within these assessments forms a starting point on which this Business Case will build upon. Figure 1-7 shows this relationship graphically.

Figure 1-7: Relationship between ITAs and Business Case



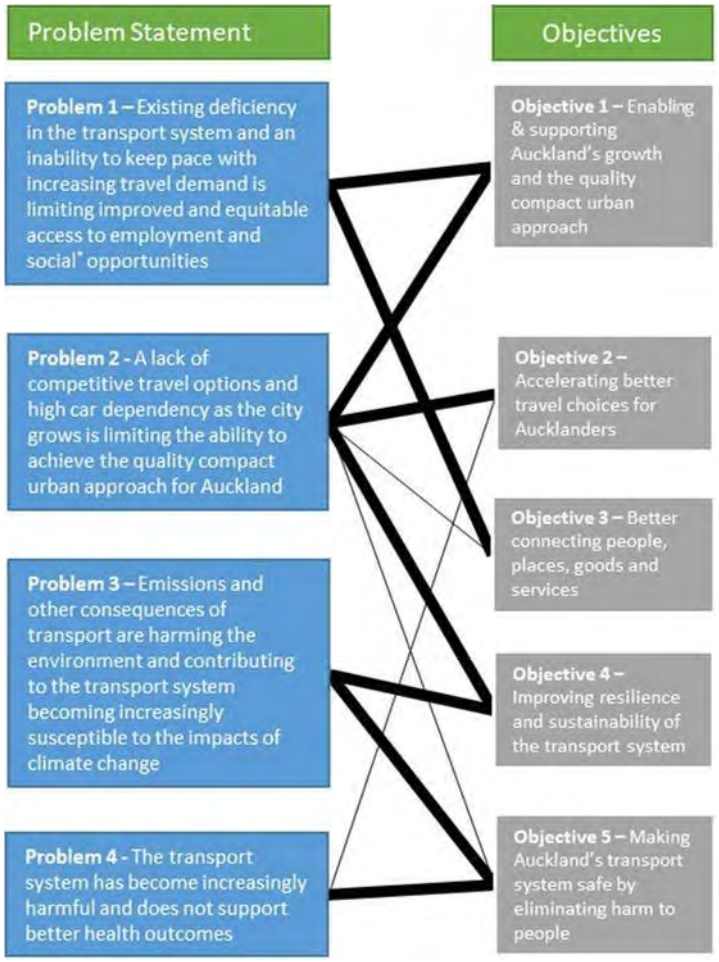
1.4.1 Future Connect

An Auckland wide piece of work was completed by AT and Waka Kotahi as a means of creating a consistent evidence based, investment direction on which to prioritise projects within the region for inclusion in the RLTP. As part of the Future connect work, Problem statements and investment objectives were developed and indicators for both were identified.

This set of Auckland Wide problems and investment objectives has been used as a starting point for the Brownfields development area investment. The problem statements and investment objectives identified as part of the Future connect work are outlined below.

The Future Connect project developed a framework (based on all available data) on which projects within the Auckland region could be rated and prioritised on a consistent basis. Future Connect brings together the elements of the Transport System for Auckland to ensure areas of highest need are identified and appropriate responses are provided. Future Connect is THE WHY, with the RLTP being THE HOW.

Figure 1-8: Future Connect



The Future Connect programme and data has been used to identify areas for prioritised investment (based on the current state of transport system and proposed growth) and the five areas in this Business Case have been identified based on this data for prioritised investment due.

1.4.2 Integrated Transport Assessments

An Integrated Transport Assessment (ITA) assesses the transport effects of a development proposal and is usually required by the consenting authority. The main objective of an ITA is to ensure that the transportation effects of a new development proposal are well considered, and that there is an emphasis on efficiency, safety and accessibility to and from the development by all transport modes where practical; and that the adverse transport effects of the development have been effectively avoided, remedied or mitigated. The preparation of an ITA seeks to ensure that appropriate thought is given to the zoning or land use proposed so that integrated transport and land use outcomes occur.

An ITA has been prepared for the following growth areas considered in this report.

- Oranga – BECA, 2019. Oranga Precinct Integrated Transport Assessment
- Northcote – FLOW, 2017. Northcote HNZ Masterplan Integrated Transport Assessment
- Mt Roskill – BECA, 2018. HLC Infrastructure Masterplan - Mt Roskill - Integrated Transport Assessment.
- Mangere – FLOW, 2018. HLC Infrastructure Masterplan: Mangere Transport Assessment

For the Tamaki area, a transport infrastructure masterplanning exercise has been undertaken:

- Tamaki – BECA, 2017. Tamaki Infrastructure Masterplanning Overview Report

The masterplanning work is not intended to be used in the design or consenting phases and does not typically have any regulatory status. The masterplan is a dynamic planning document that lays out the intended infrastructure for the long term at a higher than conceptual level.

1.4.3 Auckland Housing Programme Transport assessment

Kāinga Ora commissioned some further work to be undertaken on the AHP areas, looking specifically at the wider network effects associated with the Kāinga Ora growth over and above the interventions identified by the ITAs.

The transport assessment work identified a number of additional interventions which have informed the Auckland Council DPO spreadsheet on the projects required to support growth in each area. This work, along with the ITAs has informed programme development for this Business Case.

1.4.4 Other Studies

There are a number of other studies that have been undertaken including (but not limited to):

- Network Optimisation PBC – This PBC identifies areas for investment in the existing transport system to enhance safety and the performance of the existing transport system.
- Auckland Region Walking and Cycling PBC – developed a case for investment in a programme of cycling activities in Auckland over the 2018-2028 period. The document sets out the strategic case for investment, the recommended programme and prioritisation of projects within the programme.
- Mangere cycling SSBC – A package of cycling improvements has been developed in the Mangere area following other projects in the area (20Connect, Airport to Botany Rapid Transit and Auckland Airport precinct developments). The package includes the following routes: Mangere Bridge/Kirkbride connection, Mangere Centre Park, Bader Drive and Jordan Road.

Table 1-1: Impact of other projects on this Business Case

Project / programme	Details	Impact on this Business Case
Network optimisation PBC	This PBC identifies areas for investment in the existing transport system to enhance safety and the performance of the existing transport system.	A number of individual projects within the areas are identified in the network optimisation programme. Where the project is consistent with the BC recommended network, the project is excluded from the recommended programme to avoid double counting of a project.
Auckland Region Walking and Cycling PBC	The PBC develops a case for investment in a programme of cycling activities in Auckland over the 2018-2028 period. The document sets out the strategic case for investment, the recommended programme and prioritisation of projects within the programme.	The PBC identifies focus areas for 'early start' on construction during the 2018-21 period include network development in the City Centre and Fringe and in selected suburban hubs including Mangere and Henderson. Focus on the Mangere area has given rise to several projects identified within the Mangere area which are included in the recommended network however part of another project for delivery.
Mangere cycling SSBC	A package of cycling improvements has been developed in the Mangere area following other projects in the area (20Connect, Airport to Botany Rapid Transit and Auckland Airport	This package of improvements has been identified in the recommended network for Mangere.

	precinct developments). The package includes the following routes: Mangere Bridge/Kirkbride connection, Mangere Centre Park, Bader Drive and Jordan Road.	As this is a separate project no assessment of cost, outcomes or funding is required.
Connected Communities programme	The Connected Communities programme aims to improve the safety, productivity and people carrying capacity of the road network by investigating, designing, and delivering bus priority, safety, and cycling and walking improvements along a number of the region's key arterials. Business cases and designs are currently underway, and AT will work with Local Boards and communities on improvements proposed for their areas.	The Connected communities programme considers a number of corridors in the Mt Roskill Area and one corridor in the Mangere Area. Corridors within this programme are highlighted as an important part of delivering the AHP growth however are not formally included in the programmes developed as part of this Business Case.
Neighbourhood interchanges PBC	The Neighbourhood interchanges PBC outlines a programme of investment to upgrade interchanges between FTN routes. The PBC focused primarily on the central isthmus area with the delivery of well-designed and user-friendly neighbourhood Interchanges to provide accessible customer focused facilities appropriate to the public transport routes that connect, and to the environment they are located.	Interventions identified in this Business Case are primarily located in the Mt Roskill area. Given that funding is not yet allocated to this programme, projects within this programme have been incorporated into the Brownfield BC programme.

2 Strategic Case: The Case for Change

The following section sets out context for the Brownfield growth areas and presents evidence to demonstrate a need for investment in the transport network. At a high level, investment in the Brownfields growth area is well aligned to transport and urban policy and strategy providing a unique opportunity to make best use of the existing transport network and achieve growth with favourable transport outcomes.

The evidence presented follows four investment themes which were identified in the Investment Logic Map:

- Travel Choice
- Road safety
- Accessibility
- Integration

Lastly, consideration of not investing in the transport network suggests significant negative impacts on people, communities and public funds and a lost opportunity to positively influence travel behaviour.

2.1 Historic trends in Auckland growth

Recent efforts to invest in the transport network and move away from the historic pattern of low-density development towards a more compact urban form have seen significant results through increased intensification, public transport ridership and active modes particularly over the last 10 years. There has been a considerable increase in dwelling consents and intensive forms of development built close to key transit corridors and interchanges.

Positive signs that have emerged through recent Auckland Plan Development Strategy monitoring (2019/2020) include:

- of the 14,776 new developments consented, the majority of growth (82 per cent) were within the existing urban area with a further 11 per cent in the future urban areas and 7 per cent in the rural areas
- higher density housing typologies (e.g. apartments and town houses) have increased 52 per cent in the last three years and are increasing at a higher rate than consents for standalone houses
- Around 74 per cent of dwellings consented in the Auckland Plan nodes[1] and 69 per cent in development areas were apartments and townhouses.

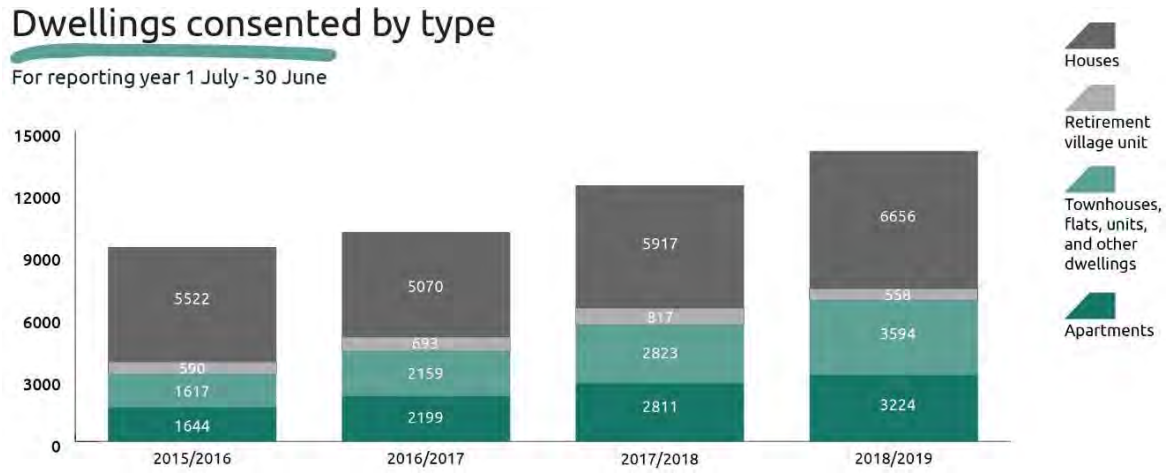
Other monitoring has shown the following trends:

- Between 1 September 2019 and 30 August 2020, 25 per cent of all dwellings consented in the Auckland Region were within 1,500m of RTN stations[2].

[1] Nodes are defined in the Auckland Plan 2050 Development Strategy as major growth areas critical to accommodating growth across Auckland. The areas are based around a significant centre and service large catchments. They encompass surrounding employment and high-density residential areas.
[2] Auckland Monthly Housing Update

- employment has risen 2.2 per cent per annum from 2009, with 25 per cent located in the city centre[3]

Figure 2-1: New dwelling typology trends



While these trends are encouraging, there is still room for improvement, for instance:

- the proportion of jobs accessible by public transport is less than 50 per cent of car accessibility
- public transport accessibility and mode-share is the lowest for Auckland's most vulnerable communities located in South and West Auckland and this polarisation of access to employment is projected to grow
- on average, 62.1 per cent of children under 13 years travel via private vehicle to education, however this is exceeded in Auckland's most vulnerable communities in South and West Auckland.

Auckland requires ongoing and focused investment in infrastructure that continues to support these trends towards a quality compact Auckland.

2.2 Importance of brownfields growth

2.2.1 Auckland is growing

Auckland is anticipated to grow significantly over the next 30 years. In order to build Auckland's strengths and the cities unique characteristics, planning for future growth is an imperative.

Around 1.72 million people currently live in Auckland.

Over the next 30 years this number could grow by another 720,000 people to reach 2.4 million. This means Auckland will need many more dwellings – possibly another 313,000, and room for extra jobs – possibly another 263,000.

Auckland will take a quality compact approach to growth and development. A compact Auckland means future development will be focused in existing and new urban areas within Auckland's urban footprint, limiting expansion into the rural hinterland.

[3] Infometrics Auckland Economic Profile, available here: https://ecoprofile.infometrics.co.nz/Auckland (accessed June 2020).

The quality aspect of this approach means that:

- most development occurs in areas that are easily accessible by public transport, walking and cycling
- most development is within reasonable walking distance of services and facilities including centres, community facilities, employment opportunities and open space
- future development maximises efficient use of land
- delivery of necessary infrastructure is coordinated to support growth in the right place at the right time.

Growth is enabled throughout most of Auckland's urban footprint, and all neighbourhoods are capable of accommodating growth to some extent. However, some existing urban areas are likely to undergo significant growth - these are known in the Auckland Plan 2050 as nodes and development areas. Redevelopment in these areas will be of a scale that will require substantial infrastructure and service investment.

Addressing the requirement for transport infrastructure to support these areas is the subject of the Business Case.

2.2.2 COVID effects on growth

The recent COVID pandemic has resulted in significant short-term changes to the transport demand on the transport system. The key question for this Business Case is what future growth and transport demands might look like and what the impacts occur on development in the identified brownfield areas.

Auckland's population was estimated to have grown by 37,000 people in the previous year from 30 June 2019 to 30 June 2020 to reach a total of 1,717,500 people[4]. Auckland had nearly half of New Zealand's total net gain from international migration (36,700), in the year ended 30 June 2020.

There is still a high degree of uncertainty around the ongoing impacts of Covid-19 on Auckland's rate of population growth. However, it is expected that population growth will slow slightly compared with growth experienced in recent years[5]. The Covid-19 shock may impact this rate of growth further. Recent work suggests that anticipated population growth across Auckland may be affected in the short term (10 years) and could be absorbed across the medium and long term (11-30 years).

In terms of transport demand Figure 2-2 outlines the agreed Auckland region scenarios, which range from a 96-62% rate of demand by mid-2022 based on a high, medium and low scenario. Recent evidence suggests the high (96% of pre COVID forecasts) is looking more likely, however this is very susceptible to future lockdowns.

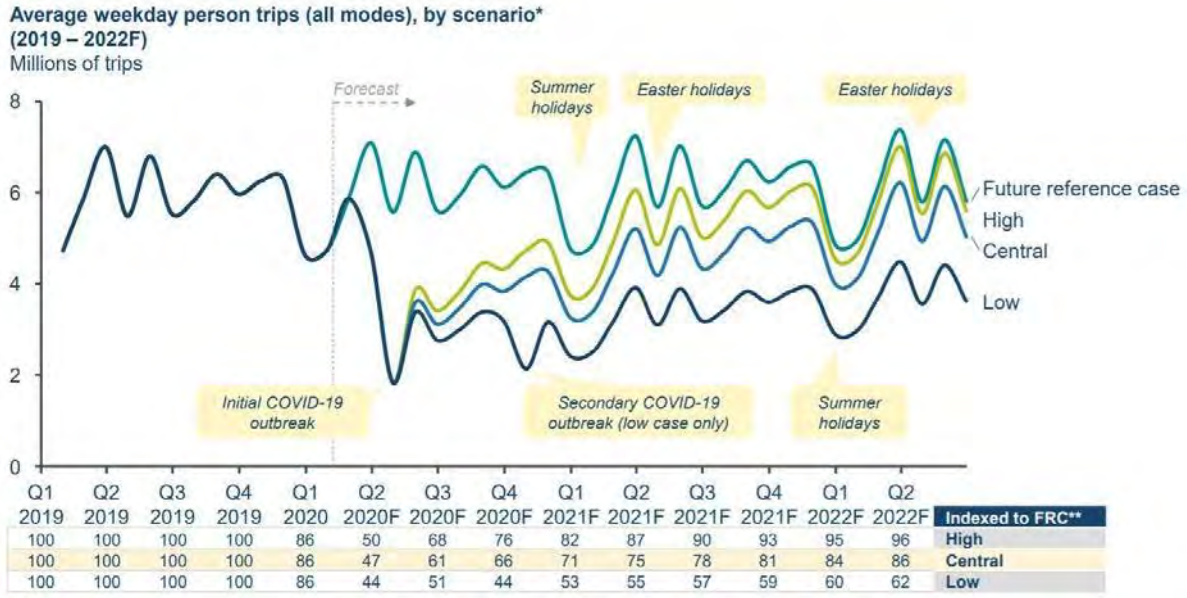
In terms of development activity, Figure 2-3 shows during the first lockdown there was a significant reduction in building activity, reducing supply and indicating that future growth may be reduced. However the most recent evidence indicates that the housing market in particular is experiencing strong buyer demand and this has been sustained for a number of months. There are many factors that could be effecting this (such as low interest rates and an influx of returning citizens). The long-term outlook is generally for reduced demand due to border restrictions and slower growth.

Specifically related to this Business Case, the five areas have been prioritised for investment consideration due in part to the fact that there is a single developer (Kāinga Ora) and as a crown entity it is likely that these developments will be less impacted by the market given in part the governments focus on affordable housing.

[4] Source: Statistics New Zealand (2020) Subnational population estimates: at 30 June 2020. Available online at https://www.stats.govt.nz/information-releases/subnational-population-estimates-at-30-june-2020 (accessed 27 October 2020)

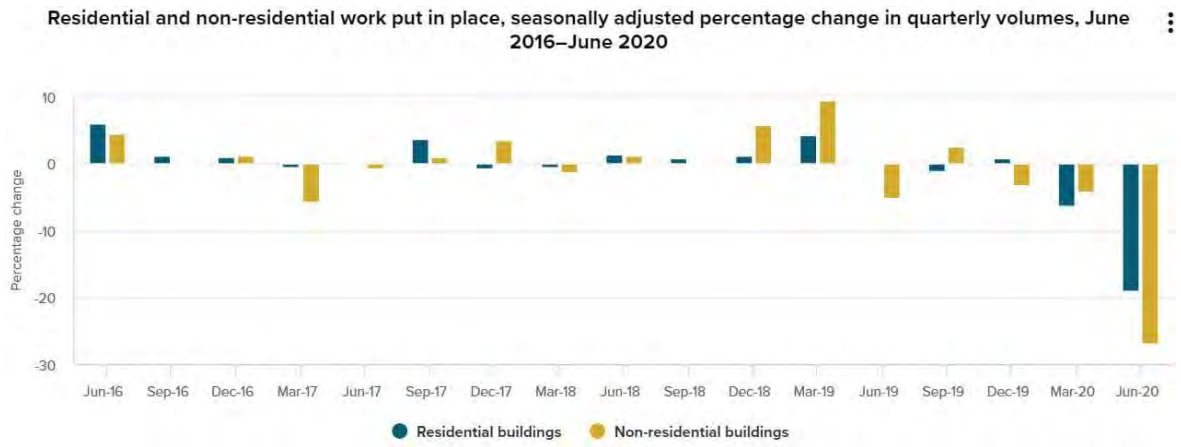
[5] Auckland Plan 2050 https://www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/auckland-plan/about-the-auckland-plan/Pages/aucklands-population.aspx

Figure 2-2 : COVID Transport scenarios



	Q1 2019	Q2 2019	Q3 2019	Q4 2019	Q1 2020	Q2 2020F	Q3 2020F	Q4 2020F	Q1 2021F	Q2 2021F	Q3 2021F	Q4 2021F	Q1 2022F	Q2 2022F
Indexed to FRC**														
High	100	100	100	100	86	50	68	76	82	87	90	93	95	96
Central	100	100	100	100	86	47	61	66	71	75	78	81	84	86
Low	100	100	100	100	86	44	51	44	53	55	57	59	60	62

Figure 2-3 : COVID Building Activity



(Source: Statistic NZ - https://www.stats.govt.nz/news/covid-19-slows-building-activity)

Anecdotal evidence recently has indicated that both building activity and transport demand has return quicker than anticipated.

2.2.3 Why the Brownfields

Auckland's growth is predominantly focussed in the Brownfields areas (approximately 70% of growth in next 30 years). Development of the brownfield area contains the majority of future growth as it is both efficient from an infrastructure and economic perspective and delivers strong urban outcomes.

Brownfields growth provides the opportunity to maximise the considerable investment made in the cities infrastructure to date. This also allows the vision of the city as outlined in the Auckland Plan to be realised, being that of a Compact city with enhanced urban form.

Development anywhere requires investment in infrastructure that could include waste, stormwater, potable water pipes, and road upgrades. But there are advantages to brownfield development. While

brownfield land typically costs developers more than greenfield land, brownfield development benefits the city in several critical ways including:

- Brownfields growth uses existing infrastructure capacity, providing value for money
- Brownfields growth creates the intensification that makes public transport and other amenities cheaper to use on a per user basis
- It delivers better urban and transport outcomes with immediate land use and transport integration
- It imposes fewer external costs (like long-distance congestion) on other users of the transport system
- It supports a low carbon transport system that supports emissions reductions while improving safety and inclusive access.

2.2.3.1 Value for money

While some greenfield development will likely be needed to accommodate Auckland's growth, Auckland Council's Future Urban Land Supply Strategy (FULSS) has estimated that greenfield infrastructure will cost around $140,000 per dwelling on average, far more than in brownfields areas where infrastructure to enable this development already exists, removing or reducing the costs of supporting infrastructure.

2.2.3.2 Supports existing and planned PT services

As the city grows there is a need for transport corridors to carry more people and goods with greater efficiency. The more people that can be moved in fewer vehicles the greater the efficiency (and therefore capacity) of the system. In addition to using existing infrastructure better, brownfields development allowing for more cost-effective public transport due to increased patronage as a result of increased density within the catchments of PT services.

The increased density of brownfields development allows for increased PT service frequency which in turn improves the service for all users, providing a region wide benefit to the transport system.

Trips are also generally shorter from brownfields areas as amenities (both employment and social) are closer. Shorter trips provide increased travel choice for users of the transport system as PT (and active modes) become more attractive to a wider range of trips the shorter the journey.

2.2.3.3 Growth in brownfields has better urban and transport outcomes

The Auckland Plan outlines that *"Auckland will follow a quality compact urban form approach to growth to realise the environmental, social and economic benefits and opportunities this approach brings"*

Some of the benefits of this approach are that it:

- *allows opportunities for more intensive living and working environments, and for more housing to be built around areas of activity and close to good transport options*
- *improves the efficiency of the substantial investment required in infrastructure – such as transport and wastewater – and other services. This also results in the best asset management and infrastructure provision*
- *means lower travel costs for people and businesses and increased economic agglomeration benefits*
- *helps to protect our natural environment and maintain Auckland's rural productivity by limiting urban sprawl.*

Figure 2-4: Artist impression of future development in Tamaki (Source: Tamaki Regeneration)

Auckland represents 37 per cent of New Zealand's GDP. Therefore, its productivity and economic, environmental and social performance is critical to the performance of New Zealand as a whole. To achieve this performance Auckland requires a transport system that meets all of its movement needs, personal and business. It also requires a transport system that functions as a fully integrated component of the wider urban system.

Having a successful transport system is critical to facilitate the interaction and exchange of ideas, goods and services. This is a key factor to achieve a well-functioning city that enables communities to access and satisfy their needs easily, safely, affordably and sustainably. The degree to which urban and transport systems can integrate and support each other has a direct effect on the city's efficiency, effectiveness and economic productivity.

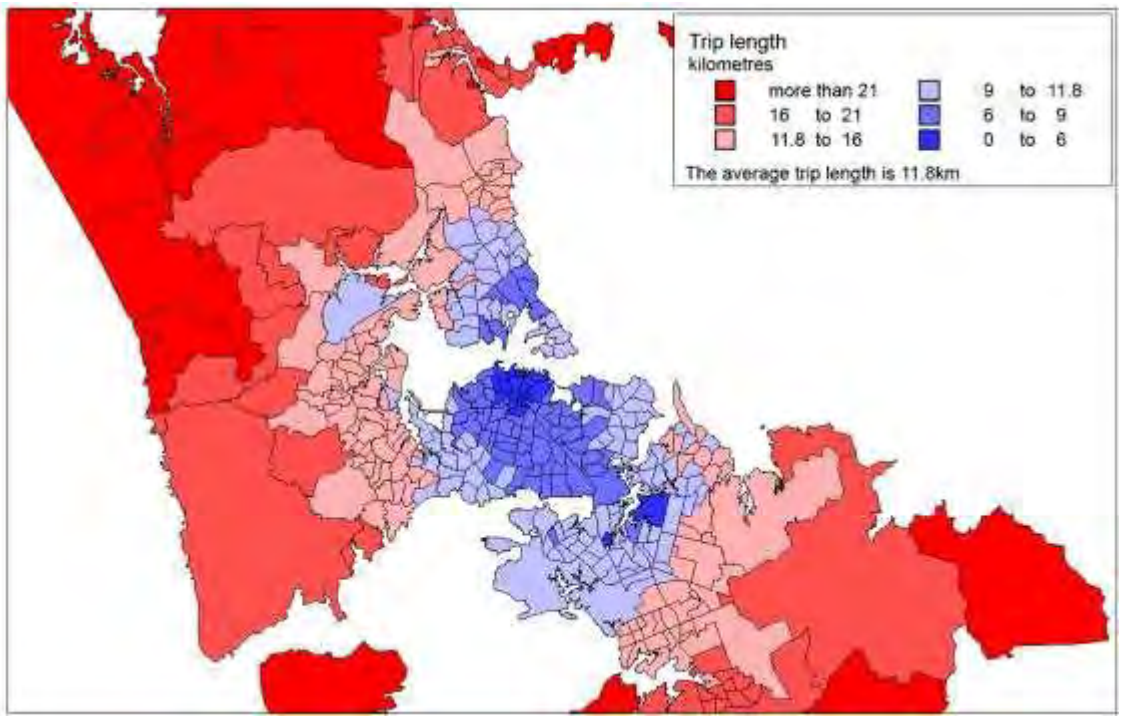
The diagram below shows the breadth of urban factors that can positively or negatively influence, or be influenced by transport behaviours, outcomes and system performance. This can be considered as a continuous reinforcing/virtuous or vicious cycle depending on the level of integration. Good transport system design requires careful consideration of all urban factors, including how they are mutually supportive and how they influence transport outcomes.

Figure 2-5: There are relationships between urban factors and transport outcomes and behaviours

2.2.4 Fewer External Transport Costs / Wider transport network effects

Brownfield's development will generally result in shorter trips on the transport network due to the closer proximity of services, employment and social facilities as illustrated by the average trip length to employment for the Auckland region as outlined in Figure 2-6. The general trend seen in this assessment shows that development located further away from the city centre, trip length generally increases. Generally, the five Brownfield areas are located within 10km of the city centre with the exception of Mangere which has proximity to other areas of employment such as the Airport precinct, Penrose and Manukau.

Figure 2-6: Trip length by residential area (Source: R Paling based on Census data from 2013)



Development of brownfields areas which have lower average trip length associated with travel to work has the following benefits:

- Reducing vehicle emissions
- Reducing private vehicle mode share (due to increased travel choice)
- Reducing the cost of travel for PT users (and likely all road users due to less vehicle kilometres on the road network also)
- Increased walking and cycling trips whose cost of travel is negligible compared to PT and the private vehicle.

Development in these areas is also more likely to make use of existing infrastructure, providing more efficient use of existing roads and PT services, reducing the overall cost burden on the transport system.

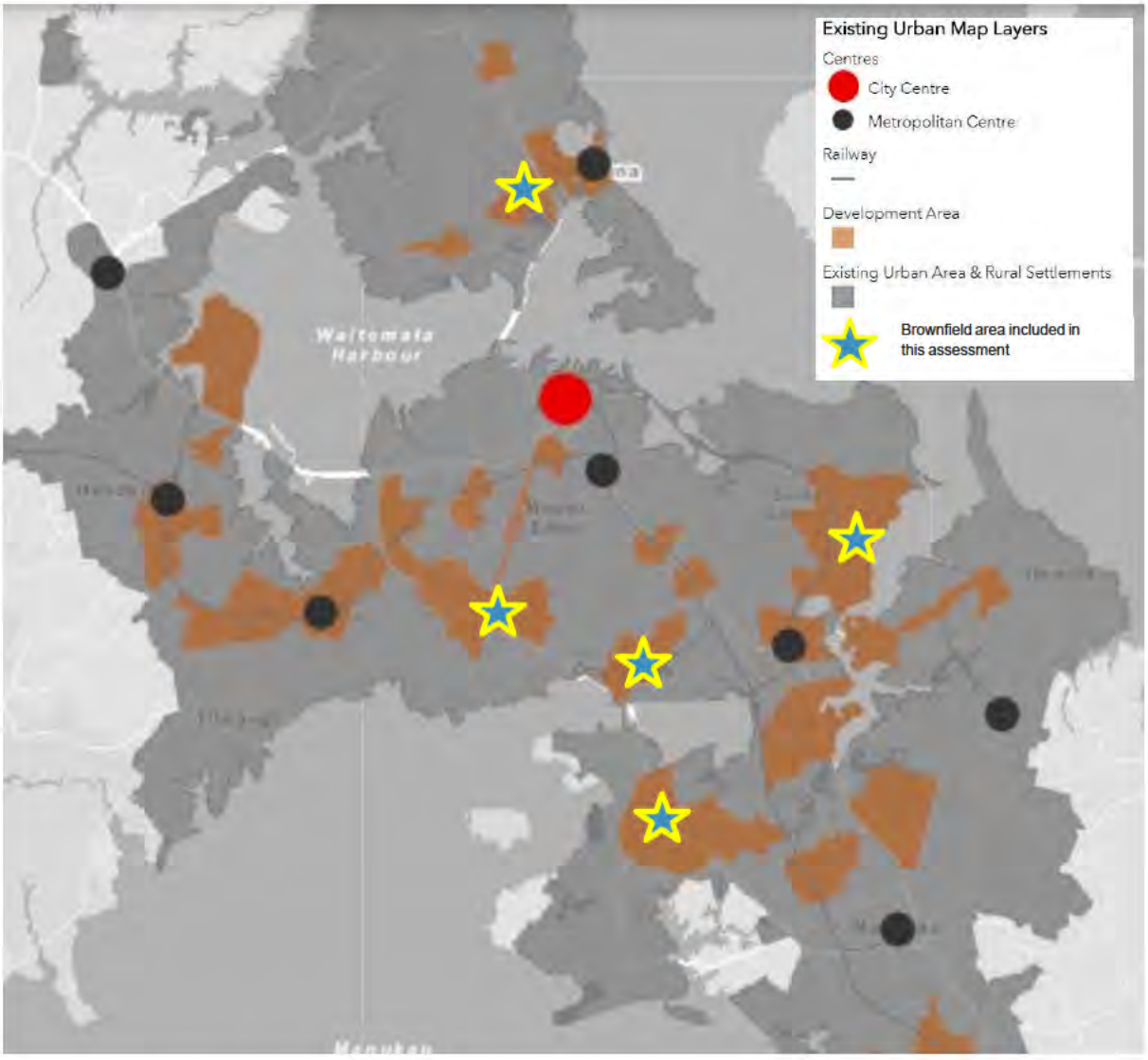
2.3 Why these areas / Why now

The Auckland Plan development scenario identifies key development areas within the existing urban area as a priority for future growth of Auckland. Figure 2-7 outlines these development areas with the five Brownfield areas identified. The five areas considered in this report have been prioritised for the following reasons:

- Kāinga Ora is well progressed on development planning in each of these areas.

- Kāinga Ora has significant land holding in each of the five areas representing a significant opportunity for land use transport integration.
- Other transport projects such as LRT and CRL upgrades will unlock significant public transport capacity in these areas leading to desirable outcomes through intensification of these Brownfield growth areas.

Figure 2-7: Auckland Development Strategy



The five brownfields growth areas considered in this Business Case account for a significant proportion of future growth in Auckland. The assumed growth from the regional transport model (Scenario i11 version 6) is outlined in Figure 2-8 below. Broadly speaking the areas accommodating significant population growth include the city centre, new greenfield areas and brownfield growth areas. Mangere, Mt Roskill, Tamaki, Oranga and Northcote account for some 40% of growth within the spatial priority areas or around double the growth anticipated in the Auckland and Manukau Centres or around 120% of the growth anticipated in new Greenfield areas. According to the regional model[6], the five brownfield Growth area will accommodate around 40,000 additional people by 2031.

[6] Estimates from Kāinga Ora are higher than this figure.

Figure 2-8: Growth assumptions in the regional transport model

Existing population and anticipated growth (from Growth Scenario i11 v6)

Spatial Priority Area Anticipated Growth 2018 – 2031 (i11 v6, August 2020)

Existing households, employment and population

Spatial Priority Area	Anticipated household growth	Anticipated employment growth	Anticipated population growth	2018 households	2018 employment	2018 population
City Centre	7,995	29,654	16,858	13,175	85,811	32,632
Tamaki	4,260	1,140	12,894	8,910	8,027	26,783
Drury	4,225	1,584	11,161	1,209	2,190	3,401
Red Hills	3,735	956	9,515	267	314	729
Mangere	3,618	698	10,380	14,555	8,125	63,583
Mt Roskill	3,167	1,497	9,451	19,610	12,148	63,306
Whenuapai PPC5	2,507	2,842	6,971	120	95	373
Whenuapai Stage 1	1,896	383	5,081	249	240	732
Manukau	1,775	2,915	5,125	2,803	18,207	10,069
Paerata	1,636	368	4,617	45	101	136
Onehunga-Oranga	1,634	671	4,685	5,794	9,655	16,003
Warkworth North	715	1,263	1,572	391	243	1,078
Northcote	453	228	1,199	2,624	5,108	7,141
Silverdale West-Dairy Flat	6	3,504	-45	277	314	886

2.4 Strategic alignment

2.4.1 Auckland Plan and Auckland development strategy

The Auckland Plan outlines that "Auckland will follow a quality compact urban form approach to growth to realise the environmental, social and economic benefits and opportunities this approach brings"

Some of the benefits of this approach are that it:

- allows opportunities for more intensive living and working environments, and for more housing to be built around areas of activity and close to good transport options
- improves the efficiency of the substantial investment required in infrastructure – such as transport and wastewater – and other services. This also results in the best asset management and infrastructure provision
- means lower travel costs for people and businesses and increased economic agglomeration benefits
- helps to protect our natural environment and maintain Auckland's rural productivity by limiting urban sprawl.

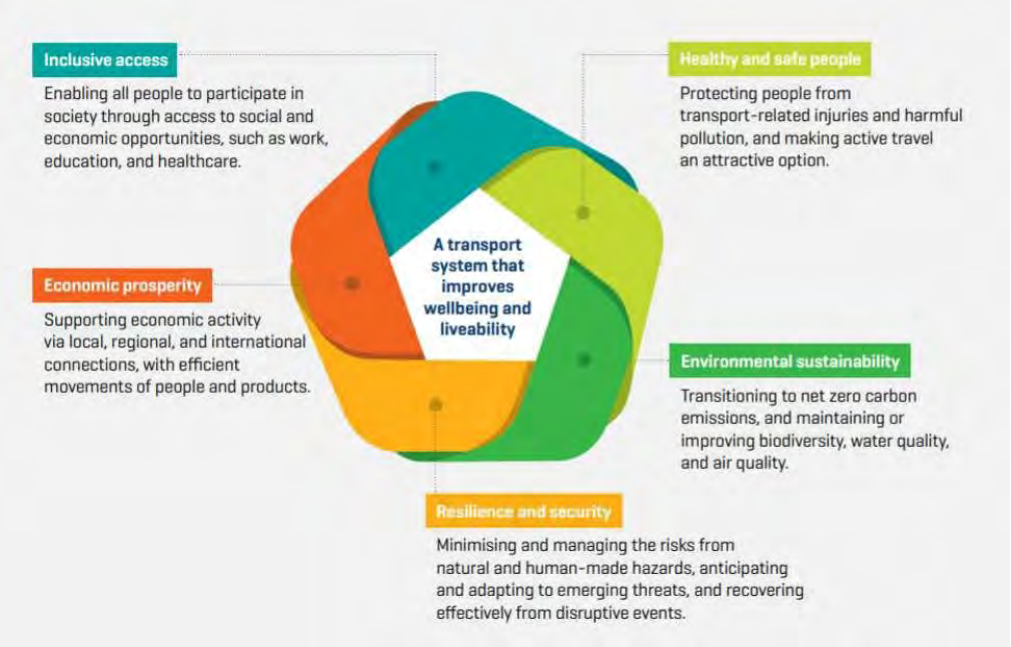
Brownfields development is a cornerstone component of the Auckland Plan and these areas have all been identified in the Auckland Plan for the development proposed.

2.4.2 Government Policy Statement on Land Transport Funding 2018

The GPS on Land Transport 2021 has been released into government policy and decision-making and continues the strategic direction of GPS 2018, but provides stronger guidance on what the Government seeks from land transport investments. The strategic priorities of Climate Change (formerly Environment) and Safety have been updated to reflect recent policy work, such as emission reduction targets and the development of Road to Zero. Access has been separated into Better Travel Options and Improving Freight Connections. Value for money is expressed as a principle that applies to all investments, rather than a strategic priority per se.

The GPS identified five key outcomes for transport as shown in Figure 2-9.

Figure 2-9: Transport outcomes



Further to the transport outcomes, four strategic priorities are identified within the 2021-2031 period as outlined in Figure 2-10.

Figure 2-10: GPS 2021 Strategic Priorities

Of particular note with the 2021 GPS is an increased emphasis on Climate Change outcomes. The Brownfields Business Case is well aligned to the climate change strategic priority due to the following attributes:

- **Increasing mode share** – A focus of the integrated transport assessments and this business case is around a significant change to the mode share currently observed in each of the Brownfields growth areas.
- **Inclusive access** – Development of the Brownfield growth areas focuses on areas within the existing urban area with a high level of access to employment and social opportunities.
- **Low carbon transport system** - Increases in the proportion of people using public transport and active modes combined with development in areas with high levels of accessibility to jobs and social opportunities results in a low carbon transport system.

Impacts of the 2021 GPS

The 2021 GPS supports a more mode neutral and results focused approach, enabling GPS investments to be funded from more than one activity class to provide the best transport solution. The Brownfield programme fit for incoming urbanisation will deliver well on three of the strategic priorities. There is also an expectation of investments to support Government commitments to ATAP and the Road to Zero.

2.4.3 Road safety and Vision Zero for Tāmaki Makaurau – A Transport safety strategy and action plan to 2030

Developed in 2019, the Vision Zero initiative extends the existing safe system approach to stop the human sacrifice of mobility, placing safety at the forefront of the future transport system for all modes by designing safe places for people. Vision Zero for Tāmaki Makaurau – A Transport safety strategy and action plan to 2030 sets out a road map for the Auckland region.

The vision zero strategy is embedded across a range of policy and strategy documents.

Figure 2-11: Vision Zero strategy

The Road to Zero: New Zealand's Road Safety Strategy 2020-2030 document sets a nationwide target of a 40% reduction in deaths and serious injuries (DSI) by 2030 with ultimate goals to eliminate all transport Deaths and Serious Injuries (DSIs) by 2050 (in line with the Auckland Plan 2050) based on 13 strategic priorities.

The Brownfield Growth areas show varying levels of road safety performance across each of the areas. In particular, high proportions of active mode DSI's have emerged as a trend in a number of areas (more detail is provided in Appendix A) which is likely to be exacerbated with increasing numbers of people walking and cycling in the development areas.

The Brownfields programme plays a key role in providing opportunity to plan and design system improvements that embed Vision Zero principles, and specifically contribute to the Vision Zero priorities highlighted below in Table 2-1.

Table 2-1: Vision Zero strategic priorities

Vision Zero Strategic Priority	
SP1	Reducing transport **DSIs, especially for vulnerable transport users**
SP2	Providing a safe transport **environment by increasing investment in safe infrastructure, technology and speed management**
SP3	Supporting safe transport user behaviour through education, training, enforcement and travel demand management
SP4	Creating safe and healthy streets through safe **active modes including access to PT schools and town centres**
SP5	Ensuring Māori participation and representation in governance decision-making and leadership
SP6	Expanding Te Ara Haepapa Māori designed and led programmes including sustainable funding pathway and development of a monitoring and evaluation framework
SP7	Delivering safe end-to-end **PT journeys**
SP8	Providing Vision Zero leadership, capability, policies, safety management tools and systems
SP9	Ensuring safety is equitable regardless of age, ethnicity and socio-economic status
SP10	Increasing public awareness of successful Vision Zero principles and practice
SP11	Embedding Vision Zero in **land use planning, placemaking and design**
SP12	Integrating safety into procurement, vehicle fleets and workplace health and safety
SP13	Establishing better data, monitoring and research into systemic causes of road trauma and its prevention

2.4.4 National Policy Statement on Urban Development

The NPS:UD came into force on 20 August 2020. The NPS:UD sets out to improve the responsiveness and competitiveness of land and development markets. In particular, it requires local authorities to open up more development capacity, so more homes can be built in response to demand.

Of key interest to this Business Case is Policy 3. This policy directs councils through their regional policy statements and district plans to enable building heights of at least six storeys within *walkable catchments* of existing and planned *rapid transit stops*, the edge of city centre and metropolitan zones. These terms are defined in the NPS as:

- rapid transit service means any existing or planned frequent, quick, reliable and high-capacity public transport service that operates on a permanent route (road or rail) that is largely separated from other traffic.
- rapid transit stop means a place where people can enter or exit a rapid transit service, whether existing or planned.

Of note, rapid transit services are required to be largely separated from other traffic, therefore this policy does not apply to bus stops on frequent routes.

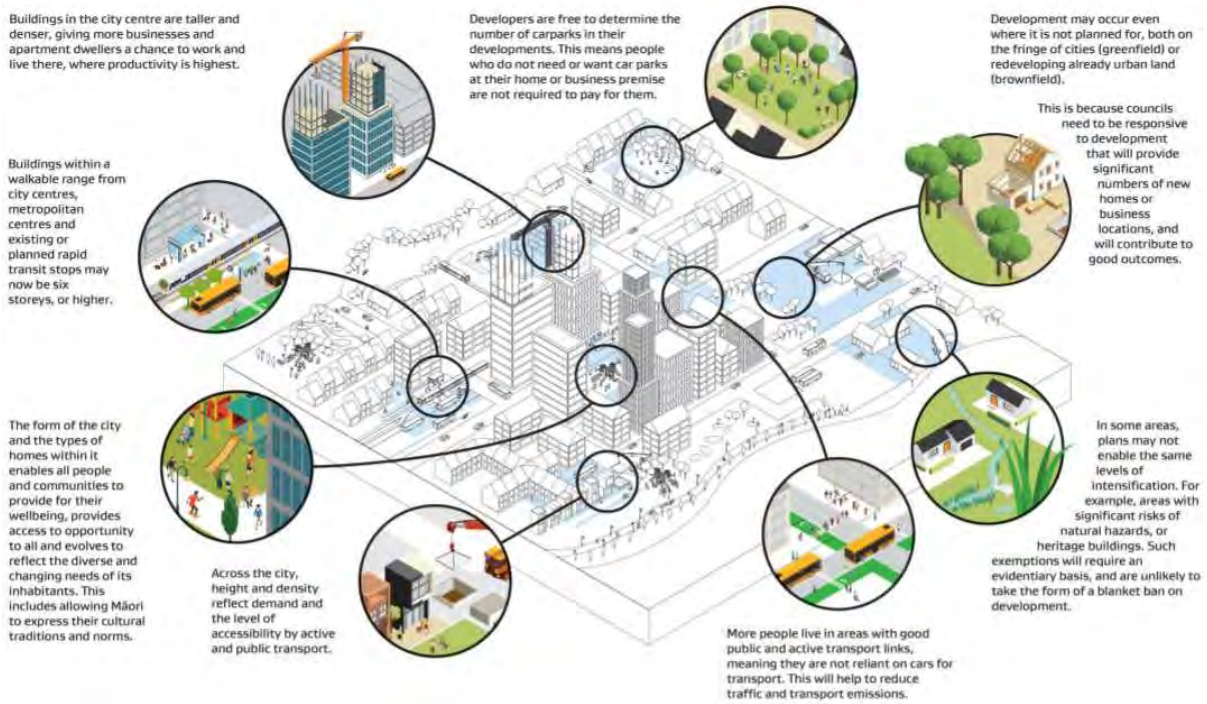
Walkable catchments are not defined in the NPS:UD, however an early MfE discussion document referenced "*zoning for high-density residential activities within an 800 m walkable catchment of centres and frequent public stops*"[1].

