Future Connect

Our long term network plan for Auckland
(first Decade)

Introduction to Future Connect
First Decade

Future Connect is Auckland Transport's Network Plan. It is a 10-year system planning tool (building towards a 30-year outlook) for Auckland's integrated transport system. Future Connect and the Regional Land Transport Plan (RLTP) come together to formulate Auckland's integrated transport plan.

Future Connect has been guided by the Auckland Plan and the Auckland Transport Alignment Project (ATAP) and developed in collaboration with partners and stakeholders. This first decade report covers the following key outputs:

- Strategic Networks – The most critical links for all modes to provide a core planning reference.
- Deficiency & Opportunity Mapping – An overview of the critical transport system problems and opportunities we expect in the next decade.
- Indicative Focus Areas – The highest priority areas for further investigation.

These key outputs provide strategic guidance for the RLTP 2021-31 and will inform future investigations.

Future Connect supports the public consultation of the draft RLTP 2021-31 investment programme by providing context and rationale for future transport investment. This report provides background information on the key Future Connect outputs. These outputs can be viewed through the Future Connect Mapping Portal at at.govt.nz/futureconnect.

What happens next

- The decisions adopted in the RLTP 2021-31 (after public feedback is taken into account) will be reflected in the final Future Connect First Decade report
- The final version of the First Decade report will be made publicly available alongside the Mapping Portal, and the adopted RLTP 2021-31 in mid-2021
- A Strategic Case to support the RLTP will also be released.

The next phase of Future Connect will focus on the Second and Third Decades.

Contents

List of Figures

List of Tables

1.0
Setting the scene

PART I: SETTING THE SCENE

The Auckland region is the largest urban area in New Zealand. It is growing rapidly, which poses significant challenges to transport, both now and into the future. As the transport system evolves, informed evidence-based strategic decision-making is vital to making better decisions and interventions by Auckland Transport and its partners, for the benefit of Auckland, its people, its economy, and its environment.

Future Connect contributes to planning and investment decisions by examining the problems and opportunities facing Auckland's transport system. Guided by problems and objectives agreed with partners, Future Connect includes the following deliverables:

1. A system planning tool that assesses problems and opportunities on Auckland's strategic modal networks and develops a network plan (this report)
2. A strategic assessment of the 'big picture' problems facing Auckland's transport system and setting out the context and investment story (a separate Strategic Case document under development with partners to inform business case processes).

This report covers the background to the development of the system planning tool and its key outputs in depth.

1. Purpose and Scope of Future Connect

1.1 What is Future Connect?

Future Connect is a system planning tool that provides a network plan for Auckland's integrated transport system. It uses AT's strategic transport objectives and key indicators, to guide integrated transport and land use planning. This is developed in collaboration with our partners and stakeholders. The tool provides:

- strategic modal networks to provide a core planning reference
- an overview of critical problems and opportunities facing Auckland's transport system
- strategic guidance for RLTP investment, investigation and delivery.

When completed, Future Connect will be a long term plan (up to 30 years) for Auckland's future integrated transport system. The initial focus, outlined in this report, is on the first decade (10 year horizon).

1.2 Purpose and Scope

The purpose of Future Connect is ultimately to provide an integrated and strategically aligned transport plan for all modal Strategic Networks in the first, second and third decades to enable better assessment, planning and investment.

The scope of Future Connect is to:

- provide a core planning reference for Strategic Networks across modes to guide and streamline planning throughout a typical project lifecycle, including investigation, design, delivery, operations and maintenance
- provide a shared evidence base for investigations, and guidance for strategies and plans, including RLTP prioritisation.

Future Connect does not:

- identify problems or opportunities on supporting (non-strategic) links of the modal networks (e.g. connector public transport (PT) routes or local roads)
- explore possible design solutions, evaluate projects or allocate funding (this is the role of the RLTP and further business case work)

Future Connect delivers the following key outputs:

1. **Strategic Networks**
   Define each strategic modal network and outline the most important links for movement of people, goods and services.
2. **Deficiency & Opportunity Mapping**
   Highlight the most significant problems and opportunities on the Strategic Networks expected over the next 10 years using a link-based analysis.
3. **Indicative Focus Areas**
   Describe the most critical multi-modal, safety and environmental problems and opportunities located on the Strategic Networks that require further investigations.

Outputs are easily accessible through the Future Connect Mapping Portal – based on Geographic Information Systems (GIS). For convenience, supporting links can also be viewed in the mapping portal[1].

Future Connect's methodology is shaped by:

- a robust, evidence-based and repeatable process to rank the most significant problems and opportunities on the Strategic Networks
- inclusion of the most important datasets or key proxies for the successful operation of all Strategic Networks, and assessment of safety and environmental issues
- Auckland Council's land use and modelling assumptions based on scenario version 11.5 and ATAP2 respectively (Auckland Forecasting Centre, August 2020)
- consideration of partner, stakeholder and Subject Matter Expert (SME) feedback on key outputs
- incorporation of the significance of local place context to inform network integration (together with the Roads and Streets Framework (RASF)).

1.3 Strategic context and objectives

The **Auckland Plan** seeks integrated outcomes for the region over the long term, including three strategic directions for transport which guide Future Connect. These strategic directions are addressed in the following ways:

i. *Better connect people, places, goods and services* through an integrated all mode system approach, including freight networks
ii. *Increase genuine travel choices for a healthy, vibrant and equitable Auckland* by integrating all the main travel modes for the first time, highlighting travel deficiencies across space so that they can be remedied and encouraging mode shift to public transport, walking and cycling
iii. *Maximise safety and environmental protection* through surfacing the worst vulnerabilities and negative consequences of the transport system.

Future Connect and the development of the RLTP are also informed by Auckland Council's adopted **Te Tāruke-ā-Tāwhiri: Auckland's Climate Plan** (2020) which has outlined key actions for transport's role in reducing emissions and adapting to climate change:

1. *Changing the way we all travel*
2. *Make travelling by public transport more appealing than using personal vehicles*
3. *Rapidly increase access to bicycles, micro-mobility devices and the safe, connected, and dedicated infrastructure that supports their use*
4. *Rapidly improve safety, connectivity, and amenity of walking infrastructure*
5. *Accelerate the transition of our passenger and light commercial vehicle fleet to low emissions vehicles*
6. *Make heavy freight systems more efficient and low carbon*
7. *Enhance the resilience of our transport network.*

[1] Future Connect Mapping Portal is available here at.govt.nz/futureconnect

It is important that transport partners ensure that their respective planning is coordinated towards achieving agreed objectives. The figure below provides an overview of how Future Connect and strategic policy documents interact and align with investment programmes in Auckland.

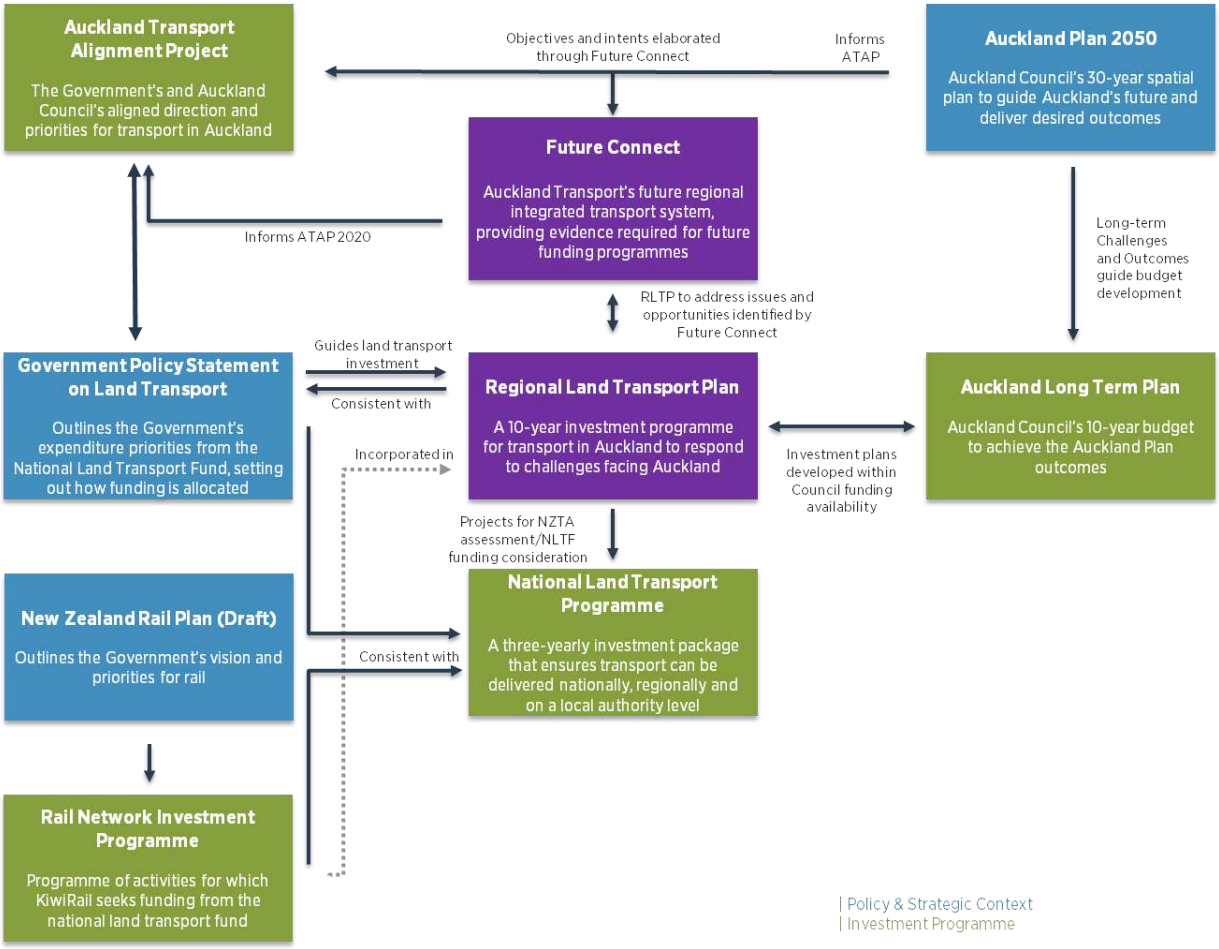


Figure 1: Future Connect's relationship with strategic policy and investment programmes

ILM – defining problems, opportunities and objectives for Auckland's transport system

An Investment Logic Map (ILM) for Future Connect and the RLTP was agreed with project partners (Auckland Council, Waka Kotahi (NZTA) and key stakeholders (KiwiRail and Ministry of Transport) in February 2020. The ILM updated and re-clarified current strategic problems, opportunities and objectives, and included a review of:

- the problems facing Auckland's transport system outlined in the Auckland Plan, ATAP 2018, and the RLTP 2018
- the benefits of investment outlined in Auckland Plan, ATAP 2018, and the Government Policy Statement (GPS) 2018.