Policy 3 must be implemented by 20 August 2022. We note that this will be done through the process set out in Schedule 1 of the RMA. Under the Auckland Unitary Plan the Terrace Housing and Apartment Buildings Zone is usually applied around Metropolitan Centres and Rapid Transit Stops. This zone has a height limit of 16 metres. Some amendments or rezoning will be required in response to the NPS:UD.

There are a number of "exclusions" which councils can utilise to reduce/not implement the building height (referred to as Qualifying Matters in the NPS:UD). Exclusions include: providing for matters of national significance under section 6 of the Act and providing sufficient business land suitable for low density uses to meet expected demand under this NPS:UD. Council may consider other matters, not listed in the NPS:UD to reduce/not implement the six storey building height, however a site specific section 32 evaluation must be undertaken to consider the implications of not implementing a building height of at least 6 storeys.

- Other changes in NPS:UD relevant to this Business Case include:
- the setting of housing bottom lines for the short-medium term by councils;
- the development of a Future Development Strategy by councils, which sets out sufficient development capacity over the next 30 years; and
- the removal of minimum car parking requirements, which must be removed by councils within 18 months, without using the process set out in Schedule 1 of the RMA.

Figure 2-12: Overview of NPS:UD (Source: Ministry for the Environment)



[1] Page 37 , Planning for successful cities: A discussion document on a proposed National Policy Statement on Urban Development, Ministry for the Environment, 2019.

These policy statements provide a strengthening of intent around brownfields development, which is where the majority of RTN facilities currently exist. The level of change expected as a result of the NPS: UD is outlined below in Table 2-2.

Table 2-2: Assessment of potential for change as a result of the NPS:UD

Area	Relevant existing / planned RT stops	Potential for change
Oranga	Te Papapa rail station catchment covers the southern half of the area	Potential for increased density / height to the south of the area
Northcote	Akoranga station catchment covers a small portion of the site to North east	Limited change
Tamaki	Glen Innes Rail station and Panmure rail station catchments cover most of the area	Much of the area is already zoned THAB. Section of MHU which could get higher density south of Hobson Drive.
Mangere	Existing Southern rail line with stations at Middlemore and Otahuhu. Proposed LRT through Mangere.	Potential for higher density development around Middlemore. Future opportunity around Mangere in particular the Bader Drive area.
Mt Roskill	Proposed LRT along Dominion Road or Sandringham Road	Significant opportunity along the future corridor depending on the preferred route.

Further maps showing the catchment area for RT stops is provided in Section 4.

2.5 Climate change response

Whilst climate change is not a new consideration for the development of transport infrastructure, recent changes in policy such as the Te Tāruke-ā-Tāwhiri: Auckland's Climate Plan and He Pou a Rangi the Climate Change Commission have reconfirmed the importance of systems change and diverse action to affect significant and timely reductions to emissions. Fundamentally the goal is to reduce our greenhouse gas emissions by 50 per cent by 2030 and achieve net zero emissions by 2050.

Reducing transport emissions is one aspect to meeting our climate targets. It is recognised that transport plays a key role and the Climate Change Commissions reflects "*We need to change the way we build and plan our towns and cities and the way people and products move around. This includes making walking and cycling easier with good cycleways and footpaths. It means moving freight off the road and onto rail and shipping. It means reliable and affordable public and shared transport systems. And it means an electric or low emissions transport fleet.*[7] This aligns well with the GPS2021 and by extension, to the development of Brownfield Growth areas and this Business Case which itself aligns closely to the goals of the GPS2021. The Brownfields Business Case is built on:

- **Transport and land use integration** – guiding principle as described in Section 3 and provides a transport network to support land use development and good urban form.
- **Prioritising mode choice** – specifically focusing on improved public transport prioritisation, reliability and services and creation of a well-connected walking and cycling network.

[7] He Pou a Rangi the Climate Change Commission, 31 January 2021 Draft Advice to Government

The result is a recommended transport system which actively reduces the reliance on private vehicles and shifts trips to low carbon alternatives.

It is noted that the climate change response of this Business Case is part of a wider Aotearoa transport response which includes complementary initiatives such as increasing the adoption of electric vehicles and use of low carbon fuels. Integrated land use planning retains an ongoing role, particularly as future Brownfields area develop and intensify.

The climate change strategies can be split into two types:

- **Mitigation** - aimed at addressing the causes and minimising the possible impacts of climate change.
- **Adaptation** – focused on reducing the negative effects and identifying opportunities that arise.

The Brownfields Business Case primarily focuses on the mitigation strategies with projects focused on shifting trips to lower-emission travel options, including public transport and active transport replacing passenger trips by private vehicle. It is expected that adaptation measures would be considered in more detail as the projects progress through future design processes.

The Brownfields Business Case addresses enabled carbon emissions (greenhouse gas emissions associated with infrastructure end use e.g., vehicles) through its influence on how the infrastructure is used. Examples of climate mitigation strategies include:

- Reallocation of road space on a number of corridors from use by private vehicles to public transport. This will both increase reliability and attractiveness of public transport services and decrease the throughput of private vehicles.
- Provision of active mode facilities creating a connected network for walking and cycling. This is expected to increase the active mode share with growth areas.
- Land use development is focused on areas with high levels of access to high quality public transport (i.e. RTN stations).
- The majority of the programme makes use of the existing network to cater for growth, reducing the need for construction of new infrastructure corridors and associated impacts on the environment.
- Development of a connected cycle network that provides both regional and local cycle links and maximises the ability of people to access public transport or key destinations.

2.6 Mode shift strategic documents

Waka Kotahi have published a document aimed at improving travel choice and reducing car dependency entitled '***Keeping cities moving'.*** The plan focuses on increasing the share of travel by public transport, walking and cycling in New Zealand's cities (what is known as 'mode shift') has a critical role to play in improving the wellbeing of New Zealanders by shaping a more accessible, safe and sustainable transport system.

The plan highlights three key ways in which Waka Kotahi can influence mode share namely:

- **Shaping urban form –** Encouraging good quality, compact, mixed-use urban development will result in densities that can support rapid/frequent transit (and vice versa), shorter trips between home and work/education/leisure, and safe, healthy and attractive urban environments to encourage more walking and cycling
- **Making shared and active modes more attractive** – Improving the quality and performance of public transport, and facilities for walking and cycling will enable more people to use them. This can involve both optimising the existing system (eg through reallocating road space),

investment in new infrastructure and services, and providing better connections between modes.

- **Influencing travel demand and transport choices** – Changing behaviour may also require a mix of incentives and disincentives (or 'push' and 'pull' factors) to either discourage use of private vehicles (by making them less attractive than other options) or making people better aware of their options and incentivising them to try something new. This may include parking policies, road pricing, travel planning and education.

Within the Brownfields programme, there is opportunity for each of the three spheres of influence to contribute to the overall outcomes of the transport network.

At a more regional level, the ATAP programme released an Auckland specific plan in relation to mode share entitled ***'Better Travel Choices'.***

Within this document, priority activities for the region are identified and responsibility is assigned to each. Of particular relevance to the Brownfield areas is the following:

Figure 2-13: Extract from Better Travel Choices: Status and responsibility for priorities

Lever	Priority	Status/Next Steps	Funding	Responsibility (Lead)
Shape urban form	*Enable, support and encourage housing and business growth in areas with better travel options*			
	Facilitate and encourage housing and business development in areas with better travel choices, especially through the actions of development agencies, and the investment priorities of infrastructure providers.	Underway/Planned	Budgeted	Shared responsibility
	Progress spatial planning in locations where major rapid transit projects are being planned and/or will soon be completed, to identify opportunities for further growth.			Auckland Council
	Ensure the ongoing review of parts of the Auckland Unitary Plan considers the need to support mode shift by enabling more growth in key locations.			Auckland Council

2.7 Investment themes

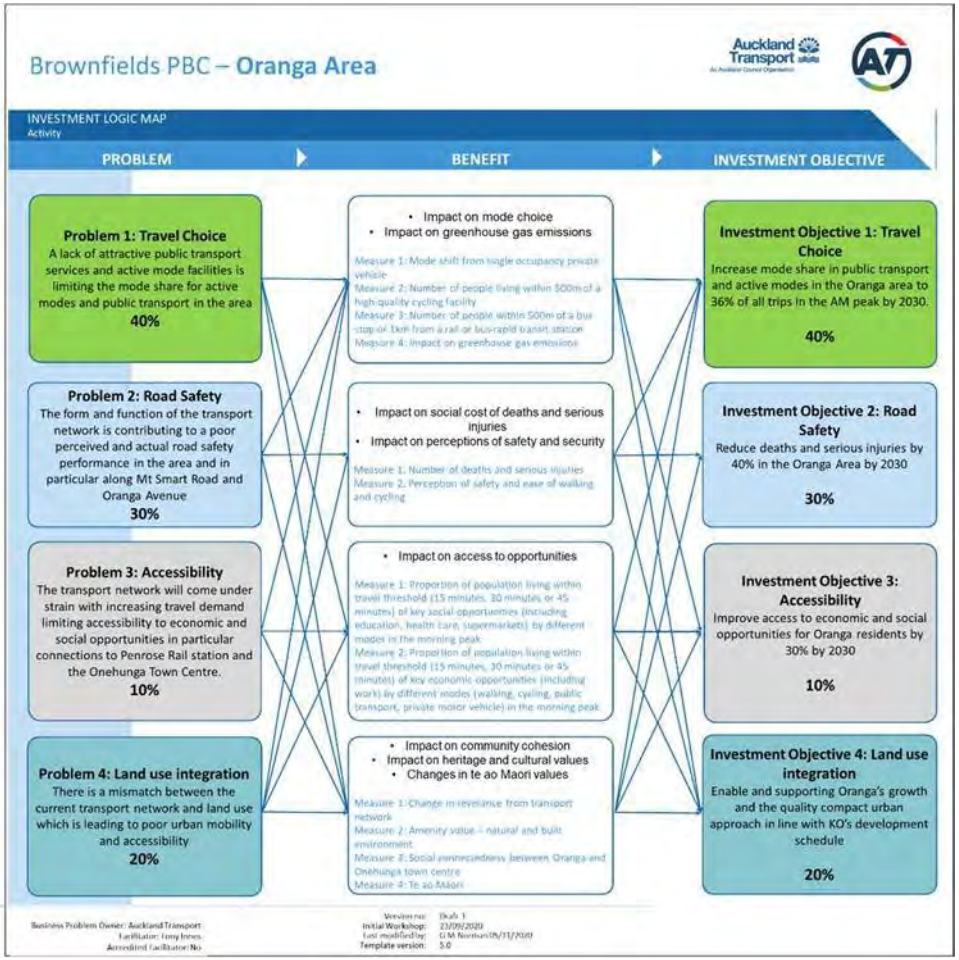
An ILM workshop was held with key stakeholders of the project. This workshop identified problems, benefits and outcomes sought for each of the five areas. These were later developed into Investment objectives for each area based on assessment of the available evidence to identify timeframes and targets appropriate to each area. Unsurprisingly there was a significant amount of similarity between the areas. This process also showed a number of key themes (for problems and investment objectives) that were common across the five areas.

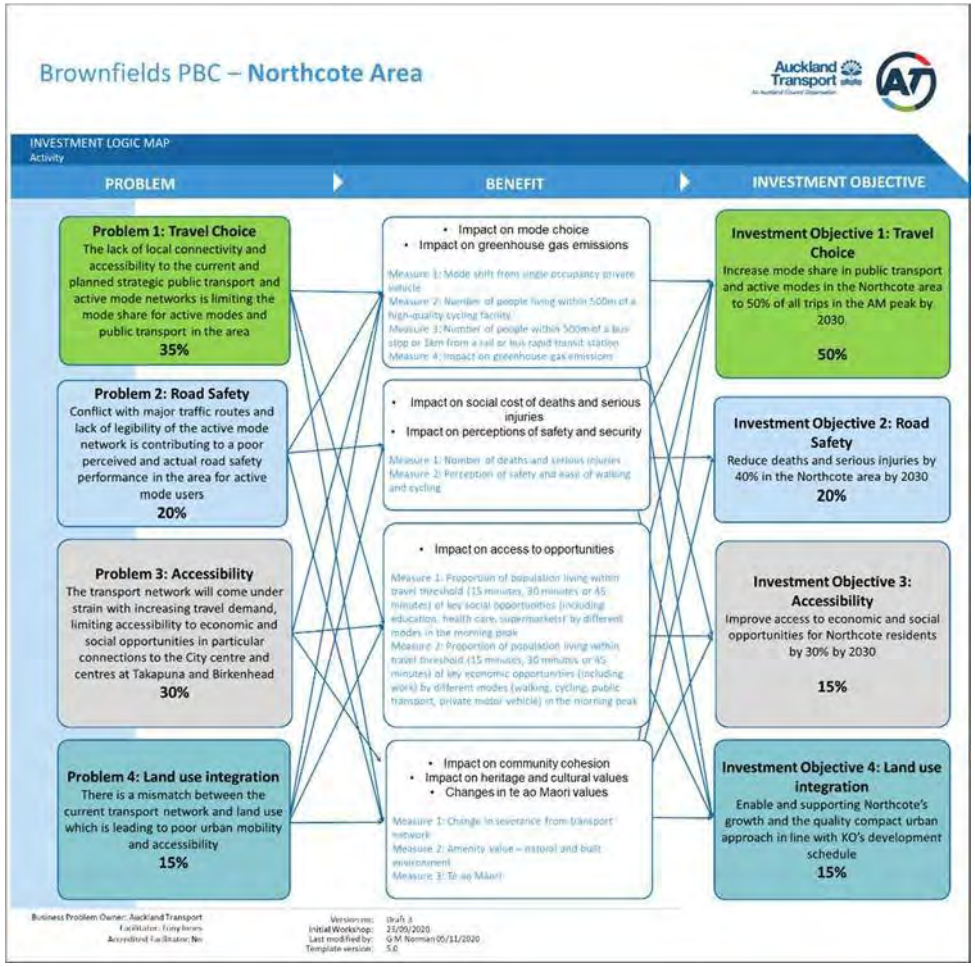
These were:

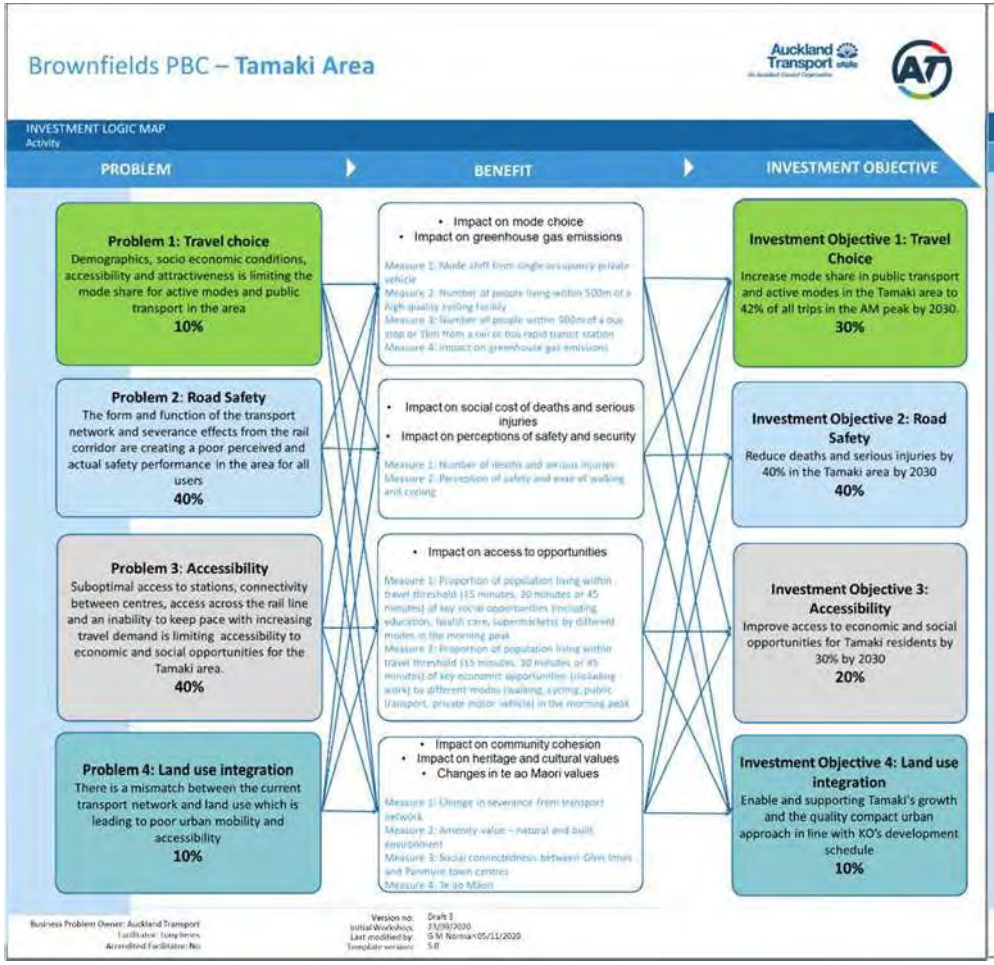
- Travel Choice
- Road safety
- Accessibility
- Integration

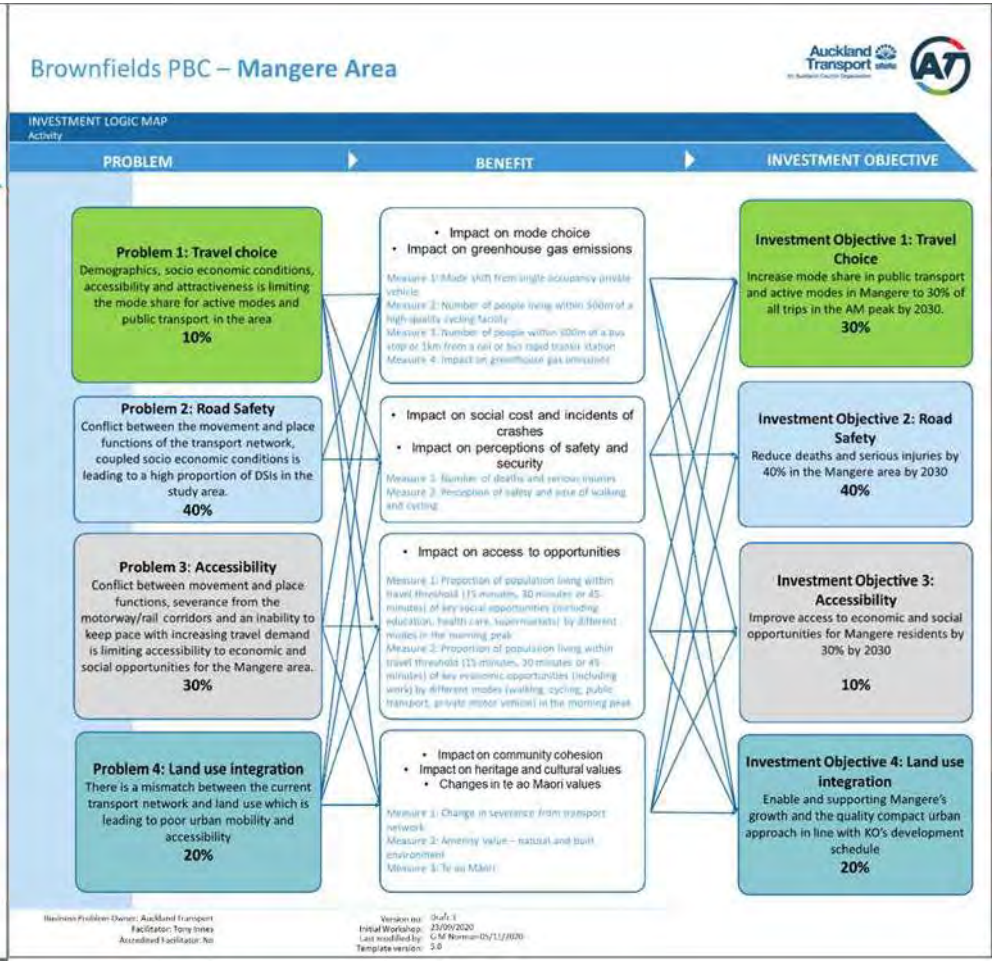
Figure 2-14 sets out the problem, benefits and investment objectives for each area as agreed during the ILM development process. Weightings have been identified for each area based on the evidence considered. Each of these areas is summarised with **Appendix A** providing area specific evidence.

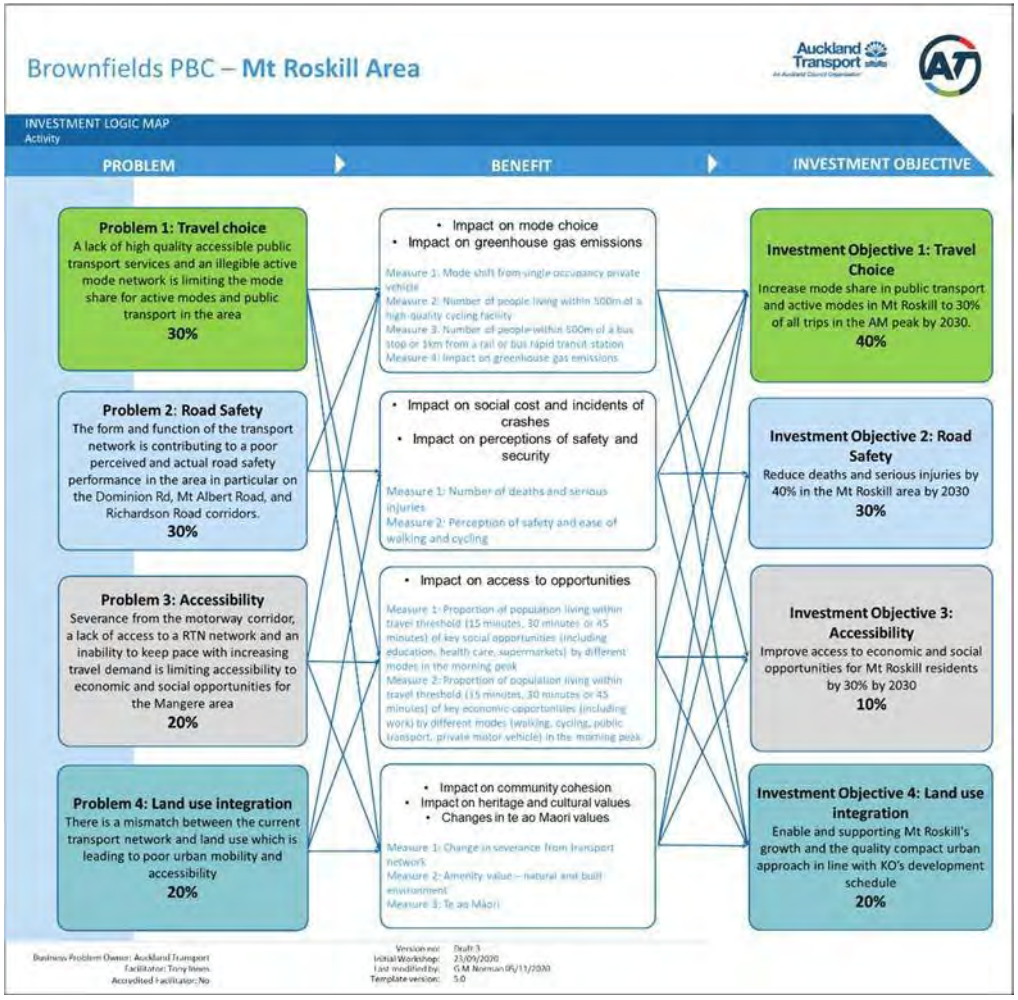
Figure 2-14 : ILM Summary by individual area






Brownfields PBC – Tamaki Area
Auckland Transport
INVESTMENT LOGIC MAP
Activity
PROBLEM
BENEFIT
INVESTMENT OBJECTIVE
Problem 1: Travel choice
Demographics, socio economic conditions, accessibility and attractiveness is limiting the mode share for active modes and public transport in the area
10%
Problem 2: Road Safety
The form and function of the transport network and severance effects from the rail corridor are creating a poor perceived and actual safety performance in the area for all users
40%
Problem 3: Accessibility
Suboptimal access to stations, connectivity between centres, access across the rail line and an inability to keep pace with increasing travel demand is limiting accessibility to economic and social opportunities for the Tamaki area.
40%
Problem 4: Land use integration
There is a mismatch between the current transport network and land use which is leading to poor urban mobility and accessibility
10%
• Impact on mode choice
• Impact on greenhouse gas emissions
• Impact on social cost of deaths and serious injuries
• Impact on perceptions of safety and security
• Impact on access to opportunities
• Impact on community cohesion
• Impact on heritage and cultural values
• Changes in te ao Maori values
Investment Objective 1: Travel Choice
Increase mode share in public transport and active modes in the Tamaki area to 42% of all trips in the AM peak by 2030.
30%
Investment Objective 2: Road Safety
Reduce deaths and serious injuries by 40% in the Tamaki area by 2030
40%
Investment Objective 3: Accessibility
Improve access to economic and social opportunities for Tamaki residents by 30% by 2030
20%
Investment Objective 4: Land use integration
Enable and supporting Tamaki's growth and the quality compact urban approach in line with KO's development schedule
10%


Brownfields PBC – Mangere Area
Auckland Transport
INVESTMENT LOGIC MAP
Activity
PROBLEM
BENEFIT
INVESTMENT OBJECTIVE
Problem 1: Travel choice
Demographics, socio economic conditions, accessibility and attractiveness is limiting the mode share for active modes and public transport in the area
10%
Problem 2: Road Safety
Conflict between the movement and place functions of the transport network, coupled socio economic conditions is leading to a high proportion of DSIs in the study area.
40%
Problem 3: Accessibility
Conflict between movement and place functions, severance from the motorway/rail corridors and an inability to keep pace with increasing travel demand is limiting accessibility to economic and social opportunities for the Mangere area.
30%
Problem 4: Land use integration
There is a mismatch between the current transport network and land use which is leading to poor urban mobility and accessibility
20%
• Impact on mode choice
• Impact on greenhouse gas emissions
• Impact on social cost and incidents of crashes
• Impact on perceptions of safety and security
• Impact on access to opportunities
• Impact on community cohesion
• Impact on heritage and cultural values
• Changes in te ao Maori values
Investment Objective 1: Travel Choice
Increase mode share in public transport and active modes in Mangere to 30% of all trips in the AM peak by 2030.
30%
Investment Objective 2: Road Safety
Reduce deaths and serious injuries by 40% in the Mangere area by 2030
40%
Investment Objective 3: Accessibility
Improve access to economic and social opportunities for Mangere residents by 30% by 2030
10%
Investment Objective 4: Land use integration
Enable and supporting Mangere's growth and the quality compact urban approach in line with KO's development schedule
20%


Brownfields PBC – Mt Roskill Area
Auckland Transport
INVESTMENT LOGIC MAP
Activity
PROBLEM
BENEFIT
INVESTMENT OBJECTIVE
Problem 1: Travel choice
A lack of high quality accessible public transport services and an illegible active mode network is limiting the mode share for active modes and public transport in the area
30%
Problem 2: Road Safety
The form and function of the transport network is contributing to a poor perceived and actual road safety performance in the area in particular on the Dominion Rd, Mt Albert Road, and Richardson Road corridors.
30%
Problem 3: Accessibility
Severance from the motorway corridor, a lack of access to a RTN network and an inability to keep pace with increasing travel demand is limiting accessibility to economic and social opportunities for the Mangere area
20%
Problem 4: Land use integration
There is a mismatch between the current transport network and land use which is leading to poor urban mobility and accessibility
20%
• Impact on mode choice
• Impact on greenhouse gas emissions
Measure 1: Mode shift from single occupancy private vehicle
Measure 2: Number of people living within 500m of a high-quality cycling facility
Measure 3: Number of people within 500m of a bus stop or 1km from a rail or bus rapid transit station
Measure 4: Impact on greenhouse gas emissions
• Impact on social cost and incidents of crashes
• Impact on perceptions of safety and security
Measure 1: Number of deaths and serious injuries
Measure 2: Perception of safety and ease of walking and cycling
• Impact on access to opportunities
Measure 1: Proportion of population living within travel threshold (15 minutes, 30 minutes or 45 minutes) of key social opportunities (including education, health care, supermarkets) by different modes in the morning peak
Measure 2: Proportion of population living within travel threshold (15 minutes, 30 minutes or 45 minutes) of key economic opportunities (including work) by different modes (walking, cycling, public transport, private motor vehicle) in the morning peak
• Impact on community cohesion
• Impact on heritage and cultural values
• Changes in te ao Maori values
Measure 1: Change in severance from transport network
Measure 2: Amenity value – natural and built environment
Measure 3: Te ao Maori
Investment Objective 1: Travel Choice
Increase mode share in public transport and active modes in Mt Roskill to 30% of all trips in the AM peak by 2030.
40%
Investment Objective 2: Road Safety
Reduce deaths and serious injuries by 40% in the Mt Roskill area by 2030
30%
Investment Objective 3: Accessibility
Improve access to economic and social opportunities for Mt Roskill residents by 30% by 2030
10%
Investment Objective 4: Land use integration
Enable and supporting Mt Roskill's growth and the quality compact urban approach in line with KO's development schedule
20%
Business Problem Owner: Auckland Transport
Facilitator: Tony Ineen
Accredited Facilitator: No
Version no: Draft 3
Initial Workshop: 21/09/2020
Last modified by: G.M Norman 06/11/2020
Template version: 5.0

2.7.1 Other work infoming problems identified

The Brownfields Business Case is a collation of work from a range of sources and projects undertaken in each of the study areas. A wealth of information and analysis is available in the growth areas and project team have sought to make use of existing work wherever possible.

In this regard, several pieces of work have formed an important source of information and assessment. The major sources of this information are discussed in more detail below.

Future Connect

The Future connect work, undertaken by AT, looks to consistently assess the performance of the regions transport network both now and in the future in order to allow prioritisation of interventions and transport projects.

The work looks at each mode and assesses the network against a number of indicators. The modes and indicators are outlined in Table 2-3.

Table 2-3: Modes and indicators considered as part of FutureConnect[8]

Deficiency & Opportunity Indicators

Mode / Problem	ILM Problem Indicator	Indicator	Def/ Opp	Network	Period	High	Moderate	Data Source	Team Source
General Traffic	Access	Travel Speed & Productivity	Deficiency	Current	AM Peak	LOS F	LOS E	Snitch - Nov 19	OPP Team
	Access	Travel Time Reliability	Deficiency	Current	AM Peak	LOS F	LOS E	Snitch - Nov 19	OPP Team
	Access	V/C ratio change 2018 vs 2031	Deficiency	Future	AM Peak	Over capacity (>=85%) in 2018 and gets worse in 2031	Under capacity (<85%) in 2018 to over capacity (>=85%) in 2031	ATAP2 MSM model outputs - v11.5 land use	AFC
Freight	Access	Travel speed	Deficiency	Current	AM Peak / Interpeak	LOS D+ Level 1 - Interpeak	LOS E+ Level 1 & 2 – AM Peak	Snitch - Nov 19	OPP Team
	Access	V/C ratio change 2018 vs 2031 (where %HCV>=10%)	Deficiency	Future	AM Peak	Over capacity (>=85%) in 2018 and worsen in 2031	Under capacity (<85%) in 2018 to over capacity (>=85%) in 2031	ATAP2 MSM model outputs - v11.5 land use	AFC
	Access	HCV Volumes increases 2018 vs 2031	Opportunity	Future	Interpeak	Significant absolute and relative volume increases from 2018 to 2031 (above 90th percentile)	Moderate absolute and relative volume increases from 2018 to 2031 (between 80th and 90th percentile)	ATAP2 MSM model outputs - v11.5 land use	AFC
Public Transport	Access + Travel Options	Travel Speed	Deficiency	Current	AM Peak	LOS F	LOS E	Smartrak - March19	OPP Team
	Access + Travel Options	Travel Time Reliability	Deficiency	Current	AM Peak	LOS F	LOS E	Smartrak - March19	OPP Team
	Access + Travel Options	V/C ratio change 2018 vs 2031	Deficiency	Future	AM Peak	Over capacity (>=85%) in 2018 and worsen in 2031	Under capacity (<85%) in 2018 to over capacity (>=85%) in 2031	ATAP2 MSM model outputs - v11.5 land use	AFC
	Access + Travel Options	PT Volumes increases 2018 vs 2031	Opportunity	Future	AM Peak	Significant absolute and relative volume increases from 2018 to 2031 (above 90th percentile)	Moderate absolute and relative volume increases from 2018 to 2031 (between 80th and 90th percentile)	ATAP2 MSM model outputs - v11.5 land use	AFC
	Access + Travel Options	Level Crossings (rail)	Deficiency	Current	-	Where they intersect GT and F strategic networks (including some secondary arterials)	Where they intersect PT strategic networks (bus routes)	ALCAM	Kiwi Rail
Cycle	Travel Options	Safe and appropriate facility – Current deficiencies	Deficiency	Current	-	No facilities or unprotected facilities in high volume / speeds roads	Inadequate shared paths with driveways	Auckland Cycleway Map + Moderation	AT GIS database
	Travel Options	Unconfirmed / unfunded links creating network gaps - Future Opportunities	Opportunity	Future	-	Unconfirmed / unfunded links creating network gaps	-	Auckland Cycleway Map + Moderation	AT GIS database
Safety	Safety	Collective Risk Corridors	Deficiency	Current	-	High & Medium High	Medium	KiwiRAP – AT GIS	Safety Team
	Safety + Travel Options	Active Road User Aggregated Corridor Risk Level	Deficiency	Current	-	High & Medium High	Medium	KiwiRAP – AT GIS	Safety Team
	Safety	Speed Limit vs Safe and Appropriate Speed	Deficiency	Current	-	10Kph difference and adjacent to metro/town centre area	10Kph difference	MegaMaps	NZTA
Environment	Environment	Stormwater run-off	Deficiency / Opportunity	Current	-	Links with > 20,000 vpd within stormwater sensitive areas	Links with > 10,000 vpd within stormwater sensitive areas	GeoMaps	Auckland Council
	Environment	Inundation & sea level rise	Opportunity	Current / Future	-	Links within coastal inundation threat areas	-	GeoMaps	Auckland Council
Walking	Travel Options	Footpath width	Deficiency	Current	-	No footpath in any one side or <1.8 m in the primary network	Footpath in any one side <1.8 m in the secondary network or <3.0m in the primary network	RAMM	Asset Team
	Safety + Travel Options	Pedestrian Severance	Deficiency	Current	-	Multi-lane roads with high volume / high speed environment (4+ lanes, >12,000 vpd, >50kph)	Wide roads with moderate volume / speed environment (3 lanes, 6,000 - 12,000 vpd, 30-40 kph)	MegaMaps	NZTA

Of particular relevance to the Brownfields Business Case is the assessment of the walking, cycling and public transport networks with current and future deficiencies identified and priorities assigned to the various corridors within the network.

For the cycling network, two indicators are considered including:

1. Safe and appropriate facility type - Lack of safe and appropriate cycle facilities (as defined by the Transport Design Manual) based on vehicular travel speed and volume.

2. Network Gaps - locations where safe and appropriate cycling facilities are not confirmed or funded by 2031.

[8] Futureconnect work was draft at the time of preparation of the business case and has been used as one of many inputs to identifying problems and projects.

The future connect then ranks corridors as High medium and low priority based on performance against the indicators and importance in the current and future networks. A number of the corridors within Brownfield Business Case areas rank as high or medium priority from a cycling perspective.

With regard to the public transport network, the following indicators are considered:

1. Morning peak bus travel speed level of service deficiency - The AM peak median travel speed relative to the posted speed limit.

2. Morning peak bus travel time reliability level of service - The AM peak travel time relative to typical travel time.

3. Morning peak PT volume/capacity (V/C) ratio change (2018 vs 2031) - Patronage relative to capacity, with 85% considered a max acceptable V/C ratio.

4. PT Volume Increases (2018 vs 2031) - Significant increases in patronage as anticipated by transport modelling.

5. Rail level crossings - Rail capacity constraint & delay and safety concern on intersecting networks.

Each corridor is then ranked as either a high, medium or low priority based on the level of PT service being accommodated now and in the first decade. A number of PT corridors within the Brownfield growth areas are identified as high and medium priority reflecting areas which are a high importance for PT services subject to delay or unreliability.

Given Future connect only looks at the 10-year timeframe and while the work accounts for growth, does not take into account the full development of Brownfield areas, some additional public transport routes where considered over and above the future connect network.

With regard to the walking network, the following indicators were considered as part of the future connect work:

1. Footpath Width - The width of the footpath on any side of the road.

2. Pedestrian Severance - Multi- Lane roads with high-speed and traffic environments, limiting crossing opportunities for people on foot.

The future connect assessment highlights a large portion of the network as medium or high priority. The Brownfields Business case have considered this as an input to identification of pedestrian deficiencies on the network in each area.

Integrated Transport assessments

As discussed in section 1.4.2, an ITA has been prepared in each area which highlights the current network conditions in each area, anticipated growth and the expected resultant travel demand and mode shift.

The project team used this information (amongst a suite of other information sources) in the identification of problems on the transport network in each area.

Other

A variety of other information sources were used to establish the nature of problems in each of the Brownfield Growth areas. These include:

- AT customer survey information – provides insights into customer satisfaction with regard to a range of network conditions including walking and cycling, Public transport, travel choice, congestion and place. This data is generally aggregated for larger areas but gives some indication as to current network conditions and sentiment.

- Assessment of the CAS database – Provides historic crash data for each area and allows the identification of crash hotspots and trends in each area.

- Consideration of current Census population statistics and travel to work patterns – Provides a snapshot on how different areas travel to work and details on the current population in each area. Many of the Brownfield growth area will experience a change in demographics but it is useful to understand current populations.

- Accessibility mapping by mode – Consideration of accessibility based on the current transport network and level of amenity and employment within walking and cycling catchment helps to frame opportunity for future mode share.

- Professional assessment of severance effects – Severance of transport movement is caused by a variety of things including Motorways, busy arterials, rail corridors, natural features and local road networks. The unique characteristics of each area was considered by the team to identify element creating barriers to the movement of people.

Details on the specific evidence in each growth area is provided in Appendix A. A summary of the problems identified is provided at the end of area section.

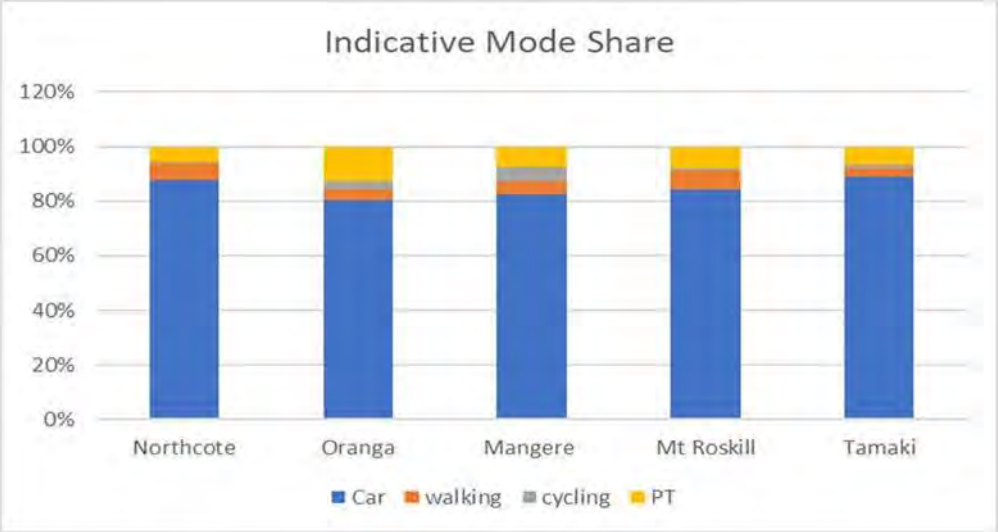
2.7.2 Travel Choice

Single occupancy vehicle mode share dominates in each of these areas, with relatively poor mode share for PT and active modes prevalent. This is due to a number of factors including level of current infrastructure (and services) and also the level of density in these areas.

With the surrounding road networks under considerable strain, this current mode share is untenable and also not consistent with the assumed aspirations of the development proposed in these areas. As an example, the Oranga development which is aiming for a car mode share from the current 80% to in the order of 65%).

Figure 2-15 shows the current mode share in each of the five areas based on the 2018 census dataset (aggregated for driver and passenger travel).

Figure 2-15 : Indicative mode share by area



The opportunity to increase the PT and active mode share will result in greater travel choice, increasing PT and active mode shares which will result in lower overall travel costs and the more efficient use of the local and wider transport system. This is confirmed in the ATAP Better Choices document as outlined in Figure 2-16 and Figure 2-17 which shows the reduced car mode share closers to the CBD and the focus (generally) of future investment on RTN which predominantly runs through these brownfields' areas.

The ATAP programme proposes to invest heavily in the Rapid Transit, public transport and active mode networks (as outlined in Figure 2-17). The Brownfields areas are well aligned with the focus of

future investment in the Auckland Region. All areas have access to the RTN network and have public transport and active networks capable of (which some improvements and enhancements) achieving a high mode share in public transport and active modes.

Figure 2-16 : ATAP Better Travel Choices Car mode share

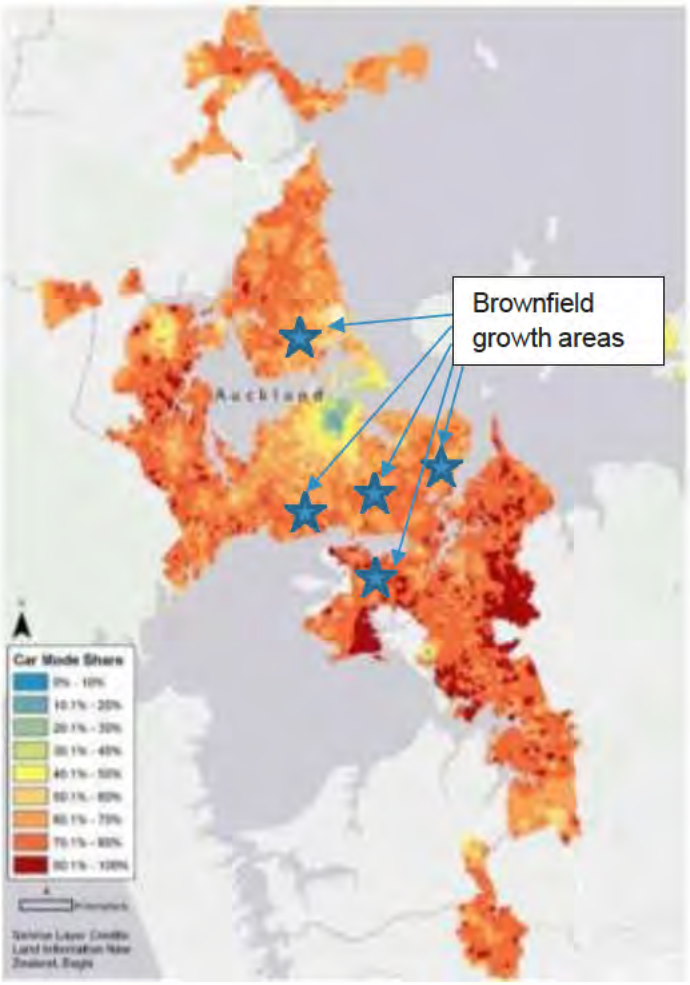
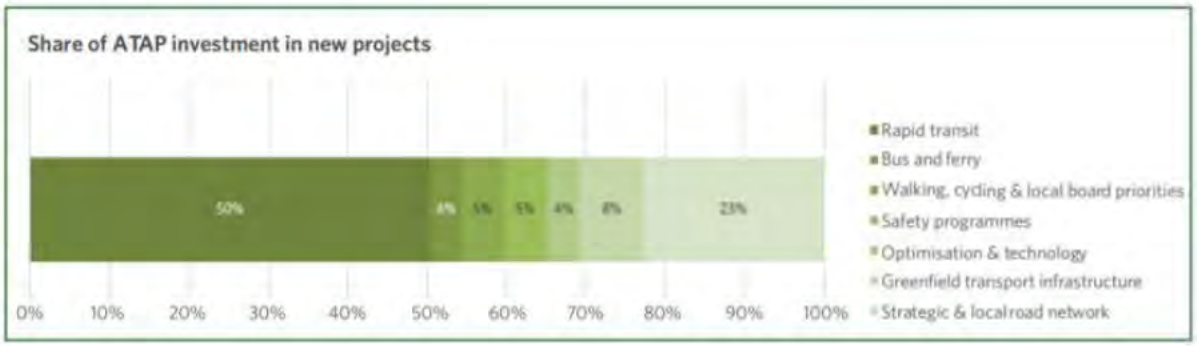


Figure 2-17 : ATAP funding by mode

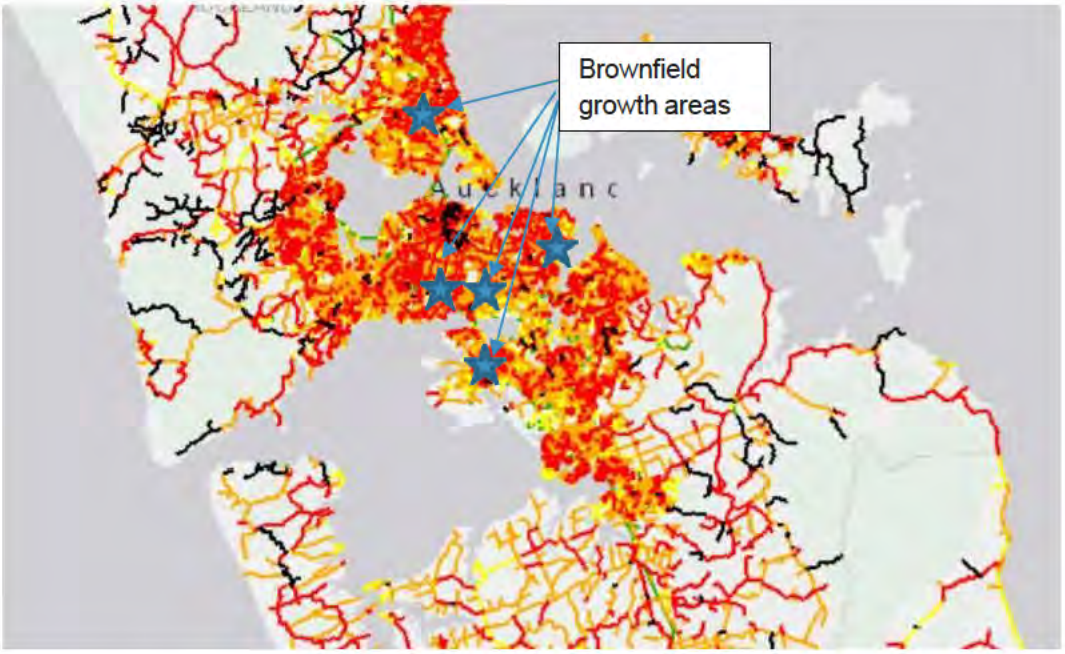


2.7.3 Road safety

As Auckland's transport infrastructure comes under increasing strain the safety performance of the system is also being compromised. As outlined in the Auckland Transport Road Safety PBC (2019) *"It is of concern to Auckland Transport that the number of reported DSI in Auckland has increased by 70% since 2012, compared to a 30% increase across New Zealand".*

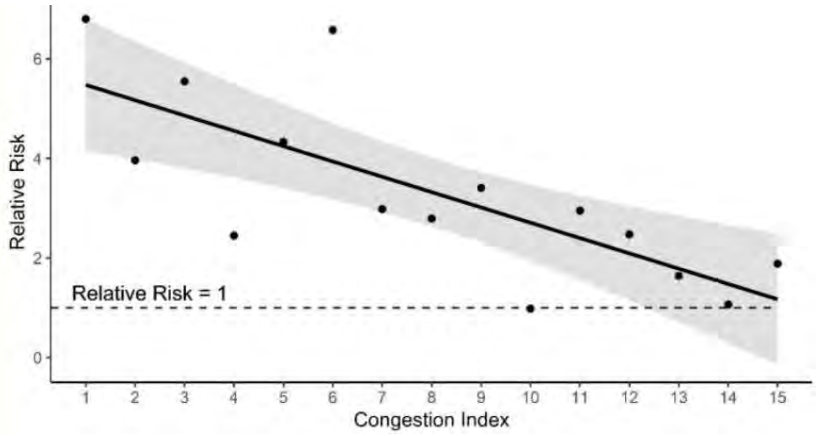
Figure 2-18 shows the areas of the transport system and the safety risk of the infrastructure. This shows the relatively poor state of the infrastructure from a safety perspective. The brownfields areas carry high traffic volumes and the transport system in this area has considerable safety risk.

Figure 2-18 : Infrastructure Risk Rating



With intensification in each of the Brownfield Growth areas, existing safety problems are expected to be exacerbated. While the relationship between traffic volumes and relatively crash risk is not linear and tends to deteriorate as traffic volumes increase, the overall number of DSIs is still expected to increase. Significantly the intensification of the brownfields area is anticipated to increase the volume of people walking and cycling in the areas. This is an area which experiences current deficiencies from a safety perspective with many of the areas having specific issues around active mode safety (further evidence provided in Appendix A). Areas which perform poorly from an active mode safety perspective are a particular focus of this programme.

Figure 2-19: Crash risk vs exposure[9]

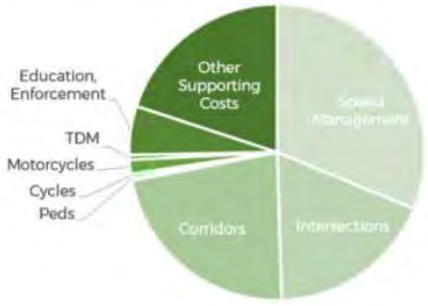


The Vision Zero philosophy and investment which this Business Case will incorporate. seeks to target interventions using a systems approach to reduce the road safety burden in the Auckland region. The Safety PBC recommended investment package (Figure 2-20) includes a wide range of interventions

Figure 2-20 : Road Safety Investment

PROGRAMME 7B: Targeting 60% DSI Reduction, within current budget | DSI ⇓ 65-75% | $1B-$1.4B

Description: Invest across Auckland to achieve at least 60% DSI reduction in 10 years (mode neutral, as per RLTP target), best DSI return for $ spend.

Intervention Effort	Application	Cost Profile
Policy & Leadership Engagement and Education Travel Demand Management Enforcement Speed Management Pedestrian Infrastructure Cycle Infrastructure Motorcycle Infrastructure Intersection Improvements Corridor Improvements	• 1,900 km of speed management • 100 intersections upgraded • 150 km of corridors upgraded • 10km of pedestrian infrastructure • 10km of cycle infrastructure • 20km of motorcycle infrastructure	

2.7.4 Perception of safety

Auckland Transport regularly collect customer insights through surveys within the Auckland Region. The Auckland Road user satisfactory survey looks to assess customer satisfaction across the region on a variety of questions / topics. The survey includes a representative sample from each ward within the region.

The customer perception across a number of criteria is provided in Table 2-4 and Table 2-5 split between each of the Auckland Wards in which the Brownfield Growth areas are situated. While customer perception for overall road safety sits between 63-74%, perceived safety for cycling is much lower at 42-54%.

[9] Angus Eugene Retallack and Bertram Ostendorf, 2020. Relationship Between Traffic Volume and Accident Frequency at Intersections

Table 2-4: Customer satisfaction results for the Brownfield Growth areas – Roads / Parking

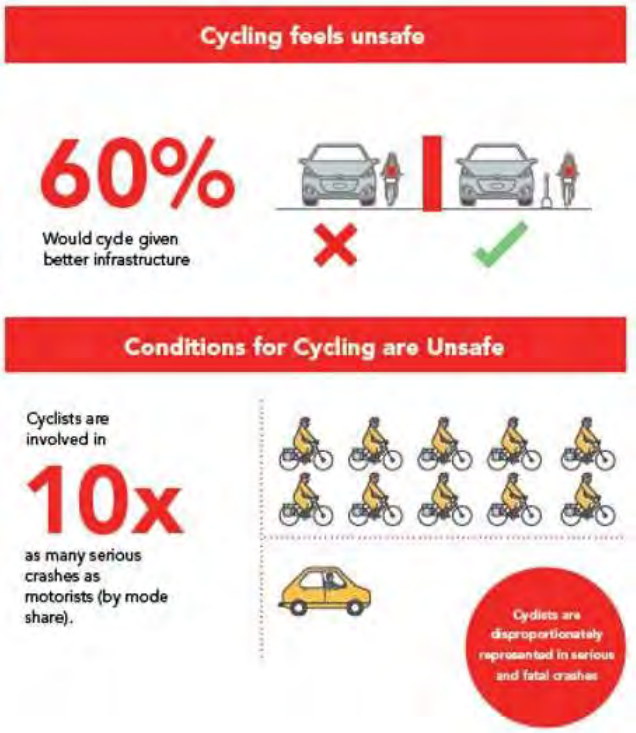
	Total Auckland	Albert - Eden - Roskill	Manaukau	Maungakiekie - Tamaki	North Shore
Quality of roads in the Auckland region	62%	74%	63%	70%	59%
Quality of roads in your local area	63%	74%	60%	69%	67%
Overall road safety in the Auckland region	62%	74%	68%	65%	63%
Surface of all sealed roads in the Auckland region	64%	74%	63%	74%	63%
Quality of unsealed roads in the Auckland region	50%	58%	55%	47%	54%
Traffic flow in the Auckland region	26%	40%	30%	25%	31%
Effectiveness of bus and transit lanes	58%	64%	59%	55%	57%
Availability of parking in your local area	61%	62%	66%	64%	52%
Availability of parking where you work or study	53%	48%	61%	54%	53%
Overall experience of traveling or driving around Auckland by road	47%	61%	53%	40%	47%

Table 2-5: Customer satisfaction results for the Brownfield Growth areas – Walking and cycling

	Total Auckland	Albert - Eden - Roskill	Manaukau	Maungakiekie -	North Shore
Quality of footpaths in the Auckland region	59%	67%	61%	58%	55%
Quality of footpaths in your local area	61%	69%	60%	63%	62%
Amount and location of safe places to cross roads	62%	65%	60%	60%	61%
Overall safety of walking in the Auckland region	65%	76%	63%	66%	65%
Overall experience of traveling around Auckland by walking	67%	79%	64%	67%	69%
Availability of cycle lanes and cycle ways in the Auckland region	51%	51%	56%	48%	53%
Condition of cycle lanes and cycle ways in the Auckland region	58%	63%	61%	62%	59%
Overall safety of cycling in the Auckland region	45%	54%	47%	42%	42%
Overall experience of traveling around Auckland by cycling	48%	63%	52%	44%	45%
Overall experience of traveling around Auckland by bus	62%	73%	58%	61%	64%
Overall experience of travelling or driving by road, walking and cycling	60%	67%	64%	64%	58%

The perception of safety related to cycling has long been idenfired as a key barrier to increasing cycling mode share. The AT cycling programme business case summarises the evidence in relation to both perceived and actual safety for cycling as shown in Figure 2-21.

Figure 2-21: Perceived cycle safety



Data collected by Auckland Transport suggests a large portion of the population are willing to try cycling but a number of barriers exist to this. Provision of safe cycling infrastructure will aim to target the Considerers and occasional categories of users, a group representing a significant share of the Auckland population.

Table 2-6: Aucklanders willingness to adopt cycling (TRA, 2016)

Category	Definition	Share of Aucklanders
Rejectors	Would not cycle regardless of conditions	46%
Considerers	Not currently active, but would consider cycling	22%
Occasional	Cycle less than once per week	12%
Medium	Cycle once per week	13%
Frequent	Cycle two or more times a week	6%

2.7.5 Accessibility

These brownfields areas could benefit from increased accessibility to employment in particular. The areas a relatively well positioned to some significant employment area, however there are a number of local challenges (predominantly severance) that is limiting this accessibility as outlined below:

- **Tamaki:** The rail line running through the area creates a substantial severance barrier between the propose growth and the industrial employment area to the west (St Johns / Mt Wellington). The presence of the Eastern Rail line provides good accessibility to significant employment centres such as the City Centre and Manukau, however access to this rail station is substandard and is expected to come under increasing pressure as the area intensifies.

- **Mangere:** Severance challenges associated with the State Highway 20A and State Highway SH20 dissecting the study area. The Southern Rail line borders the area and creates severance to areas to the east such as Middlemore, Otahuhu and Papatoetoe. There is also poor PT accessibility to employment areas such as the Airport precinct and areas to the east such as Manukau and East Tamaki. The proposed LRT through this area will likely improve PT accessibility.

- **Mt Roskill:** Currently there is limited access to the RTN network for the Mt Roskill study area. Access to key employment centres relies on busy arterial road corridors which cater for all modes. The study area is severed by the SH20 corridor which bisects the area and limited crossing points are provided.

- **Northcote:** Due to local arterial roads in the area there is a high level of severance for some customers getting to the nearby RTN and planned shared user path.

- **Oranga:** Severance to the employment areas to the south (Onehunga and Manukau) and east (Penrose) and the rail stations from a major arterial road is a challenge in this area.

2.7.6 Land use integration

There is a significant level of growth forecast in these areas. The transport infrastructure in these areas is under pressure currently and many of the corridors are not fit for purpose. With this level of growth there is a risk that the transport infrastructure does not meet the needs of this growth, or that the required enhancements to the transport system are not realised at the right time to meet the growth aspirations.

This could result in a number of adverse outcomes, including:

- Mode share aspirations are not met as the services and level of service is not sufficiently attractive enough for users

- Increased car trips will not only increase demand for these trips but also potentially result in increased car ownership and parking pressure, resulting in poor urban amenity.

- The increase in demand exceeds the transport system capacity, reducing network performance for all users and reducing mobility of users in these growth areas.

- Users of the transport system not being open to changing modes of travel due to poor integration and performance of the alternative modes being encouraged.

It is therefore critical that there is an integrated approach to ensuring that the level of development and transport system enhancement are matched. This will ensure the outcomes sought are achieved, and without this integration there risks poor urban and transport outcomes.

2.8 What happens if AT does not invest in the Brownfields now?

Brownfield's growth can occur without a co-ordinated programme of transport interventions proposed by this Business Case. Kāinga Ora, the primary developer in each area has / is in the progress of developing neighbourhood ITAs which identify transport upgrades required to mitigate the effects of the development. Likewise, some private development may be subject to a similar requirement to undertake an ITA and identify mitigation measures. However, the majority of private development will not be required to undertake an ITA given the number of units or zoning concerned as such will not be required to mitigate effects on the transport network outside design issues.

Development contributions collected by Auckland Council will contribute to wider transport costs but are not necessarily spent in the surrounding area.

This ad hoc development scenario is considered to have the following impacts on transport outcomes:

- **Transport mitigation will have a local focus -** i.e. access to sites and direct connections to the network. Little consideration will be given to the wider function of the transport network and cumulative effects of development will not be addressed.

- **Lost opportunity to for better integration** – Without a clear transport plan, the opportunity for land use integration is limited reflecting a responsive approach to demand rather than influencing demand from the outset.

- **Mode share will be limited** – History suggests development in this manner is likely to lead to more dependence on private vehicle and less public transport and active mode use.

- **Retrofit and rework** – Kāinga Ora are beginning construction on several areas and will begin other in the short term. As part of this work, KO will upgrade bulk infrastructure such as water, wastewater and stormwater networks and upgrade sections of road. If investment was not provided by AT, there is a high likelihood AT would need to come back at a later date to upgrade sections of road or intersections. This would create additional cost to New Zealand Inc. and more disruption for the communities in each area.

- **Reputation risk –** With increasing congestion and no significant improvements to travel choices, there is a reputational risk to AT around failure to appropriately cater and plan for Brownfields Growth.

The AHP programme is already in construction with developments under construction in Tamaki, Mt Roskill, Northcote and Oranga. As such, there are a number of areas where urgent investment is required by AT to avoid undesirable outcomes as per the points above. The Northcote Road / Lake Road / Ocean View Road roundabout is a good example of how a co-ordinated approach to development could save money, minimise disruption and reduce reputational issues for all parties involved. An article from Stuff.co.nz outlines the public reaction to construction at this intersection.

Case Study: Northcote Road / Lake Road / Ocean View Road roundabout – Source: Stuff article April 2021

stuff ≡ auckland

Government and Auckland Council spend $600k building North Shore roundabout - twice

Caroline Williams - 05:00, Apr 18 2021

Tax and ratepayers have forked out $600,000 for a roundabout to be built on Auckland's North Shore, twice.

Council-controlled Auckland Transport first built the roundabout on Ocean View Road in 2018. Construction of the roundabout cost about $400,000, costs which also included traffic management, speed tables and pavement work as part of the Northcote Safe Cycle Route.

But that roundabout was recently demolished – to allow the construction of a water main which will serve the Northcote Development, a major Government housing project just over 100 metres away.

Now that work is complete, the roundabout is being built, again.

The Northcote Development involves the construction of 1500 new terraced and apartment homes – a mix of open market properties, as well as Kāinga Ora state housing and KiwiBuild homes.

National Party housing spokeswoman Nicola Willis has slammed the situation as "a shambles."

"Taxpayers and ratepayers will be rightly concerned by the totally uncoordinated approach shown here," Willis told Stuff.

The office of Housing Minister Megan Woods said it was a matter for Kāinga Ora and did not answer questions from Stuff.

Kāinga Ora project director Aileen Maniti said removal and reinstallation of the roundabout, which has an upgraded design to help larger vehicles navigate the intersection, has cost tax and rate payers around $200,000. Of that cost, Kāinga Ora was paying about $77,000.

When asked about the situation, Auckland Transport spokesman Mark Hannan said the onus fell on Kāinga Ora and its contractor to pay for the cost of removing and reinstalling the roundabout, similar to how a developer who removed a footpath would pay to put it back.

Despite this, Auckland Transport coughed up $96,000 to cover half the cost of the upgrade.

Hannan denied any ratepayer money had been wasted.....

3 Economic Case

The following section sets out the process for identification of an investment response to the problems faced in the Brownfield Growth areas. The investment response considers the Waka Kotahi intervention hierarchy focusing on integrated planning and demand management before looking into infrastructure projects.

Land use, non-infrastructure interventions and infrastructure interventions have been considered in each area. A series of programme options have been developed and assessed against a multi-criteria analysis tool.

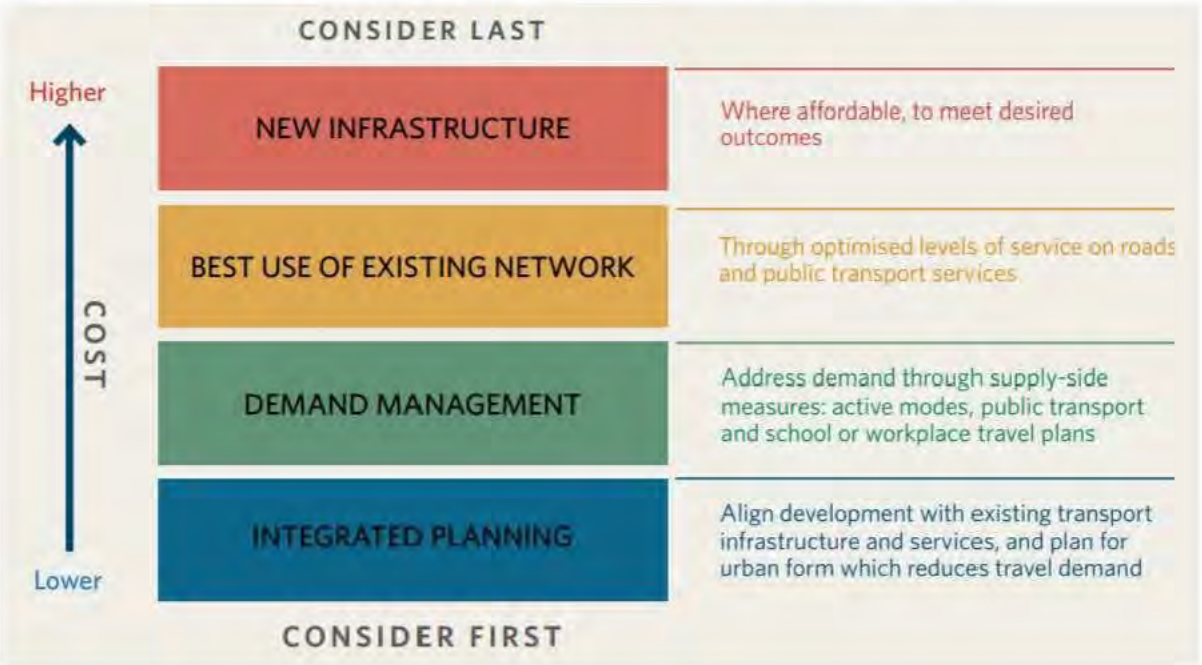
A recommended programme has been identified for each growth area. The outcomes of the recommended programme, costs and key risks and dependencies have been highlighted.

3.1 Overview of process

This section provides an overview of the methodology used to develop and assess programme options for each of the Brownfields development areas.

The Waka Kotahi guidance on programme business cases includes an intervention hierarchy applicable to all steps in the planning and investment process. The guidance (Figure 3-1) suggests that alternative and option selection should start with lowest cost alternatives and options, including making best use of existing transport capacity, before considering higher cost alternatives and options. This Business Case has followed this process with consideration of integrated planning in the first instance followed by consideration demand management interventions before consideration of optimisation of the existing transport network in the Brownfield areas.

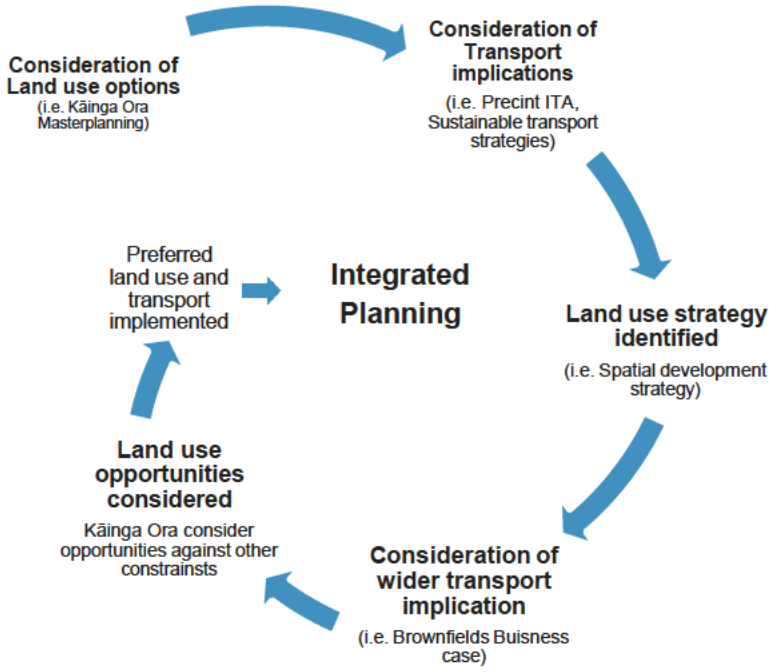
Figure 3-1: Intervention hierarchy for National Land Transport Fund (NLTF) investment



3.2 Integrated planning

A lot of previous work has been undertaken in both the integrated planning space with Kāinga Ora and others in each of the areas. Sustainable transport strategies developed by Kāinga Ora also address demand management and making best use of the existing network.

Figure 3-2: Path to integrated planning for the Brownfields areas



A key outcome of this Business Case is the identification of land use opportunities for further consideration by Kāinga Ora for development of the Brownfield Growth areas. Further detail on the assessment of land use opportunities is included in Section 3.

3.3 Land use optioneering

Kāinga Ora have investigated multiple land use scenarios in each of the development areas arriving at a preferred option following input from the integrated transport assessment and sustainable transport strategies.

Master planning in each of the areas looks to best achieve outcomes against a number of criteria, not just transport outcomes.

As part of this Business Case, a further assessment of land use opportunities to best optimise the transport network have been identified (Section 3.10-3.14) which will be considered as development in each area proceeds to the next stages.

3.4 Travel Demand Management

As part of the redevelopment of the brownfield areas, Kāinga Ora have prepared a sustainable transport strategy which identifies desired outcomes from a transport perspective and outlines a number of demand management initiatives to help achieve these.

Using Kāinga Ora's work as a base, demand management tools have been considered in the context of the brownfields Business Case. Appendix B outlines options considered, assesses the likely effectiveness of these measures and makes recommendations as to what is proposed as part of the Business Case package of interventions.

The Early Assessment Sifting Tool (EAST) has been used in order to assess the various options for demand management in the brownfield areas. Demand management options have been considered simultaneously for all brownfield areas as no significant differences are anticipated with regard to the effectiveness and viability to the various interventions.

The EAST tool considers each intervention against the following criteria:

- Investment objectives
- Practical Feasibility
- Cost
- Key risks and uncertainties
- Climate change
- Impacts on
- Te Ao Māori
- Environmental and Social Responsibility
- Fatal flaws

Full details of the EAST assessment is provided in Appendix B. Table 3-1 sets out the options considered and provides a summary of decisions made with regard to inclusion in the recommended programme.

Table 3-1: Summary of EAST assessment of demand management options

Alternative or option details			Summary of decision made	
Unique identifier	**Name of alternative/option**	**Description of alternative/option**	**Summary of decision made**	**Progress or discontinue this alternative/option?**
1	Establishment and support of associations to champion demand management	Many already exist in each area. If so, additional funding is provided to each group to continue work with the community	To be included	Progress
2	Shared bike schemes or assistance with bike ownership		Seen as valuable but difficult for AT to implement. To be implemented through intervention 1.	Discontinue
3	Electric vehicle parking	– Provision of electric parking spaces within developments promoting use of electric vehicles to reduce fleet emissions.	To be included but needs to be incorporated on private land. KO to implement.	Progress
4	Wayfinding	– creating a more legible network and improving user experience on the network.	To be included. Needs to be implemented on both active mode routes and local roads.	Progress
5	School Travel Plans	– Promotion of sustainable travel for schools for both students and staff.	To be included. Picked up by the wider AT school travel plan programme.	Progress
6	Personalised travel plans for residents	– An Auckland transport programme providing individuals with personalised travel advise.	General messaging picked up in consultation material. Not considered good value for money. Not to be progressed as part of this programme.	Discontinue
7	Workplace travel plan	– workplace specific travel plans aiming to reduce reliance on single occupancy vehicle trips.	Limited employment areas within the Brownfield areas.	Discontinue
8	Education schemes	– Advertising campaigns to promote low speed travel in residential areas or cycle safety workshops	Region wide education schemes already in place.	Discontinue
9	Reduced operating speeds on local roads	– While this is technically an infrastructure intervention, local street upgrades fall outside the scope of this Business Case and will likely be implemented by developers in the area but are an important part in delivering outcomes for the wider area.	Important intervention within the Brownfields areas. To be implemented by KO is most part with some key connections	Progress

			identified within the programmes.	
10	Changes to speed limits	(e.g. Speed Limits Bylaw (2019)) & enforcement)	Considered part of intervention 9. Not recommended to do in isolation.	Discontinue
11	Safe School Streets trial	– An Auckland Transport trail implementing low cost interventions on a temporary basis	To be implemented.	Progress
12	Unbundle parking in higher density developments	so that people choose how much parking they use. The cost of parking should be additional to the cost of housing so that people who do not choose to own a parking space are not subsidising those who do. This will help to incentivise lower car ownership.	Desired but within KO / Developer control	Progress
13	Provide a car share scheme	that is proportional to the scale of the regeneration site with a range of vehicles to choose from to suit different needs.	Difficult for AT or KO to implement however seen as valuable. Approach third party suppliers to implement	Progress
14	Limit on-street parking	to prioritise more space for high value uses such as cycle lanes, vegetation, play space for kids etc. On-street parking can also be consolidated in locations away from the frontages of housing. Where on-street parking is provided, angled parking is both a more efficient use of space and can be used as a traffic calming method.	To be implemented. Combined responsibility of KO and AT	Progress
15	Car free dwellings	Kāinga Ora developments provide a low off-street parking to unit ratio.	To be implemented in certain locations. KO to implement	Progress
16	Look at opportunities to provide additional temporary parking for events such as Tangihanga.	This could be achieved by opening a grassed area or temporarily utilising hard surfaced areas such as play space	To be implemented on a case-by-case basis	Progress

3.5 Best use of existing network – PT service improvements

Making best use of the existing network is an important part of responding to problems identified in the Brownfield areas, particularly as the transport network and service patterns already exist in some form. A particular focus has been placed on public transport services in each area and what changes if any are required to the existing and future PT networks to best serve the Brownfield growth areas.

Four general themes have been identified with regard to changes in PT services including:

- Increasing peak hour services – Increases in number of buses and ability to move people during the periods of high demand. This will reduce the effect of crowding and improve passenger amenity.

- Increased frequency off peak – Increases in off-peak frequency will improve the attractiveness and competitiveness of PT as a viable travel choice outside of peak times.
- Increase in service duration – Service duration increases allow more flexibility to passengers and improves public transport viability as a travel choice outside of peak times.
- Changes to public transport routes – As a result of the forecast growth in the Brownfield areas, demand for trips which are not currently served via public transport could be provided via changes to the service patterns.
- Relocation of bus stops – Bus stop locations are aligned to integrate with development density and local connections (i.e. pedestrian paths).

Appendix B provides further detail as to the assessment of options while Table 3-2 provides a summary of decisions made with regard to each of the options.

Table 3-2: Summary of EAST assessment of PT service changes

Alternative or option details			Summary of decision made	
Unique identifier	**Name of alternative/option**	**Description of alternative/option**	**Summary of decision made**	**Progress or discontinue this alternative/option?**
1	Increasing peak hour services	Increases in number of buses and ability to move people during the periods of high demand. This will reduce the effect of crowding and improve passenger amenity.	To be included within Business Case	Progress
2	Increased frequency off peak	Increases in off-peak frequency will improve the attractiveness and competitiveness of PT as a viable travel choice outside of peak times.	To be included within Business Case	Progress
3	Increase in service duration	Service duration increases allow more flexibility to passengers and improves public transport viability as a travel choice outside of peak times.	To be included within Business Case	Progress
4	Changes to public transport routes	As a result of the forecast growth in the Brownfield areas, demand for trips which are not currently served via public transport could be provided via changes to the service patterns.	To be included where deficiencies are identified in term of access to PT services.	Progress

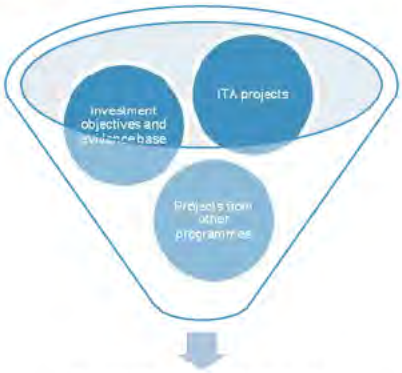
3.6 Best use of existing network options

The majority of infrastructure projects identified as part of the Brownfield Growth areas will primarily fit into the category of making best use of existing networks. Within the Brownfield areas, the majority of projects will involve upgrades to the existing network to make the network fit for purpose given intensification and a shift in how people travel. Limited new infrastructure projects are planned.

3.7 Development and assessment of programme options

With regard to the identification of infrastructure upgrades required to support the Brownfield Growth areas, significant existing work is available in the form of ITAs, Development Plans and sustainable transport plans and has formed a basis for the development of programme options.

Figure 3-3: Inputs to the option development process



The formation and assessment of programmes within each area was undertaken through a series of workshops and working sessions with technical stakeholders including participants. The following steps were taken by the project team:

- Workshop 1 – Investment logic mapping exercise to define and problems in each area.
- Workshop 2 – Programme development, with foundation programmes presented then workshop participants contributed to the development of further programme options.
- Open Day – A draft Assessment of Programmes was presented to the stakeholder group and feedback received on both the composition of programmes and assessment.

3.7.1 Programme Assessment

Programme options developed for each of the Brownfields Growth areas have been assessed using a Multi Criteria Assessment (MCA) framework, consistent with the latest guidance from Waka Kotahi. The MCA framework considers the following attributes:

- Investment objectives / Benefits – How the programme performs against the investment objectives and benefits sought for the programme
- Achievability – Looking at the programmes ability to be delivered from a technical, safety and consent ability perspective.
- Affordability – Is funding available and what is the expected value for money.
- Environmental Effects of the programme – looking at a range of considerations.
- Social and community – Consideration of effects from the programme
- Impacts on Te Ao Maori
- Climate change adaption and mitigation (based on MfE guides 2017/18)
- Property Impacts
- Cumulative Impacts

More detail on the MCA framework, scoring mechanism and Do minimum option are provided in Appendix C.

3.8 Partners and stakeholder engagement

Through the development of precinct and neighbourhood development plans in each of the Brownfields growth areas, Kāinga Ora has undertaken a number of phases of community engagement. Kāinga Ora's recognises the need to engage with communities and stakeholder groups across the life of the development projects and has regular touch points with communities throughout the life cycle of a development including after the completion of a development as KO continues to manage state housing.

The outputs of the various consultation exercises can be observed in detail in Kāinga Ora reporting, the following section provides an example of consultation and feedback for the Mangere area.

1.1.1 Mangere Engagement Case study:

In the Mangere Development there are two active neighbourhoods underway: Mangere West and Aorere. Early engagement has recently begun in Mangere East as part of the feasibility stage. A summary of community engagement undertaken in Mangere is set out in the following section.

Mangere West (A)

Engagement status: Mangere West A was the first neighbourhood development within the Mangere Precinct and initial engagement began late 2017. As the first neighbourhood, the engagement has focused on building general understanding of the development (as a large, transformational programme), and has involved working closely with mana whenua. At a neighbourhood level, engagement has focused on the stages and milestones, including regular updates to residents, neighbours and key stakeholder groups on the progress of stages 1 and 2. This includes ongoing engagement with the community to identify collaboration opportunities and to understand and mitigate challenges. Last year the engagement also focused on raising awareness of home ownership opportunities in the area.

Aorere

Engagement status: The Aorere development kicked off in 2019 and is the second neighbourhood in Mangere actively undergoing development. Engagement commenced in 2019 and continues in the form of information evenings, information days, and discussions with neighbours/residents, briefings with schools and community leaders, and meetings with mana whenua. Like Mangere West, engagement has focused on the stages and milestones, but also working with local groups to understand the community's needs, interests, and concerns.

Mangere East

This neighbourhood is in the feasibility / pre-Business Case stage. Early engagement in Mangere east has begun, which has included a workshop with local stakeholders (community groups and local services, including pre-schools) to better understand the existing challenges and opportunities within the neighbourhood, as well as individual meetings with churches and cultural groups.

Precinct wide

In addition to the localised, neighbourhood engagement, the Mangere Development Team have engaged with the wider Mangere Community through:

- Regular engagement/partnership with mana whenua to discuss key outcomes, issues and solutions
- Attendance at local events, including the Mangere markets
- Presenting at community meetings, such as Nga Manga network
- Monthly meetings/discussions with the Mangere Housing Community Reference Group
- Regular contact/discussions with nearby schools, community leaders, including Church leaders, local board members.

3.9 Community transport feedback themes

Feedback obtained during the community consultation can be summarised into several key themes which are discussed in more detail below:

- **Parking supply** – The communities within the growth areas have expressed concern over a reduction in parking availability as a result from increased density in the area and transport upgrades removing parking on street. This feedback is consistent with recent projects which include removal of parking or intensive development applications which are notified to the surrounding community. This highlights a consenting and reputational risk around provision of on street parking.

- **Walking and cycling connectivity** – There is strong feedback from Brownfields communities around desires for a cohesive and connected active mode network. This is a key theme the Business Case is addressing through development of walking and cycling networks.

- **Separation of active modes from busy roads** – A common theme from the community highlighted the need for physical separation between cycling facilities and general traffic in order for less confident users to feel safe and secure while cycling.

- **Public transport services going to the right places** – Feedback in a number of areas suggested public transport services currently operating did not serve individuals trips. Of particular relevance were comments relating to PT trips in Mangere providing a poor connection to the surrounding employment in the airport precinct, and poor connections between Oranga and the Penrose / East Tamaki industrial areas.

- **Severance from other infrastructure corridors** – Many of the Brownfield Growth areas have close proximity to strategic transport corridors. Community feedback highlights severance issues associated with some of these corridors. Specially, the Mangere feedback highlights severance from both rail and motorway corridors, Mt Roskill highlights severance from SH20 and Tamaki highlights severance from the rail corridor.

The key issues identified resonate well with the problem statements identified in each of the areas. Parking supply will continue to be a key engagement and reputational risk as the programme evolved to subsequent stages.

3.10 Oranga Area

The following section outlines specifics relating to the Oranga area, land use opportunities identified, programme options considered, assessment and recommendations.

3.10.1 Development context

The Oranga area is already under construction and is anticipated to be developed in the next 9 years. Table 3-3: Oranga development schedule sets out the anticipated rate of development within the Oranga area.

Table 3-3: Oranga development schedule

Timeframe	Households
2021 (current)	380
2023	420
2025	620
2027	780
2030	1050

The development form is mostly in 1-3 storey units. Sites adjacent to Mt Smart Road (southern portion of the area) are generally anticipated to develop to a higher density than those further north towards Oranga Avenue.

3.10.2 Do minimum scenario

Within the Oranga Area, no existing projects have been identified to be part of the do-minimum scenario.

The intersection of Mt Smart Road / Mays /Station Road has an existing Network optimisation Project (project number 20100105). In speaking with the project manager, no funding is currently allocated to this project, therefore this intersection has been excluded from the Do-Minimum scenario and included in the programme.

3.10.3 Urban integration opportunities

Within the Oranga Area, opportunity for integration between land use and transport is centred around access to both FTN bus services and the existing RTN network via Te Papapa Rail station and Penrose Rail station. The walk-up catchment for the Te Papapa Rail station covers the southern portion of the site. FTN routes past the site run along Mt Smart Road. Figure 3-4 shows the urban integration opportunities identified in the Oranga area. In order to achieve a well-integrated urban system, Table 3-4 sets out opportunities and recommendations.

Figure 3-4: Oranga land use opportunities

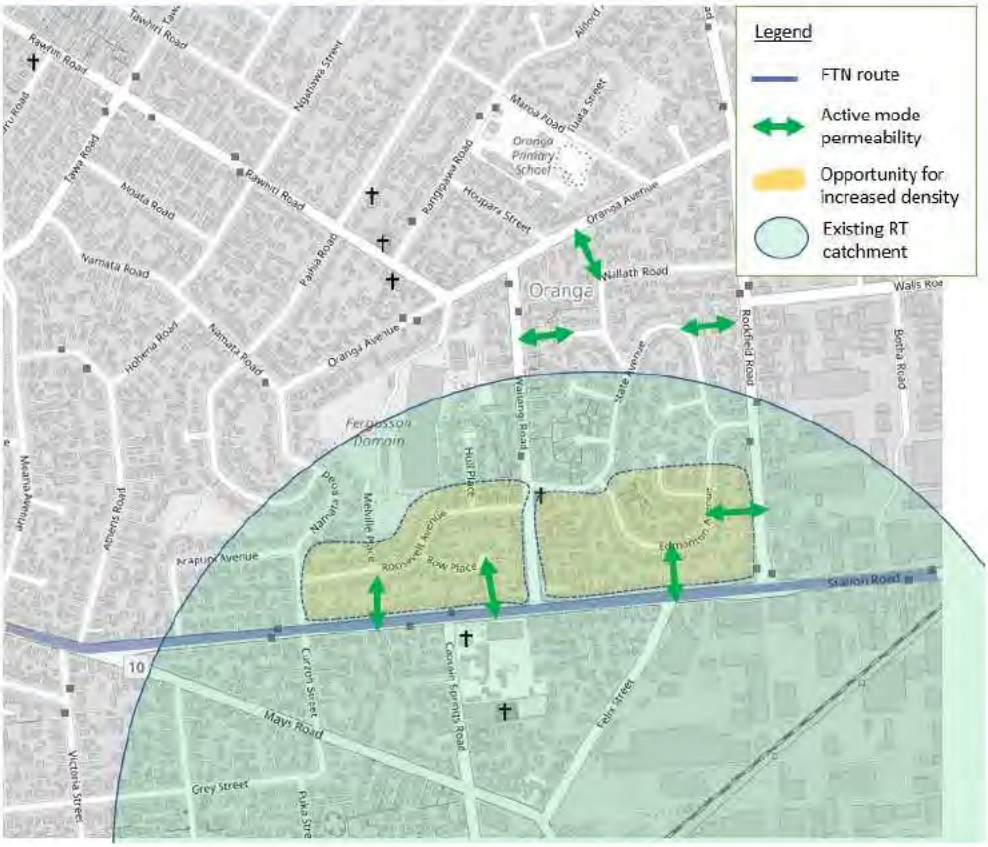


Table 3-4: Oranga Integration opportunities

Integration opportunity	Current KO proposal	Recommendation
Provide a more permeable active mode network	As part of Kāinga Ora development proposal, a number of the links are being provided	Consider an additional link between Wallath and Oranga Ave
Provide higher density development in the southern portion of the site	Kāinga Ora development proposal includes higher density in this area	Consider additional development density in line with NPS-UD in southern portion of the site.

3.10.4 Programmes considered

In order to address growth of the Oranga area and the problems this creates, five programmes were developed for the Oranga area. All programme options are compared against a Do-minimum programme. For the Oranga area, the Do-Minimum programme includes no additional capital projects as there are currently no committed projects in the area. An increase has been assumed to bus services as a result of increases to people living in the area.

Table 3-5 provides a brief overview of programmes considered and the relative cost of each programme option. Appendix D provides maps of all programme options considered.

Table 3-5: Oranga area programmes considered

Programme	Description	Indicative cost[10]
Do Minimum	No projects identified	-

[10] Includes costs of some projects forming part of other programmes

	Increases to Bus services	
Programme A – Development requirements	A package of improvements reflective of development requirements identified in the ITA.	$25M
Programme B – Active mode focus	A focus on improvements to Active mode provisions including midblock upgrades to Mt Smart Road, Oranga Avenue and Waitangi Road. Includes an active mode connection to Penrose station.	$54M
Programme C – Public Transport focus	A focus on improvements to Public transport provisions focusing on Mt Smart Road and the intersection with Mays Road. Includes an active mode connection to Penrose station.	$55M
Programme D – Hybrid High cost	A hybrid programme including both active mode and public transport interventions. The package focuses on higher quality interventions	$55M
Programme E – Hybrid Balanced	A hybrid programme including both active mode and public transport interventions with focus on value for money on several corridors.	$48M

Programme assessment

Each programme has been assessed against the MCA framework. All options are scored in relatively to the Do-Minimum programme. Table 3-6 summarises the assessment of programmes against the MCA framework.

Table 3-6: Oranga Programme assessment

Criteria	Definition	Do Minimum	Programme A - Development requirement	Programme B - Active Mode focus	Programme C - PT focus	Programme D - Hybrid high cost	Programme E - Hybrid balanced
Investment		Investment					
Benefits	Impact on Mode choice	0	1	2	2	2	2
	Impact on Greenhouse gas emissions	0	1	2	2	2	2
	Impact on social cost of deaths and serious injuries	0	1	2	1	2	2
	Impact on perceptions of safety and security	0	1	2	1	2	1
	Impact on access to opportunities	0	1	2	2	2	2
	Changes in liveability of places	0	1	2	2	2	2
	Changes in Te Ao Maori values	0	1	2	2	2	2
	Impact on community cohesion / Severance	0	1	2	1	2	2
Achievability	Technical	0	-1	-2	-2	-2	-1

	Consentability	0	-1	-2	-1	-2	-1
Affordability	Funding availability and ability to get additional funding (if needed)	0	-1	-2	-2	-2	-1
	Value for money	0	1	1	1	1	2
Opportunities and Impacts		Opportunities and Impacts					
Environmental Effects	Landscape / visual	0	0	0	0	0	0
	Water Quality/Stormwater	0	0	-1	-1	-1	0
	Ecology	0	0	-1	0	-1	0
	Natural Hazards	0	0	0	0	0	0
	Cultural & historic heritage	0	0	0	0	0	0
Social and community	Urban design	0	1	2	1	2	2
	Human Health and Wellbeing	0	1	2	1	2	2
	Reputation	0	1	-1	1	-1	0
Impacts on Te Ao Maori		0	0	0	0	0	0
Climate change adaption and mitigation (based on MfE guides 2017/18)		0	0	1	2	2	2
Property Impacts		0	0	-1	-1	-1	-1
Cumulative Impacts		0	0	0	0	0	0

3.10.5 Recommended programme options

With the Oranga Area, the recommended option identified is **Programme E – Hybrid balanced.** Table 3-7 below sets out what were considered the key differentiating factors which lead the project team to identify this programme as the recommended programme.