These will be further elaborated on in a strategic assessment in the Future Connect Strategic Case, which will be released together with the final RLTP 2021-31 once approved.

The ILM directs both Future Connect and the RLTP in different ways:

- Future Connect through problem statements and the identification of Deficiency & Opportunity Indicators on the strategic modal networks
- ATAP/RLTP through objectives to guide project assessments and the development of the investment programme.

Relationship between Future Connect and the RLTP/ATAP

Future Connect's key outputs inform and guide RLTP investment prioritisation towards the most critical multi-modal and intermodal problems on the Strategic Networks. The RLTP's prioritisation and investment programme takes into account Future Connect's identified deficiencies on the strategic modal networks, but also other factors such as available funding, value for money objectives, and the maintenance and renewal programme, amongst others. The RLTP is a response to system needs, which is in part infomed by Future Connect. The ATAP 2020 process achieves transport investment alignment between local and central government partners and funders which is then reflected in the RLTP investment programme.

The following figure, a key output of the ILM process, shows how Future Connect's Problem Statements relate to the Objectives. The ILM has been confirmed with partners and key stakeholders.

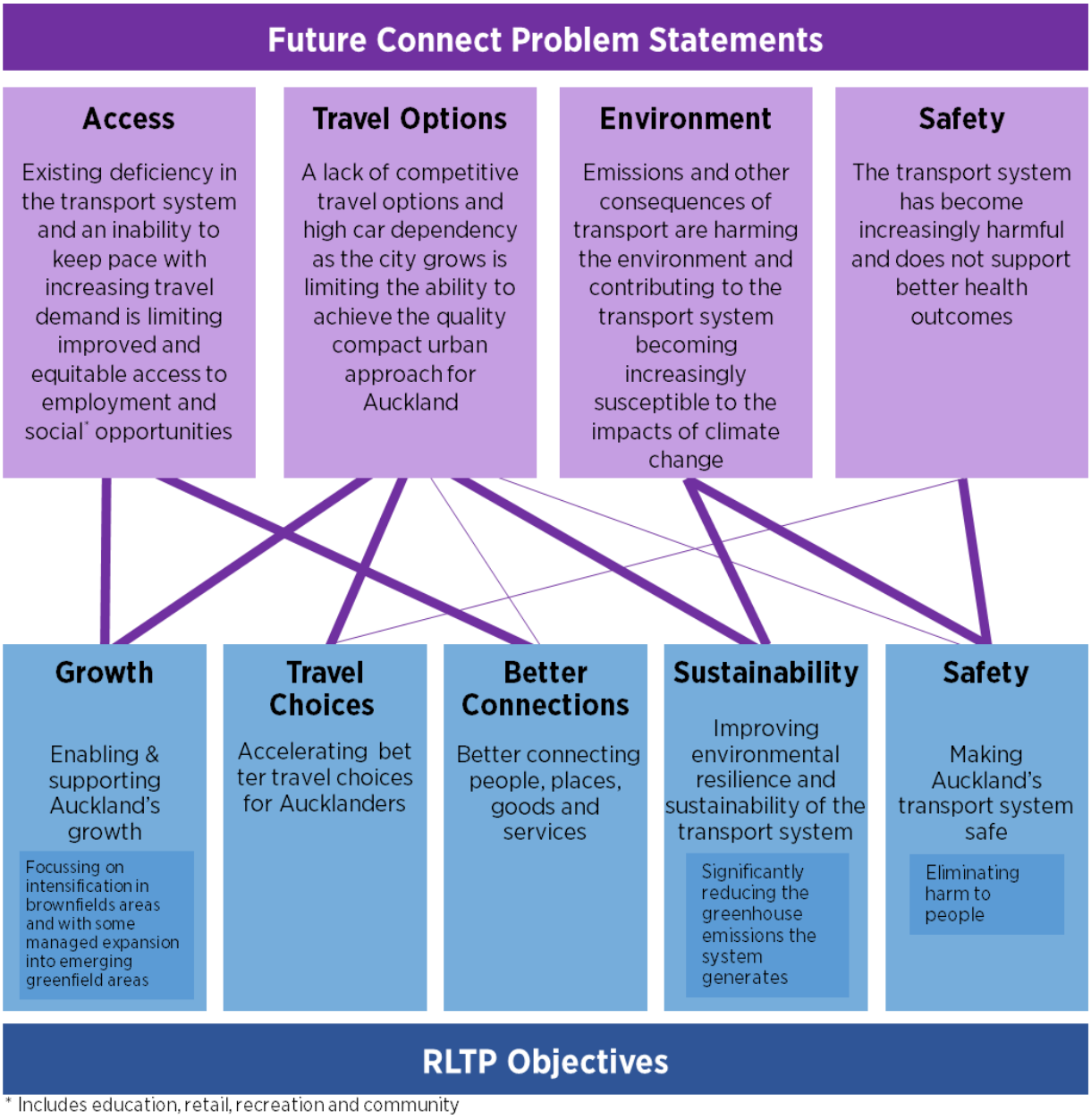


Figure 2: Future Connect Investment Logic Map (Including updated ATAP 2020 Objectives)

The RLTP Objectives align with updated ATAP 2020 objectives and are the same as Future Connect's system planning objectives because they aim to achieve the same outcomes. Measures have been drafted that ensure progress towards objectives can be monitored.

2. Approach of Future Connect

Future Connect has taken a strategic approach to uncover the most important problems and opportunities on the modal networks to improve integration over the next 30 years.