Table 3-7: Recommended programme rationale

MCA criteria	Rationale
Benefits	**Mode shift:** Programmes B, C, D and E are likely to deliver similar amounts of Mode shift and are considered to broadly reflect the target of 36% in Oranga. Programme A is not expected to lead to a step change in mode share and is likely to be closer to existing levels. **Safety:** Evidence shows a trend in active mode related crashes in the area; thus Programmes B, D and E deliver the highest level of safety benefits. Programmes A and C provide some benefits but due to less active mode provision, score lower compared with other programmes. **Integration:** Within the Oranga area, scoring against the integration criteria were primarily related to active mode provision and reducing severance caused by Mt Smart Road. Programmes B, D and E delivered best against this criterion with Programmes A and C provide a lesser level of benefits. **Access:** Programmes B-E all score similarly against the access criteria due to improvements for walking and cycling to Penrose and Onehunga, and improvements to local PT services. Programme A fails to deliver the wide connections hence scores lower against this criterion. **Overall:** Programme E had a largely comparable level of benefits to higher cost programmes (B and D). The primary difference related to the

	perceived safety of some interventions through opting for a lower level of pedestrian and cycling separation. Programme E was considered to provide a step change over Programme A and provide greater safety and community cohesion benefits over Programme C.
Achievability	Programme E was considered less complex from a technical and consenting standpoint through avoiding shifting kerbs and property take where possible.
Affordability	Programmes E is roughly double the cost of Programme A however provides significant additional benefits to this option and is expected to result in an incremental BCR of over 1. Programmes B, C and D all have a higher cost than Programme E and are expected to provided marginal gains over Programme E in terms of monetised and non-monetised benefits. Programme E provides the most cost-effective solution compared with other programme options.
Environmental effects	Programme E has reduced environmental effects than Programmes B, C and D through reduced kerb realignment and widening.
Social and Community	Programme E scored best in this criterion
Impacts	Overall impacts of Programme E are comparable to other options. Programme E (like several other programme options) score well against the climate change impact through enabling mode shift away from private vehicles.

Table 3-8 sets out the projects included within the recommended programme for the Oranga area. Figure 3-5 sets out a plan of the recommended projects.

Table 3-8: Recommended programme project details for Oranga

Reference number	Intervention	Scope of proposed upgrade	Included in another programme / project ?
O1	Namata Road / Mt Smart Road	Traffic signals	No
O2	Oranga / Rockfield	Extension of Right turn bay	No
O3c	Oranga Road active modes	Speed calming only with connection to Oranga primary	No
O4a	Mt Smart Road upgrade	On road separated cycle lanes – Mays to Maurice.	No
O5	Waitangi Road upgrade	Speed management and footpath enhancements	No
O6b	Rockfield Road	Separation of cycle lanes north of Waitangi	No
O7	Waitangi Road / Mt Smart Road	Small roundabout	No
O8	Oranga Local neighbourhood road upgrades	Local road improvements including streetlighting, footpath and pedestrian links, pedestrian crossings and traffic calming	No

O9c	Mt Smart Road / Mays /Station	Signals and bus priority	No
O10	Active mode connection to Penrose	Shared path facility	No
O10	Active mode connection to Penrose	Maurice Road signals	No
O11	Speed management on Captain Springs	Manage / Lower speed and widen footpaths	No
O12b	Victoria Street	Speed calming and no facilities	No
O13	Felix Street bus stops	Bus stop upgrade and crossing facility	No
O14	Penrose station upgrade	Bus interchange improvements and cycle parking	No

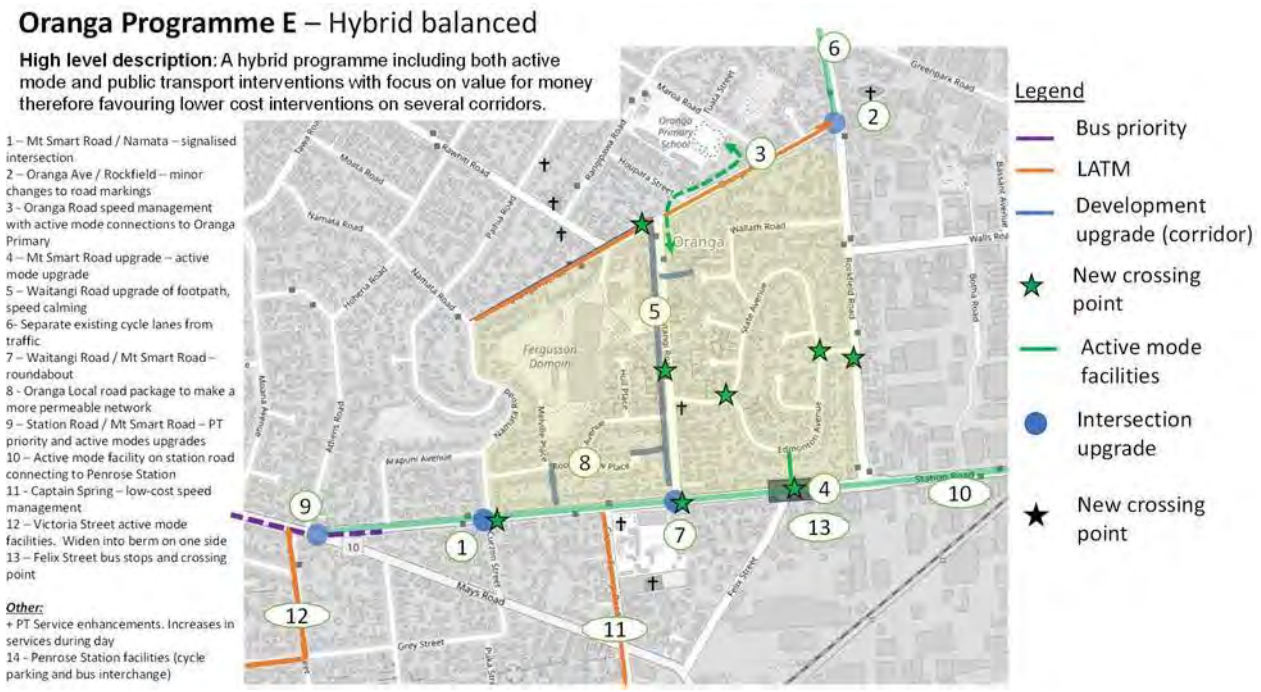
The recommended package of investment is largely consistent with the ITA assessment undertaken for Oranga and projects identified through this process. Some additional projects have been added to better deliver on the investment objectives.

The following projects have not been included or have changed in scope from the ITA recommendations:

- Rockfield Road (South of Oranga) was identified for active mode upgrade, but the business case has not recommended this upgrade in favour of using Oranga Road to provide this connection.
- The ITA recommends upgrades to the Rockfield Road / Station Road intersection – This was considered however the intersection is considered fit for purpose given the expected users and demands.

A summary of do minimum assumptions, developer requirements (from the ITA), additional projects recommended, and the recommended programme is included in Appendix E.

Figure 3-5: Oranga Recommended programme



3.10.6 Summary for Oranga

The recommended programme for Oranga is summarised in Table 3-9.

Table 3-9: Oranga recommended programme

Attribute	Summary
Programme Cost	• Capital cost of $34M (undiscounted, no escalation) • A change from $48m in Table 3.5 due to value engineering post workshop • Operational cost: $6.2M per annum • Benefits: $62.9M (discounted 40 year) • BCR: 1.7
Addressing problem causes **(Problem cause –** Programme response)	**Lack of separated walking and cycling facilities** – Provision of separated active mode facilities on key routes. **Lack of priority for public transport services** – Priority measures for buses on Mt Smart / at the Station Road / Mt Smart intersection. **The transport network unable to cater for growth** – provision of active mode and PT improvements to provide mode shift. **Existing travel patterns are dispersed** – Travel patterns remain dispersed but improvements to active mode provision and East-west bus routes will better serve key movements. **Mt Smart Road provides a barrier to active mode travel** – provision of addition crossings and intersections. **The local street network in Oranga lacks permeability** – A number of cul-de-sacs removed as part of KO local road improvements.
Programme Outcomes	• Reduction of 72 DSI's over 40 years • Mode share of 17% for active modes • 10% more jobs and social opportunities accessible by cycling and PT • 80 ton reduction in CO2 emissions per year
Key risks and dependencies	**Funding priority** – The Oranga area is unlikely to be represented high on any funding priority given the smaller nature of the development area. There is a risk funding will not be provided to support the area resulting in lost opportunity. **Disruption and retrofit** – Kāinga Ora are developing the Oranga area in the short term and are underway with construction at the time of preparing this Business Case. If investment is not provided by AT/ WK, there is risk of additional disruption and need to implement costly retrofits at a later date.

3.11 Northcote area

The following section outlines specifics relating to the Northcote area, land use opportunities identified, programme options considered, assessment and recommendations.

3.11.1 Development context

The Northcote area is already under construction and the Kāinga Ora portion of the development area is anticipated to be developed in the next 5 years. Panuku are also undertaking a redevelopment of the Town Centre area which may include a residential component. Table 3-10 sets out the anticipated rate of development within the Northcote area.

Table 3-10: Northcote development schedule

Timeframe	Households	Other
2021 (current)	380	
2023	800	
2025	1100	Panuku Town centre revitalisation
2027	1500	

The development form is a mixture of standalone households, terraced housing and apartment blocks. Density of households is primarily driven through the nature of land holding and where sites allow more intensive development.

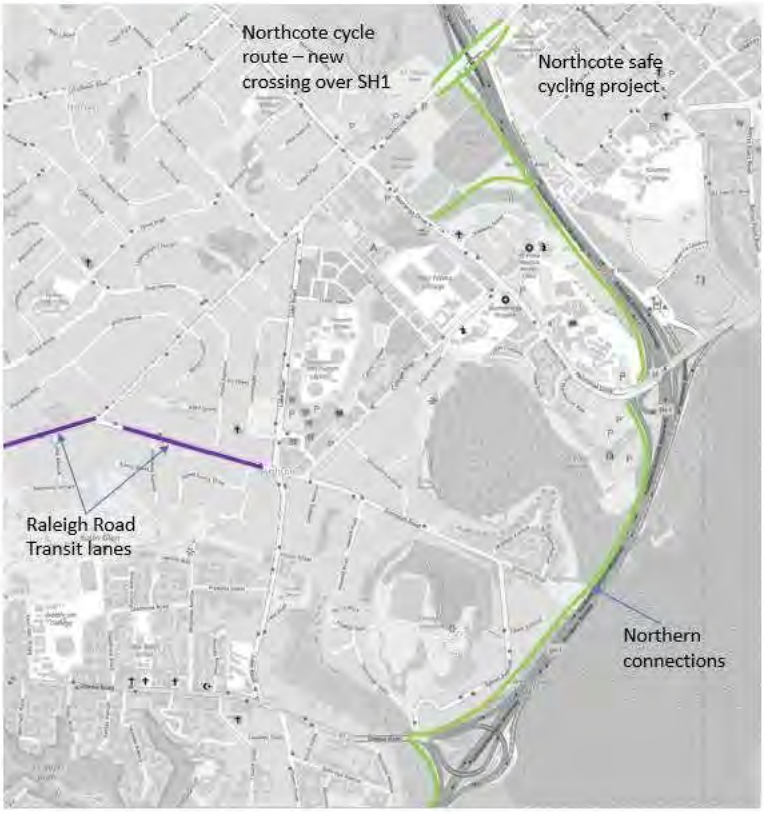
3.11.2 Do minimum scenario

Within the Northcote area, several projects have been identified to be part of the do-minimum scenario including:

- Raleigh Road Transit lanes – AT project to implement transit lanes
- Northcote safe cycling routes – Provision of active mode facilities at the Northcote interchange
- Northern Connections Cycleway – Provision of a strategic cycleway on SH1 corridor

The do minimum scenario is shown in Figure 3-6.

Figure 3-6: Northcote do-minimum



3.11.3 Urban integration opportunities

Within the Northcote Area, opportunity for integration between land use and transport is focused on access to the PT network and the role in which the Northcote centre plays for the area. Much of the development area is located just outside of a typical walk-up catchment to the Northern busway however well within cyclable or micro mobility distance. A FTN route is anticipated to run on Lake

Road and Akoranga Drive in the future. The Northcote centre provides a range of retail to serve the local area and surrounding suburbs and some limited business.

Figure 3-7 shows the urban integration opportunities identified in the Northcote area. In order to achieve a well-integrated urban system, Figure 3-7 sets out opportunities and recommendations.

Figure 3-7: Urban integration opportunities in Northcote

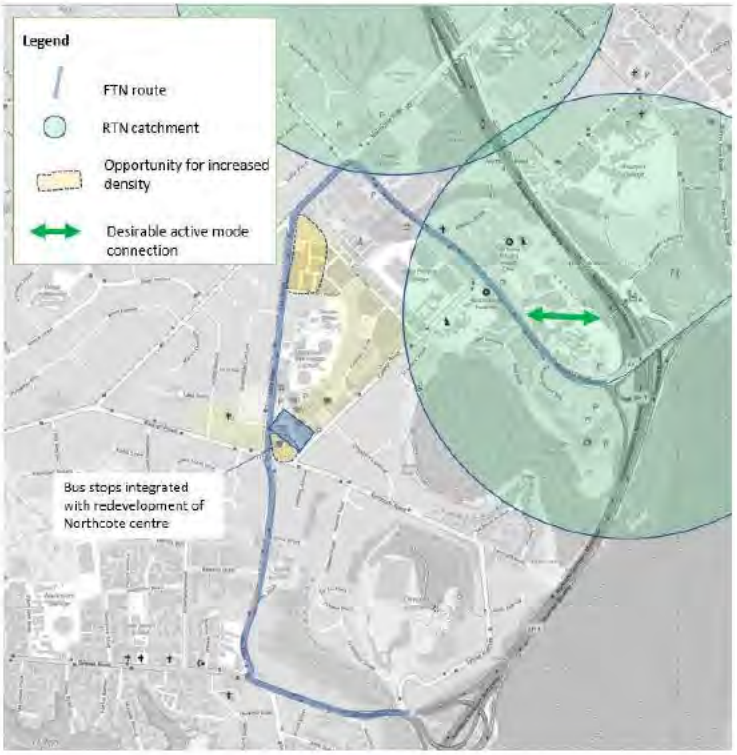


Table 3-11: Urban integration opportunities in Northcote

Integration opportunity	Current development proposal	Recommendation
Integration PT stop with Northcote Town centre	Panuku is developing a plan for this area	Reconfiguration of PT stops for Northcote centre to better serve bus service (avoid double backing)
Provide higher density development in the southern portion of the site	Kāinga Ora development proposal includes higher density in this area	N/A
Better connection to Akoranga Station	Currently a private connection is provided through AUT	Consider an agreement with AUT to provide a legible connection through AUT land to the Overbridge.

3.11.4 Programmes considered

In order to address growth of the Northcote area and the problems this creates; five programmes were developed for the Northcote area. All programme options are compared against a Do-minimum programme. For the Northcote area, the Do-Minimum programme includes the completion of the Northcote safe cycling project and the Northern Pathway project given the recent NZUP funding announcement. An increase has been assumed to bus services as a result of increases to people living in the area.

Table 3-12 provides a brief overview of programmes considered and the relative cost of each programme option. Appendix D provides maps of all programme options considered.

Table 3-12: Northcote area programmes considered

Programme	Description	Indicative cost[11]
Do Minimum	Northcote safe cycling project assumed to be completed. Northern Pathway project in place Increases to peak hour bus services	-
Programme A – Development requirements	A package of improvements reflective of development requirements identified in the ITA.	$35M
Programme B – Active mode focus	A focus on improvements to Active mode provisions including midblock upgrades to Lake Road, College Road and Exmouth.	$60M
Programme C – Public Transport focus	A focus on improvements to Public transport provisions focusing on Lake Road, Northcote Road and Akoranga Drive.	$45M
Programme D – Hybrid High cost	A hybrid programme including both active mode and public transport interventions. The package focuses on higher quality interventions	$80M
Programme E – Hybrid value for money	A hybrid programme including both active mode and public transport interventions with focus on value for money therefore favouring lower cost interventions on several corridors.	$40M

3.11.5 Programme assessment

Each programme has been assessed against the MCA framework. All options are scored in relatively to the Do-Minimum programme. Table 3-13 summarises the assessment of programmes against the MCA framework.

Table 3-13: Northcote Programme assessment

Criteria	Definition	Do Minimum	Programme A - ITA	Programme B - Active Mode focus	Programme C - PT focus	Programme D - Hybrid high cost	Programme E - Hybrid value for money
Investment		Investment					
Benefits	Impact on Mode choice	0	1	2	2	3	2
	Impact on Greenhouse gas emissions	0	1	2	2	3	2
	Impact on social cost of deaths and serious injuries	0	1	2	1	2	1
	Impact on perceptions of safety and security	0	1	2	1	2	1
	Impact on access to opportunities	0	1	2	2	3	2
	Changes in liveability of places	0	1	2	2	2	2
	Changes in Te Ao Maori values	0	1	2	2	2	2

[11] Includes costs of some projects part of other programmes

	Impact on community cohesion	0	1	2	1	2	2
Achievability	Technical	0	-1	-2	-1	-2	-2
	Consentability	0	-1	-2	-1	-2	-1
Affordability	Funding availability and ability to get additional funding (if needed)	0	-1	-2	-1	-3	-1
	Value for money	0	1	2	2	1	2
Opportunities and Impacts		Opportunities and Impacts					
Environmental Effects	Landscape / visual	0	0	0	0	0	0
	Water Quality/Stormwater	0	0	-2	-1	-1	0
	Ecology	0	0	-1	0	-1	0
	Natural Hazards	0	0	0	0	0	0
	Cultural & historic heritage	0	0	0	0	0	0
Social and community	Urban design	0	1	2	1	2	1
	Human Health and Wellbeing	0	1	2	1	2	1
	Reputation	0	0	-1	1	-1	0
Climate change adaption and mitigation (based on MfE guides 2017/18)		0	1	2	2	3	2
Property Impacts		0	-1	-2	-2	-3	-2
Cumulative Impacts		0	0	0	0	0	0

3.11.6 Recommended programme options

With the Northcote Area, the recommended option identified is Programme E – Hybrid balanced. Table 3-14 below sets out what were considered the key differentiating factors which lead the project team to identify this programme as the recommended programme.

Table 3-14: Recommended programme rationale

MCA criteria	Rationale
Benefits	**Mode shift:** Programme D provides the highest level of mode share with high quality upgrades. Programmes B, C, and E are likely to deliver similar amounts of Mode shift and are considered to broadly reflect the target of 50% in Northcote. Programme A is not expected to lead to a step change in mode share and is likely to be closer to existing levels. **Safety:** Programmes B and D deliver the highest level of safety benefits. Programmes A, C and E provide some benefits but due to less active mode provision, score lower compared with other programmes. **Integration:** Within the Northcote area, scoring against the integration criteria were primarily related to active mode provision. Programmes B-E

	were considered to score similarly and provide additional benefits over Programme A. **Access:** Programmes D provides the highest score against the accessibility criteria. Programmes B, C and E all provide moderate benefits and Programme A scores comparatively less benefits due to lack of wider connectivity. **Overall:** Programme E provides a comparable level of benefits to Programmes B and C. Programme D provides an increased level of benefits with improved access and mode share outcomes albeit with a larger investment.
Achievability	Programme E sits in the middle of programme options with a mixture of more intensive interventions and low cost / low impact options.
Affordability	Programme E represents a small increase in overall cost from Programme A but provides increased value for money through delivering more benefit. Programme E is more affordable than Programmes B and D. **High Level BCR assessment:** Programme B C and E – BCR of between 1-2 Programme A, D – BCR 0.5-1.5
Environmental effects	Programme E is comparable to Programme A in terms of effects and provides an improvement over other programme options.
Social and Community	Programme E score similarly to Programme A. Programmes B, C and D all were assessed to lead to better social and community outcomes.
Impacts	Programme E strikes a balance of positive climate change outcomes and negative property impacts.

Table 3-15 sets out the projects included within the recommended programme for the Northcote area. Figure 3-8 sets out a plan of the recommended projects.

Table 3-15: Recommended programme project details for Northcote

Reference number	Intervention	Scope of proposed upgrade	Included in another programme / project ?
1b	Akoranga Drive / Northcote Road intersection upgrade	Ped and cycle improvements including removal of slip lanes	No
2b	Akoranga Drive / College Road intersection upgrade	Major upgrade including priority on approaches	No
3	Ocean View Rd / Pupuke Rd / Raleigh Rd intersection upgrade	Signals	No
4	Raleigh Rd / Lake Rd / Exmouth Rd intersection upgrade	Signals	No
5a	Greenways connection to Northern connections (Akoranga Drive)	Shared path on separate corridor	No

5b	Active mode crossing over Akoranga Drive	Midblock ped crossing	No
6b	Exmouth Road cycle route extension	Speed management only	No
7b	Ocean View Rd / Lake Rd / Northcote Rd intersection upgrade	Walking and cycling upgrade only	No
8b	Lake Road upgrade to collector roads	Low cost retrofit of separators to existing on street cycle lanes	No
9b	College Road active mode upgrade	Separated north of Tonar. Speed Calming south of Tonar	No
10	Akoranga Drive to Busway overpass	Shared path through the AUT campus	No
12	Akoranga Drive Transit lane changes	Change from T2 to T3 or bus	No
14	Akoranga Station enhancements	Cycle parking at Akoranga Station	Yes

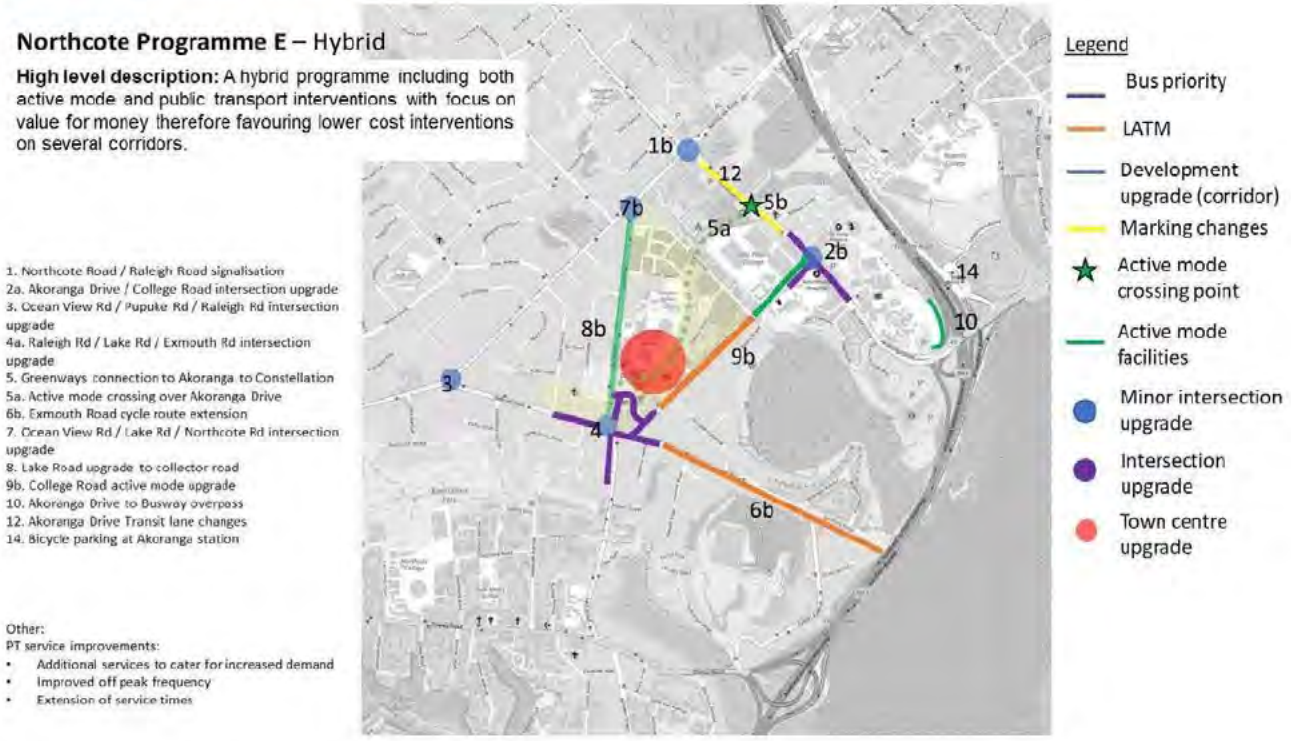
The recommended package of investment is largely consistent with the ITA assessment undertaken for Northcote and projects identified through this process. Some additional projects have been added to better deliver on the investment objectives.

The following projects have not been included or have changed in scope from the ITA recommendations:

- Upgrade of Lake Road – The ITA identifies the need for a collector road upgrade with separated walking and cycling facilities likely to require property acquisition. Given the corridor has recently been upgraded and has a reasonable walking and cycling provision, the business case recommends the corridor is retrofitted with cycle separators rather than implementing a full road upgrade.

A summary of do minimum assumptions, developer requirements (from the ITA), additional projects recommended, and the recommended programme is included in Appendix E.

Figure 3-8: Northcote Recommended programme



3.11.7 Summary for Northcote

The recommended programme for Northcote is summarised in Table 3-16.

Table 3-16: Northcote recommended programme

Attribute	Summary
Programme Cost	• Capital cost of $36.7M (undiscounted, no escalation) • A change from $40m in Table 3.12 due to value engineering and the allocation of Akoranga station to another programme • Operational cost: $4.9m per annum • Benefits: $38.1M (discounted 40 year) • BCR: 1.2
Addressing problem causes (***Problem cause*** – Programme response)	***Lack of separated walking and cycling facilities*** – Separated facilities on Lake road and part of College Road and an off road greenway route. ***The user experience on public transport does not meet expectations*** – Priority provided in key areas of congestion and improvements to Northcote centre stop. ***The transport network unable to cater for growth*** – Improvements to PT and Active modes to provide better travel choice. ***Existing travel patterns are dispersed*** – Improved PT and walking and cycling provision so more trips are catered for. ***Active mode connections to key destinations are poor*** – Improved connection to Northern Pathway, Takapuna and Akoranga Station ***The local street network in Northcote lacks permeability*** – Improvements to local permeability including a continuous off road greenway route connecting to Northern Pathway.

	Northcote is not well connected to strategic transport links – Improved connection to the Northern Pathway and Akoranga Station.
Programme Outcomes	• Reduction of 32 DSI's over 40 years • Mode share of 25% for active modes • 10% more jobs and social opportunities assessable by cycling and PT • 1900 ton reduction in CO2 emissions per year
Key risks and dependencies	**Funding priority** – The Northcote area is unlikely to be represented high on any funding priority given the smaller nature of the development area. There is a risk funding will not be provided to support the area resulting in lost opportunity. **Northern Pathway project dependency** – The northern pathways project represents a step change in strategic cycle facilities and connectivity for the Northcote area. A number of projects within the programme are dependent on the Northern Pathway facility being in place. The overall mode share of the Northcote area is dependent on this strategic facility and the change it makes in the active mode network.

3.12 Tamaki area

The following section outlines specifics relating to the Tamaki area, land use opportunities identified, programme options considered, assessment and recommendations.

3.12.1 Development context

The Tamaki Regeneration Programme will develop in the order of 12,000 additional homes in this area over the next 30 years. Panuku are also undertaking a redevelopment of the Glen Innes and Panmure Town Centres. An indicative schedule to the development of the area is provided in Table 3-17.

Table 3-17: Tamaki Development schedule

Timeframe	Households	Other
2021 (current)	612 (as of 2019)	
2025	2000	
2030	4000	Panmure regeneration project lead by Panuku
2035	6000	Glen Innes regeneration project lead by Panuku
2040	8000	
2045	10000	
2050	12000	

3.12.2 Do Minimum scenario

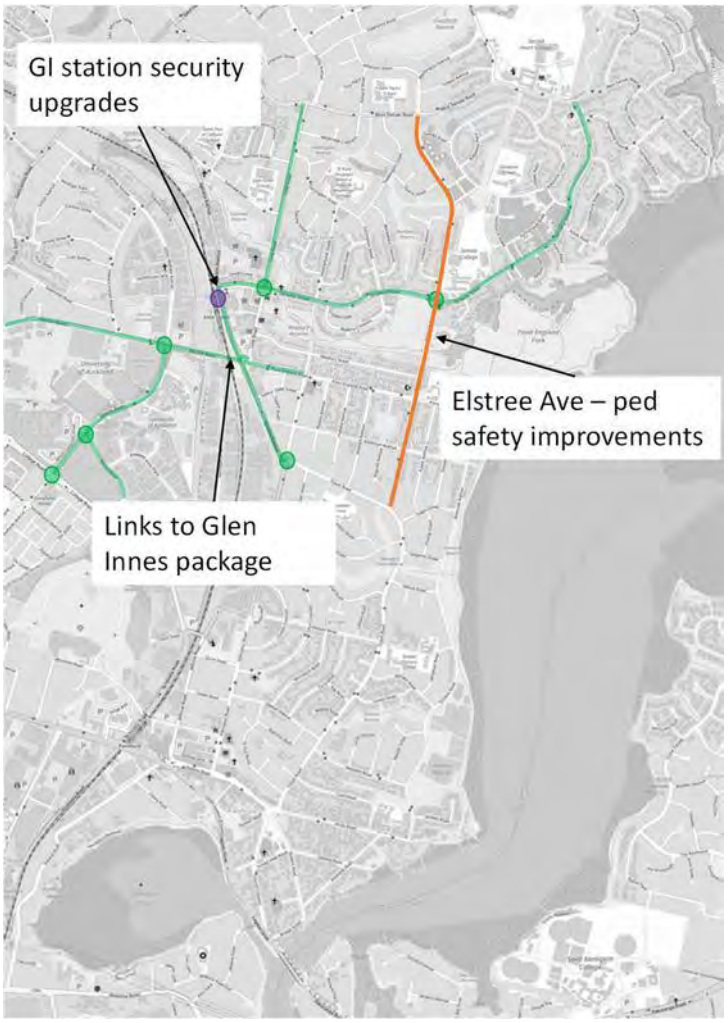
Within the Tamaki area, several projects have been identified to be part of the do-minimum scenario including:

- Glen Innes rail station – minor project to upgrade security
- Line Road / Taniwha Street – Project to provide raised crossings
- Elstree Avenue – existing project to improve pedestrian safety
- Line / Taniwha Street – existing project to raise pedestrian crossings

- Links to Glen Innes active mode upgrades – Taniwha Street (between Apirana Avenue and West Tamaki Road), Line Road (between Line Road and West Tamaki Road), Apirana Avenue (between Taniwha Street and Pilkington Road), Point England Road (between Line Road and Pilkington Road), Merton Road (between College Road and Apirana Avenue), Morrin Road (between Merton Road and Stonefields Avenue), Stonefields Avenue (between Morrin Road and College Road).

The do minimum scenario is shown in Figure 3-6.

Figure 3-9: Tamaki Do-Minimum scenario



There are a number of projects within other programmes or packages in addition to those listed above. These have not been included in the do-minimum scenario due to no commitment to funding and implementation at this point in time.

These include:

- Te Horeta project
- Connected community corridor on St Heliers Bay Road

3.12.3 Urban integration opportunities

Within the Tamaki Area, opportunity for integration between land use and transport is focused on access to the existing RTN network and opportunity around the Glen Innes and Panmure centres.

With the Central Rail Link project, accessibility provided by the Glen Innes and Panmure stations will see an improvement with high frequency and capacity on the RT line.

Figure 3-7 shows the urban integration opportunities identified in the Tamaki area. In order to achieve a well-integrated urban system, Figure 3-10 sets out opportunities and recommendations.

Figure 3-10: Urban integration opportunities in Tamaki

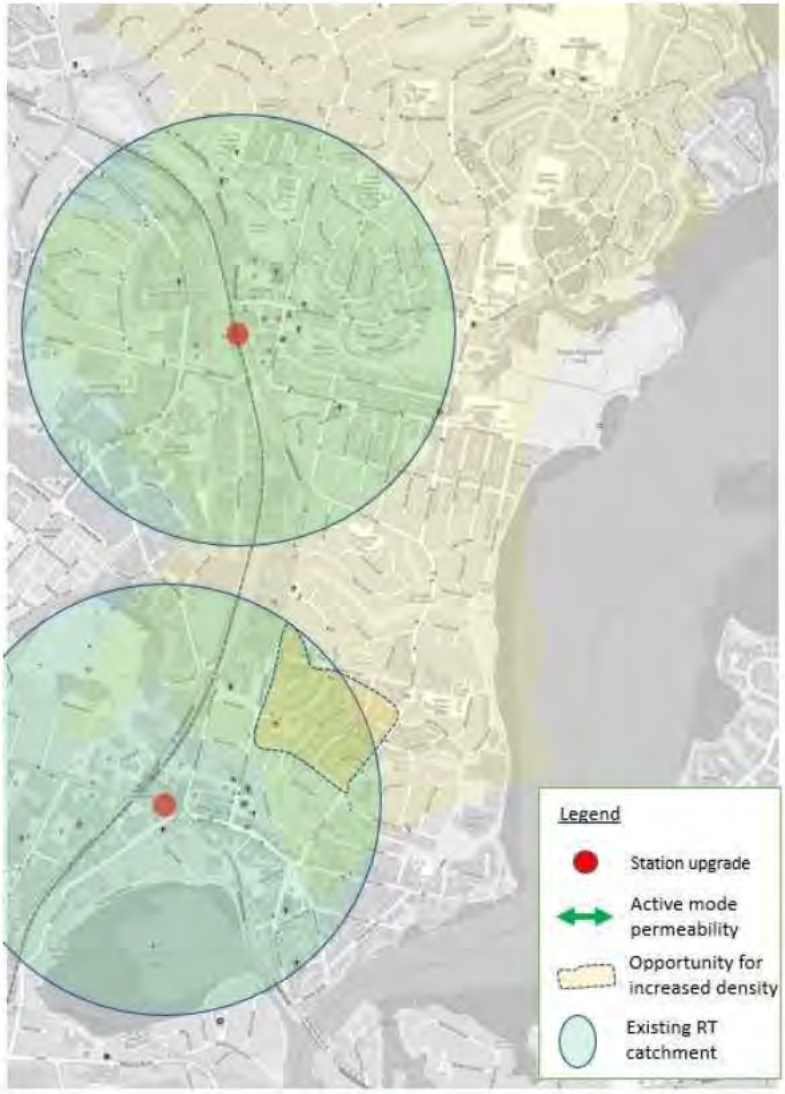


Table 3-18: Urban integration opportunities in Tamaki

Integration opportunity	Current development proposal	Recommendation
TOD development of Glen Innes	TRC is leading the redevelopment of the GI town centre	High-density mixed-use development within catchment of the station. Opportunity to make use of publicly owned land to drive change.
Increase density of Panmure North suburb	KO has extensive land holdings in the area and is intending to redevelop the area	Consider higher density development in line with the NPS:UD

3.12.4 Programmes considered

In order to address growth of the Tamaki area and the problems this creates, four programmes were developed for the Tamaki area. All programme options are compared against a Do-minimum programme. For the Tamaki area, the Do-Minimum programme includes the completion of the AMETI stage 2 upgrades an increase in bus services as a result of increases to people living in the area.

Table 3-19 provides a brief overview of programmes considered and the relative cost of each programme option. Appendix D provides maps of all programme options considered.

Table 3-19: Tamaki area programmes considered

Programme	Description	Indicative cost[12]
Do Minimum	AMETI project phase 2 Increase in Bus services in the peak hour	-
Programme A – Development requirements	A package of improvements reflective of development requirements identified in the previous work	$312M
Programme B – Access to the RTN / Centres	A focus on improvements for both active mode and bus services into centres / RTN stations at Glen Innes and Panmure.	$352M
Programme C – Reducing Conflict	A focus on reducing conflict of different transport users and place function. Involves provision of alternative routes on several key corridors.	$465M
Programme D – TOD focus	A focus on improvements for both active mode and bus services into centres / RTN stations at Glen Innes and Panmure and removal of general vehicle traffic from GI to provide opportunity for intensive development around the station.	$403M

3.12.5 Programme assessment

Each programme has been assessed against the MCA framework. All options are scored in relatively to the Do-Minimum programme. Table 3-20 summarises the assessment of programmes against the MCA framework.

Table 3-20: Tamaki Programme assessment

Criteria	Definition	Do Minimum	Programme A - ITA	Programme B - Local access	Programme C - Reducing conflict	Programme D - TOD focus
Investment		Investment				
Benefits	Impact on Mode choice	0	2	2	3	3
	Impact on Greenhouse gas emissions	0	2	2	3	3
	Impact on social cost of deaths and serious injuries	0	2	2	3	2

[12] Includes costs for some projects part of other programmes

	Impact on perceptions of safety and security	0	2	2	3	2
	Impact on access to opportunities	0	2	2	3	3
	Changes in liveability of places	0	2	3	3	3
	Changes in Te Ao Maori values	0	2	2	3	3
	Impact on community cohesion	0	2	2	3	3
Achievability	Technical	0	-1	-1	-2	-2
	Consentability	0	-1	-1	-2	-1
Affordability	Funding availability and ability to get additional funding (if needed)	0	-2	-2	-3	-2
	Value for money	0	1	1	1	2
Opportunities and Impacts		Opportunities and Impacts				
Environmental Effects	Landscape / visual	0	0	0	0	0
	Water Quality/Stormwater	0	-1	-1	-2	-1
	Ecology	0	-1	-1	-1	-1
	Natural Hazards	0	0	0	0	0
	Cultural & historic heritage	0	0	0	0	0
Social and community	Urban design	0	1	1	2	2
	Social cohesion	0				
	Human Health and Wellbeing	0	2	2	3	3
	Reputation	0	0	0	-1	0
Climate change adaption and mitigation (based on MfE guides 2017/18)		0	2	2	3	3
Property Impacts		0	-1	-1	-2	-1
Cumulative Impacts		0	0	0	0	0

3.12.6 Recommended programme options

With the Tamaki Area, the recommended option identified is **Programme D – TOD focus.** Table 3-21 below sets out what were considered the key differentiating factors which lead the project team to identify this programme as the recommended programme.

Table 3-21: Recommended programme rationale

MCA criteria	Rationale
Benefits	**Mode shift:** Programme C and D provides the highest level of mode share with high quality upgrades for PT and active modes. Programmes A and B are likely to deliver similar amounts of Mode shift but unlikely to reach levels for programmes C and D. **Safety:** Programmes C deliver the highest level of safety benefits through separation of transport functions to different corridors and

	reducing conflicts. Programmes A, B and D provide some benefits are required to manage conflict. **Integration:** Within the Tamaki area, scoring against the integration criteria are primarily influenced in how the programmes compliment development of the GI and Panmure centres. Programmes C and D were considered to score similarly and provide additional benefits over Programme A and B. **Access:** Programmes C and D provides the highest score against the accessibility criteria. Programmes A and B all provide moderate benefits and comparatively less due to the scale of interventions. **Overall:** Programme D provides a high level of benefits (comparable with Programme C) and a step change in mode share and access over lower cost programmes A and B.
Achievability	Programme D represents a mid-point in achievability between programme C (harder to achieve) and Programmes A and B (easier to achieve)
Affordability	Programme D is the second most expensive programme considered however is considered to score well from a value for money perspective. **High Level BCR assessment:** Programme A, B, C – BCR of between 0.5-1.5 Programme D – BCR of between 1-2
Environmental effects	All programmes score similar against the environmental criteria with the exception of Programme C which is considered to have some additional impacts on Water quality / stormwater.
Social and Community	Programme D scores highest for social and community. This is comparable to Programme C but an improvement over Programmes A and B.
Impacts	Programme D delivers well against Climate change while keeping property impacts consistent with the lower impact programmes (A and B).

Table 3-22 sets out the projects included within the recommended programme for the Tamaki area. Figure 3-11 sets out a plan of the recommended projects.

Table 3-22: Recommended programme project details for Tamaki

Reference number	Intervention	Scope of proposed upgrade	Included in another programme / Project?
1a	Tripoli Road to Apirana Avenue upgrade to collector road	Collector road upgrade with active mode facilities	**No**
2	Glen Innes Rail Station Upgrade	Upgrade to rail facilities	**No**
3	Taniwha St / Elstree Ave intersection upgrade	Signalised intersection with no land take	**No**
4	Taniwha Road (east) collector road upgrade	Some widening for bus priority over and above Links to GI project	**No**

5	Taniwha Road (west) collector road upgrade	Some widening for bus priority over and above Links to GI project	**No**
6	Elstree Ave / Pt England Rd intersection upgrade	Intersection upgrade	**No**
7	Pilkington Rd / Tripoli Rd intersection upgrade	Intersection upgrade	**No**
8	Hobson Dr / Tripoli Rd intersection upgrade	Intersection upgrade	**No**
9	Merton Road / Morrin Road intersection upgrade	Assume signalisation	**No**
10	Merton Rail Bridge upgrade	Bridge replacement to widen Merton Road approach	**No**
11	Tripoli Road / Erima Avenue intersection upgrade	Intersection upgrade	**No**
12	Line Road / Apirana Ave intersection upgrade	Assume signalisation in conjunction with item 10. No property	**No**
13	West Tamaki Road / Line Road intersection upgrade	Intersection upgrade	**No**
14	West Tamaki Road / Elstree Avenue intersection upgrade	Intersection upgrade	**No**
15b	Line Road collector road upgrade	More substantial upgrade to cater for increased traffic	**No**
16	Eastview Rd / Line Rd intersection upgrade	Intersection upgrade	**No**
17	Eastview Rd / Apirana Ave intersection upgrade	Intersection upgrade	**No**
18	St Heliers Bay Road / Apirana Ave intersection upgrade	Intersection upgrade	**No**
19	St Heliers Bay Road / Kohimarama Road intersection upgrade	Intersection upgrade	**No**
20	Line Road / Taniwha St intersection upgrade	Assume signals with some land taken	**No**
21	Queens Rd / Church Cres intersection upgrade	Intersection upgrade	**No**
22	Apirana Ave / Taniwha St intersection upgrade	Assume signals with some land taken	**No**

23	Te Horeta Road upgrade	Separate project to provide a new road link parallel to Rail corridor	**Te Horeta business case (22100021)**
24	Pilkington Road street frontage upgrade	Arterial road upgrade. Maintaining kerb to kerb for the most part.	**No**
25	Pt England Road street frontage upgrade	Collector Road upgrade	**No**
26	Elstree Avenue street frontage upgrades - north of Taniwha	Collector Road upgrade	**No**
27b	Apirana Avenue	Active mode upgrade	**No**
28	Glen Innes rail station - access cycleway and Felton Matthew	Connection between station platform	**No**
29	Queen Road Active mode	Active mode upgrade	**No**
30	Stewart / Green Road active mode	Active mode upgrade	**No**
31	Elmstree Avenue (Pt. England to Taniwha)	Active mode upgrade	**No**
32	Hobson Drive	Active mode upgrade	**No**
33	Cycleway extension GI to Panmure	Active mode facility	**Te Horeta business case (22100021)**
34	Felton Matthew Avenue upgrade	General upgrade to collector status	**No**
35	West Tamaki Road upgrade	General upgrade to collector status	**No**
36	Apirana Avenue	Pedestrian mall within GI centre	**No**
37	Taniwha Street (between Apirana Avenue and West Tamaki Road) – 2,570 metres;	Active mode upgrade	**Link to GI W+C (10100034a and b)**
38	Line Road (between Line Road and West Tamaki Road) – 950 metres;	Active mode upgrade	**Link to GI W+C (10100034a and b)**
39	Apirana Avenue (between Taniwha Street and Pilkington Road) – 950 metres;	Active mode upgrade	**Link to GI W+C (10100034a and b)**
40	Point England Road (between Line Road and Pilkington Road) – 250 metres;	Active mode upgrade	**Link to GI W+C (10100034a and b)**
41	Merton Road (between College Road and Apirana	Active mode upgrade	**Link to GI W+C (10100034a and b)**

	Avenue) – 1,380 metres;		
42	Morrin Road (between Merton Road and Stonefields Avenue) - 640 metres; and	Active mode upgrade	**Link to GI W+C (10100034a and b)**
43	Stonefields Avenue (between Morrin Road and College Road) – 260 metres.	Active mode upgrade	**Link to GI W+C (10100034a and b)**
44	Taniwha Street/Line Road	Active mode upgrade to intersection	**Link to GI W+C (10100034a and b)**
45	Taniwha Street/Elstree Avenue	Active mode upgrade to intersection	**Link to GI W+C (10100034a and b)**
46	Apirana Avenue/Pilkington Road	Active mode upgrade to intersection	**Link to GI W+C (10100034a and b)**
47	Merton Road/Morrin Road	Active mode upgrade to intersection	**Link to GI W+C (10100034a and b)**
48	Stonefields Avenue/Morrin Road	Active mode upgrade to intersection	**Link to GI W+C (10100034a and b)**
49	Stonefields Avenue/College Road signalised intersection	Active mode upgrade to intersection	**Link to GI W+C (10100034a and b)**
50	Church Cres - Collector Road Upgrade	Road upgrade with cycle facilities	**No**
51	Panmure North - Local neighbourhood roading asset renewal and upgrades	Local road package	**No**
52	Point England - Local neighbourhood roading asset renewal and upgrades	Local road package	**No**
53	Northwest Glen Innes - Local neighbourhood roading asset renewal and upgrades	Local road package	**No**

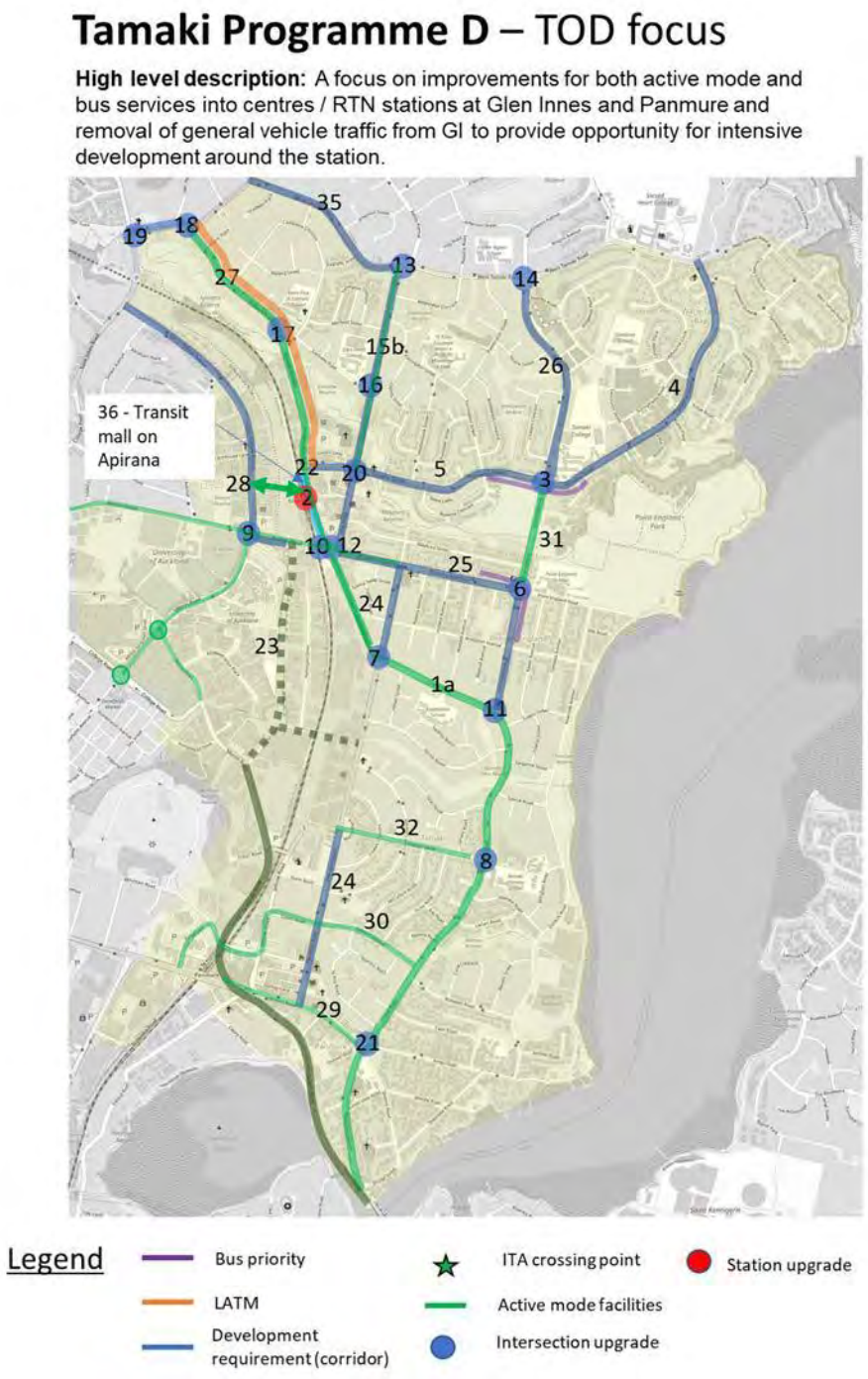
The recommended package of investment is largely consistent with the transport assessment undertaken for Tamaki and projects identified through this process. Some additional projects have been added to better deliver on the investment objectives.

The following projects have not been included or have changed in scope from the ITA recommendations:

- Apirana Avenue – identified by the ITA for bus priority however the investigations as part of the business case suggest priority is not required and rather can be focused on key intersections such as Taniwha Street and Merton Road intersections.

A summary of do minimum assumptions, developer requirements (from the ITA), additional projects recommended, and the recommended programme is included in Appendix E.

Figure 3-11: Tamaki Recommended programme



3.12.7 Summary for Tamaki

The recommended programme for Tamaki is summarised in Table 3-23.

Table 3-23: Tamaki recommended programme

Attribute	Summary
Programme Cost	• Capital cost of $356M (undiscounted, no escalation) • A change from $403m in Table 3.19 due to value engineering and allocating some projects to other delivery programmes (to avoid double counting) • Operational cost: $10m per annum • Benefits: $212.1M (discounted 40 year) • BCR: 1.0 • (Excludes benefits associated with placemaking)
Addressing problem causes **(Problem cause –** Programme response)	***Lack of separated walking and cycling facilities*** – Separated walking and cycling facilities implemented on a number of corridors through the study area. ***The user experience on public transport does not meet expectations*** – Key upgrades at the Glen Innes Rail station, interchange with this station, PT priority implemented at key pinch points in the network. ***The rail corridor acts as a barrier to active mode trips*** – Improved permeability between Felton Matthew and Glen Innes Station / centre. Te Horeta Project provides additional connection across rail. ***Inappropriate form and function of existing streets, particularly within Glen Innes and Panmure town centres*** – Development of a PT mall on Apirana adjacent the Glen Innes station. Improvements to Active modes on Queen Street providing improved access to Panmure. Upgrades to a number of other corridors throughout the study area to respond to intensification. ***The transport network, in particular active modes and PT are unable to cater with expected demand from the growth*** – A number of corridors with PT and active mode upgrades to drive a step change of mode share in the area. ***Opportunities to travel by public transport are limited to some destinations, and from some areas of Tamaki*** – Improvements to key PT corridor of Tripoli Road. Active mode improvements to serve local trips. ***Arterials, major intersections and rail corridor create barriers to active mode trips*** – A number of intersection upgrades providing safe and convenient crossing points for active modes. ***Active mode connections to key destinations are poor*** – Improved active connections to the cycleway, Panmure and Glen Innes Centre.
Programme Outcomes	• Reduction of 268 DSI's over 40 years • Mode share of 22% for active modes • 10% more jobs and social opportunities assessable by cycling and PT • 200 ton reduction in CO2 emissions per year
Key risks and dependencies	**Town centre revitalisation** – A key dependency of the development in Tamaki is the town centre revitalisation being undertaken by TRC and Panuku. Provision of local services, shops and jobs is important to the overall outcomes within the Tamaki area. **Other Transport projects** – A number of separate transport projects form an integral part of the overall transport response in the Tamaki area. These include the Links to GI cycling improvements and the Te Horeta Link. The

	delivery and timing of delivery for these projects will affect the options and timing of the recommended network.

3.13 Mt Roskill area

The following section outlines specifics relating to the Mt Roskill area, land use opportunities identified, programme options considered, assessment and recommendations.

3.13.1 Development context

The total growth proposed by Kāinga Ora in is the order of 9,500 additional homes in this area (approximately 2,700 state houses currently in the area) over the next 30 years. An indicative schedule to the development of the area is provided in Table 3-24.

Table 3-24: Mt Roskill Development schedule

Timeframe	Households
2021 (current)	2749
2025	
2030	
2035	
2040	
2045	
2050	**12197**

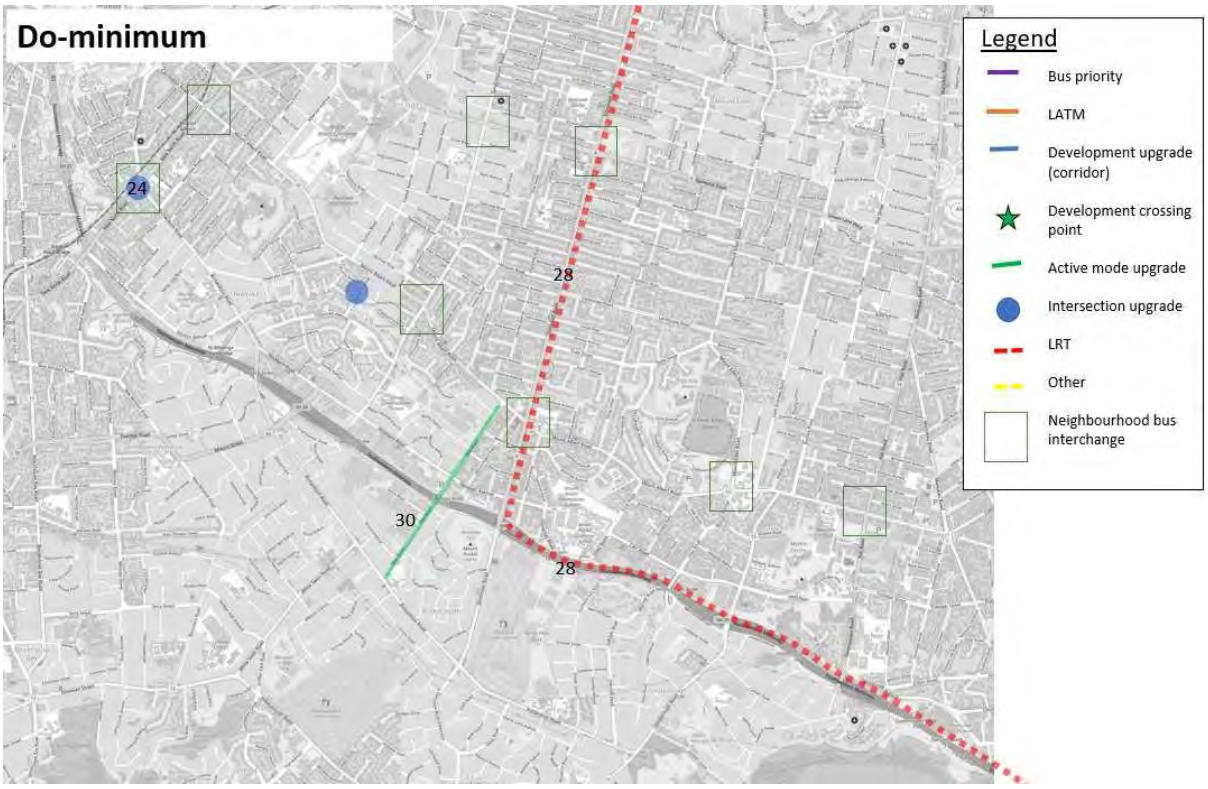
3.13.2 Do minimum scenario

Within the Mt Roskill area, several projects have been identified to be part of the do-minimum scenario including:

- Auckland Light Rail project – The Auckland Light rail project is expected to run through the Mt Roskill area on either Dominion Road or Sandringham Road. The exact route is not known at this point, but the project is assumed to be in place.
- New North Road / Richardson Road – network optimisation upgrade
- May Road collector upgrade - Existing project (10100462b) with construction in August 2021
- Neighbourhood interchange programme – A number of minor upgrades to intersections throughout the area to improve transfer between bus routes. These upgrades have been assumed however many of the intersections are proposed for more significant upgrades on top of this work.

The do minimum scenario is shown in Figure 3-6.

Figure 3-12: Mt Roskill Do Minimum scenario



There are a number of other projects and programmes with projects identified within the Mt Roskill area which are highlighted as part of this Business Case but do not form part of the Do-minimum scenario including:

- Connected communities – A number of the North-south corridors are part of the connected community programme. Given the lack of funding and implementation certainty, these projects have been excluded from the do-minimum.

3.13.3 Urban integration opportunities

Within the Mt Roskill Area, opportunity for integration between land use and transport is focused on access to both the existing RTN network (Mt Albert Station) and opportunity for integration with a new RTN line through the centre of the area. The alignment of the future LRT project is not yet confirmed and is believed to follow either the Dominion Road or Sandringham Road corridor. Around the future RTN alignment, significant opportunity exists to increase development density with catchment of the RTN alignment.

Figure 3-7 shows the urban integration opportunities identified in the Tamaki area. In order to achieve a well-integrated urban system, Figure 3-13 sets out opportunities and recommendations.

Figure 3-13: Urban integration opportunities in Mt Roskill

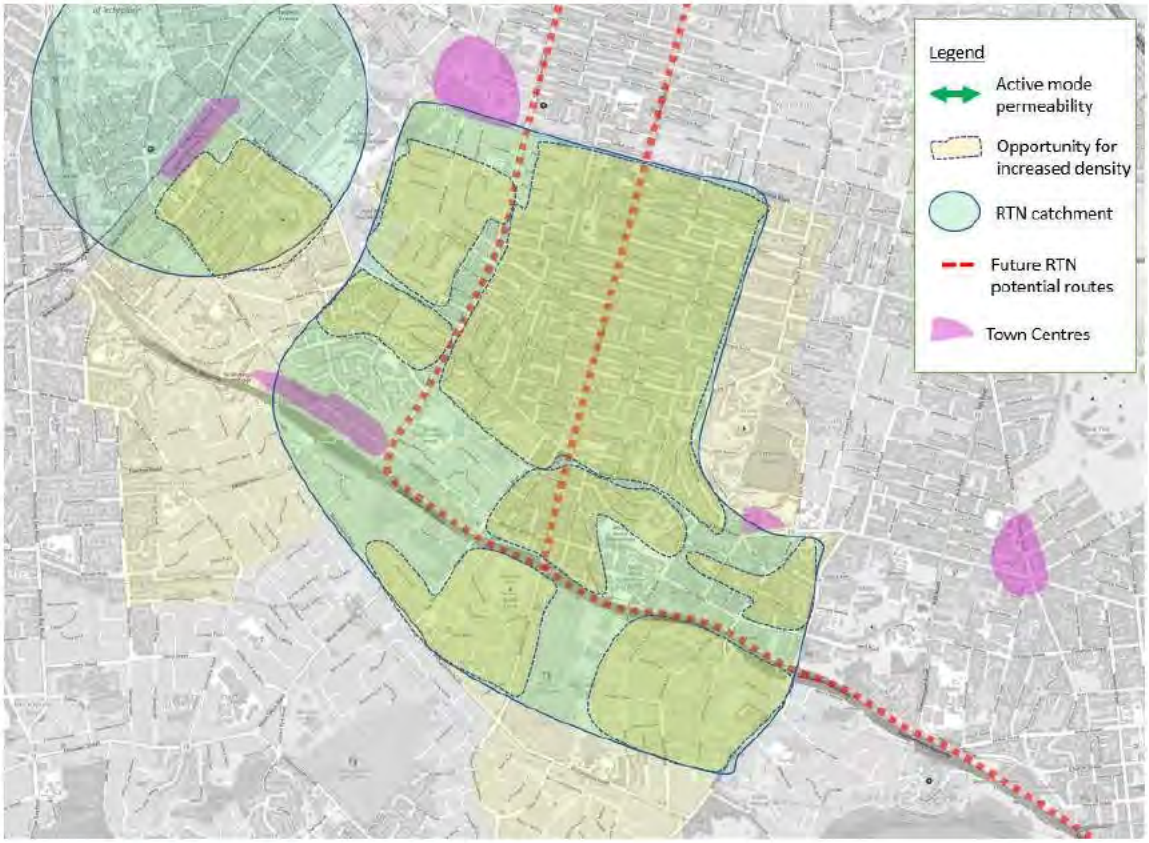


Table 3-25: Urban integration opportunities in Mt Roskill

Integration opportunity	Current development proposal	Recommendation
Increased density along the LRT route	Currently KO development is concentrated in the Wesley Area thus increased development opportunity exists if LRT was to follow the Sandringham Road corridor. KO has limited land holdings to the north of the study area.	Consider higher density development in line with the NPS:UD within walk up catchment to a future RTN.
Mixed land uses	Currently a number of centres are spread through the wider area. No large-scale development of business areas is currently proposed	Provision of increased retail and employment opportunities within centres to meet growing demand for local services and employment.

3.13.4 Programmes considered

In order to address growth of the Mt Roskill area and the problems this creates, four programmes were developed for the Mt Roskill area. All programme options are compared against a Do-minimum programme. For the Mt Roskill area, the Do-Minimum programme includes the light rail project and an increase in bus services on a number of corridors as a result of increases to people living in the area.

Table 3-26 provides a brief overview of programmes considered and the relative cost of each programme option. Appendix D provides maps of all programme options considered.

Table 3-26: Mt Roskill area programmes considered

Programme	Description	Indicative cost[13]
Do Minimum	Light Rail project assumed in place Increases to peak hour bus services	-
Programme A – Development requirements	A package of improvements reflective of development requirements identified in the ITA.	$295M
Programme B – Maximising mode share	A focus on improvements to Public transport provisions. The package focuses on higher quality interventions with a number of future FTN routes upgraded for buses.	$748M
Programme C – Value for money	A focus on value for money with improvements to portions of the network forecast to have the worst levels of delay. Given the value for money focus, the programme favours lower cost interventions on several corridors.	$380M
Programme D – focus on Priority areas	A geographic bias towards the areas which are intended to be more heavily developed by KO such as Wesley and Mt Roskill.	$433M

3.13.5 Programme assessment

Each programme has been assessed against the MCA framework. All options are scored in relatively to the Do-Minimum programme. Table 3-27 summarises the assessment of programmes against the MCA framework.

Table 3-27: Mt Roskill Programme assessment

Criteria	Definition	Do Minimum	Programme A - Development requirements	Programme B - Maximising mode share	Programme C - Value for money	Programme D - High priority areas
Investment		Investment				
Benefits	Impact on Mode choice	0	1	3	2	2
	Impact on Greenhouse gas emissions	0	1	3	2	2
	Impact on social cost of deaths and serious injuries	0	1	2	2	2
	Impact on perceptions of safety and security	0	1	2	2	2

[13] Includes costs of some projects part of other programmes

	Impact on access to opportunities	0	1	3	2	2
	Changes in liveability of places	0	1	2	2	2
	Changes in Te Ao Māori values	0	1	2	2	2
	Impact on community cohesion	0	1	2	1	2
Achievability	Technical	0	-1	-3	-2	-2
	Consentability	0	-1	-3	-2	-2
Affordability	Funding availability and ability to get additional funding (if needed)	0	-1	-3	-2	-2
	Value for money	0	1	1	2	2
Opportunities and Impacts		Opportunities and Impacts				
Environmental Effects	Landscape / visual	0	0	-1	0	0
	Water Quality/Stormwater	0	-1	-1	-1	-1
	Ecology	0	-1	-1	-1	-1
	Natural Hazards	0	0	0	0	0
	Cultural & historic heritage	0	0	0	0	0
Social and community	Urban design	0	1	1	2	2
	Human Health and Wellbeing	0	1	2	2	2
	Reputation	0	0	-1	0	0
Climate change adaption and mitigation (based on MfE guides 2017/18)		0	1	3	2	2
Property Impacts		0	-1	-3	-2	-2
Cumulative Impacts		0	0	0	0	0

3.13.6 Recommended programme options

With the Mt Roskill Area, the recommended option identified is **Programme D – High priority areas.** Table 3-28 below sets out what were considered the key differentiating factors which lead the project team to identify this programme as the recommended programme.

Table 3-28: Recommended programme rationale

MCA criteria	Rationale
Benefits	**Mode shift:** Programme B provides the highest level of mode share with high quality upgrades for PT and active modes over the majority of the area. Programmes D provides a similar level of benefits but focuses on a smaller geographical area. Programme C provides a reduced level of mode share potential over the full area. Programme A does not provide

	are likely to deliver similar amounts of Mode shift but unlikely to reach levels for programmes C and D. **Safety:** Programmes B, C and D deliver the highest level of safety benefits through addressing safety hotspots and provision of active mode facilities. Programmes A provides a reduced level of safety benefits as it address most of the critical intersections in the area, the level of midblock provision for active modes is reduced. **Integration:** Within the Mt Roskill area, the integration score was differentiated by programmes ability to address severance. Programmes B and D were considered to best connect communities and reduce severance. Programmes A and C, while providing benefits did not score as high against this criteria. **Access:** Programme B provides the highest score against the accessibility criteria providing the best access to economic opportunities. Programmes A,C and D all provide moderate benefits and comparatively less than B. Programme B delivers a step change in benefits over all other programmes. Programme C and D delivers additional benefits over Programme A but a step down compared with Programme B.
Achievability	Programme D performs at a mid-level compared with other programme options with moderate technical and consenting challenges. **High Level BCR assessment:** Programme A, B – BCR of between 0.5-1.5 Programme C and D – BCR of between 1.0-2.0
Affordability	The programme cost is again midway between the most expensive (Programme C) and cheapest (Programme A). Programme C is expected to return a favourable value for money.
Environmental effects	Programme D has some minor adverse environmental effects but is largely comparable to other programme options.
Social and Community	Programme C and D compares favourably to the other programme options.
Impacts	Programme D provides a mid-level of climate change benefits and has a mid-level of property impacts.

Table 3-29 sets out the projects included within the recommended programme for the Mt Roskill area. Figure 3-14 sets out a plan of the recommended projects.

Table 3-29: Recommended programme project details for Mt Roskill

Reference number	Intervention	Scope of proposed upgrade	Included in another programme / project?
1	Sandringham Road / Balmoral Road intersection upgrade	Neighbourhood interchange + medium intersection upgrade	Neighbourhood Interchanges (14100093a) construction in Sep 2021
2	Dominion Road Extn upgrades to arterials	Active mode + bus priority	No

3	Maioro St / Richardson Rd intersection upgrade	Minor intersection Upgrade	No
4	Mount Albert Rd / Dominion Rd intersection upgrade	Neighbourhood interchange + medium intersection upgrade	Neighbourhood Interchanges (14100093a) construction in Sep 2021
5	Hayr Road / Carr Road intersection upgrade	Intersection upgrade	**No**
6	Mount Albert Road / Hillsborough Road intersection upgrade	Intersection upgrade	**No**
7	Mount Albert Road / Pah Road intersection upgrade	Neighbourhood interchange + medium intersection upgrade	Neighbourhood Interchanges (14100093a) construction in Sep 2021
8b	Mount Albert Road upgrades to arterials	Separated cycle facilities	**No**
9b	Dominion Rd / Balmoral Rd intersection upgrade	Neighbourhood interchange + medium intersection upgrade	Neighbourhood Interchanges (14100093a) construction in Sep 2021
10	Richardson Rd / Owairaka Ave intersection upgrade	Intersection upgrade	No
11	Mt Albert Rd / Mt Eden Rd intersection upgrade	Neighbourhood interchange + medium intersection upgrade	Neighbourhood Interchanges (14100093a) construction in Sep 2021
12	Hillsborough Rd / Herd Rd / Carr Rd intersection upgrade	Intersection upgrade	No
13a	Richardson Rd / O'Donnell Ave intersection upgrade	Intersection upgrade	No
13b	Stoddard Rd / Richardson Rd intersection upgrade	Intersection upgrade	No
14	Stoddard Rd / Denize Rd intersection upgrade	Intersection upgrade	No
15a	Stoddard Rd / Sandringham Rd Extn intersection upgrade	Minor upgrade with bus priority	No

15b	Stoddard Rd / Sandringham Rd Extn intersection upgrade	Neighbourhood interchange + medium intersection upgrade	No
16a	Sandringham Rd Extn / O'Donnell Ave intersection upgrade	Intersection upgrade	No
16b	Sandringham Rd Extn / Gifford Ave intersection upgrade	Intersection upgrade	No
17	Mount Albert Rd / Sandringham Rd intersection upgrade	Neighbourhood interchange + medium intersection upgrade	Neighbourhood Interchanges (14100093a) construction in Sep 2021
18	May Road / Stoddard Road / Denbigh Avenue intersection upgrade	Intersection upgrade	No
19b	Dominion Road / Denbigh Avenue intersection upgrade + neighbourhood interchange	Neighbourhood interchange + medium intersection upgrade	No
20	New North Road upgrades to arterials	Bus priority upgrade (K2K)	**Connected Communities**
21	Mt Eden Road upgrades to arterials	PT and walking and cycling (B2B)	**Connected Communities**
22	Hillsborough Road upgrades to arterials	Bus priority upgrade (K2K)	**Connected Communities**
23B	New North Rd / Mt Albert Rd intersection upgrade	Neighbourhood interchange + medium intersection upgrade	Neighbourhood Interchanges (14100093a) construction in Sep 2021
24B	New North Rd / Richardson Rd intersection upgrade	Neighbourhood interchange + medium intersection upgrade	**Network optimisation project to improve lane configuration (20100097) 2020**
25	New North Rd / Hendon Ave intersection upgrade	Intersection upgrade	Connected Communities
26	Mount Albert Rd / Owairaka Ave intersection upgrade	Intersection upgrade	No
27	Maioro Street / New Windsor Road intersection upgrade	Intersection upgrade	No
28	Mt Roskill light rail	Rapid transit corridor	**ALR project**
29	Owairaka Avenue collector road upgrade	Connected communities: PT (K2K)	KO development requirements / **Connected communities**

30	May Road collector road upgrade	Collector Road upgrade	Existing project (10100462b) construction in August 2021
31	Matipo Street collector road upgrade	Collector Road upgrade	No
32	Parau Street collector road upgrade	Collector Road upgrade	No
33	Fowlds Avenue collector road upgrade	Collector Road upgrade	No
34	Hendon Avenue collector road upgrade	Collector Road upgrade	No
34	Frost Road collector road upgrade	Collector Road upgrade	No
36	Alberton Avenue collector upgrade	Active modes	No
37a	Balmoral Road between Sandringham and New North	Active mode and bus priority	No
39	Royal Oak Roundabout	Signals - PT upgrade / walking and cycling	No
40	Sandringham Road upgrade	PT upgrade for double decker services	**Connected Communities**
41	Oakley Creek Greenway / Owairaka Greenway	Greenway active mode facility	Local Board Initiatives Programme: Puketapapa Greenways - Mt Roskill Safer Communities Package 1 (10100483a-d)
42a	Stoddard Richardson upgrade	PT upgrade between New North to Owairaka	No
42c	Stoddard Richardson upgrade	PT upgrade Owairaka to Sandringham (K2K)	**Connected Communities**
43	Denbigh / Sommerset / Carr	Bus priority	**Overlap with SD.Safer Communities Programme-**
44b	Richardson Road - Stoddard to Maioro	Bus priority upgrade (K2K)	**Connected Communities**
45	Hayr and Warren Road	Bus priority upgrade (K2K)	**Connected Communities**
46	Maioro / Tiverton upgrade	Bus priority upgrade (K2K)	**Connected Communities**
50	New Windsor / Boundary Road	Bus priority upgrade (K2K)	**Connected Communities**
51	Maioro Street	PT and walking and cycling (K2K)	**Connected Communities Also a network optimisation programme to provide a Dynamic Bus Lane (20100122)**
52	Melrose / Oakdale Road	Bus priority upgrade (K2K)	**Connected Communities**
53	Richardson / Glass	Bus priority upgrade (K2K)	**Connected Communities**

54	Manukau Road	PT and walking and cycling (B2B and K2K)	**Connected Communities**
55	Greenlane	PT and walking and cycling (B2B)	**Connected Communities**
57	Mt Roskill walking and cycling bridges over SH20 new	Active mode facility	No
61	Roskill South Transport - Intersection upgrades	Package of local road improvements	No
62	Waikowhai local transport upgrades	Package of local road improvements	No
63	Owairaka - Local neighbourhood roading asset renewal and upgrades	Package of local road improvements	No
64	Roskill South - Local neighbourhood roading asset renewal and upgrades	Package of local road improvements	No
65	Wesley - Local neighbourhood roading asset renewal and upgrades	Package of local road improvements	No
66	Waikowhai - Local neighbourhood roading asset renewal and upgrades	Package of local road improvements	No
67	Richardson / Hillsborough Road	Intersection upgrade	No
68	Dominion Road Ext / Hillsborough Road	Intersection upgrade	No

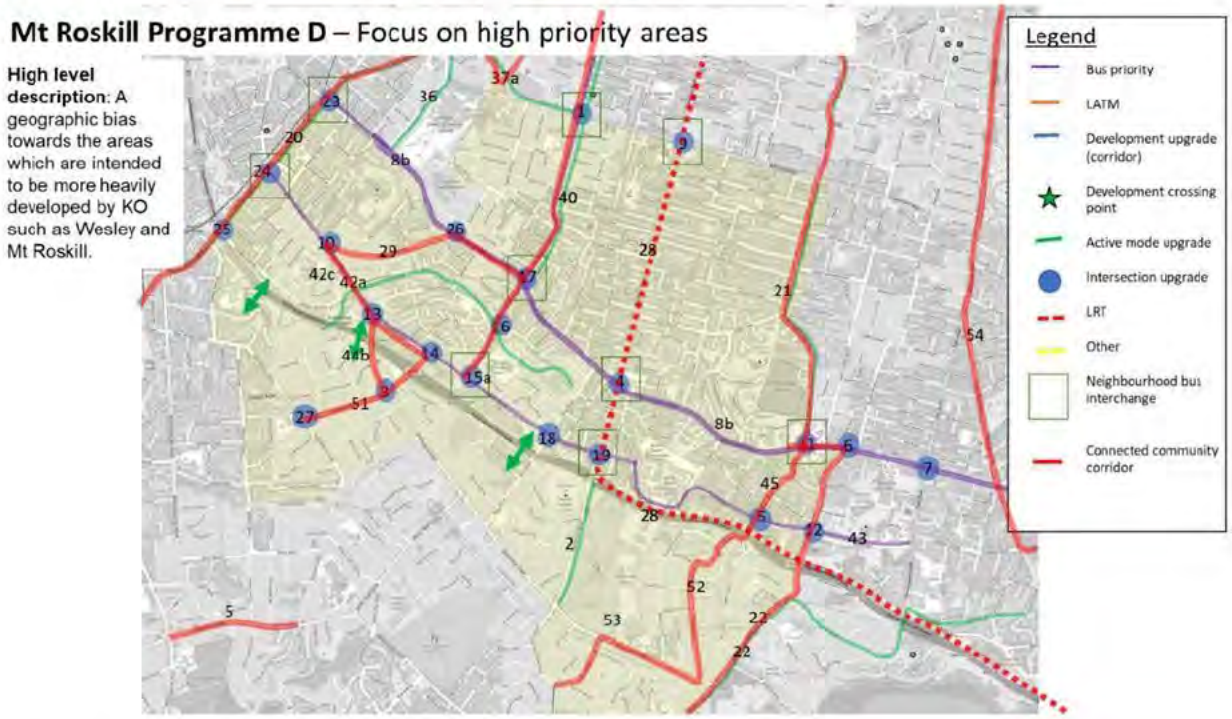
The recommended package of investment is largely consistent with the ITA assessment undertaken for Mt Roskill and projects identified through this process. Some additional projects have been added to better deliver on the investment objectives.

The following projects have not been included or have changed in scope from the ITA recommendations:

- Mt Eden / Balmoral intersection – Intersection was identified for upgrade. The business case does not recommend this upgrade due to the limited land holding and development around the intersection and notes the neighbourhood interchange programme will improve PT transfers here.
- Mt Albert Road – The previous work identifies the need to upgrade to an arterial road standard, likely requiring property. The Business case identifies the need to upgrade this corridor however opts for a solution which fits within the road reserve.

A summary of do minimum assumptions, developer requirements (from the ITA), additional projects recommended, and the recommended programme is included in Appendix E.

Figure 3-14: Mt Roskill Recommended programme



3.13.7 Summary for Mt Roskill

The recommended programme for Mt Roskill is summarised in Table 3-30.

Table 3-30: Mt Roskill recommended programme

Attribute	Summary
Programme Cost	• Capital cost of $273M (undiscounted, no escalation) • A change from $433m in Table 3.26 due to value engineering and allocating some projects to other delivery programmes like Connected Communities (to avoid double counting) • Operational cost: $15.4M per annum • Benefits: $223.8M (discounted 40 year) • BCR: 1.3
Addressing problem causes **(Problem cause –** Programme response)	***Lack of cycling facilities and deficient walking network*** – Walking the cycling upgrades to key arterial corridors and provision of off-road greenway routes. ***The user experience on public transport does not meet expectations*** – Improvements to the PT network including provision of an additional E-W route, and priority at key pinch points in the network. The programme is complemented by Connected Community upgrades to many of the N-S arterial routes and the ALR project. ***Inappropriate form and function of existing streets*** – Upgrade of a number of Collector and Arterial Road corridors to the latest standards. ***The motorway corridor is a barrier to active mode and PT trips*** – Additional crossings provided over SH20. Improvements to existing crossings. ***The transport network, in particular active modes and PT are unable to cater with expected demand from the growth*** – Significant PT and active mode upgrades to enable a significant mode share.

	Opportunities to travel by public transport are limited to some destinations, and from some areas of Roskill – Improvements to cross town routes including provision of an additional corridor allows connection to a variety of origins and destinations. ***Active mode connections to key destinations are poor*** – Improved active mode connections around each of the centres within the study area including Wesley, Sandringham, Mt Albert, Mt Eden and Three Kings. ***The local street network in some areas lacks permeability*** – Local Road package improves pedestrian and cycle permeability, and a number of intersection/ access points are upgraded to improve accessibility.
Programme Outcomes	• Reduction of 316 DSI's over 40 years • Mode share of 22% for active modes • 10% more jobs and social opportunities accessible by cycling and PT • 22,600 ton reduction in CO2 emissions per year
Key risks and dependencies	Light Rail – The light rail project has a significant impact to both the transport network and land use in the Mt Roskill. The programme has been developed with the LRT project assumed to be in place. Any changes to this will require review of the transport response and land use. Other projects – The connected communities programme includes a number of key corridors through the Mt Roskill development area. The primary risk around these corridors is co-ordination around implementation timeframes. Development in the various Mt Roskill neighbourhood will act as a key catalyst to upgrades identified for these corridor upgrades.

3.14 Mangere area

The following section outlines specifics relating to the Mangere area, land use opportunities identified, programme options considered, assessment and recommendations.

3.14.1 Development context

The total growth proposed by Kāinga Ora in is the order of 7,000 additional homes in this area (approximately 3,200 state houses currently in the area) over the next 30 years. An indicative schedule to the development of the area is provided in Table 3-31

Table 3-31: Mangere Development schedule

Timeframe	Households
2021 (current)	3,200
2025	4,500
2030	7,000
2035	8,500
2040	9,500
2045	10,200
2050	10,200

Within the Mangere area, several projects have been identified to be part of the do-minimum scenario including:

- Mangere cycle improvements – Package of cycle improvements on Coronation Road, Bader Drive, Mackenzie Road, part of Kirkbride Road and upgrade of the Mangere centre park link.

- Auckland Light Rail project – The Auckland Light rail project is expected to run through the Mangere area with stations in Mangere Town Centre. The exact route is not known at this point, but the project is assumed to be in place.

The do minimum scenario is shown in Figure 3-6.

Figure 3-15: Mangere Do Minimum scenario

There are a number of other projects and programmes with projects identified within the Mangere area which are highlighted as part of this Business Case but do not form part of the Do-minimum scenario including:

- Connected Communities – bus priority upgrade on Massey Road / Buckland Road

- 20 Connect – Provision of strategic cycle facilities on SH20 and SH20A

3.14.2 Urban integration opportunities

Within the Mangere Area, opportunity for integration between land use and transport is focused on access to the existing RTN network and opportunity around the Mangere centre. RTN access is provided in the existing situation via a rail station at Middlemore and Otahuhu. With the proposed light rail project, potential access will be provided to Mangere centre / Mangere west. In the Favona area, the street network is limiting accessibility.

Figure 3-16 shows the urban integration opportunities identified in the Mangere area. In order to achieve a well-integrated urban system, Table 3-32 sets out opportunities and recommendations.

Figure 3-16: Urban integration opportunities in Mangere

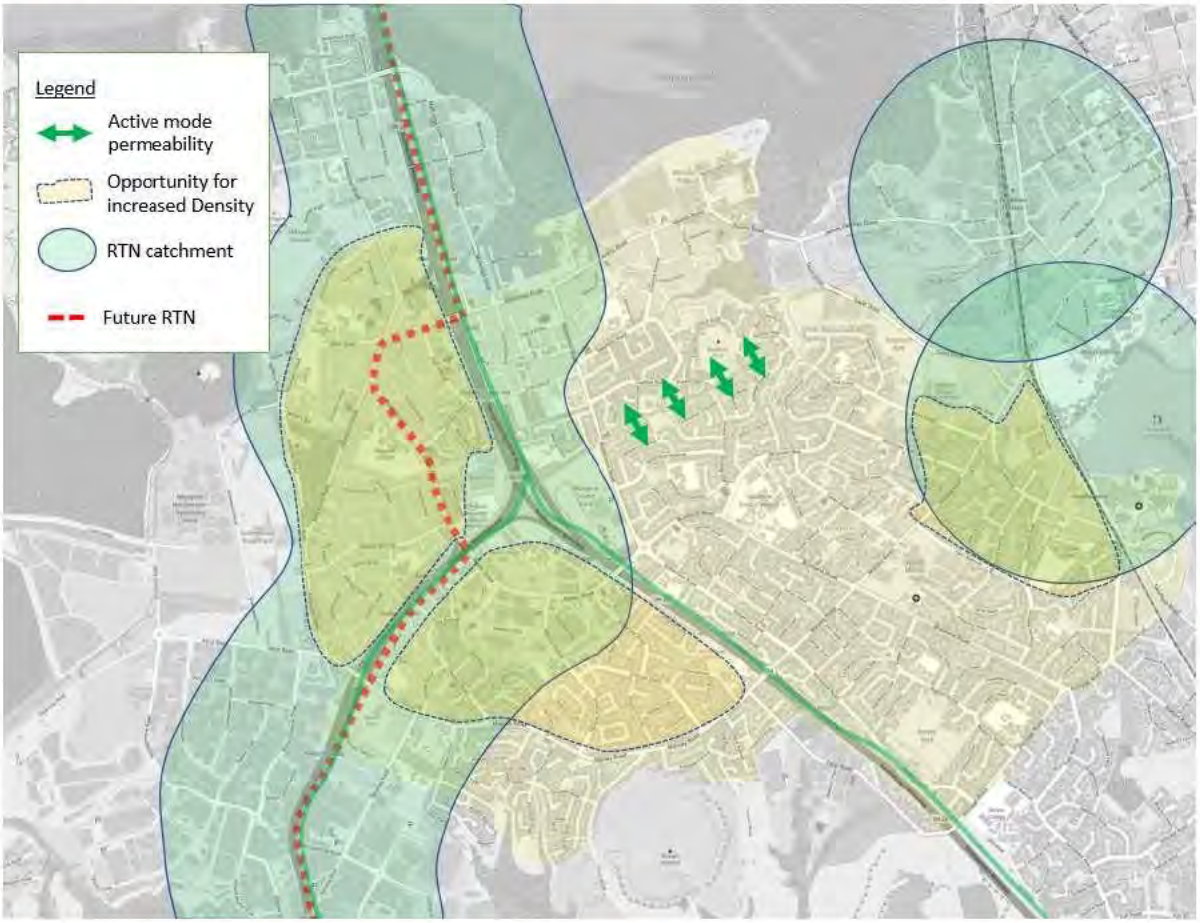


Table 3-32: Urban integration opportunities in Mangere

Integration opportunity	Current development proposal	Recommendation
Light Rail corridor	While the LRT alignment through the Mt Roskill area is uncertain, significant opportunity exists for integration with this project once confirmed. With the NPS-UD direction, significant opportunity exists within the catchment of the LRT corridor for substantial increases in density.	Increased density within the LRT catchment will support the LRT service and realise mode share outcomes sought by the programme.
Mangere centre TOD development	The Mangere centre is within walking distance of the RTN and provides a central retail and employment centre for the surrounding area.	Provide/encourage increased density and mix of uses around the Mangere centre.
Density around Middlemore station	Current plans in the Middlemore neighbourhood involve sporadic KO ownership and low intensity.	Increase development of this area in line with NPS:UD principals.
Development density in Mangere West	KO development plans already have extensive development In the Mangere west area	Opportunity to increase development in line with NPS:UD principals.

Local street permeability in Favona	Current street network has a lack of north-south permeability over a 1.3km stretch between Robertson Road and Bicknell Road.	Reconfigure local roads / active mode connections to create a more permeable road network.

3.14.3 Programmes considered

In order to address growth of the Mangere area and the problems this creates, five programmes were developed for the Mt Roskill area. All programme options are compared against a Do-minimum programme. For the Mangere area, the Do-Minimum programme includes the light rail project and an increase in bus services on a number of corridors as a result of increases to people living in the area.

Table 3-33 provides a brief overview of programmes considered and the relative cost of each programme option. Appendix D provides maps of all programme options considered.

Table 3-33: Mangere area programmes considered

Programme	Description	Indicative cost[14]
Do Minimum	Light Rail project assumed in place Increases to peak hour bus services	-
Programme A – Development requirements	A package of improvements reflective of development requirements identified in the ITA.	$320M
Programme B – Access to the RTN	A focus on improvements providing access to the RTN via both active mode and bus services.	$545M
Programme C – Local access	A focus on improvements for both active mode and bus services into centres including Mangere Town centre, Mangere east and Middlemore.	$482M
Programme D – Hybrid value for money	A focus on value for money with improvements to portions of the network forecast to have the worst levels of delay. Given the value for money focus, the programme favours lower cost interventions on several corridors.	$370M
Programme E – High PT investment	A focus on improvements to Public transport provisions. The package focuses on higher quality interventions with a number of future FTN routes upgraded for buses.	$637M

3.14.4 Programme assessment

Each programme has been assessed against the MCA framework. All options are scored in relatively to the Do-Minimum programme. Table 3-34 summarises the assessment of programmes against the MCA framework.

Table 3-34: Mangere Programme assessment

Criteria	Definition	Do Minimum	Programme A - ITA	Programme B - Access to the RTN	Programme C - Local access	Programme D - Value for money focus	Programme E - High PT

[14] Includes some costs of projects part of other programmes

Investment		Investment					
Benefits	Impact on Mode choice	0	2	2	2	2	3
	Impact on Greenhouse gas emissions	0	2	2	2	2	3
	Impact on social cost of deaths and serious injuries	0	2	2	2	2	2
	Impact on perceptions of safety and security	0	1	2	2	2	2
	Impact on access to opportunities	0	2	2	2	1	3
	Changes in liveability of places	0	1	2	2	1	2
	Changes in Te Ao Maori values	0	1	2	2	1	2
	Impact on community cohesion	0	1	2	2	1	2
Achievability	Technical	0	-2	-2	-2	-1	-3
	Consentability	0	-2	-2	-2	-1	-3
Affordability	Funding availability and ability to get additional funding (if needed)	0	-1	-2	-2	-1	-3
	Value for money	0	1	2	1	2	1
Opportunities and Impacts		Opportunities and Impacts					
Environmental Effects	Landscape / visual	0	0	0	0	0	0
	Water Quality/Stormwater	0	-1	-1	-1	-1	-2
	Ecology	0	-1	-1	-1	-1	-1
	Natural Hazards	0	0	0	0	0	0
	Cultural & historic heritage	0	0	0	0	0	0
Social and community	Urban design	0	1	2	2	1	2
	Human Health and Wellbeing	0	1	2	2	1	2
	Reputation	0	0	-1	-1	0	-2
Climate change adaption and mitigation (based on MfE guides 2017/18)		0	2	2	2	2	3
Property Impacts		0	-1	-2	-2	-1	-3
Cumulative Impacts		0	0	0	0	0	0

3.14.5 Recommended programme options

With the Mangere Area, the recommended option identified is **Programme B – Access to the RTN.** Table 3-35 below sets out what were considered the key differentiating factors which lead the project team to identify this programme as the recommended programme.

Table 3-35: Recommended programme rationale

MCA criteria	Rationale
Benefits	**Mode shift:** Programme E provides the highest level of mode share with high quality upgrades for PT (particularly on Buckland / Massey) and active modes over the majority of the area. Programmes A, B, C and D provides a similar level of benefits, but a reduced mode shift compared with Programme E. **Safety:** All programme have been scored similarly against safety, while Programme A scores worse against perceived safety due to a reduced level of active mode provision. **Integration:** Within the Mangere area, the integration score was differentiated by programmes ability to address severance. Programmes A and D, while providing some benefits, failed to address severance in Favona hence scored lower than programmes B, C and E. **Access:** Programme E provides the highest score against the accessibility criteria providing the best access to economic opportunities. Programmes A,B and C all provide moderate benefits. Programme D provided the lowest level of benefits due to a reduced PT provision. Programme B provide a high level of benefits, with only Programme E providing an increased level of mode share and access for a significant increase in investment.
Achievability	Programme B is considered similar to Programme A and C from an achievability perspective. Programme B has less challenges than higher investment packages such as Programme E.
Affordability	Programme B represents a significant increase in investment over Programme A. Programme is more affordable than Programme E. From a value for money, both Programme B and D are considered to provide the highest value for money. **High Level BCR assessment:** Programme A and C – BCR of less than 1. Programme B and D – BCR of 0.5-1.5
Environmental effects	All options result in a similar level of environmental effects with the exception of Programme E which is likely to lead to a slight increase.
Social and Community	Programme B is expected to deliver well against the social and community criteria.
Impacts	Programme B provide moderate climate change benefits and moderate property impacts.