2.1 Future Connect phases

Future Connect is divided into two main phases covering different planning horizons. The figure below shows the first phase looking ahead to 2031, which will be followed by a second and third decade phase (20-30 year horizon).

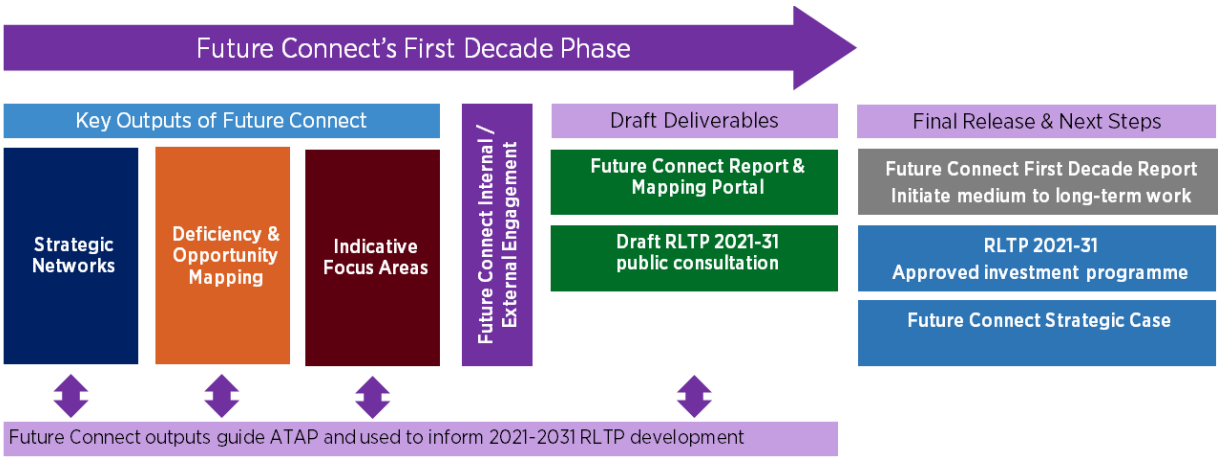


Figure 3: Future Connect's first decade phase

The Strategic Networks will change over time. Future Connect includes a formal change management process to ensure the continued integrity and usefulness of the networks to the whole organisation, partners and stakeholders as they evolve over time.

2.2 How we've worked with our partners and stakeholders

Future Connect was developed in partnership with Waka Kotahi and Auckland Council.

External Engagement

In late 2020, AT presented Future Connect to various partners and stakeholders, including government agencies, and industry / community organisations with an interest transport.

Feedback has helped improve the strategic fit of Future Connect, and better align with the work and ambitions of others. Technical input helped refine the Strategic Networks and Deficiency & Opportunity Indicators, leading to a better long-list of Indicative Focus Areas.

PARTNERS AND STAKEHOLDERS

- Auckland Council, including
  - Councillors
  - Planning Committee
  - Local Boards
- Waka Kotahi
- Ministry of Transport
- KiwiRail
- Kāinga Ora
- Freight Reference Group
- NZ Automobile Association
- Road Safety Governance Group
- Bike Auckland

Mana Whenua Engagement

The Future Connect team engaged with Mana Whenua to introduce the project to interested representatives from the 19 Iwi with Kaitiaki responsibilities in the Tāmaki Makaurau region.

Engagement sessions focused on network deficiencies and opportunities and Indicative Focus Areas as they relate to Māori centres of activity.

Kaitiaki feedback added a qualitative lens to the Indicative Focus Areas. This included concerns about:

- the complexity of Kāinga Ora and Tāmaki redevelopment areas
- sites of cultural and natural significance severed by Focus Areas
- the negative effects of heavy vehicles on the quality of coastal roads[2].

In response to Iwi feedback, a change was made to the environmental deficiency indicator so that the impact of future growth on stormwater runoff is part of the analysis (not current traffic volumes).

Cultural impact and values assessments will also have information that will support future investigations and will be taken into consideration early in the system planning process.

2.3 Reviewing and updating Future Connect

Future Connect will be kept up-to-date and relevant through:

- implementation of an Integrated Strategic Network change management process. Once changes have been assessed and approved, the mapping portal will be updated, and stakeholders will be informed
- a review every three years prior to the RLTP to inform the development of the investment programme, and other Auckland Transport plans, strategies, projects and functions
- reflecting changes in projects and assumptions, for example through a review of modal priority using the Roads and Streets Framework, the results of business case investigations, or updated deficiency / opportunity data.

Future Connect's approach to dealing with future uncertainties, including sudden shocks that may affect its ten year horizon, is threefold:

1. Reviewing the assumptions behind data at the time, and ensuring that it is the best available (especially assumptions and data underpinning regional modelling)
2. Updating the key outputs (Strategic Networks, Deficiency & Opportunity Mapping, Indicative Focus Areas) as and when required, through:
    a. updating key deliverables with in-house resources
    b. an established change management process, enabling periodic reviews, as and when required
3. Providing an option to do interim 'State of the System' reports on particular modes or the integrated network.

[2] Note that the Freight Strategic Network will help limit these negative impacts.

Dealing with an uncertain future

Future Connect itself is a living plan and an ongoing project, working with partners and stakeholders to adapt to a changing transport landscape.

The recent global COVID-19 health pandemic has starkly illustrated the transport system's vulnerability to unforeseen shocks. The sudden drop-off in the use of the transport system has reshaped transport operations and significantly reduced Auckland Council and government revenues.