Table 3-36 sets out the projects included within the recommended programme for the Mangere area. Figure 3-17 sets out a plan of the recommended projects.

Table 3-36: Recommended programme project details for Mangere

Reference number	Intervention	Scope of proposed upgrade	Included in another programme / project ?
1	Bader Drive / Robertson Road intersection upgrade	Intersection upgrade	No
2	Mckenzie Road / Coronation Road / SH20 Interchange intersection upgrade	Intersection upgrade	No
3b1	Massey Road Bus Priority road upgrade for bus lanes	Bus priority + active modes	Connected Communities
3b2	Buckland Road / Bader Drive / Bus Priority road upgrade for bus lanes	Bus priority + active modes	No
4	Massey Road / Buckland Road intersection upgrade	Intersection upgrade	Connected Communities
5	Massey Road / Tennesse Avenue intersection upgrade	Intersection upgrade	No
6	Walmsley Road / McKenzie Road / Miller Road intersection upgrade	Intersection upgrade	No
7	Robertson Road kerb realignment	Collector Road upgrade	No
8	Walmsley Road / Kaka Road intersection upgrade	Intersection upgrade	No
9	Kirkbride Road / Westney Road / Jordan Road intersection upgrade	Intersection upgrade	No
10	Massey Road / Thomas Road intersection upgrade	Intersection upgrade	No
11	Massey Road / Mascot Avenue intersection upgrade	Intersection upgrade	No
12	Kirkbride Road / Ascot Road intersection upgrade	Intersection upgrade	Mangere cycling improvements project
13	Richard Pearse Drive / Ascot Road intersection upgrade	Intersection upgrade	No
14	Massey Road / Gray Avenue intersection upgrade	Intersection upgrade	No
15	Favona Road / James Fletcher Drive to provide cycle lane arterials	Collector Road upgrade with separated cycle facilities	No
16	Savill Drive upgrade	LATM	No
17	Walmsley Road / Robertson Road / Market Cove access intersection upgrade	Intersection upgrade	No
18	SH20 / Walmsley Road Interchange intersection upgrade	Intersection upgrade	No

19	Bader Drive / McKenzie Road intersection upgrade	Intersection upgrade	Mangere cycling improvements project
20	Massey Road / Robertson Road / Henwood Road intersection upgrade	Intersection upgrade	ITA - could also be part of connected community work
21	State Highway 20 and SH20A cycle lanes	Strategic cycling facility on SH20/SH20A	**20 Connect**
22	Mangere light rail	Separate LRT project	**Separate project**
23	Middlemore Rail Station Upgrade	Rail station upgrades to facilities and platforms	**Existing project (22100061) Existing projects to improve security and provide staff facilities (10100051)**
24	Middlemore rail crossing new	New pedestrian / cycle crossing between Grey and Swaffield	**No**
25	Jordan Road	LATM	**Mangere cycling improvements project**
26	Idlewild Avenue	Active mode upgrade	**No**
27	Mangere Centre park link	Active mode facility	**Mangere cycling improvements project**
28	Kirkbride / Mackenzie active mode upgrade	Active mode upgrade	**Mangere cycling improvements project**
29	Wakefield and Gadsby	LATM	**No**
30	Harania Marys Foreshore path	Active mode facility	**No**
31	Lenore Foreshore path	Active mode facility	**No**
32	Wickman Way	LATM	**No**
33	Tennessee Avenue	LATM	**No**
34	Vine Street	LATM	**No**
35	Grey Avenue	LATM	**No**
36	Buckland Road (south of Massey)	Active mode upgrade	**No**
		PT upgrade - bus lanes	**Connected Communities**
37	Hospital Road	Active mode upgrade - no kerbs moved	**No**
38	Walmsley Road PT priority	Bus priority measures and interchange with rail station	**No**
39	Middlemore western bus interchange	Bus stops / station access from western side	**No**
41	Garus to Bukem Active mode link	Active mode link	**No**
42	Garus Avenue	LATM	**No**

49	Bader Drive active modes	Active mode upgrade	STAAI - Mangere Cycling Project (12100062a,b,c)
N/A	Friesian Drive kerb realignment	Collector road upgrade	**No**
N/A	Ashgrove Road kerb realignment	Collector road upgrade	**No**
N/A	Mountain Road collector road upgrade	Collector road upgrade	**No**
N/A	McKinstry Avenue kerb realignment	Collector road upgrade	**No**
N/A	Aorere - Local neighbourhood roading asset renewal and upgrades	Package of local road upgrades	**No**
N/A	Middlemore Crescent - Local neighbourhood roading asset renewal and upgrades	Package of local road upgrades	**No**
N/A	Mangere East - Local neighbourhood roading asset renewal and upgrades	Package of local road upgrades	**No**
N/A	Mangere West - Local neighbourhood roading asset renewal and upgrades	Package of local road upgrades	**No**

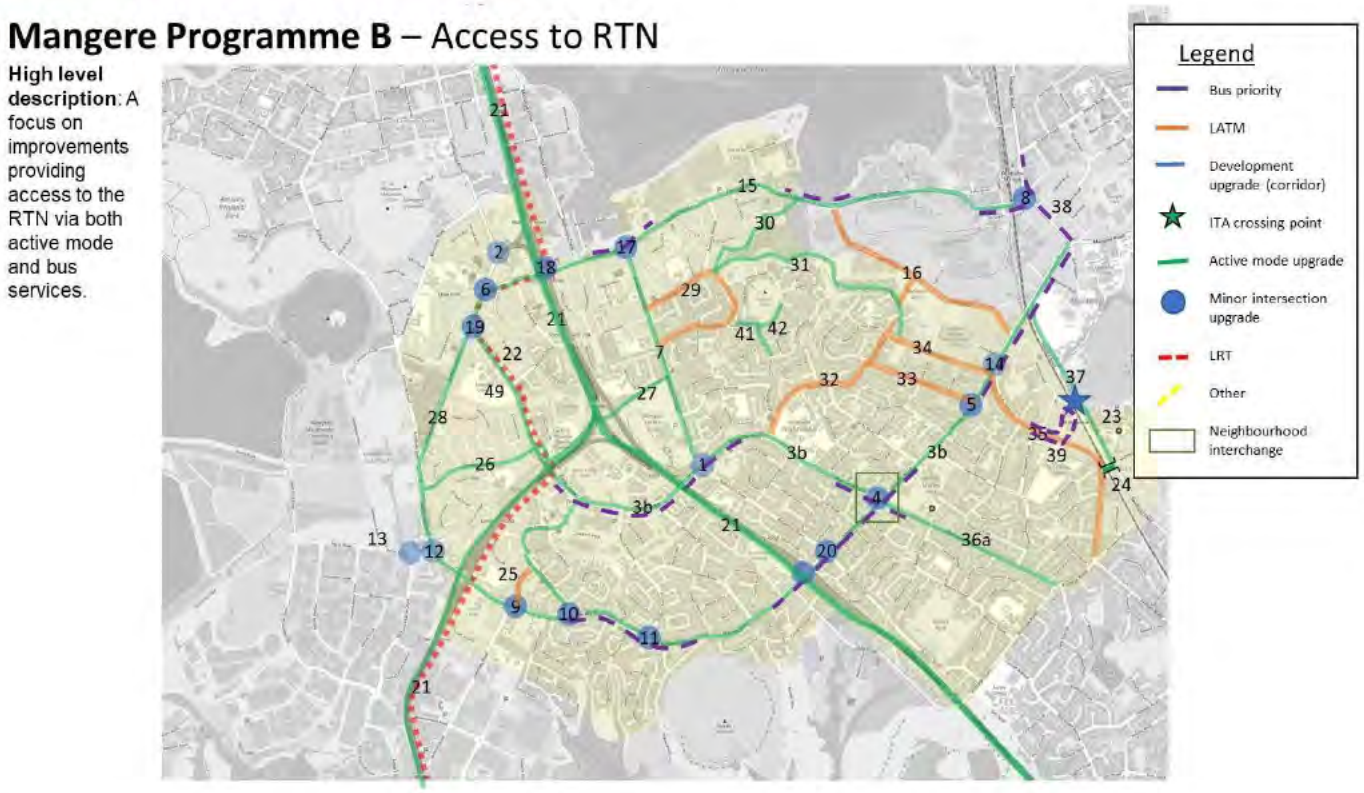
The recommended package of investment is largely consistent with the ITA assessment undertaken for Mangere and projects identified through this process. Some additional projects have been added to better deliver on the investment objectives.

The following projects have not been included or have changed in scope from the ITA recommendations:

- Savill Drive was identified for upgrade as a collector road. Through the business case this was identified for a lower cost LATM treatment as the route is unlikely to attract high volumes of pedestrians and cyclists and requires road space to serve industrial activity.
- Jordan Road was identified for upgrade as part of the ITA. The business case recommends LATM on this link due to constraints and limited road space available.
- Massey Road and Buckland Road – The ITA identified the whole corridor for upgrade including bus priority. The BC has identified sections of the corridor requiring bus priority while upgrades on other sections to focus on walking and cycling.

A summary of do minimum assumptions, developer requirements (from the ITA), additional projects recommended, and the recommended programme is included in Appendix E.

Figure 3-17: Mangere Recommended programme



3.14.6 Summary for Mangere

The recommended programme for Mangere is summarised in Table 3-37.

Table 3-37: Mangere recommended programme

Attribute	Summary
Programme Cost	• Capital cost of $334M (undiscounted, no escalation) • A change from $545m in Table 3.33 due to value engineering and allocating some projects to other delivery programmes (avoid double counting) • Operational cost: $14.6 per annum • Benefits: $210.6 (discounted 40 year) • BCR: 1.0
Addressing problem causes **(Problem cause – Programme response)**	***Lack of cycling facilities and deficient walking network*** – A significant number of corridors upgraded with separated walking and cycling facilities ***The user experience on public transport does not meet expectations*** – Improvements to PT including prioritisation on the FTN route on Massey Road / Buckland Road. Improved connections to Middlemore station. ***Inappropriate form and function of existing streets*** – A number of Collector and arterial road corridors upgraded to support growth. ***Motorways and the rail corridor act as barriers to active mode and PT trips*** – Upgrades to a number of the existing crossing points of the Stat Highway network. An additional crossing of the Rail corridor proposed. ***The transport network, in particular active modes and PT are unable to cater with expected demand from the growth*** – Upgrades to active

	mode and PT provision to enable a step change in Mode share for the area. ***Opportunities to travel by public transport are limited to some destinations, and from some areas of Mangere –*** Improved PT provision including FTN, connection to the Southern Rail line and connection into the future ALR project. ***Active mode connections to key destinations are poor*** – Improved active mode connection to Mangere Town centre, The Middlemore Hospital, RTN network and to the airport. ***The local street network in Mangere lacks permeability, especially in Mangere East/Favona*** – Improved local road permeability including additional connectivity in Favona, crossings of the rail corridor.
Programme Outcomes	• Reduction of 216 DSI's over 40 years • Mode share of 18% for active modes • 10% more jobs and social opportunities assessable by cycling and PT • 17,000 ton reduction in CO2 emissions per year
Key risks and dependencies	**Light Rail** – The light rail project has a significant impact to both the transport network and land use in the Mangere. The programme has been developed with the LRT project assumed to be in place. Any changes to this, will require review of the transport response and land use. **Other projects** – The connected communities programme includes a number of key corridors through the Mt Roskill development area. The primary risk around these corridors is co-ordination around implementation timeframes. Development in the various Mt Roskill neighbourhood will act as a key catalyst to upgrades identified for these corridor upgrades.

3.15 Option development

Following the identification of recommended programmes in each of the study areas, further option development has been undertaken:

- To provide greater cost certainty on the selected options
- Sense check the banded rates used to cost all other options

Of the 236 options included in the recommended programmes for each area, 12 options were selected for further investigation intended to provide a representative sample of the various banded rates used to cost other options. These include:

- Mount Albert Road upgrade
- Apirana Avenue collector road upgrade
- Apirana Avenue PT mall
- Lake Road / Raleigh Road intersection upgrade
- Mt Smart Road / Station Road upgrade

- Station Road shared path
- Line Road collector upgrade
- Walmsley Street upgrade

For each of the above, indicative cross sections or concept level intersection layouts were developed. A cost estimator then prepared a IBE level cost estimate based on the information and scope provided. Detail on the scope and cost estimates has been provided in Appendix E.

***Example**: Concept level design for the Station Road shared path*

Table 3-38 provides a comparison of banded rate cost estimate for each project against the IBE estimate. Given the level of detail in scope, the IBE P95 cost with administration fees has been compared.

Table 3-38: Banded rate vs IBE estimate

Project	Cost	IBE description	P95 + 5 % admin	Accuracy %
Mount Albert Road upgrades to arterials	28,925,000	Mt Albert Road Section A	$17,293,769	75%
		Mt Albert Road Section B	$4,264,634	

		Total	$21,558,403	
Apirana Avenue	7,565,000	Apirana Avenue upgrade	$6,168,503	82%
Apirana Avenue PT mall	6,600,000	Apirana Avenue PT mall	$2,867,662	43%
Lake Road / Raleigh Road intersection	1,000,000	Lake Road / Raleigh Road intersection	$723,820	72%
Mt Smart Road / Station Road	1,000,000	Mt Smart / Station Road	$727,707	73%
Station Road shared path	4,340,000	Station Road	$2,311,150	53%
Line Road collector road upgrade	4,895,000	Line Road upgrade	$3,250,061	66%
Walmsley Street upgrade	15,575,000	Favona Road section	$3,220,231	107%
		Walmsley section	$13,444,100	
		Total	$16,664,332	

The IBE estimates are generally lower than the banded rates used to estimate projects at an average of 24% lower. This demonstrates a level of conservatism built into the banded rates used to estimate project cost.

Given the level of detail available at this time, the banded rates used in the assessment of programme cost has been maintained despite the IBE estimates coming in roughly 76% of the unit rate method used to cost the programme. This is considered appropriate for the following reasons:

- Scope of options is yet to be determined in detail. This will be developed in the next phase and could lead to changes in cost.
- The programme covers a significant time frame with options spread over the next 25 years. Standards for transport infrastructure are expected to change over this period. History suggests changes in standards increase project cost over time.

4 Recommended Programme

The following section sets the recommended programme for each of the five areas. The recommended programme is summarised with regard to:

- Cost
- Outcomes achieved
- Non monetised benefits
- Monetised benefits
- Risks and dependencies
- Staging
- Prioritisation of projects
- Project pathways

4.1 Cost

Bringing together the five areas, at the overall programme level, investment in the transport network to support Brownfields Growth is a considerable investment in the order of $1.02B required over the next 20 years.

The total costs across the five areas are summarised in the Table 4-1.

Table 4-1: Costs for recommended programme in each area

Area	Total Cost (excluding projects in other programmes)	Cost 1-3 years	Cost 4-6 years	Cost 7-10 years	Cost 10 years +
Oranga	$34,172,500	$23,632,500	$10,540,000	$0	$0
Northcote	$36,670,000	$4,200,000	$26,520,000	$5,950,000	$0
Mt Roskill	$273,373,851	$71,837,440	$72,799,533	$80,377,539	$48,359,338
Tamaki	$355,910,887	$126,940,475	$129,382,043	$82,486,368	$17,102,000
Mangere	$333,626,989	$52,941,651	$145,272,457	$98,312,882	$37,100,000
Total	$1,033,754,227	$279,552,066	$384,514,033	$267,126,789	$102,561,338

4.2 Outcomes

The outcomes of the recommended programme have been assessed using the Waka Kotahi Appraisal Summary Table and measures identified in the ILM (Table 4-2).

Table 4-2: Appraisal Summary Table

Summary Description			
Option Name	Kāinga Ora Brownfields Business Case	**Date and Appraisal Period**	Apr-21 Appraisal period – 2021-2061
Problem/ opportunity statement	**Problem 1** – Existing deficiency in the transport system and an inability to keep pace with increasing travel demand from (permitted and planned) growth is limiting improved and equitable access to employment and social opportunities **Problem 2** - A lack of competitive travel options and high car dependency as the city grows (from planned and permitted growth) is limiting the ability to achieve the quality compact urban approach for Auckland **Problem 3** - The transport system has become increasingly harmful and does not support better health outcomes for users or the environment	**Investment objectives**	**Objective 1** – Enabling & supporting Auckland's growth and the quality compact urban approach **Objective 2** – Accelerating better travel choices for Aucklanders **Objective 3** – Better connecting people, places, goods and services
How it gives effect to the GSP	The incoming 2021 GPS supports a more mode neutral and results focused approach, enabling GPS investments to be funded from more than one activity class to provide the best transport solution. The Brownfield programme fit for incoming urbanisation will deliver well on three of the strategic priorities, being Safety, Better Travel options and Climate Change. There is also an expectation of investments to support Government commitments to ATAP and the Road to Zero.	**How the project gives effect to local community outcomes**	The Business Case covers four Local Board areas, of which each have their own outcomes. Outcomes across the Local Boards have consistent themes. The themes which this project gives effect to include:1. Inclusive, diverse communities that are active, healthy and connected. This project provides facilities that connect people to destinations, encourages walking and cycling which in turn improves health.2. Transport choices are accessible, sustainable, and safe. The project delivers transport choices to each of the neighbourhoods, providing the facilities that encourage people to get out of private vehicles and using more sustainable transport modes. At the centre of the upgrades is safety, which will be the focus of all interventions.3. Infrastructure is future-proofed and neighbourhoods are well planned. The Business Case has considered the short and long term requirements of each neighbourhood, while ensuring the delivery of infrastructure meets the needs of short, medium and long term network requirements.4. Providing vibrant places and spaces. The Business Case delivers neighbourhood interchanges and connections that provide access to active mode facilities.
Transport Outcomes Name of Benefit	**Non-Monetised Impact** (description in numerical or narrative terms, e.g., number of crashes)		**Monetised Impact** (description in dollar terms in real terms, non-discounted)

	Name of Measure (The quantitative or qualitative measure as per the Benefits Framework)	Baseline Situation (status quo or measure at year zero of the appraisal period)	Do Minimum Impact (forecast of expected change over time, should the option not be implemented)	Preferred Option Impact (forecast of expected change over time, should the option be implemented)	Do Minimum Impact (expected change over time, should the option not be implemented)	Option Impact (in absolute terms, to allow comparison with the Do Minimum)
Healthy & safe people *(add or delete as appropriate)*						
1.1 Impact on social cost and incidents of crashes	1.1.3 Number of death and serious injuries *(Quantitative)*	5 Year Crash History (CAS) and Annual DSIs1. Tamaki = 38 DSIs / 7.6 annually2. Roskill = 113 DSIs / 22.6 annually3. Oranga = 6 DSIs / 1.2 annually4. Mangere = 119 DSIs / 23.8 annually5. Northcote = 6 DSIs / 1.2 annuallyTOTAL Annual DSIs = 5643% of DSIs involve vulnerable road users.	DSIs will remain similar to that currently observed but may increase. Exposure will increase, particularly for vulnerable road users, but education and safer vehicles may counterbalance that increase for some crash types.	Reduction in DSIs (40% - 2020-2030 Road Safety Strategy target) 1. Tamaki = 7.6 annually 2. Roskill = 7.9 annually 3. Oranga = 1.8 annually 4. Mangere = 5.4 annually5. Northcote = 0.8 annuallyTOTAL Annual DSIs = 23	Crash costs have been calculated on a benefit basis. As such, there is no Do Minimum $value	Annual Safety Benefit value. $value has not been extrapolated or discounted1. Tamaki = $3,109,0002. Roskill = $3,813,0003. Oranga = $1,318,0004. Mangere = $2,805,0005. Northcote = $619,000
2.1 Impacts on perceptions of safety and security	2.1.1 Perception of safety and ease of walking and cycling*(Qualitative)*	Walking generally relies on footpaths with pram crossings at intersection or midblock. Limited dedicated cycle facilities exist, with on road facilities not being protected	With the increase in population and households about each KO area, poor perceptions would continue, resulting in car dominated neighbourhoods and poor active mode uptake	Providing connected walking and cycling networks and corridors where walking and cycling interventions provide safe, dedicated facilities will encourage uptake in active mode use, as will new footpaths through green space. The more people walking and cycling will also have a positive security outcome by having more people about.	N/A	N/A
3.1 Impact of mode on physical and mental health	3.1.1 Physical health benefits from active modes *(Quantitative)*	Existing Mode Share - Active Modes 1. Tamaki = 14% 2. Roskill = 12% 3. Oranga = 13% 4. Mangere = 11% 5. Northcote = 14%	Not Assessed - based on forecast analysis which considers benefit stream only according to the economic methodology	Estimated long term Mode Share - Active Modes 1. Tamaki = 22% 2. Roskill = 22% 3. Oranga = 17% 4. Mangere = 18% 5. Northcote = 25%	N/A	Annual Health Benefit value. $value has not been extrapolated or discounted 1. Tamaki = $3,476,000 2. Roskill = $4,602,000 3. Oranga = $1,744,000 4. Mangere = $4,259,000 5. Northcote = $1,169,000
Economic Prosperity *(add or delete as appropriate)*						

5.1 Impact on system reliability	5.1.1 Punctuality - public transport. Percentage of scheduled service trips between 59 seconds before and 4 minutes 59 seconds after the scheduled departure time of selected point *(Qualitative)*	The baseline is as it is today where buses generally mix with traffic along the corridors that pass through the Kāinga Ora neighbourhoods.	The impact of not providing priority facilities for buses operating along FTN corridors will be low uptake in public transport and an over reliance on private vehicle travel.	It is essential that high volume bus corridors that serve large populations provide frequent, reliable and an attractive experience. Doing so will encourage people to shift to public transport, therefore reducing the reliance on private vehicle travel and provide a more efficient transport system.	N/A	N/A
5.2 Impact on network productivity and utilisation	5.2.6 Access to key economic destinations (all modes). Proportion of population living within thresholds of key social and economic opportunities by different modes in the morning peak. *(Quantitative)*		This metric has been assessed using mapping of the Do Minimum cycle and public transport network and the forecast 2038 population. **MODE: CYCLE**1. 15-minute cycle of healthcare - 342,000 people (**Map 1**)2. 15-minute cycle of schools - 35,400 children aged 5-18 (**Map 2**)3. 15-minute cycle from major employment centres - 645,800 worker population (**Map 3**)**MODE: PUBLIC TRANSPORT**4. 15 minutes on PT from healthcare - 464,300 people (**Map 4**)5. 15 minutes on PT from schools - 71,950 children aged 5-18 (**Map 5**)6. 15 minutes on PT from major employment centres - 933,950 people (**Map 6**)	This metric has been assessed using mapping of the Do Minimum cycle and public transport network and the forecast 2038 population. **MODE: CYCLE**1. 15-minute cycle of healthcare - 375,200 people (**Map 1**)2. 15-minute cycle of schools - 42,400 children aged 5-18 (**Map 2**)3. 15-minute cycle from major employment centres - 697,500 worker population (**Map 3**) **MODE: PUBLIC TRANSPORT**4. 15 minutes on PT from healthcare - 483,350 (10% improvement) - 506,500 (30% improvement) people (**Map 4**)5. 15 minutes on PT from schools - 74,000 (10% improvement) - 75,850 (30% improvement) children aged 5-18 (**Map 5**)6. 15 minutes on PT from major employment centres - 938,100 (10% improvement) - 945,400 (30% improvement) people (**Map 6**)	N/A	N/A
Environmental Sustainability *(add or delete as appropriate)*						

8.1 Impact on greenhouse gas emissions (mandatory)	8.1.1 CO2 Emissions - Tonnes of CO2 equivalents omitted. *(Quantitative)*	The baseline is as it is today, with increasing travel demands offset by future uptake of electric vehicles.	Not Assessed - based on forecast analysis which considers benefit stream only according to the economic methodology	Reduction in CO2 emissions in 2038: 1. Tamaki = 7,600 tonnes/year 2. Roskill = 22,600 tonnes/year 3. Oranga = 600 tonnes/year 4. Mangere = 17,000 tonnes/year 5. Northcote = 1,900 tonnes/year **50,000 tonnes/year total**	N/A	Annual 2038 CO2 Reduction Benefit value. $value has not been extrapolated or discounted 1. Tamaki = $499,000 2. Roskill = $1,481,000 3. Oranga = $1,744,000 4. Mangere = $1,126,000 5. Northcote = $127,000
	8.1.2 Mode Shift from single occupancy private vehicle. *(Quantitative)*	Existing Mode Share - Car Driver 1. Tamaki = 48% 2. Roskill = 50% 3. Oranga = 48% 4. Mangere = 51% 5. Northcote = 51%	Not Assessed - based on forecast analysis which considers benefit stream only according to the economic methodology	Estimated long term Mode Share - Car Driver 1. Tamaki = 34% 2. Roskill = 34% 3. Oranga = 40% 4. Mangere = 35% 5. Northcote = 33%	N/A	Not explicitly assessed, but Mode Shift Benefits make up the majority of the programme's active travel and public transport benefits. Annual Active & PT Benefit value. $value has not been extrapolated or discounted 1. Tamaki = $7,387,000 2. Roskill = $7,602,000 3. Oranga = $1,809,000 4. Mangere = $6,689,000 5. Northcote = $1,303,000
Inclusive Access *(add or delete as appropriate)*						
10.1 Impact on user experience of the transport system	10.1.1 People - throughput of cyclists *(Quantitative)*	17,500 daily cycle trips across the region in the Auckland Cycle Model base year (2016)	36,200 daily cycle trips across the region in the Auckland Cycle Model without KO investment programme (2028)	43,400 daily cycle trips across the region in the Auckland Cycle Model with KO investment programme (2028)	N/A	N/A
	2.1.1 (Repeat) Perception of safety and ease of walking and cycling*(Quantitative)*	Walking generally relies on footpaths with pram crossings at intersection or midblock. Limited dedicated cycle facilities exist, with on road facilities not being protected	With the increase in population and households about each KO area, poor perceptions would continue, resulting in car dominated neighbourhoods and poor active mode uptake	Providing connected walking and cycling networks and corridors where walking and cycling interventions provide safe, dedicated facilities will encourage uptake in active mode use. The more people walking and cycling will also have a positive security outcome by having more people about.	N/A	N/A

	10.1.9 Travel Time - General Road Users *(Quantitative)*	Not Assessed - based on forecast analysis which considers benefit stream only according to the economic methodology	Not Assessed - based on forecast analysis which considers benefit stream only according to the economic methodology	General road user benefits have been assessed based on the economic assessment framework. Interventions were based on Low (5 sec), Medium (10 sec) and High (20 sec) improvements being achieved.	N/A	Annual Benefit value. $value has not been extrapolated or discounted 1. Tamaki = $522,000 2. Roskill = $213,000 3. Oranga = $71,000 4. Mangere = $1,114,000 5. Northcote = $0
	10.1.9 Travel Time - Public Transport Users *(Quantitative)*	Not Assessed - based on forecast analysis which considers benefit stream only according to the economic methodology	Not Assessed - based on forecast analysis which considers benefit stream only according to the economic methodology	Public Transport user benefits have been assessed based on the economic assessment framework. Interventions were based on bus travel time savings of Low (5 sec), Medium (10 sec) and High (30 sec) improvements being achieved on FTN corridors.	N/A	Annual Benefit value. $value has not been extrapolated or discounted 1. Tamaki = $580,000 2. Roskill = $619,000 3. Oranga = $43,000 4. Mangere = $188,000 5. Northcote = $79,000 (excludes neighbourhood interchange benefits)
10.2 Impact on mode choice	10.2.4 Number of people living within 500m of a high-quality cycling facility *(Quantitative)*	Assessed for the forecast scenario only.	This metric has been assessed using mapping of the Do Minimum cycle network and the forecast 2038 population. Refer to **Map 7**. The population is assessed to be 876,500 people	This metric has been assessed using mapping of the Do Minimum cycle network and the forecast 2038 population. Refer to **Map 7**. The population is assessed to be 962,900 people	N/A	N/A
	10.2.5 Number of employees within 1km from a rail of bus rapid transit station *(Quantitative)*	Not Assessed	Not Assessed	Not Assessed	N/A	N/A
	10.2.6 Number of people within 1km from a rail or bus rapid transit station *(Quantitative)*	This metric has been assessed using mapping of the rail and bus rapid transit stations and the MSM 2018 population. Refer to **Map 8**. The population is assessed to be 294,200 people	Not Assessed	This metric has been assessed using mapping of the rail and bus rapid transit stations and the MSM 2038 population. Refer to **Map 8**. The population is assessed to be 432,700 people	N/A	N/A
Māori Culture						

12.1 Impact on Te Ao Māori (mandatory)		The Local Boards covering the Brownfields Business Case are all located in areas of ethnic diversity, of which exists across Auckland. The Local Boards support activities to increase inter-cultural connections and will promote places and spaces for people to interact safely.		From a transport perspective, this Business Case assists with achieving the Local Board outcomes. The Otara_Papakura Local Board which covers Mangere for example want to help their community with active pursuits, with the challenges in doing this however being the need to overcome the perception that the area is not safe, and reducing constraints for those facing greater challenges around accessibility, such as older people and those with less financial means making them more likely to be socially excluded. Improving accessibility and safety is an outcome of the Business Case as demonstrated in the metrics summarised above.		

1. Summary of Non-Monetised benefits (Descriptive)	**2. Summary of Financial Impacts** (Total dollars in nominal, non-discounted terms – provided for context only ahead of financial case)		**3. Summary of Monetised Option benefits and costs** (Real, Present Value terms, relative to the Do Minimum)	
Quantitative benefits which have been monetised focus on safety, walking and cycling, public transport and general vehicle capacity improvements. Walking and cycling benefits provide the largest benefits. Followed by safety, public transport, and then general road users. Quantitative benefits have also been assessed using accessibility mapping. The mapping shows that the project increases the population within the 15-minute time threshold used for assessing employment, social destinations such as hospitals and schools for cycling and public transport. *Qualitative benefits such as perception of safety and ease of walking and cycling and punctuality of public transport services have been assessed to improve in response to the Business Case. The interventions proposed focus on improving active mode and public transport facilities about the key corridors within each neighbourhood.*	**Capital Costs**	Total discounted Costs - 40-year evaluation period 1. Tamaki = $211.9 Million 2. Roskill = $176.7 Million 3. Oranga = $36.1 Million 4. Mangere = $207.0 Million 5. Northcote = $31.9 Million **Programme = $663.7 Million**	**Total monetised benefits, <u>excluding</u> Wider Economic Benefits (WEBs)**	Total discounted benefit - 40 year evaluation period 1. Tamaki = $212.1 Million 2. Roskill = $223.8 Million 3. Oranga = $62.9 Million 4. Mangere = $210.6 Million 5. Northcote = $37.2 Million **Programme = $746.6 Million**
			Total monetised benefits, <u>including</u> Wider Economic Benefits (WEBS)	Not Assessed

	Operating Costs	Not Assessed	**Total monetised costs**	Total discounted Costs - 40 year evaluation period 1. Tamaki = $211.9 Million 2. Roskill = $176.7 Million 3. Oranga = $36.1 Million 4. Mangere = $207.0 Million 5. Northcote = $31.9 Million **Programme = $663.7 Million**
			BCR (excluding WEBs)	Benefit Cost Ratio 1. Tamaki = 1.0 2. Roskill = 1.3 3. Oranga = 1.7 4. Mangere = 1.0 5. Northcote = 1.2 **Programme = 1.1**
	Total Financial Costs	Total discounted Costs - 40 year evaluation period 1. Tamaki = $211.9 Million 2. Roskill = $176.7 Million 3. Oranga = $36.1 Million 4. Mangere = $207.0 Million 5. Northcote = $31.9 Million **Programme = $663.7 Million**	**BCR (including WEBs)**	Not Assessed
Rationale for selecting preferred option *The preferred option has been chosen by following the Business Case process. Long List and short listed options were developed and assessed, including workshops with key stakeholders. Through a multi criteria analysis (MCA), the preferred option was identified, with this option then being assessed in greater detail.*				

4.3 Benefits

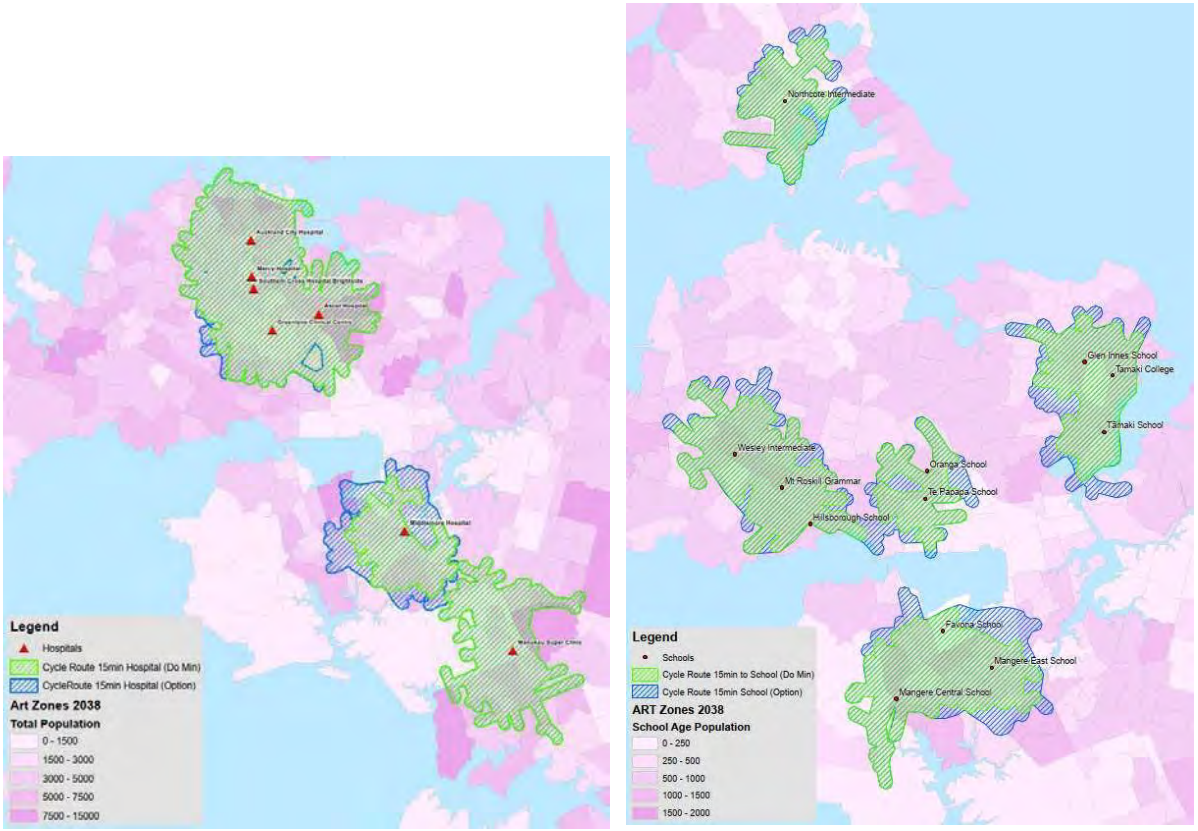
The key outcomes from the programme can be summarised as follows:

- A reduction in deaths and serious injuries – Annual reduction of 56 DSI per year across the programme
- A step change in mode share for active modes and public transport with a 10-20% reduction in car mode share.
- Increases in accessibility for Public Transport, Walking and cycling within development areas particularly at the local level, i.e., accessibility to jobs and social facilities within 15min walk and cycle.
- More people living within 500m of a high-quality cycle facility (extra 90,000 people) or Rapid Transit station (extra 140,000 people across the region[15]).

Figure 4-1 and Figure 4-2 outline the accessibility to social facilities and employment centres within a 15-minute cycle journey. The recommended network provides noticeable improvements in a number of the growth areas, expanding catchments which will provide travel options to more people.

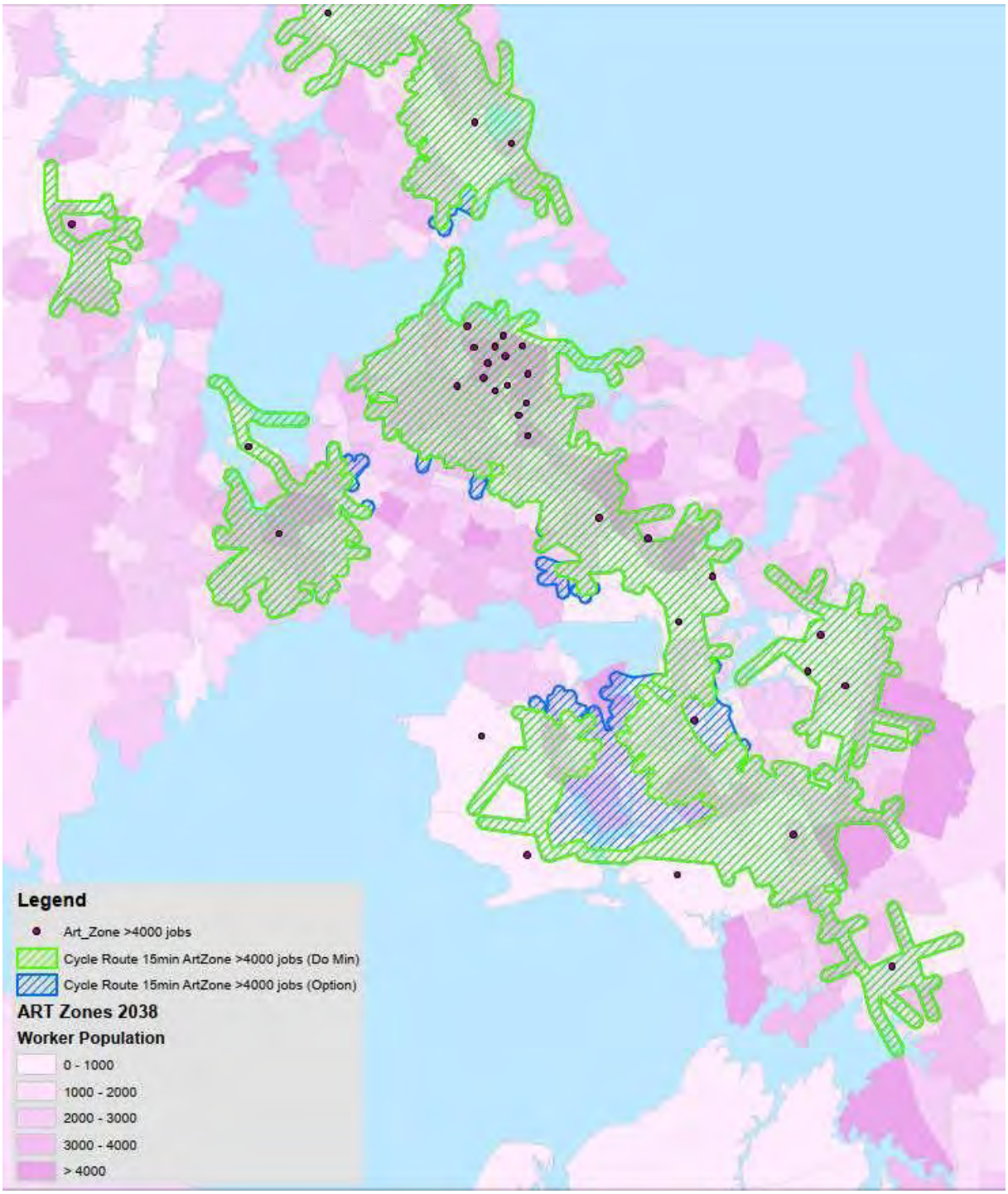
Cycle access to employment is generally dependant on proximity to an employment centre. Northcote, Mangere and Oranga have local employment centre accessible by bike and benefits associated with the recommended programme. While Tamaki and Mt Roskill do not show accessibility by bike, there are a number of smaller employment nodes throughout the surrounding area which are not picked up in this assessment.

Figure 4-1: Access to Hospitals and Schools by cycling



[15] Excludes influence of LRT project.

Figure 4-2: Accessibility to employment centres by cycling



Public transport accessibility is assessed in Figure 4-3 and Figure 4-4. Access to hospital by PT sees some improvements with more of the Mangere and Mt Roskill areas within a 15min public transport catchment as a result of the programme. With respect to schools, all five study areas show a strong level of connectivity via PT.

Access to employment centres via a 15minute PT journey sees some minor change as a result of the preferred programme but enhancements are generally focused on providing additional capacity to existing services rather than provision of new routes.

Figure 4-3: Accessibility to hospitals and schools by PT

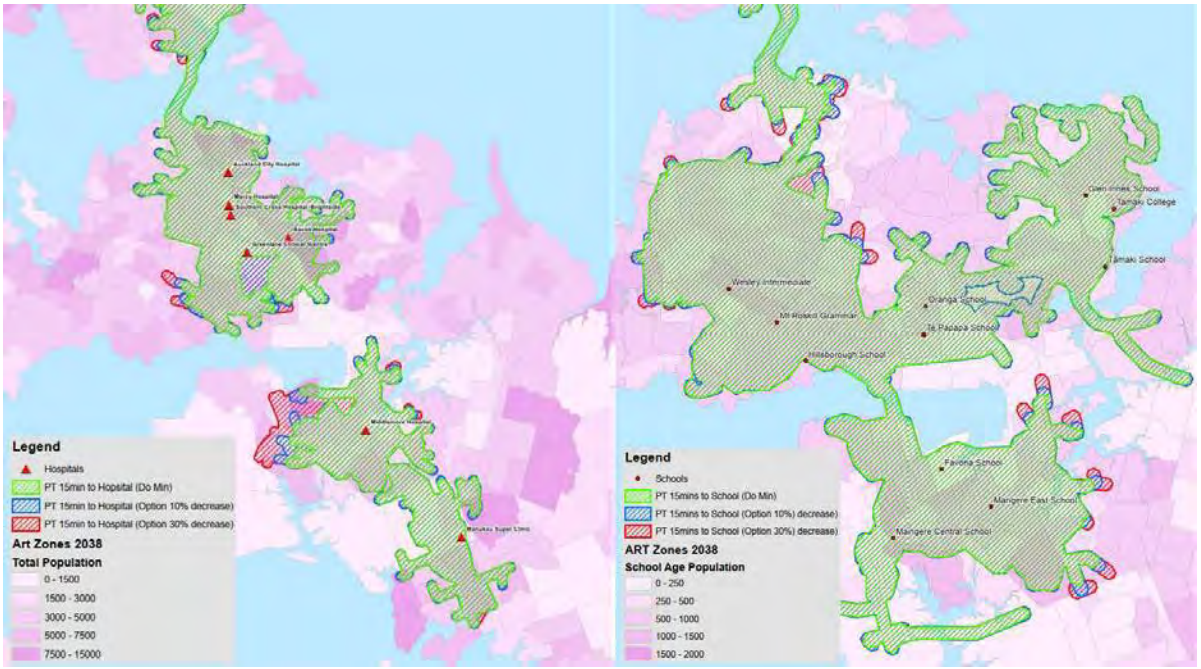
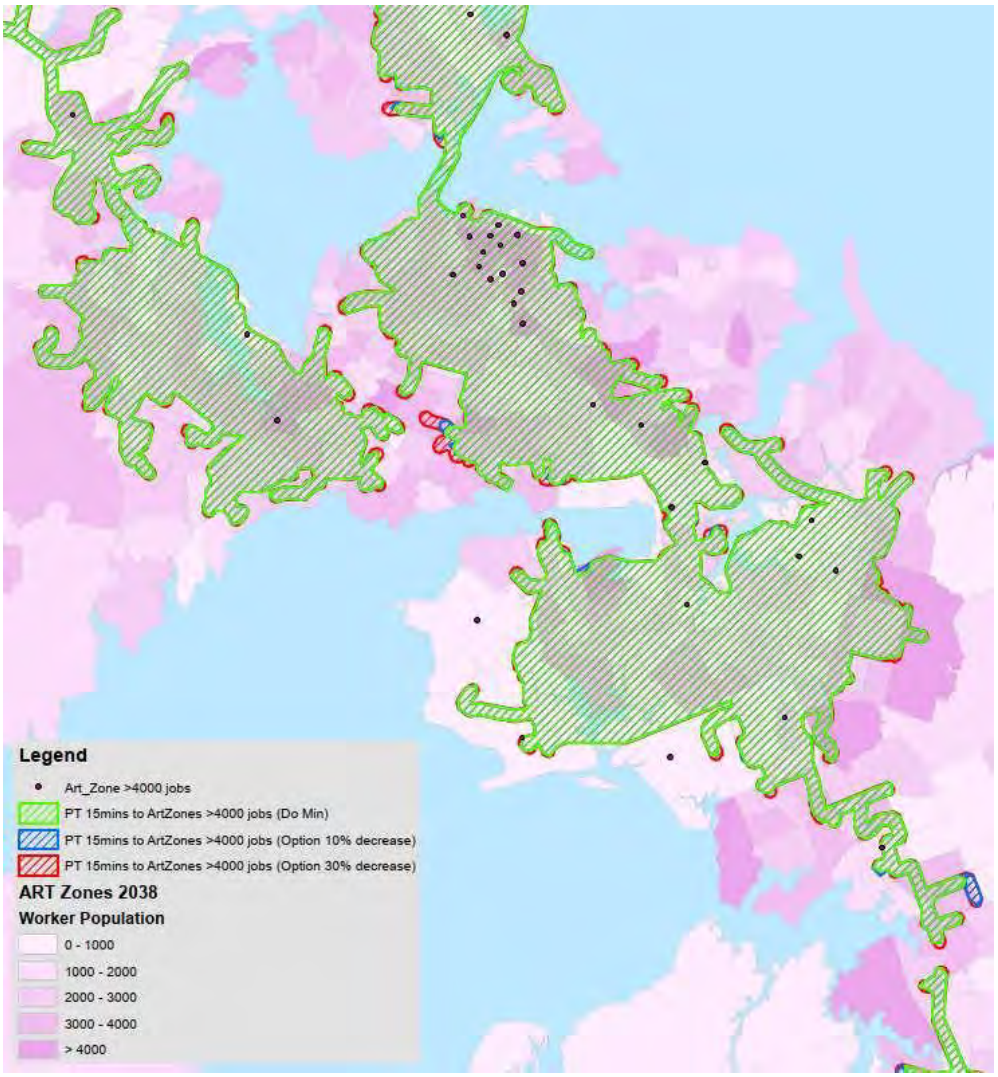


Figure 4-4: Accessibility to employment centres by PT



A key change which can be observed from the recommended programme is the level of access to high quality cycle facilities. Figure 4-5 shows the relative change in access to facilities. All five Brownfields areas receive significant benefits in this regard.