Recent research by Waka Kotahi outlines the likely impact on Auckland's economy:

> *"Auckland's reliance on tourism and [its] gateway role plus [a] large number of international students and high volume of migrant workers means a large short-medium term impact. May be an increase in internal migration as people seek employment opportunities from elsewhere plus a reduction in outward migration as housing market and business relocations cool"*
> Source: COVID 19 - implications for land transport (summary), 2020:11, NZTA

The change generated by the COVID-19 pandemic leaves important uncertainties regarding:

- how significantly travel demand may be reduced or reshaped,
- potentially unforeseen travel behaviour changes,
- whether urban growth slows and how long it takes to rebound,
- how substantial and enduring reductions in available capex and opex funding will be, and the impact on programme and project delays, especially over the first decade.

Future updates of Future Connect will include a review of current assumptions and scenarios. Once the 2021 RLTP is final, some transport projects assumed completed by 2028 for Future Connect might be delayed or not funded. Full revisions of Future Connect will need to reflect updated project assumptions.

Despite the potential for short term change, many of the fundamentals of transport in Auckland will remain slow to change, for example, the distribution of land use drivers. However, the impact of advances in mobility alternatives and technology, and the increased application of an environmental lens to the transport system, might further impact the way we travel and will need to be considered for the long-term plan (up to 30 years).

2.4 How Future Connect will guide what we do

Future Connect delivers a system planning tool and network plan that supports planning and investment with partners and stakeholders, but also throughout Auckland Transport's project lifecycles.

Project lifecycle

The figure below shows where Future Connect fits into the lifecycle of a project.

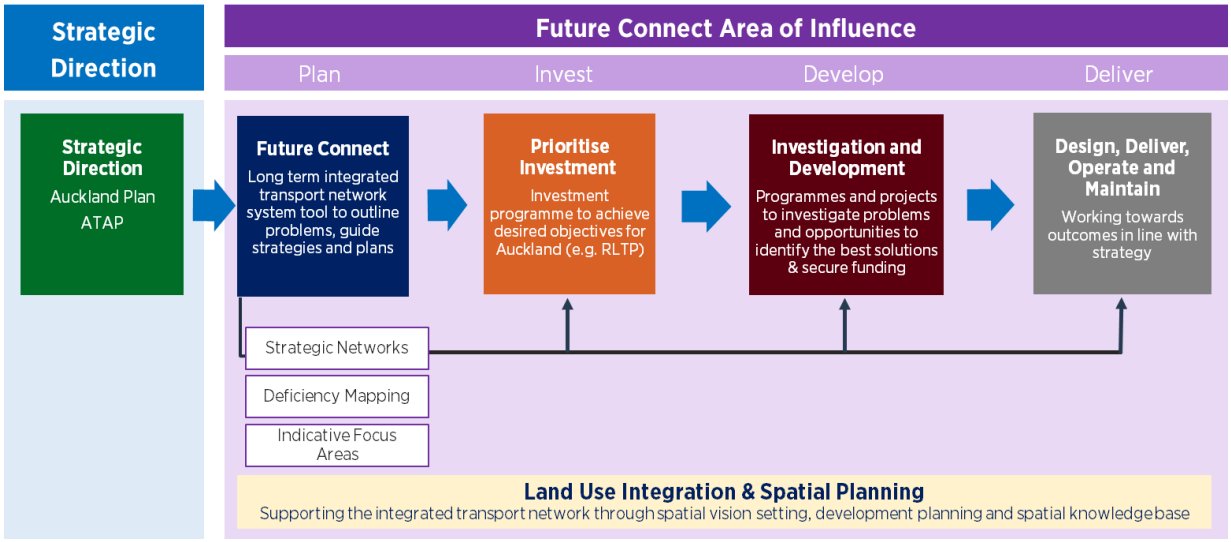


Figure 4: Future Connect and the Project Lifecycle

The figure below outlines the strong interface Strategic Networks have with some of Auckland Transport's current work streams, as examples of its role and value.

PLAN	INVEST & DELIVER	OPERATE & MAINTAIN
Roads and Streets Framework RASF assesses the strategic significance of movement and place function. Future Connect's Strategic Networks are an input for RASF assessments	**Supporting Growth** Alignment of Strategic Networks or define new networks in greenfield areas	**Network Operating Plan (NOP)** The NOP reflects changes to the current Strategic Networks and RASF, which details the significance of each mode by location and therefore what should be prioritised
Regional Public Transport Plan Iterative alignment of Public Transport Strategic Networks	**Cycling Programme Business Case** Aligning of implementation with Strategic Networks	**Auckland Transport Operations Centre** The current Strategic Networks guide network operational decision-making and solutions (e.g. event management)
Land Use Integration & Spatial Planning Strategic Networks are supported through spatial vision setting (e.g. Area/Centre Plans, Masterplans), growth and development planning (e.g. Crown/ Private Plan Changes, Consents)	**Connected Communities** Alignment of Strategic Networks through detailed investigations	**Asset Management** Future Connect Strategic Networks guide asset management approach over longer term

Table 1: Future Connect's interface with key Auckland Transport work streams

Future Connect provides a useful and up-to-date reference point to understand the Strategic Networks and their key deficiencies and opportunities, which informs strategic decisions and co-ordinated multi-modal service delivery.

Working with Partners and Stakeholders

The deficiencies and opportunities facing the transport system in Auckland cannot be addressed by Auckland Transport alone. Future Connect recognises the need to continue to work closely with partners and stakeholders to better coordinate and guide future investment. This brings the transport system to greater maturity and establishes it on a sure footing for the future.

In addition to ATAP, it is anticipated that Future Connect will also guide external partner and stakeholder plans, programmes and projects, as illustrated in potential 'use case' examples below.

PANUKU DEVELOPMENT AUCKLAND / KĀINGA ORA	SUSTAINABILITY OFFICE (AUCKLAND COUNCIL)	PRIVATE DEVELOPMENT AGENCY
Provide future Strategic Network guidance to the unfolding of development under the Manukau Framework Plan over the next 20 years (Panuku), or Inform the Tāmaki Regeneration Programme of Strategic Network deficiencies in the area (Kāinga Ora)	Assist Auckland Council better target the worst environmental problems on the road network	Provide a single source of information for developers on future planned Strategic Networks (Public Transport, Cycle & Micromobility, Walking, Freight, General Traffic)

Table 2: Potential partner and stakeholder 'use case' scenarios

2.0
An Integrated Transport System

PART II: AN INTEGRATED TRANSPORT SYSTEM

Auckland's transport system faces significant challenges to both supporting and shaping land use development while meeting customer needs, enabling the movement of goods, and minimising the negative impact on the environment, well-being and safety.

3. Auckland's transport system

The urban form of the Auckland region is shaped by a discontinuous physical topography and many waterways which disrupt easy transport connections between areas. Auckland has seen periods of rapid expansion, especially post-World War 2, with:

- the urban area expanding beyond the central isthmus
- the removal of the tram network
- construction of motorway extensions, and
- the growth of significant peripheral settlements.

Transport networks have developed to support a growing urban Auckland and inter-regional links.

Auckland's transport system has the following challenges:

- **Challenging natural landscape**. Transport networks must operate across a broken topography with significant waterways, especially between sub-regions
- **Dispersed travel patterns** related to urban form and the land use pattern
- **Arterial roads often the only route**. As a result, arterials carry significant trip volumes for a range of purposes, making them essential for access to employment, education, healthcare and leisure, as well as the transportation of freight. Auckland's continued growth will place greater pressure on the arterials, meaning that congestion will increase unless steps are taken to improve network efficiency and productivity
- **Many modes one road**. The most direct routes between areas are often desire lines for different modes. Road corridors that serve multiple modes, and that are physically constrained, face significant competing modal priority issues.

Auckland, over time, has developed a series of modal networks to different stages of maturity, consisting of:

- a motorway network with most major links now in place (e.g. Western Ring Route, Waterview)
- a road network, which is still developing as the city grows, carrying the bulk of trips
- a freight network, but with minimal dedicated freight priority
- a burgeoning public transport (PT) network (with growing patronage but from a low user base) underpinned by strong investment over the last decade, including implementation of the New Bus Network
- increasing investment on the Rapid Transit Network (RTN) that will improve PT capacity and reach, significantly the City Rail Link (CRL)
- recent cycling infrastructure improvements forming the beginnings of a cycle network
- renewed interest in the importance of walking and door to door journeys.

4. Achieving better transport system integration

The increasingly complex and changeable travel demand profile in Auckland means a multi-modal system that is safe, sustainable and customer responsive is needed to meet current and future requirements.

4.1 A System of Networks

A system view that encompasses all modal networks across the region is important in the context of Auckland to achieve a properly integrated, multi-modal transport system that meets the needs of all Aucklanders

All modes have a role in the movement of people and goods. Future Connect therefore applies a system view to modal networks to achieve a better integrated transport system in the region. No one mode is more important than any other at a network level.

A system view of the transport network means:

- **Each mode has a network role to play**. Recognition of the unique contribution and role that each mode plays while making the best use of the existing system
- **Major corridors often have many purposes**. A recognition that major roads often serve many modes
- **Modal priority on a link relates to movement and place**. Differences in modal priority occur on individual roads / corridors and relate to the strategic role of that road / corridor and the local place function. Application of the value of place and adjoining land uses to Strategic Network priority is achieved through a RASF assessment
- **Awareness of inter-dependencies** between the operation of different modal networks, and the impacts on safety, the environment, and the customer. Though integrated planning, there will be opportunities to reconcile competing interests and priorities
- **Time influences modal priority.** Time of day, day of the week and time of year may impact the desired road use priority, depending on travel demand, adjacent land use and activity.
- **Towards a multi-nodal urban model**[3]. Auckland over the long term will continue to have a strong City Centre with a regionally significant role, but metropolitan centres will play an increasingly important role in the future (refer to Figure 5 below). These centres and other local centres require a well-connected transport system to serve their growth in business and employment, civic services, and residential options over time.

[3] The Auckland Plan 2050 signals that a multi-nodal future will strengthen over time.

Figure 5: Future multi-nodal city served by an efficient transport system (based on Auckland Plan 2050)

4.2 How Future Connect relates to the Roads & Streets Framework and the Auckland Network Operating Plan

Auckland Transport has a series of system tools to ensure the integration of planning, land use, operations and design.

Future Connect's Strategic Networks provides a top-down view of the system of networks, encompassing all modes of transport. The RASF provides a bottom-up system view and ensures the importance of land use and place is integrated into any decision making on Auckland's roads and streets. Strategic Network principles are applied in determining modal priorities for the networks[4].

A RASF Mandate includes a modal priority assessment which provides strategic guidance to guide design choices for local corridors or networks set by the Transport Design Manual (TDM). The figure below illustrates these relationships.