Figure 4-6 shows the area within the direct catchment of a RTN station. As the programme does not include RTN investment purse, there is no change associated with the programme. The Northcote, a portion of Mangere, Oranga and Tamaki areas all have a level of access to the RTN network. At a local level, the programme improves accessibility to the RTN through improvements to active mode and PT infrastructure.

The majority of Mangere and Mt Roskill areas are outside the RTN catchment as it stands. The LRT project is anticipated to run through the centre of the Mangere and Mt Roskill areas and as such will mean a large portion of these areas is within a catchment once implemented.

Figure 4-5: Access to a high-quality cycle route

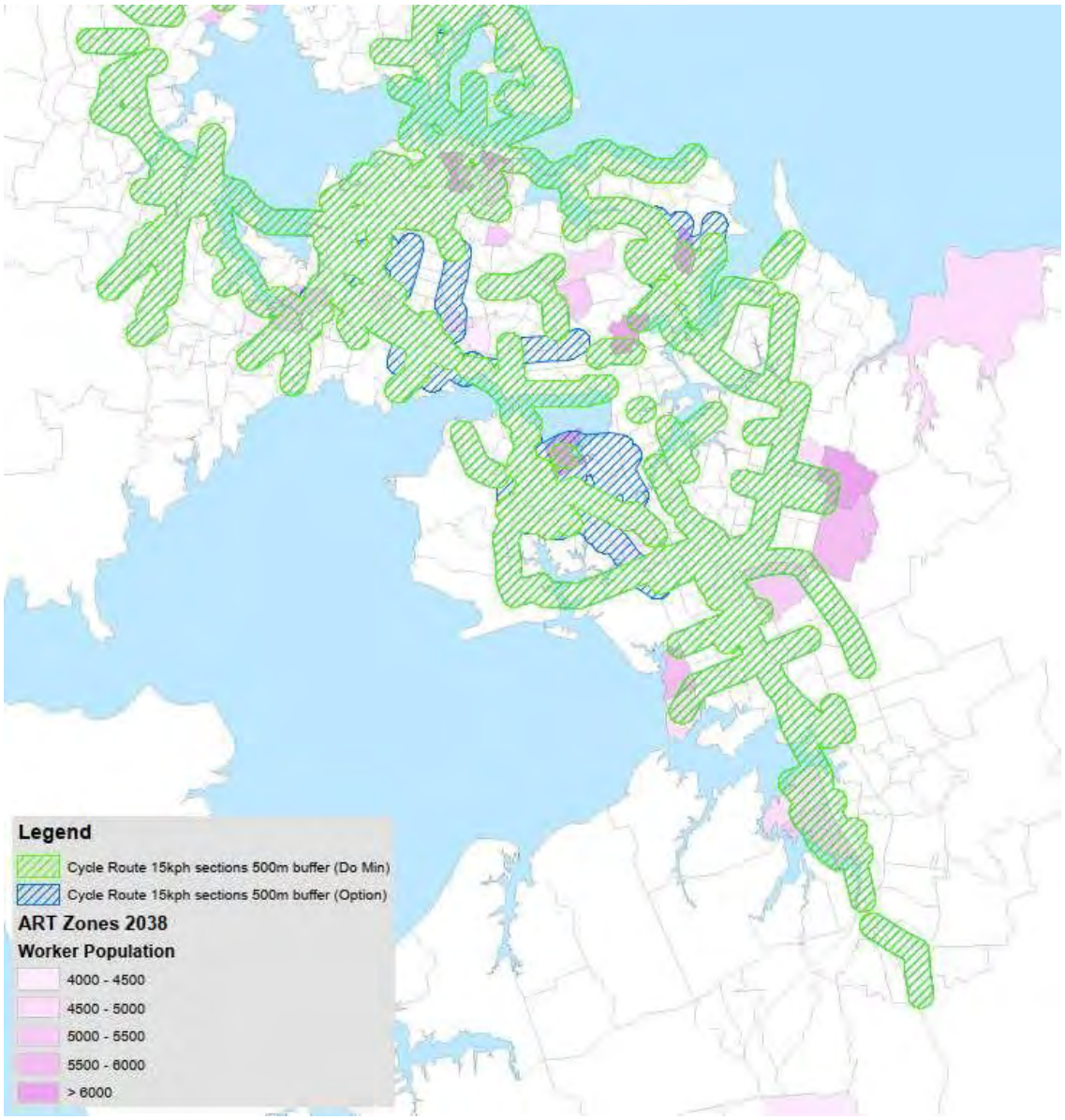
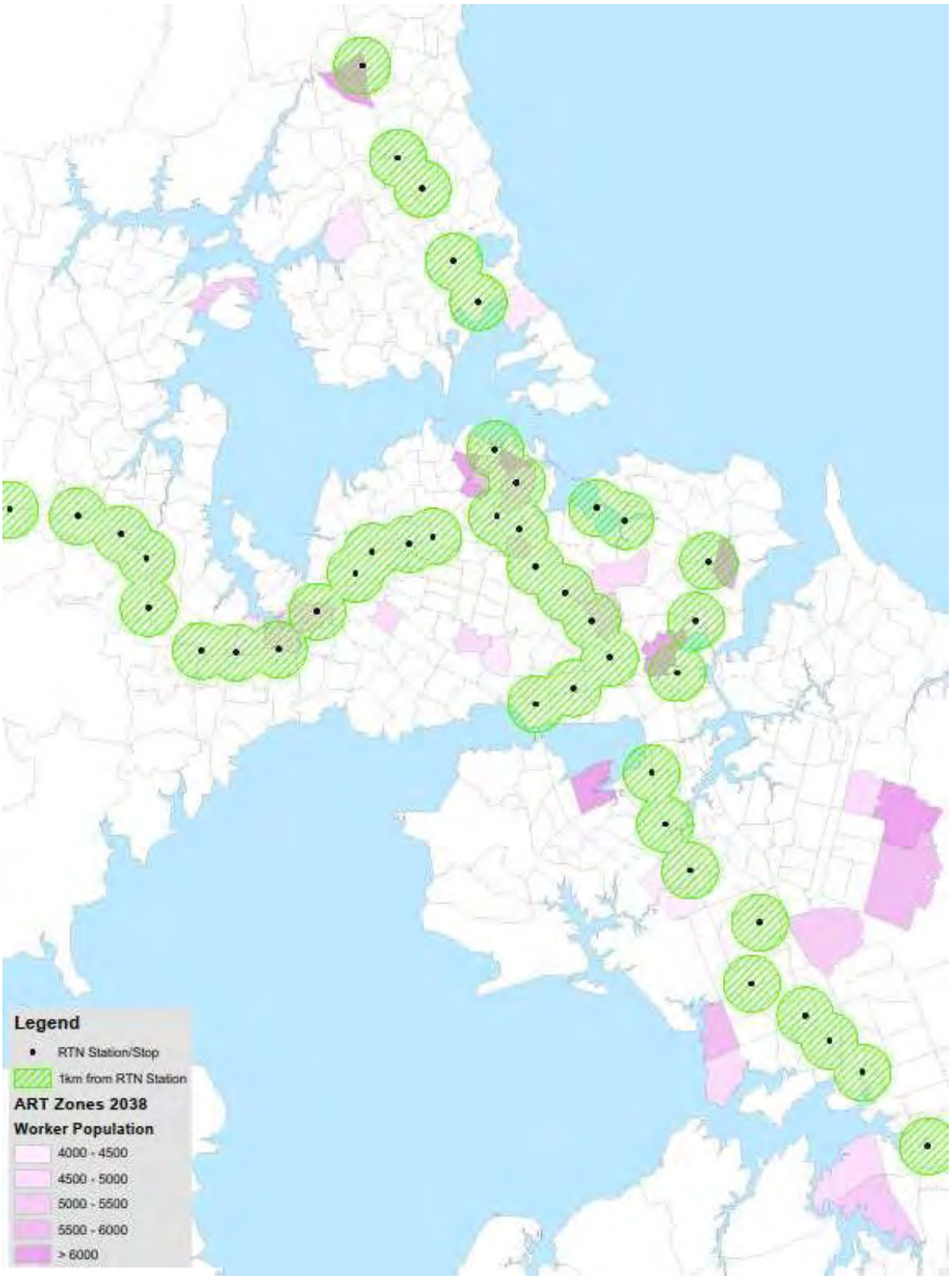


Figure 4-6: Access to RTN station



4.4 Monetised outcomes

Overall programme economics are summarised in Table 4-3. Refer to Appendix F for further details on the economics assessment of options and programmes. A peer review has been undertaken on the economic assessment. Details on the economic assessment are included in Appendix F.

Table 4-3: Overall programme BCR

Area	Discounted benefits	Discounted costs	BCR
Programme	$746.6M	$663.7M	1.1

Sensitivity testing has been undertaken on the programme to ascertain the level of confidence around the economic benefits for the recommended programme. A range of sensitivity tests were undertaken looking at variations to different benefit streams within each of the areas.

The results of the sensitivity testing are shown in Table 4-4.

The sensitivity testing shows the greatest sensitivity to changes in active mode benefits and safety benefits which intuitively also carry the highest degree of uncertainty. Mode shift assumptions and forecasts of active modes users are inherently uncertain and failure to attract the assumed users will reduce the level of economic benefits in this benefit stream. On the flip side, if interventions are successful and attract more users than forecast, benefits will increase.

Crash benefits are another significant area of economic benefits sought by the programme. The Brownfields programme has some significant overlap with other projects and programmes. As such a risk exists that safety benefits are double counted between programmes. As such the sensitivity test around a reduction in safety benefits is a particularly relevant test.

Overall, the sensitivity testing suggests a range of between 80%-120% of the stated benefits correlating to a BCR of between 1.0-1.4.

Table 4-4: Sensitivity testing on economics for the programme

Sensitivity test	Oranga	Northcote	Roskill	Tāmaki	Māngere	% change
Low active mode benefits (-50%)	$45.6 m	$25.7 m	$178.3 m	$177.7 m	$168.4 m	**80%**
High discount rate (6%)	$53.2 m	$31.6 m	$194.3 m	$185.8 m	$184.5 m	**87%**
Low safety benefits (-50%)	$49.8 m	$31.1 m	$186.1 m	$181.4 m	$182.8 m	**85%**
Low PT benefits (-50%)	$62.4 m	$36.5 m	$217.7 m	$206.4 m	$208.7 m	**98%**
Low capacity benefits (-50%)	$62.2 m	$37.2 m	$221.7 m	$207.0 m	$199.5 m	**97%**
Low interchange/station benefits (-50%)	$62.9 m	$37.1 m	$203.4 m	$182.1m	$188.1 m	**90%**
Default benefits	**$62.9 m**	**$37.2 m**	**$223.8 m**	**$212.1 m**	**$210.6 m**	**100%**
High interchange/station benefits (+50%)	$62.9 m	$37.4 m	$244.2 m	$242.1 m	$233.1 m	**110%**
High capacity benefits (+50%)	$63.6 m	$37.2 m	$225.9 m	$217.3 m	$221.6 m	**103%**
High PT benefits (+50%)	$63.3 m	$38.0 m	$229.9 m	$217.9 m	$212.4 m	**102%**

Longer evaluation period (60 years)	$72.4 m	$42.8 m	$251.4 m	$234.9 m	$235.6 m	**112%**
High safety benefits (+50%)	$75.9 m	$43.4 m	$261.5 m	$242.9 m	$238.3 m	**115%**
Low discount rate (3%)	$69.6 m	$41.2 m	$244.4 m	$230.6 m	$228.8 m	**109%**
High active mode benefits (+50%)	**$80.1 m**	**$48.8 m**	**$269.3 m**	**$246.5 m**	**$252.7 m**	**120%**

Some more specific sensitivity testing has been undertaken looking at key assumptions made in the assessment of the recommended programmes. The results of this assessment are outlined in Table 4-5.

Table 4-5: Specific sensitivity testing on economics for the programme

Sensitivity test	Oranga	Northcote	Roskill	Tāmaki	Māngere	% change overall
Low proportion of new ped trips (10%)	$62.5 m	$36.5 m	$218.0 m	$206.7 m	$208.8 m	**98%**
Low safety benefit for high interventions	$60.2 m	$37.2 m	$211.8 m	$204.0 m	$205.4 m	**96%**
Low proportion of late buses (15%)	$62.7 m	$36.9 m	$221.3 m	$209.8 m	$209.8 m	**99%**
Low bus occupancy (15 passengers)	$62.7 m	$36.9 m	$220.9 m	$209.4 m	$209.7 m	**99%**
Default benefits	**$62.9 m**	**$37.2 m**	**$223.8 m**	**$212.1 m**	**$210.6 m**	**100%**
High bus occupancy (30 passengers)	$63.3 m	$38.0 m	$229.6 m	$217.6 m	$212.3 m	**102%**
High safety benefit for high interventions	$65.5 m	$37.2 m	$235.8 m	$220.2 m	$215.7 m	**104%**
High proportion of late buses (35%)	$63.0 m	$37.6 m	$226.3 m	$214.5 m	$211.3 m	**101%**
High proportion of new ped trips (30%)	$66.2 m	$42.6 m	$216.6 m	$229.2 m	$208.3 m	**102%**

4.5 Key programme risks and dependencies

Key programme risks and dependencies at the programme level have been identified and are discussed in Table 4-6.

Table 4-6: Key programme risks and dependencies

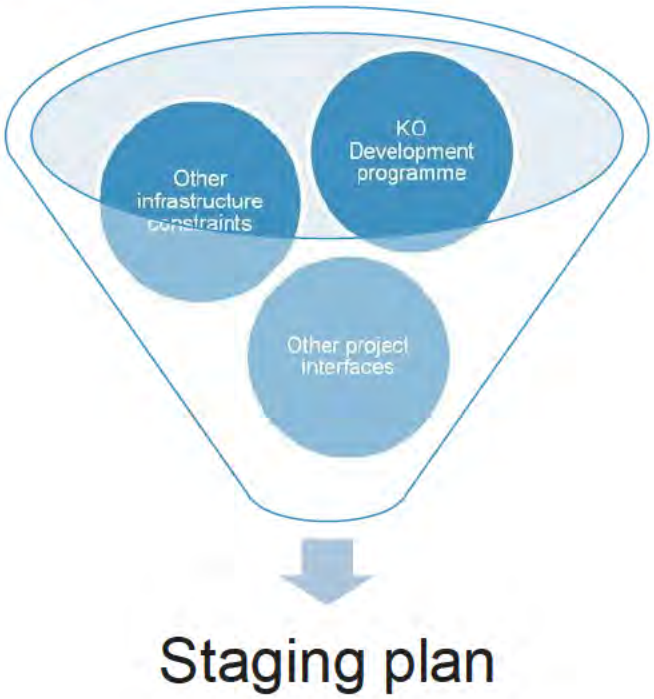
Key Risk area	Description	Effects	Controls
Light Rail project	As part of the development of the programmes for Mt Roskill and Mangere, the LRT project has been assumed to be in place within a 10-year timeframe. This represents both a critical dependence and significant opportunity. As the Light Rail project progresses there is a need for the Brownfields Programme to consider any changes to this important project.	Potential effects to Brownfield's programme could include: • The need to reconsider upgrades on key corridors such as Sandringham Road and Dominion Road • Reconfiguration of frequency and local bus services • Consideration of key interchange points and stations • Consideration of land use opportunities around the corridor / interchanges such as increases to density.	The management case sets out a governance structure to manage the ongoing implementation of the recommended programme. A change management structure is identified which will be used to manage any significant change such as the LRT project
Interface with other projects	A number of other significant projects exist within and directly adjacent to the Brownfields Growth areas i.e. Connected communities, Te Horeta project, Northern Pathway, Mangere cycle improvements…	The risk of interface with other projects is twofold: **Timing and implementation** – the timing of other projects effects both the ability to provide housing, outcomes and implementation timeframes of projects within the Brownfields Programmes. **Double counting of benefits** – with a number of projects included in the same geographic area, there is potential for double counting of benefits.	The management case provides a proposed methodology for on going management of the programme including integration with other programmes. The economic methodology has excluded benefits from projects included in other programmes. Sensitivity testing has been undertaken to explore the potential impacts of double counting.
Multiparty co-ordination	The Brownfields programme involves a number of organisations involved in implementation and funding.	Risk of misalignment on funding priorities. I.e., KO and AT do not agree on the relative order of investment leading to difficulties in implementing options with shared funding responsibility	A joint agency governance group is indented to be formed which will jointly agree forward work programme. Funding will be sought in bundles to provide flexibility for implementation of

		Misalignment in implementation leads to unnecessary disruption to the transport network.	projects to align with other organisations.
Delayed delivery affects programme outcomes	Delay to the implementation of projects is likely to have adverse effects on programme outcomes.	Delay to projects could result in mode shift aspirations not being realised and a BAU approach adopted	Funding sought to implement projects when required.

4.6 Staging of projects

An initial staging plan has been developed based on the programme for land development in each area for KO land holding. Other infrastructure constraints have been considered in development of the staging plan including availability of wastewater and water capacity in development areas. Figure 4-7 sets out the inputs used to develop a staging plan for each area.

Figure 4-7: Input into staging plan



The Kāinga Ora development staging plan is outlined in Table 4-7. This provides an indicative timeframe for the development of the various neighbourhoods within each area. This information has formed the basis on when individual infrastructure projects are required.

Table 4-7: Kāinga Ora development staging

	Precinct / neighbourhood	Existing HH	Forecast HH	Net increase	Construction start	Construction End
Mt Roskill	Roskill South	279	978	699	Mar-18	Feb-24
	Owairaka	226	1101	875	May-18	Sep-34
	Waikowhai	349	1126	777	Jul-19	Jun-28
	Wesley	852	6000	5148	Nov-19	Mar-36
	Mt Albert East	126	395	269	Jun-20	Nov-38
	Mt Roskill Schools	146	443	297	Jun-23	Oct-30
	New Windsor	77	234	157	Jan-27	Jul-34
	Sandringham	167	496	329	Mar-28	Jul-37
	Balmoral	38	104	66	Oct-30	Nov-33
	Dominion Road	180	310	130	Aug-31	Jan-38
	Three Kings	273	887	614	Jul-32	Apr-41
	Mt Eden	2	19	17	Jan-33	Jan-36
	Warren and Carr	34	104	70	Jan-36	Dec-40
	Subtotal	**2749**	**12197**	**9448**		
Mangere Precinct	Mangere West	228	929	701	Jan-17	Aug-26
	Middlemore Crescent	100	375	275	Jul-18	Feb-29
	Aorere	142	487	345	Aug-18	Oct-25
	Mangere East	385	1376	991	Feb-20	Mar-29
	Middlemore	125	267	142	May-20	Jan-25
	Mangere West	342	1056	714	Jan-22	Mar-30
	Sutton Park	119	189	70	May-23	Jun-30
	Mangere central	508	3709	3201	Jan-24	Jun-39
	Favona	280	580	300	Aug-25	Nov-33
	Buckland and Wickman	364	1296	932	May-26	Dec-37
	Subtotal	**2593**	**10264**	**7671**		
Northcote Precinct	Northcote	317	1569	1252	Jan-17	Jun-24
	Subtotal	**317**	**1569**	**1252**		
Oranga	Oranga	439	1225	786	Jun-18	Sep-28
	Subtotal	**439**	**1225**	**786**		
Tamaki	Panmure North	89	2002	1913	Oct-19	Jan-38
	Glen Innes Northwest	94	1580	1486	Jan-21	May-32
	Point England	3	1172	1169	Jul-21	Aug-34
	Glen Innes Central	29	2800	2771	Feb-24	Mar-39
	Panmure Central	24	1133	1109	Feb-30	Jan-41
	Employment precinct	-	287	287	Oct-38	May-43
	Glen Innes Northeast	57	1205	1148	Feb-39	Apr-45
	Subtotal	**296**	**10179**	**9883**		

4.7 Investment Prioritisation Method

Waka Kotahi is responsible for developing a three-year National Land Transport Programme (NLTP). 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 in the 2021–24 NLTP.

The Investment Prioritisation Method applies to activities proposed for the 2021–24 NLTP. As such, an assessment has been carried out against the IPM framework for each area within the Brownfields programme.

The Investment Prioritisation Method for 2021–24 NLTP has three factors, namely:

- **GPS Alignment** - GPS alignment indicates the alignment of a proposed programmes with a GPS strategic priority and identifies the potential contribution to achieving the GPS strategic priority
- **Scheduling** - indicates the criticality or interdependency of the proposed activity or combination of activities with other activities in a programme or package or as part of a network.
- **Efficiency** - indicates expected return on investment and considers the whole of life costs and benefits through cost-benefit analysis

Table 4-8 sets out an assessment of the programme against the IPM assessment framework.

Table 4-8: IPM assessment

IPM factor	Sub category	Brownfields Programme
GPS alignment	Safety	**High** – 40% reduction in DSI long term and as a result of a number of interventions
	Mode Choice	**Very High -** >6% change in mode share
	Access	**Very high** - >8% change in access to jobs
	Climate change	**Very High** - >6% reduction in VKT
Scheduling	Independency	**High** Transport activities are part of a programme of housing development from Kainga Ora and delivery in the 2021 NLTP period is required to enable further implementation of that programme. Non-delivery of the proposed programme in the 2021 NLTP has a significant impact on realising the benefits of the programme.
	Criticality	**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
Efficiency	Benefit cost ratio	**LOW** Programme has a BCR of 1.1
Overall score / rating		VH / H /L **Overall IPM score of 2**

4.8 Prioritisation of projects

AT will fund some of the projects identified (in part or full) and this will therefore require National Land Transport Fund (NLTF) funding. The same criteria that AT have used to prioritise their wider programme of NLTF funded projects has been used for consistency. These criteria include:

- Strategic Fit
- Effectiveness
- Value for Money
- Sequencing

A five-point scoring system has been applied to each of these criteria, with 5 being the highest or best performing score. Further details on prioritisation is included in Appendix G.

Figure 4-8 to Figure 4-12 provide a summary of the recommended network in each area split into four time periods and showing relative project priority within each programme.

Figure 4-8: Oranga project staging, priority and cost

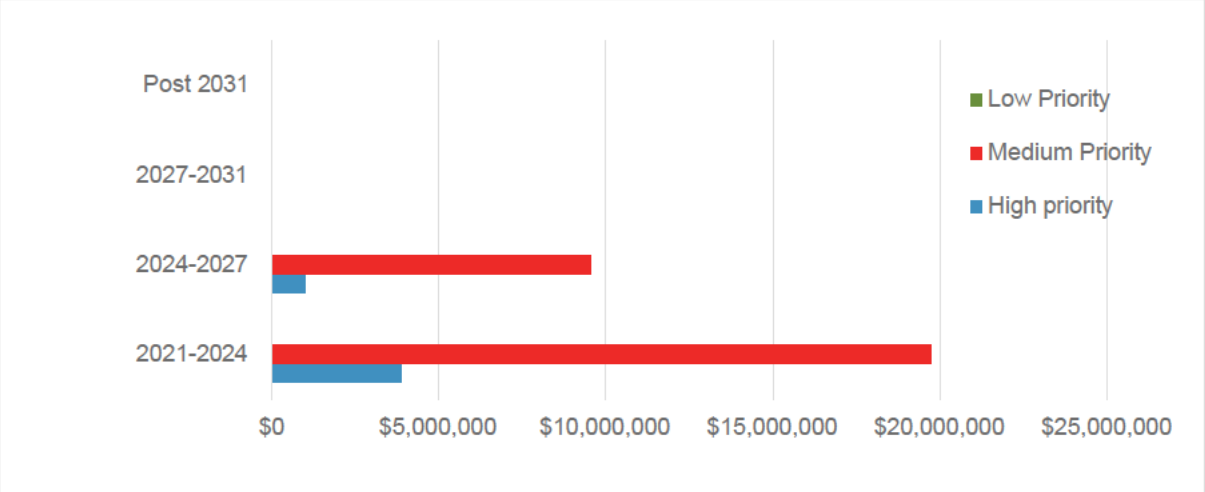


Figure 4-9: Northcote project staging, priority and cost

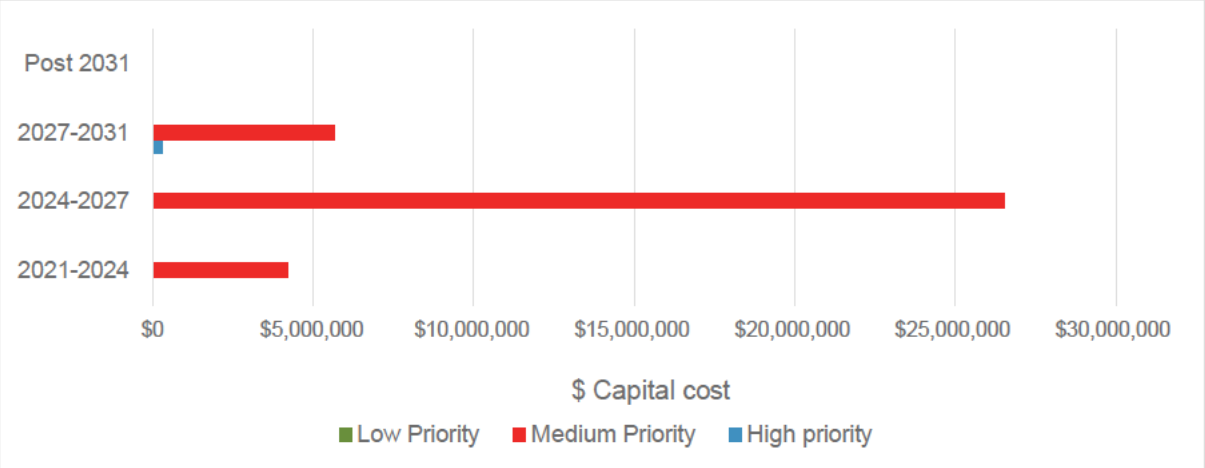


Figure 4-10: Mt Roskill project staging, priority and cost

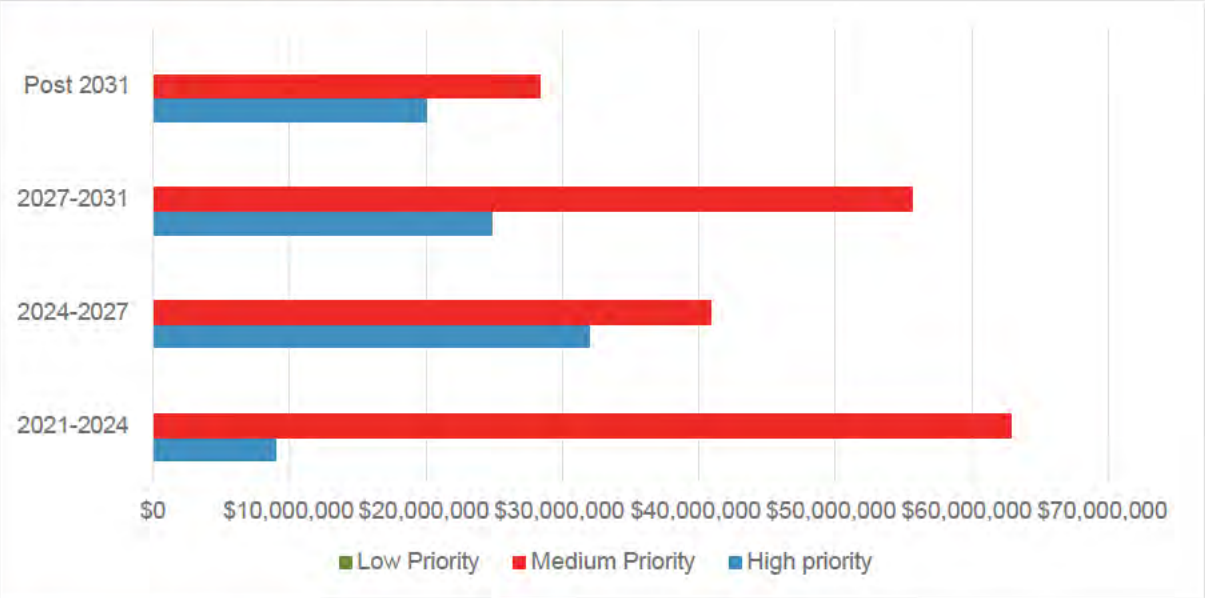
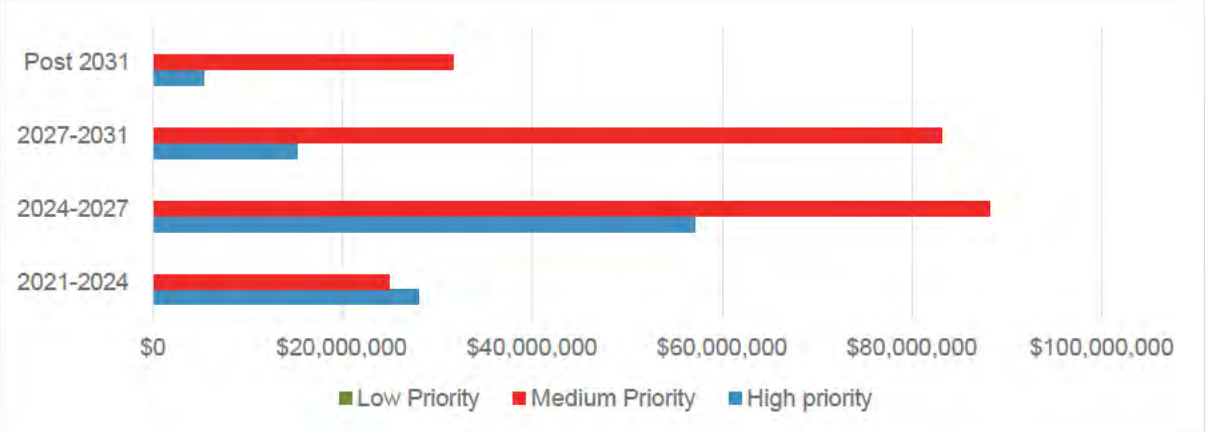


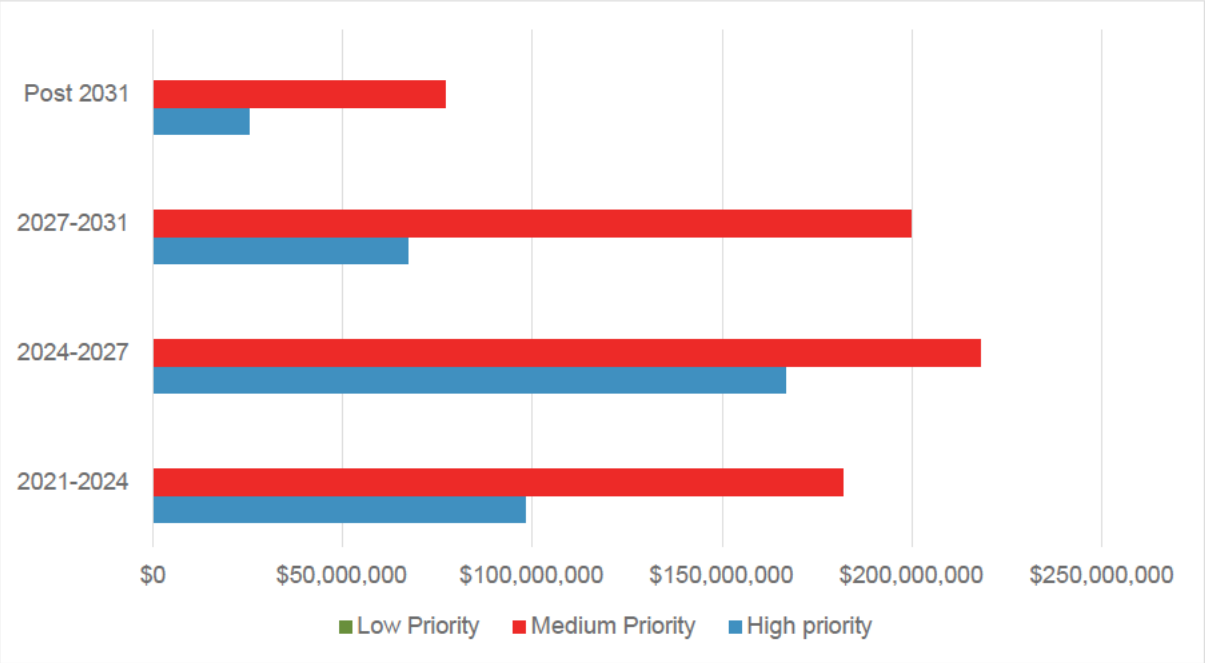
Figure 4-11: Tamaki project staging, priority and cost

Figure 4-12: Mangere project staging, priority and cost



The total programme cost, staging plan and project priority is provided in Figure 4-13.

Figure 4-13: Brownfields programme project staging, priority and cost



4.9 Programme Pathways

This is a large programme of works with a wide range of interventions that are different in scale, complexity and project lifecycle. Typically, a project identified within a PBC progresses to the next stage of the business case process, typically an Indicative Business Case, Single Staged Business Case for single stage business case lite, depending on complexity. Waka Kotahi guidance also currently makes provision for assessing low cost, low risk improvement programmes of activities. Within the 2021-2024 RLTP period, the threshold for a LCLR activity is $2m[16].

Given the urgency and scale of this programme a number of projects within the recommended programmes are proposed to progress straight to design and implementation reflecting the level of expenditure and complexity of these projects. This will result in two categories of next steps for each project including:

- SSBC – Project requiring further investigation (SSBC or SSBC lite)
- Implementation - Projects which are recommended to go straight to design and implementation.

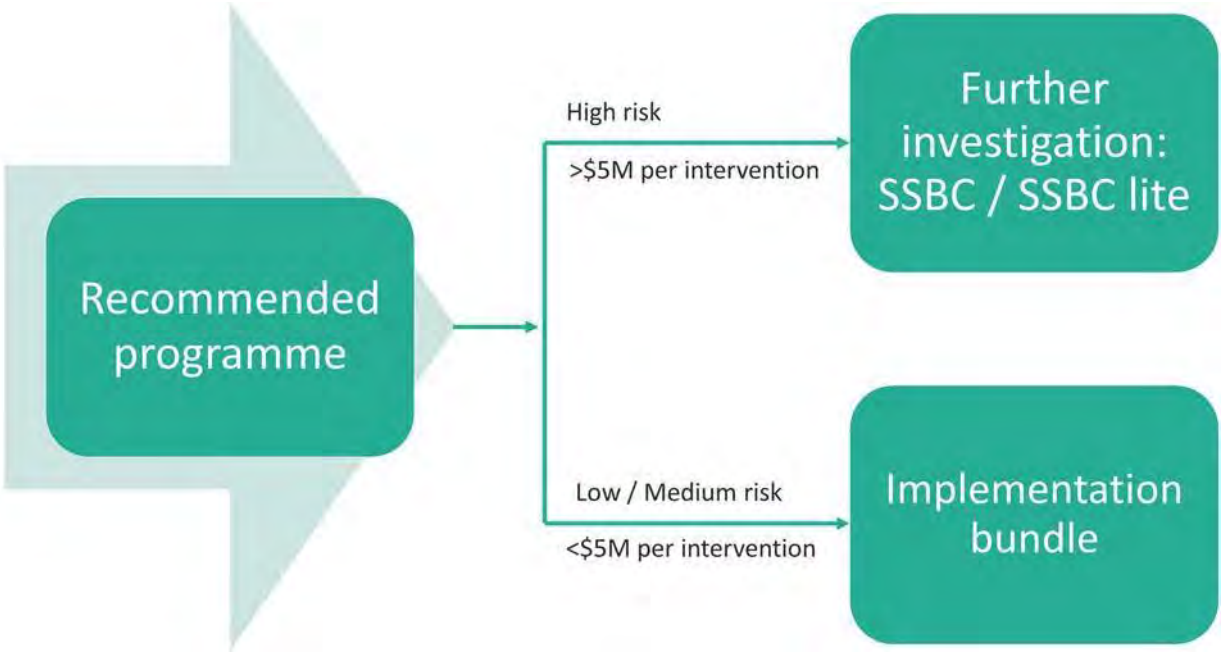
Given the two potential paths for projects within the recommended programme for each area, funding required from this business falls into the following categories:

- Funding for Investigations: SSBC projects (anticipated to be delivered in the next 6 years)
- Implementation bundles: Projects in the 1-3 year and 4–6-year RLTP periods

Figure 4-14 sets out the proposed paths for projects within the recommended programme.

[16] Capital cost + administration cost

Figure 4-14: Possible next steps for projects within the recommended programme



4.10 Thresholds and assessments

The next step for each project within the programme has been determined through an assessment against the following criteria:

- **Cost** – The cost of the option. A high score relates to projects over $5m in value, A medium relates to projects between $2-5m and low relates to projects under $2m.
- **Risk** – A project which is likely to require property and consents with effects on the surrounding community is considered to have high complexity. A project which needs consent but has no property requirement scores a medium and a project which does not require consents or property is low.

Projects with a high score in cost or risk are considered to require a SSBC in order for the project to progress. Projects with low/medium score in cost and risk are proposed to be included in the various funding package depending on implementation timeframes.

The Threshold applied to cost ($5m) between requirements for further investigation vs inclusion in the Design and implementation bucket is greater than the current LCLR threshold identified by Waka Kotahi (sits at $2m for the current RLTP period). This is considered appropriate for the following reasons:

- Brownfield growth is recognised as strategically important in the Auckland Plan.
- The Brownfields areas are a strategically important lever to achieving mode shift in the Auckland Region as recognised in the ATAP better Travel Choices 2020 report
- A lot of work has been done on the Brownfield areas including area ITAs, sustainable transport plans and neighbourhood ITAs prepared by Kāinga Ora. Many of the interventions identified have more detailed work siting behind this work.
- The programme is urgent with a number of neighbourhood developments beginning construction imminently. If investment is not made in these areas, upgrades will be piecemeal with rework and inefficiencies.

- A multiagency governance structure is proposed to overlook implementation of projects within the implementation bundle.

To provide a level of review from an assurance perspective it is also proposed at the projects in the 'Implementation Bundle' provide a two-page summary to the Governance Group to seek approval for implementation (i.e. post design) that sets out the following information:

- Roads and streets mandate
- Updated costs
- Updated BCR (if costs have increased more than 20%)
- Cost share agreement between partners
- Risks and opportunities
- Procurement approach

Based on the current programme and applying the above approach has identified:

- SSBC's for 48 interventions totalling $616M (>$5M or high risk)
- Implementation bundle for 101 interventions totalling $418m (<$5M and not high risk)
- Other – refers to project which are separate projects or part of other programme. Nothing required for these as part of this business case other than identifying their importance and urgency.

Table 4-9: Summary of next steps

Area	Next steps	Number of projects	Total $
Oranga	SSBC	3	$11,680,000
	Implementation	12	$22,492,500
	Other	0	$0
	Subtotal	15	$34,172,500
Northcote	SSBC	3	$15,000,000
	Implementation	9	$21,670,000
	Other	1	$0
	Subtotal	13	$36,670,000
Mt Roskill	SSBC	8	$90,460,000
	Implementation	36	$182,913,851
	Other	20	$0
	Subtotal	64	$273,373,851
Tamaki	SSBC	20	$308,506,887
	Implementation	18	$47,404,000
	Other	15	$0
	Subtotal	53	$355,910,887

Mangere	SSBC	14	$190,205,000
	Implementation	26	$143,421,989
	Other	11	$0
	Subtotal	51	$333,626,989
All areas	SSBC (total cost)	48	$615,851,887
	SSBC (investigation)	48	$24,634,075
	Implementation	101	$417,902,340
	Other	47	
	Subtotal	196	$1,033,754,227

More detail on each project is included in Appendix H.

5 Commercial case

5.1 Consenting Strategy

As part of this Business Case a detailed consenting strategy has not been developed. The programme is diverse and the more complex projects where consenting is required will go through an SSBC phase where a project specific consenting strategy will be developed.

For projects progressing straight to implementation, a key criterion for progressing in this manner is simplicity from a consenting perspective, or no requirement for a consent. As such, whatever consenting requirements exist as part of the project can be dealt with through design and implementation through the chosen delivery mechanism.

A review of the programme consenting approach was however undertaken and given the general type of projects, there will likely be a need for resource and regional consents on many projects due to the impacts of the works proposed. These projects are however well understood by Auckland Transport who undertake these works as part of their daily operations. Where consents are required, the traditional two step council approach is typically utilised.

Given these works are related to the Auckland Housing Programme and the importance on housing supply presently, there is the option that part of the programme will be aggregated. If this was to occur consideration should also be given to using an aggregated consenting approach. This would be determined in the SSBC.

5.2 Procurement

The next stages of the programme (SSBC and implementation) are of a substantial scale over a long period of time. Whilst a procurement strategy has not been completed at this time (due to greater confirmation on each scope (due to funding) consideration of the different procurement options has been undertaken.

Table 5-1 summarises these options and a recommendation based on current information to be confirmed and developed further in the Procurement Strategy development.

Table 5-1: Procurement options

Project next step	Procurement Options	Recommended
SSBC's	• Aggregation into a single SSBC in each area • Separate SSBC contracts with approved suppliers • Delivery through existing programmes (i.e. Network optimisation, safer communities etc.)	Aggregation of a suite of similar interventions SSBC for each area. For example in Mangere, two SSBC contracts, one for intersections and one for midblock upgrades, or alternatively two aggregated contracts by sub area in Mangere.
Implementation bundle	AT procurement options • AT design office could be used to progress design • Use of AT TTEPS panel for design • Use of the maintenance contractor in each area for construction Kāinga Ora procurement options: • Piritahi Alliance for design and build	Given the scale of the proposed package, it is recommended to use a mixture of AT procurement options and Piritahi to design and build interventions.

A procurement strategy will be developed prior to the next stage of works commencing and will be endorsed by all programme partners including Waka Kotahi and Auckland Transport.

Given the timing and funding availability (there is funding for some of these works) it is likely that a combination of the above options will be used. Aggregation (possibly by area) is also likely to drive efficiency of outcomes and process. The procurement strategy will respond to this and outline the options and recommended an approach.

5.3 Comms and Engagement

As part of this Business Case there has been engagement with key stakeholders. This has helped shape the recommended programme and approach. This is a transformational project is built up areas and therefore comms and engagement moving forward will be a critical part of the success of the next steps.

It is considered that there are three key aspects of the next stages from a comms and engagement perspective, being:

- An overarching programme Comms and Engagement strategy that sets out the overall outcomes and approach for the different elements of the programme
- The larger projects that are to go through a SSBC process will have project (or area if aggregated) focussed messaging and approach to comms and engagement
- The smaller 'Implementation bundle' package in the programme will require an overall 'bundle' comms and engagement approach which sets out the key messaging and provides for the required interface between the project and AT

It will be important that this comms and engagement strategy is developed, endorsed and implemented as a single strategy for all partners to the programme.

This comms and engagement strategy should be developed collaboratively prior to the commencement of the next phase of the project once this business case is endorsed.