[4] The principles that apply to each Strategic Modal Network can be found in the Auckland Strategic Networks report available here at.govt.nz/futureconnect

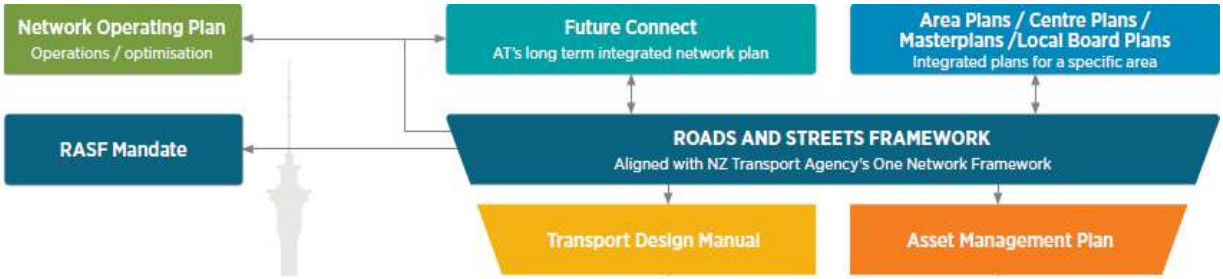


Figure 6: The relationship between Future Connect, RASF, ANOP and the TDM

Modal Priorities

Where there are multiple modal priorities in a corridor, there may be space constraints that limit the ability to provide for all the priorities identified by Future Connect. The RASF provides the tools to address these conflicts, using modal priorities to understand where trade-offs are acceptable.

A regional baseline RASF assessment is planned, to identify modal priorities and deficiencies for all roads and streets. This baseline assessment will feed into integrated planning, the refinement of Indicative Focus Areas and the change management process[5].

To manage current network operations, Future Connect's Current Strategic Networks informs AT's Auckland Network Operating Plan (ANOP). Transport operations in these corridors can then be managed to ensure appropriate levels of service.

4.3 Intervention Hierarchy

Future Connect applies the system view developed in collaboration with our partners and stakeholders as the first step in the intervention hierarchy, to provide strategic guidance for planning and investment – refer to the figure below. The other hierarchy levels are applied to shape the appropriate response to any problem or opportunity on the network.

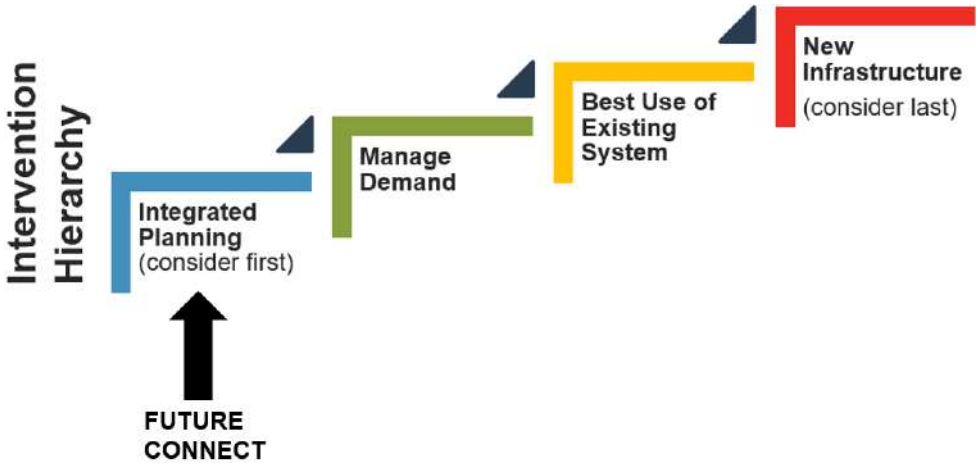


Figure 7: Intervention Hierarchy

[5] Note that details pertaining to Change Management can be found in section 4 of the Auckland Strategic Networks report available here at.govt.nz/futureconnect

Note that Future Connect is a strategic-level project. This means it only incorporates strategic links in its key outputs. Supporting links must also be considered and investigated as part of the transport system. This is particularly important at a local level.

5. Strategic Networks

Future Connect proposes Strategic Networks to ensure that the most critical links are identified, captured spatially and integrated into a single planning tool providing a core reference. Future Connect uses a multi-layered approach to integrated planning, and applies a safety and environmental lens to all modes, as illustrated in the figure below.