6 Financial Case

6.1 Funding allocation

The recommended programme in each area includes projects requiring funding from a variety of funding sources. Projects within the programme have been assessed to assign a funding share by organisation so funding requirements can be quantified by organisation. A principles-based approach has been used to assign funding share by organisation.

It should be noted that mechanisms may not exist to realise this responsibility. The Auckland Unitary Plan(operative in Part) provisions limit the degree to which developers can be conditioned to mitigate the transport effects from their development. For example:

- Not all development requires consent or has rules that enable transport impacts to be assessed.
- Even trip generation thresholds, which don't apply in all zones, limit consideration to improvements to the local transport network.
- The rules apply on a site by site basis and don't allow consideration of the accumulative effect of individual developments - even when undertaken by the same developer.

Notwithstanding the above developers may still contribute through:

I. Off line voluntary agreements. Kāinga Ora has voluntarily prepared Integrated Transport Assessments for its larger development areas which have identified some transport improvements required to support growth in these areas. They can also elect to deliver or part fund some of these on an area-by-area basis through their rebuild programme. However, except where AUP(OiP) provisions come into play this is on a voluntary basis and the ITA recommendations or conclusions are not binding. There is also the ability for the Crown to fund the required transport programme by means other than via Waka Kotahi funding processes to represent its interest as developer and landlord to the state housing that will eventuate.

II. The Council has some ability via the LGA to impose development contributions or annual charges on an area-by-area basis to recover the costs of growth.

The proposed funding split therefore represents Auckland Transport's theoretical position on the responsibility for funding the services and projects required to serve the anticipated brownfields growth. In the event that growth occurs, and this responsibility is not agreed or secured then there will be a funding gap which, if not filled by Auckland Transport and its funders, will adversely affect the transport outcomes sought for the region.

6.2 Funding allocation principles

While funding splits need to be agreed with a developer (i.e. Kāinga Ora), at the programme level, assumptions on funding responsibility have been made at an area level to understand likely area costs by organisation and levels of funding required for Auckland Transport, Waka Kotahi and Auckland Council.

Individual funding splits will also need to be periodically reviewed in the event of changes in yields or staging.

Table 6-1: High level funding split principles

Type of project	Subcategories	Responsibility	Eligibility for Waka Kotahi / NLTF funding
Strategic transport network (i.e. upgrades to arterial corridors, FTN routes and strategic cycle routes)	Remote from development	Auckland Transport 100%	Yes – dependant on scope
	Within or directly adjacent to development area	Shared between developer and Auckland Transport	Yes – dependant on scope
Midblock corridor upgrades	Local road upgrades	Developer	No
	Collector road	Shared between developer and Auckland Transport	Generally, no if the work is required to mitigate development effects
New road connections / realignment of existing roads within redevelopment area	New local / collector road	Developer	No
Intersection upgrades	Local-local, Collector-local, Arterial-Local	Developer	Generally, no if the work is required to mitigate development effects
	Collector-collector, Arterial-arterial and arterial-collector	Shared between developer and Auckland Transport.	Yes – depending on scope
Pedestrian or cycle connections across roads / Road to road identified in ITAs	Pedestrian facilities	Shared between developer and Auckland Transport.	Yes – depending on scope
Cycling connections	Wider strategic network	Auckland Transport / WK	Yes – depending on scope
	Local connection	Developer / Local board / AT	No
Local area traffic calming/management	Development frontage	Developer	No
	Outside direct development area	Shared between developer and Auckland Transport	Yes – Depending on scope

Footpath widening / upgrade	Within development area and on desire lines from the development	Developer	No
	Gaps on wider network	Auckland Transport / Auckland Council / Local Boards	Yes – depending on scope
Street lighting upgrades	• Within development area.	Developer Or shared on selected circumstances, Auckland Transport may contribute as part of renewals programme.	No Yes – as part of renewals budgets.
Local PT facilities	Bus stops / interchanges	Shared between developer and Auckland Transport	Yes- subject to score
PT services	Operational costs for changes to services	Auckland Transport	Yes

For the purpose of this Business Case, the funding split between Kāinga Ora and Auckland Transport for a shared project has been calculated using the proportion of net Kāinga Ora household growth against the 2048 total households in a respective area. Kāinga Ora's growth within the brownfields areas varies between 21-45% of total households as outlined in Table 6-2 below.

Table 6-2: Proportion of KO growth vs total households by area

Area	KO existing households (KO March 2021)	KO development households (KO March 2021)	Net KO growth in Households (KO March 2021)	Total households in zone (MSM 2048, Scenario i11.6)	Proportion
Mt Roskill	3200	11200	8,000	38,870	21%
Mangere	3,125	10,125	7000	25,028	28%
Oranga	390	1050	655	1,444	45%
Northcote	TBC	TBC	1,343	3,542	38%
Tamaki	TBC	TBC	11628	28,353	41%

6.3 Cashflow allocation

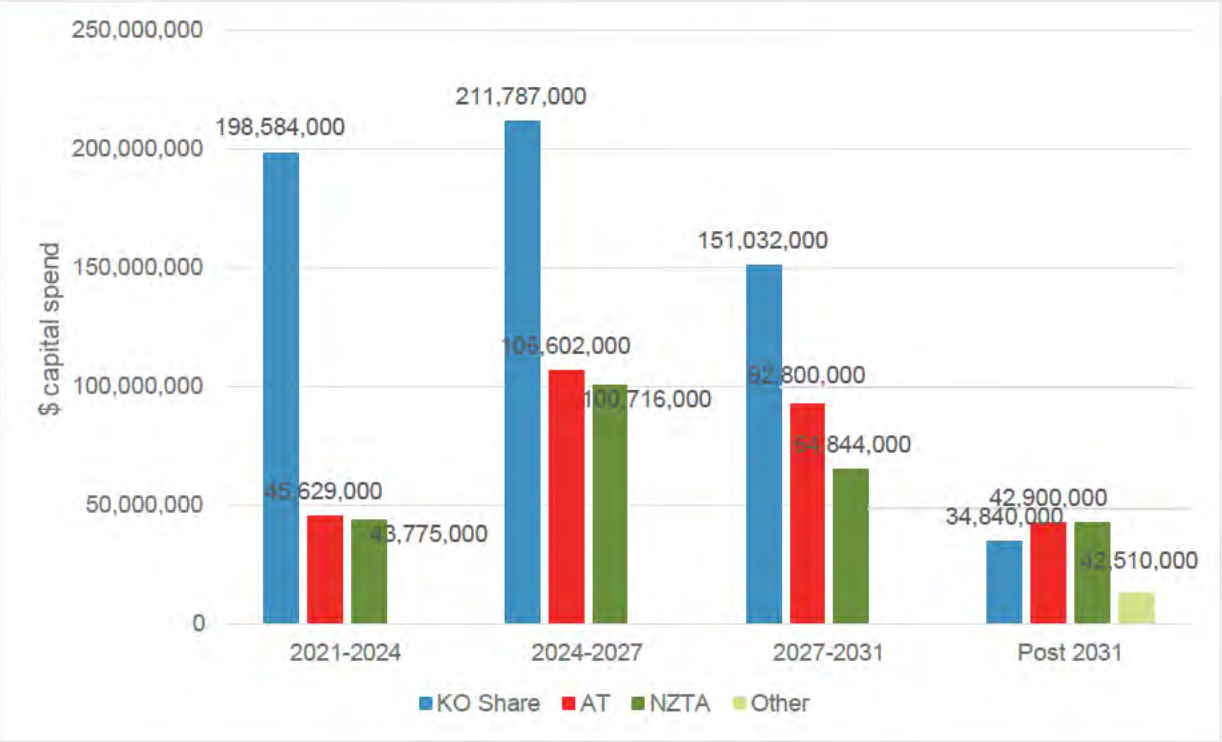
The cashflow by organisation for capital projects is provided in Figure 6-1. The totals are excluding any escalation.

Figure 6-1: Capital project cashflow by period by organisation

Operational costs have been considered with respect to Travel Demand Management interventions and changes to bus services required to support development in the growth areas.

Figure 6-2 provides an estimate of cashflow with some consideration of escalation effects assuming a 2% per annum average rate. With 2% escalation assumed, the programme total increases from $1.03B to $1.15B.

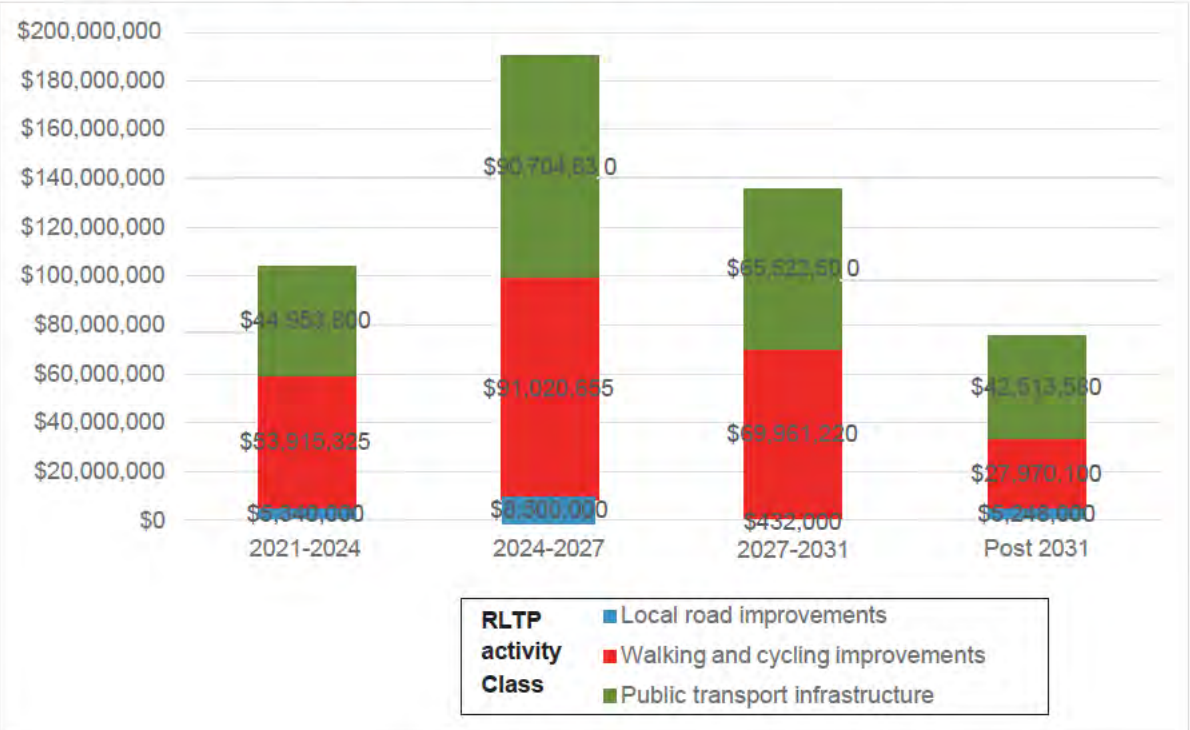
Figure 6-2: Cashflow including escalation (2% per annum assumed)



6.4 Funding by activity class

All projects within the Brownfields recommended programmes have been assigned to a RLTP activity class based on the primary benefit of the projects. Figure 6-3 outlines the RLTP programme cost by activity class. The cost includes expected cost to Waka Kotahi and Auckland Transport only and excludes costs allocated to Kāinga Ora as per the allocation set out in Section 6.3.

Figure 6-3: Recommended programme by RLTP activity class



6.5 Available funding

RLTP / NLTP

The Regional Land Transport Plan (RLTP) for the 2021-2031 period identifies funding allocated within the region for the next 10 years.

Two-line items in the Draft RLTP relates to the Brownfields Growth areas as shown in Table 6-3. The Tamaki area is identified separately to the wider AHP area.

Table 6-3: RLTP line item for Brownfields development compared to recommended programme costs

	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28-2030/31	Total
Tamaki Regeneration	0	3	8.5	9.8	11.3	4.6	3.7	40.9
Projects supporting Auckland Housing Programme	2	10	10	15	25	44	295	401
Recommended programme cashflow	$279M			$368M			$266M	$103M
Shortfall	$-246			$-258			$+33	

The RLTP funding allocation represents a significant shortfall compared with the recommended implementation of the recommended programme. As such prioritisation is required to identify which project should go ahead and which should be deferred, or alternative funding sources sought.

Using the prioritisation framework set out in Section 4.8, the projects recommended to be implemented using the current available funding in the NLTP are outlined in Table 6-4. The list assumes projects will be funded by AT and Waka Kotahi only. If Kainga Ora were to contribute to some of the projects, the next highest-ranking projects could be added to the implementation list.

Table 6-4: NLTP funding – top priority projects

Area	Number	Project	Cost	Priority score		2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28-2030/31	Post 2030
Oranga	O1	Namata Road / Mt Smart Road	$1,000,000	13	High		1						
Oranga	O3c	Oranga Road active modes	$200,000	12	Medium		1						
Oranga	O5	Waitangi Road upgrade	$2,892,500	13	High			1					
Oranga	O6b	Rockfield Road	$200,000	12	Medium		1						
Oranga	O9c	Mt Smart Road / Mays /Station	$1,000,000	13	High				1				
Oranga	O13	Felix Street bus stops	$300,000	12	Medium			1					
Northcote	5a	Greenways connection to Northern connections (Akoranga Drive)	7,120,000	12	Medium							1	
Northcote	5b	Active mode crossing over Akoranga Drive	300,000	14	High							1	
Northcote	6b	Exmouth Road cycle route extension	200,000	12	Medium							1	
Mt Roskill	1	Sandringham Road / Balmoral Road intersection upgrade	3,000,000	14	High							1	
Mt Roskill	2	Dominion Road Extn upgrades to arterials	5,785,000	13	High				1				
Mt Roskill	4	Mount Albert Rd / Dominion Rd intersection upgrade	3,000,000	14	High							1	
Mt Roskill	5	Hayr Road / Carr Road intersection upgrade	6,000,000	12	Medium								1
Mt Roskill	7	Mount Albert Road / Pah Road intersection upgrade	3,000,000	13	High								1
Mt Roskill	8b	Mount Albert Road upgrades to arterials	28,925,000	13	High							1	
Mt Roskill	9b	Dominion Rd / Balmoral Rd intersection upgrade	3,000,000	15	High								1
Mt Roskill	10	Richardson Rd / Owairaka Ave intersection upgrade	1,000,000	13	High	1							
Mt Roskill	11	Mt Albert Rd / Mt Eden Rd intersection upgrade	3,000,000	13	High							1	
Mt Roskill	12	Hillsborough Rd / Herd Rd / Carr Rd intersection upgrade	10,000,000	12	Medium							1	
Mt Roskill	13a	Richardson Rd / O'Donnell Ave intersection upgrade	1,000,000	13	High								1
Mt Roskill	13b	Stoddard Rd / Richardson Rd intersection upgrade	1,000,000	12	Medium			1					
Mt Roskill	14	Stoddard Rd / Denize Rd intersection upgrade	1,000,000	13	High		1						

Mt Roskill	15a	Stoddard Rd / Sandringham Rd Extn intersection upgrade	**1,000,000**	13	High		1						
Mt Roskill	15b	Stoddard Rd / Sandringham Rd Extn intersection upgrade	**3,000,000**	14	High			1					
Mt Roskill	17	Mount Albert Rd / Sandringham Rd intersection upgrade	**3,000,000**	14	High		1						
Mt Roskill	19b	Dominion Road / Denbigh Avenue intersection upgrade + neighbourhood interchange	**3,000,000**	13	High				1				
Mt Roskill	34	Hendon Avenue collector road upgrade	**1,600,000**	12	Medium	1							
Mt Roskill	37a	Balmoral Road between Sandrigham and New North	**13,750,000**	12	Medium							1	
Mt Roskill	39	Royal Oak Roundabout	**10,000,000**	13	High							1	
Mt Roskill	57	Mt Roskill walking and cycling bridges over SH20 new	**10,000,000**	14	High							1	
Mt Roskill	67	Richardson / Hillsborough Road	**3,000,000**	13	High		1						
Mt Roskill	68	Dominion Road Ext / Hillsborough Road	**3,000,000**	12	Medium		1						
Tamaki	1a	Tripoli Road to Apirana Avenue upgrade to collector road	**40,500,000**	14	High					0.6	0.4		
Tamaki	2	Glen Innes Rail Station Upgrade	**40,000,000**	16	High							1	
Tamaki	3	Taniwha St / Elstree Ave intersection upgrade	**3,000,000**	13	High							1	
Tamaki	5	Taniwha Road (west) collector road upgrade	**3,362,000**	13	High							1	
Tamaki	6	Elstree Ave / Pt England Rd intersection upgrade	**3,000,000**	13	High						1		
Tamaki	7	Pilkington Rd / Tripoli Rd intersection upgrade	**3,000,000**	13	High						1		
Tamaki	8	Hobson Dr / Tripoli Rd intersection upgrade	**3,000,000**	13	High						1		
Tamaki	9	Merton Road / Morrin Road intersection upgrade	**6,000,000**	13	High							1	
Tamaki	10	Merton Rail Bridge upgrade	**10,000,000**	13	High							1	
Tamaki	11	Tripoli Road / Erima Avenue intersection upgrade	**3,000,000**	13	High					1			
Tamaki	12	Line Road / Apirana Ave intersection upgrade	**3,000,000**	15	High					1			
Tamaki	13	West Tamaki Road / Line Road intersection upgrade	**3,000,000**	12	Medium							1	
Tamaki	14	West Tamaki Road / Elstree Avenue intersection upgrade	**3,000,000**	12	Medium							1	
Tamaki	15b	Line Road collector road upgrade	**4,895,000**	12	Medium							1	
Tamaki	16	Eastview Rd / Line Rd intersection upgrade	**3,000,000**	14	High							1	

Tamaki	17	Eastview Rd / Apirana Ave intersection upgrade	1,000,000	13	High							1	
Tamaki	20	Line Road / Taniwha St intersection upgrade	6,000,000	14	High							1	
Tamaki	21	Queens Rd / Church Cres intersection upgrade	10,000,000	12	Medium								1
Tamaki	22	Apirana Ave / Taniwha St intersection upgrade	6,000,000	14	High					1			
Tamaki	26	Elstree Avenue street frontage upgrades - north of Taniwha	10,340,000	12	Medium						0.5	0.5	
Tamaki	27b	Apirana Avenue	7,565,000	13	High						1		
Tamaki	28	Glen Innes rail station - access cycleway and Felton Matthew	10,000,000	15	High							1	
Tamaki	31	Elmstree Avenue (pt england to Taniwha)	2,670,000	12	Medium							1	
Tamaki	32	Hobson Drive	2,670,000	13	High						1		
Tamaki	34	Felton Matthew Avenue upgrade	5,785,000	12	Medium							1	
Tamaki	36	Apirana Avenue	6,600,000	15	High						1		
Tamaki	52	Point England - Local neighbourhood roading asset renewal and upgrades	37,227,013	12	Medium								1
Tamaki	53	Northwest Glen Innes - Local neighbourhood roading asset renewal and upgrades	16,781,453	12	Medium								1
Mangere	1	Bader Drive / Robertson Road intersection upgrade	6,000,000	13	High							1	
Mangere	2	Mckenzie Road / Coronation Road / SH20 Interchange intersection upgrade	3,000,000	12	Medium							1	
Mangere	3b2	Buckland Road / Bader Drive / Bus Priority road upgrade for bus lanes	27,500,000	13	High							1	
Mangere	5	Massey Road / Tennesse Avenue intersection upgrade	1,000,000	13	High							1	
Mangere	6	Walmsley Road / McKenzie Road / Miller Road intersection upgrade	10,000,000	13	High							1	
Mangere	9	Kirkbride Road / Westney Road / Jordan Road intersection upgrade	10,000,000	12	Medium							1	
Mangere	20	Massey Road / Robertson Road / Henwood Road intersection upgrade	10,000,000	13	High			1					
Mangere	23	Middlemore Rail Station Upgrade	30,000,000	14	High							1	
Mangere	24	Middlemore rail crossing new	15,000,000	13	High							1	
Mangere	29	Wakefield and Gadsby	200,000	13	High							1	

Mangere	32	Wickman Way	**200,000**	13	High							1	
Mangere	33	Tennessee Avenue	**200,000**	13	High							1	
Mangere	34	Vine Street	**240,000**	13	High							1	
Mangere	35	Grey Avenue	**380,000**	13	High							1	
Mangere	36	Buckland Road (south of Massey)	**6,230,000**	12	Medium				1				
Mangere	37	Hospital Road	**4,450,000**	12	Medium				1				
Mangere	39	Middlemore western bus interchange	**5,000,000**	13	High				1				
Mangere	41	Garus to Bukem Active mode link	**3,000,000**	12	Medium							1	
Mangere	N/A	Mangere East - Local neighbourhood roading asset renewal and upgrades	**24,001,725**	12	Medium								1
						$2,600,000	$12,400,000	$17,192,500	$25,465,000	$36,300,000	$47,205,000	$302,897,000	$101,010,191
			$545,069,691			2	13	18.5	24.8	36.3	48.6	298.7	

6.6 Housing acceleration funding from central government

In April 2021, central government announced a funding package to accelerate development of housing development areas. The Fund aims to increase the supply of houses, particularly affordable homes that low to moderate income households can afford (whether for rent or home ownership), is critical to addressing New Zealand's housing affordability issues. The Fund will be focused on priority locations where high housing need has been identified including Kāinga Ora large scale projects.

The key components of the fund include:

- An infrastructure fund to unlock a mix of private sector led and government led developments in locations facing the biggest housing supply and affordability challenges, and
- additional funding for the Land for Housing Programme to accelerate development of vacant or underutilised Crown owned land, operate in more regions, and deliver a broader range of affordable housing options for rental and home ownership.

Cabinet will consider the detailed criteria of the fund in June 2021. The Government expects money to start going out the door in the second half of the year.

This represents a significant opportunity for the Brownfields Growth areas, although details on eligibility are yet to be released.

6.7 Affordability of next steps

Table 6-5 sets out the funding required to progress the programme to the next stages.

Table 6-5: Cost for next steps by area

Next steps	Number of projects	Total $	$ RLTP 1-3 years	$ RLTP 4-6 years	$ RLTP 7-10 years	$ Post RLTP
SSBC (total cost)	48	$615,851,887	$153,770,475	$238,199,043	$154,282,368	$69,600,000
SSBC (investigation)	48	$24,634,075	$6,150,819	$9,527,962	$6,171,295	$2,784,000
Implementation	101	$417,902,340	$125,781,591	$146,314,990	$112,844,421	$32,961,338
Other	47					
Subtotal	196	$1,033,754,227	$279,552,066	$384,514,033	$267,126,789	$102,561,338

The table above sets out next steps cost by project pathway and period. The funding required is then split according to the funding allocation principles set out in Section 6.2. The required funding to progress the projects significantly exceeds available funding in the RLTP. An alternative funding source is required to implement the programme to the desired staging.

6.8 Developer contributions

Auckland Council currently collects developer contributions for all new developments in the Auckland region. Transport is included as a component of the development contribution levy and calculated for each area independently. Development contributions are collected at the resource consent stage.

At present development contributions are derived from consideration of the following:

- Projects identified within an area in the next 10 years
- Projects within the LTP or RLTP only
- Projects costs is split into 3 categories (Growth, LOS and Renewals)
- Growth related costs are then spread across anticipated HUE development

The methodology outlined above gives rise to different transport rates applied to different areas. Table 6-6 provides an indication as to the transport component in each development area.

Table 6-6: Developer contributions in each of the Brownfields areas

Area	$/HUE for transport	Net KO growth	Indicative development contributions for KO growth (2020 rates)	Indicative development contributions for all growth (2020 rates)
Oranga	**$5528**	**655**	**$3.6M**	**$5.5M**
Northcote	**$8454**	**1343**	**$11.4M**	**$19.8M**
Tamaki	**$11746**	**11628**	**$136.6M**	**142.5M**
Mt Roskill	**$5528**	**8000**	**$44.2M**	**$56.1M**
Mangere	**$6822**	**7000**	**$47.8M**	**$58.4M**

Auckland Council have assumed a level of developer contributions in identifying the available funding in the RLTP ($401M) for AHP areas. As such, development contributions will not provide additional funds to deliver projects outside of the RLTP allocation.

6.9 Alternative funding options

The Level of funding in the RLTP with a component of DC's, falls short of the required funding to implement the recommended programmes for Brownfields Growth areas.

Some infrastructure within the recommended programme can be delivered by Kāinga Ora through mitigation of effects at a local level through measures identified in the neighbourhood ITA's. However, many development sites do not require an ITA to be prepared according with Unitary Plan rules therefore the current approach relies on developer offering a level of mitigation of local effects voluntarily.

Alternative funding arrangements are an option to cover any potential shortfall in funding for the recommended programme. Table 6-7 sets out alternative funding options which could be considered to cover any shortfall in funding.

Table 6-7: Alternative funding options

Option	Application to the Brownfields Growth areas	Viability
Existing situation – Hybrid of DC's and local mitigation	Developers in each area continue to pay DC's.	**Non-viable** A general deficiency in funding levels, and uncertainty around the level of local mitigation provided and a lack of leverage

	Local mitigation of effects is paid for by developers (sometimes on a voluntary basis)	for AT to require this for many development sites.
Extension of the development contributions to cover funding required	Using the existing DC framework, further funding could be collected to cover the expected shortfall in funding for transport. This could consider a longer timeframe than currently considered (i.e. 20 years) and include unfunded projects. This method would spread funding between all developers in a given area.	**Viable** However, needs to be considered as part of a wider region wide strategy.
Infrastructure Funding and Financing legislation	A loan from a third party could be drawn down to fund infrastructure. Repayment of the loan could come from future residents through targeted rates (i.e., Crown Infrastructure partners scheme in Milldale)	**Non-viable** Given the nature of Kāinga Ora housing and management of housing stock post construction, it is unlikely and undesirable that a targeted rate is applied to these areas.
Additional Crown Funding	Additional funding could be provided by Crown entities to pay for infrastructure i.e. KO or the Housing Acceleration Fund.	**Viable** While this could be relatively easy to implement, crown entities could be considered to be supplementing wider growth through provision of infrastructure in each area without passing costs to other developers.

7 Management case

The management case assesses whether a proposal is deliverable and demonstrates that an appropriate project management regime is in place for the next phases of the project. It tests the project planning, governance structure, risk management, communications and stakeholder management, benefits realisation and assurance.

7.1 Next Phases

This is a programme of considerable scale in a complex urban environment and will need careful and appropriate management to ensure it is successfully implemented. Section 4.9 sets out the recommended next steps for each project. This includes two broad categories:

- Single staged Business Case – Intended for larger and more complex projects
- Implementation bundles – Smaller and less complex projects progress straight to implementation with a streamlined assurance process.

Improvement activities will need to be supported by audits, such as Non-Monetised User Audits and Safety Audits. These works are typical of what AT and partners do on a regular basis and there are the appropriate organisational systems and approaches to give confidence in delivery. It is however important that a programme of this scale has sufficiently focussed resourcing to appropriately implement the systems and processes required.

7.2 Governance

Growth within the Brownfields areas is important to both the developers as well as transport authorities given the proposed level of investment in each area.

To assist in ongoing management of the Brownfield Growth programme, a steering group focussed on this programme is recommended with representation from each of the following organisations:

- Auckland Council – DPO office
- Auckland Transport – Strategic Projects, Isthmus, and Greenfields
- Auckland Transport - Strategic Land Use & Spatial Management
- Kāinga Ora
- Ministry of Housing and Urban Development

This governance group will not replace the approval processes of each member organisation, however it will/should have an appropriate level of delegated authority to ensure the programme is delivered efficiently and appropriately. The role of this governance group is proposed to:

- Endorse programme strategies, including but not limited to procurement, consenting and comms and engagement
- Review implementation of the projects and ensure assurance processes being followed
- Confirm and allocate funding within the programme based on agreed prioritisation framework
- Approve projects in the programme moving to implementation

The Governance Group should meet as required, but at least monthly for the duration of the programme.

7.3 Programme structure and resourcing

As outlined above this is a large programme in its own right and whilst AT and the project partners deliver this type of project on a regular basis, to ensure that there is the required level of coordination and focus to deliver this project a core dedicated team is proposed that will call on partner resources and teams.

Figure 7-1 shows the proposed team structure. Key elements include:

Figure 7-1 : Proposed programme structure

- Programme specific governance as outlined above
- A dedicated programme manager providing a single point of coordination and accountability for delivery of the programme and its outcomes (1 FTE)
- Programme manager supported by
    - Area leads – managing day to day coordination within individual areas. This role will be tailored to the amount of funding / projects expected in each area during any given period. Initially, given a lack of funding in the next few years this could be covered by a single person. Subject to more funding becoming available, this may need to increase in the future. (1FTE initially, growing as the programme develops)
    - comms and engagement lead to ensure coordinated messaging across the programme (1 FTE)
    - financial controls support to ensure programme funding is tracked and monitored in a central location to allow funding allocation to be undertaken effectively (0.5 FTE)

It is anticipated that individual contracts for work will be managed by each respective partner organisation (AT or KO), with reporting also provided to the Programme Manager to coordinate the overall programme

As part of this business case a database has been developed that outlines each project, its costs, proposed schedule etc and this should be a key central point of truth for the programme manager to monitor and base decisions on.

7.4 Risk and opportunity management

The Auckland Brownfields Programme is a large programme comprised of multiple projects, inherent with areas of uncertainty that transpire into risks and opportunities. These are being managed to enable successful delivery of outcomes in each of the areas.

Risk and opportunity are being managed at three levels:

- Organisational business risk and opportunity
- Programme wide risk and opportunity
- Project and area-specific risk and opportunity.

The risk management process is consistent with AS/NZS ISO 31000:2009 and is consistent with typical risk management processes undertaken by AT and the Transport Agency.

Table 7-1 sets out the key risks and opportunities in the Brownfield growth areas across specific areas and the wider programme.

Table 7-1: Critical and high risks – Brownfield Growth areas

Risk Cause(s)	Risk Consequence(s)	Risk Owner	Controls	Current Risk Likelihood	Current Risk Consequence	Current Risk Level	Implications for Brownfields Programme
Funding committed elsewhere so AT cannot deliver share of projects	Ability to develop KO land is affected. Outcomes are at risk. Dig once approach can not be met.	AT / WK	Prioritisation of projects in line with RLTP. Identification of alternative funding sources	Likely	Major	Critical	The NLTP funding allocation provides some of the funding required in the next 10 years however there is a large deficit. If only high priority projects can be implemented, the outcomes of the programme will not be achieved. However given the highest priority projects will be implemented, benefits are expected from a reduce level of investment. Alternative funding sources should be sought for the shortfall.
Timing of Funding - Risk – Financial Event – RLTP AT funding timings not matching Kāinga Ora	Impact on ATAP/RLTP from a transport system & sequencing perspective. Outcomes are not achieved, and community expectation not met	AT / WK	Joint governance group to clearly articulate dependencies	Likely	Major	Critical	As it stands, the NLTP funding provides funding later to the implementation dates recommended from this work. Delay to implementation of projects has the potential to reduce benefits of projects. As development occurs without appropriate transport upgrade, travel behaviour is expected to following existing trends and travel beahviour will be more difficult to influence compared with a scenario where infrastructure was provided in conjunction with development.
Funding contributions – Risk AT and KO do not agree on the relative contribution to infrastructure required	Could result in delays to construction. Piece meal approach to construction Outcomes could not be achieved.	AT / KO	Joint Governance group established to agree funding split.	Likely	Major	Critical	With no joint agreement on funding, funding is difficult to obtain from third parties It is recommended this item is addressed by the Programme Governance group as a matter of priority.

Reliance on other projects such as LRT to cater for growth and achieve outcomes in Mangere and Mt Roskill	If LRT is not implemented transport network will come under increasing strain and development could be constrained	AT / KO	Land use to be reviewed in light of LRT decision. Investment in the area to be reviewed	Likely	Mode rate	High	Both the ALR project and Connected communities programme have significant implications for the Mangere and Mt Roskill Study areas. If these projects are not delivered, the recommended programme in each area will need to be revisited. In the Case of both Mangere and Mt Roskill, land use will need to be revisited in light of the absence of an RTN for much of the corridor. The recommended programmes adopted for each area would likely change (i.e. High PT programme for Mangere). The connected community projects such as Sandringham Road or Mt Eden Road play an important role for development areas. If these projects are delayed, consideration of development staging is recommended.
Engagement risk – A risk sufficient community engagement has not taken place	Current engagement undertaken to date has been through KO and AC channels. There is a risk community expectation are not met particularly for projects progressing to implementation.	AT	Programme wide engagement strategy is developed in the next phase. Engagement undertaken with KO.	Likely	Mode rate	High	No community engagement has taken place on the programme as a whole. There is risk the community oppose some of the projects within the programme and fail to see the wider context of the programme. During the next phase, communications and engagement will need to be actively managed in a coordinated manner with Kainga Ora.

7.5 Monitoring and benefits tracking

Ongoing tracking and measurement are another important aspect of the programme to make sure the outcomes sought are delivered. This is particularly important for a programme of this scale and duration where there is likely to be considerable change in what actually occurs (such as pace and scale of development) over next 20 years.

The Brownfields Programme Business Case has therefore been developed with reference to Waka Kotahi's benefit management framework. Adopting a consistent approach ensures the benefits of each project align with strategic objectives and help deliver the programme-level benefits. Benefits, Measures and KPIs have been mapped to each investment objective allowing proposed outputs to be logically mapped to benefits, so that different scenarios can be compared on the basis of their benefits impact.

Benefit realisation is intended to fulfil two key functions:

1. Assessment against anticipated benefits of a project which helps validate how well the purpose for investment has been achieved
2. At a programme wide level, providing confirmation of the proposed staging approach.

Given the 20-year time period for the implementation of the recommended programme, staging of infrastructure is critical to the success of the network in delivering against the investment objectives. Given the implementation of projects is likely to occur over time (in part due to funding constraints) this provide opportunity to monitor performance of projects which have been implemented.

Tracking of network performance in the following areas should be prioritised and Table 7-2 provides an example of what will need to be further developed as the programme progress

Table 7-2: Priority measures for North benefit realisation

Benefit	Measurement focus	Monitoring plan options
Mode shift of the existing areas	• Public transport patronage • Active mode counts • Mode share data from Stats NZ	• Monthly and annual public transport patronage trends • AT cycle count data • AT traffic counts • Census journey to work data
Reliability of public transport services	• Public transport journey times on keys routes in each area	• AT HOP data
Reliability of the strategic road network	• General vehicle journey time information • Travel time information	• AT congestion monitoring • Mobile phone data
Walking and cycling mode share and experience	• Perception of walking and cycle facilities • Walking and cycling numbers on at key locations	• AT customer insight biannual survey results • AT cycle count data • Monitoring of new facilities
Road safety	• Crash statistics	• NZ Transport Agency CAS database

The Programme Manager should establish a benefits realisation tracking approach that sets, monitors and report on the key outcomes sought as outlined in this business case and pace and scale of development in each of the study area.

Waka Kotahi and Auckland Transport have experience at setting these frameworks up and this expertise should be drawn upon to implement this early to provide the strongest chance of success.

7.6 Lessons Learnt

Given the long timeframe for implementation, lessons learnt from this programme will be fed back into the programme management team and will help to streamline implementation and design of future interventions.

Further to this, Auckland Transport will use resources from other programmes such as the Cycling Programme to provide valuable insights.

The Programme management team will manage the recording and implementation of lessons learnt through a Lessons Learnt Review (LLR) and Contract Management Review process.on a annual basis.

7.7 Change Management

This programme is predicated on a number of key assumptions, with the most significant being the forecast delivery of housing from KO. This staging is also highly susceptible to changes, mainly minor, but also significant delay of acceleration of different areas depending on a number of factors (such as other infrastructure).

The programme prioritisation therefore needs to be able to respond to this uncertainty. It is recommended that the prioritisation of the programme be reviewed as significant changes are made or at least every six months. This will give all partners confidence in the programme. Any update should go to the Governance Group for endorsement.

7.8 Database / document control

The programme should interface with each partners document control systems. The AC DPO currently acts as the custodian of the infrastructure project lists. AT have provided project information to the DPO which has in turn updated the database with this information.

Any changes to project lists will be subject to a change management process set out by the DPO. This process will ensure all partners (i.e. Kāinga Ora) are informed of any changes.

7.9 Recommended Next Steps

It is the recommendation of this business case that:

- The preferred programme for each of the areas be endorsed
- The establishment of a programme specific Governance Group and team be endorsed
- Endorsement is given to the low-risk project identified in the ‘Implementation Bundle’ moving directly to implementation (subject to a cost review just prior to implementation)
- Funding being approved for the next three years as per the RLTP.

Appendix C - Options Assessment process

The following section sets out the MCA assessment framework and scoring process.

7.9.1 MCA Criteria

The criteria upon which the MCA will be undertaken are outlined.

Category		Criteria	Measure
Investment objectives / Benefits		Impact on Mode choice	• Mode shift from single occupancy private vehicle • Number of people living within 500m of a high-quality cycling facility • Number of people within 500m of a bus stop or 1km from a rail or bus rapid transit station
		Impact on Greenhouse gas emissions	• Impact on greenhouse gas emissions
		Impact on social cost of deaths and serious injuries	• Number of deaths and serious injuries
		Impact on perceptions of safety and security	• Perception of safety and ease of walking and cycling
		Impact on access to opportunities	• Proportion of population living within travel threshold (15 minutes, 30 minutes or 45 minutes) of key social opportunities by different modes in the morning peak • Proportion of population living within travel threshold (15 minutes, 30 minutes or 45 minutes) of key economic opportunities (including work) by different modes in the morning peak
		Changes in livability of places	• Amenity value – natural and built environment
		Changes in te ao Maori values	• Te ao Māori
		Impact on community cohesion	• Social connectedness between XX and XX
Achievability	Technical	• What are risks of delivery of the project?	• What are the construction challenges in terms of staging or constraints (topography, geotechnical) • What impact would each option have on utilities; consider location/relocation and tie in with existing services.
	Safety	• Will safe transport outcomes be delivered?	• What is the predicted level of DSI?

		• How aligned is option to safe systems outcomes? • What are CPTED outcomes?	• What are the CPTED risks associated with the shared path? • What is the level of compliance to the safe systems requirements?
	Consent ability	• What is the level of consenting complexity and risk?	• Will new consents or changes to the existing designation be required that could impact on project timeframes? Consider the level of complexity or the consents (discretionary/non-complying/prohibited)
Afford ability	Funding availability and ability to get additional funding (if needed)	• Does cost fit within current available funding? • What are risks for owners of funding the project?	• Operational cost assessment – tolling will cover all operational costs, no tolling will impact existing maintenance budgets and resources. • Can the project be delivered within the $411M budget? • What is confidence level in any additional funding being achieved?
	Value for money	• What is the forecast balance between benefits and costs for the project?	• What is the BCR of the project? • What is the incremental BCR
Opportunities and Impacts			
Environmental Effects	Landscape / visual	• The extent of effects on: o The natural landscape and features such as streams, coastal edges, natural vegetation and underlying topography – acknowledging planned changes to area in light of urban land use / zoning o Natural character and outstanding natural features/landscapes/SEA's including geological features (mapped and protected features) o Opportunities for improved Landscape and Visual outcomes	• Level of impact on areas identified
	Water Quality/ Stormwater	• Impact of operational stormwater (both quantity and quality) on the receiving environment, including: o Potential flooding effects of the option within the catchments (land, freshwater, coastal) o Extent and consequences of likely mitigation measures o Opportunities for improved Water quality outcomes	• Level of impact across the area
	Ecology	• Extent of effects on: o Significant indigenous flora;	• Level of impact across the project area

		o Significant habitats of indigenous fauna; o Indigenous biodiversity; o Stream / waterway ecology o Marine ecology o Opportunities for improved ecological outcomes	
	Natural Hazards	• Extent of effect infrastructure (precipitation, inundation, flooding, adverse effects on geology; steep slopes; seismic impacts; other resilience risks (low level infrastructure near coastlines, inundation areas) • Opportunities for reducing exposure or minimising impacts to natural hazards	• What is the likely increase in risk across project areas, on infrastructure in topographically low level areas and steep topography
	Cultural & historic heritage	• Extent of effects on: o Cultural and Historic heritage (as defined in the RMA 1991, HNZPTA 2014 and ICOMOS NZ Charter 2010) • Opportunities to enhance awareness and understanding of cultural and historic heritage through project design and deliverables	• Level of impact on areas identified • Ability to deliver enhancement outcomes as identified to the left
Social and community	Urban design	• To what extent does the option support a quality environment particularly relating to: o Context and planned place making considerations o An inviting, pleasant and high amenity public realm o Open space integration o Active interface between public and private realm o Scale of long-term impact on the amenity and character of the surrounding environment.	• Level of impact on areas identified
	Social cohesion	• Impact on, use, connectivity / accessibility for and to the existing and future communities including use and access to: o Employment o Education o Retail o Recreation o Other communities or within the same community o Shops / services / other community recreational, cultural facilities / 'attractors' o Severance of the existing community (including consented)	• Level of impact on social outcomes across project area and specific communities

		o Scale of effect on existing community facilities community and open space o Public access to the coast, rivers and lakes	
	Human Health and Wellbeing	• Will the option potentially affect any sensitive receivers nearby or consented (adjacent residential, childcare centres, hospitals, rest homes, places of worship, marae and schools)? particularly relating to: o Air Quality o Contaminated land o Noise and vibration o Safety	• Forecast impacts on air quality? • Levels of contaminated land impacted? • Forecast impacts on noise? • Any areas of risk for vibrational impacts?
	Reputation	• Expectation that this will provide for long term growth, given the time involved from initial planning through to delivery. • Reputational risks to Waka Kotahi related to negative feedback from public and key stakeholders, including Mana Whenua.	• Likely public response to the option? • Consistency with previous communications? • Likely stakeholder response to the option?
Impacts on Te Ao Maori		• What if any impacts on Te Ao Maori, including areas of significance for Maori, Maori Land and Kaitiakitanga • Cultural Values • Kaitikitanga • Ki uta ki Tai • Opportunities to improve Cultural outcomes	• Is there any Maori land impacts? • Are there areas of significance to Maori identified to be impacted? • What are wider Kaitiakitanga considerations?
Climate change adaption and mitigation (based on MfE guides 2017/18)		• Extent of effect on earth works controls / stormwater system designs, infrastructure, geology, ecology and coastal environment (steep slopes and failure), emissions and vegetation systems.	• What is the likely increase in at risk areas to climate change across area and issues
Property Impacts		• Scale of public / private land (m^2 / number of properties / special status of impacted property) required to deliver the option.	• Likelihood, extent and complexity of additional property acquisition. Risk to overall project delivery timeframes.
Cumulative Impacts		• Are there any cumulative impacts over time?	• Will any of the impacts identified increase overtime and interrelated nature result in cumulative impacts?

7.9.2 MCA Scoring system

Scoring allows for differentiation between options. The scoring system used needs to have sufficient range to sufficiently discern the benefits, disbenefits and/or effects of the various options.

A 7-point scoring system, as detailed in table 2 below, will be used for this project. It will be used to rate quantitative and qualitative measures within the MCA template. The rating scale comprises a 7-point scale from -3 to +3. A summary of option performance can be obtained by adding these scores together. The total score or relative ranking of each option will be reported as part of the MCA table.

Magnitude	Definition	Score
Major positive (+ve)	Major positive impacts resulting in substantial and long-term improvements or enhancements of the existing environment.	3
Moderate positive (+ve)	Moderate positive impact, possibly of short-, medium- or long-term duration. Positive outcome may be in terms of new opportunities and outcomes of enhancement or improvement.	2
Minor positive (+ve)	Minimal positive impact, possibly only lasting over the short term. May be confined to a limited area.	1
Neutral	Neutral – no discernible or predicted positive or negative impact.	0
Minor negative (-ve)	Minimal negative impact, possibly only lasting over the short term, and definitely able to be managed or mitigated. May be confined to a small area.	-1
Moderate negative (-ve)	Moderate negative impact. Impacts may be short, medium or long term and are highly likely to respond to management actions.	-2
Major negative (-ve)	Impacts with serious, long-term and possibly irreversible effect leading to serious damage, degradation or deterioration of the physical, economic, cultural or social environment. Required major rescope of concept, design, location and justification, or	-3

Scoring is compared to the do-minimum and should assume a typical level of mitigation is applied.

7.9.3 Do Minimum identification

The Do Minimum scenario for each area is defined as follows:

- Committed projects with the RLTP;
- A reasonable level of increased PT provision (increased peak hour services) to meet increased demand;
- Projects under investigation/development which are reasonably likely to occur; and
- A package of local road improvements such as upgrades to the frontage of a local / collector road where development occurs.

As a fundamental basis for the assessment, the anticipated land use development is assumed to occur in the Do-minimum option. Other options performance will be compared to the Do-Minimum option.