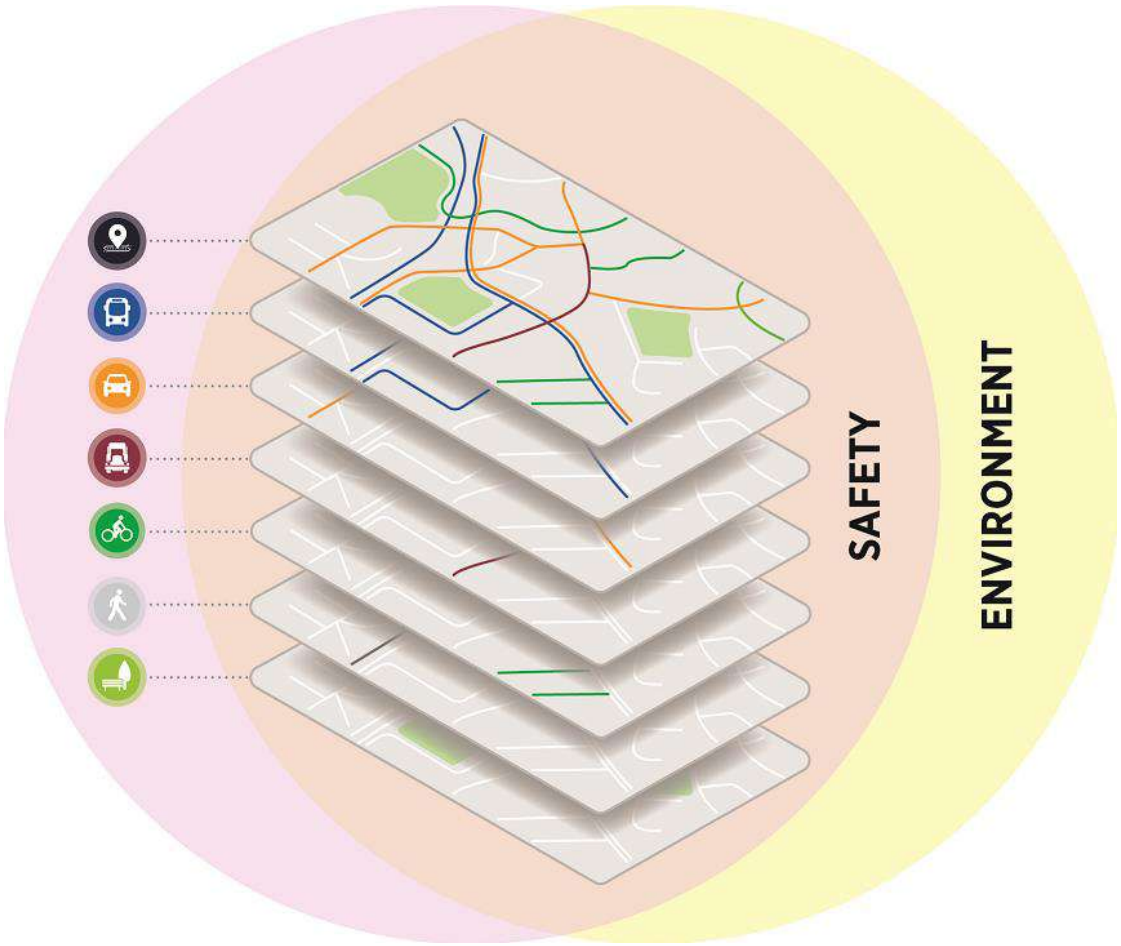


Figure 8: Future Connect's multi-layered planning approach

5.1 Strategic Networks: definitions and principles

Future Connect distinguishes between modal networks that are 'strategic', and those that are regarded as 'supporting' (non-strategic). Supporting networks complement the functioning of the strategic networks so the transport system works as a whole, for example PT network connectors serving the rapid transit network, or general traffic collector roads linking to arterial roads. Supporting links are essential for providing complete door-to-door journeys.

The Auckland Regional Strategic Network and its routes are together defined as:

- **The most critical links** for movement of people, goods and services to be managed as part of an integrated multi-modal network
- Key connections with **important regional activity** and a **high volume of users** linking sub regions and key centres with other parts of New Zealand
- **The backbone** of the transport system providing safe, efficient and reliable movement of people, goods and services across the region
- Providing easy **whole-of-trip** journeys for customers.

Future Connect examines the five main modal networks across the region. Principles were developed by the SME working group to continually guide the system view and the integration of these five strategic modal networks – refer to the table below.

Themes	Integration principles
Manage effects on the environment	• Avoid, remedy or mitigate any adverse effects on the environment • Adapt to a changing climate and respond to the microclimatic factors of each area • Provide a transport system that supports more sustainable modes to enable reductions in emissions.
Safe network	• Provide a safe and secure transport network, free from death and serious injury for all users • Provide a safe and convenient network of routes accessible to people of all ages, abilities and backgrounds • Provide greater attention to modal networks for vulnerable users to avoid conflict, particularly where there is expected to be an increase in the movement function of a corridor and an increase in vulnerable users
Connect nodes	• Provide connection between the common destinations that link people to people, goods, services and opportunities • Support inter-regional connectivity

Themes	Integration principles
Connect modes	• Provide for travel options and the ability to connect easily at interchanges, including changing between modes
Provide access	• Provide direct and efficient access to centres and key destinations
Integrate land use and transport	• Enable a compact urban form through land use integration • Support land use with complementary networks resulting in effective movement of people and goods • Enable convenient and direct public transport, walking and cycling access to centres
Modal priority	• When a corridor is part of a strategic network, this must be considered in the modal priority assessment • Use RASF to identify modal priorities and potential conflicts in a corridor
Mode shift	• Provide quality active mode and dedicated public transport routes to enable mode shift away from private car use • Prioritise sustainable modes where needed to provide an improved throughput across the network
Place function as well as movement	• Enable the reflection of place value as well as movement in corridors
Reliable and resilient	• Create routes that can withstand unexpected events and severe weather conditions • Avoid disruption or minimise it when it occurs by adopting a whole-of-system approach
Make the best of existing networks	• Optimise people throughput to support current and future demand across different periods of the day • Prioritise people throughput as the movement function as demand for use of the corridor increases • Support access to public transport by active travel modes • While understanding the implications of kerbside functions with the road's surrounding land use functions, limit stationary activities on arterial roads where it inhibits efficient people throughput or conflicts with the objectives of other strategic transport networks

Table 3: Integration principles for Strategic Networks

5.2 Strategic Network development

Future Connect has brought together information from mode-specific plans and strategies to develop the Strategic Networks for all modes, and for both the Current and the First Decade (2021-31) periods. This process involved the collection of data and information from different plans and strategies, and updating and developing new definitions when necessary.

The figure below shows the origin of each of the modal networks for both the current and the first decade. In addition it shows the process and additional inputs required to progress from the Current to the First Decade networks.

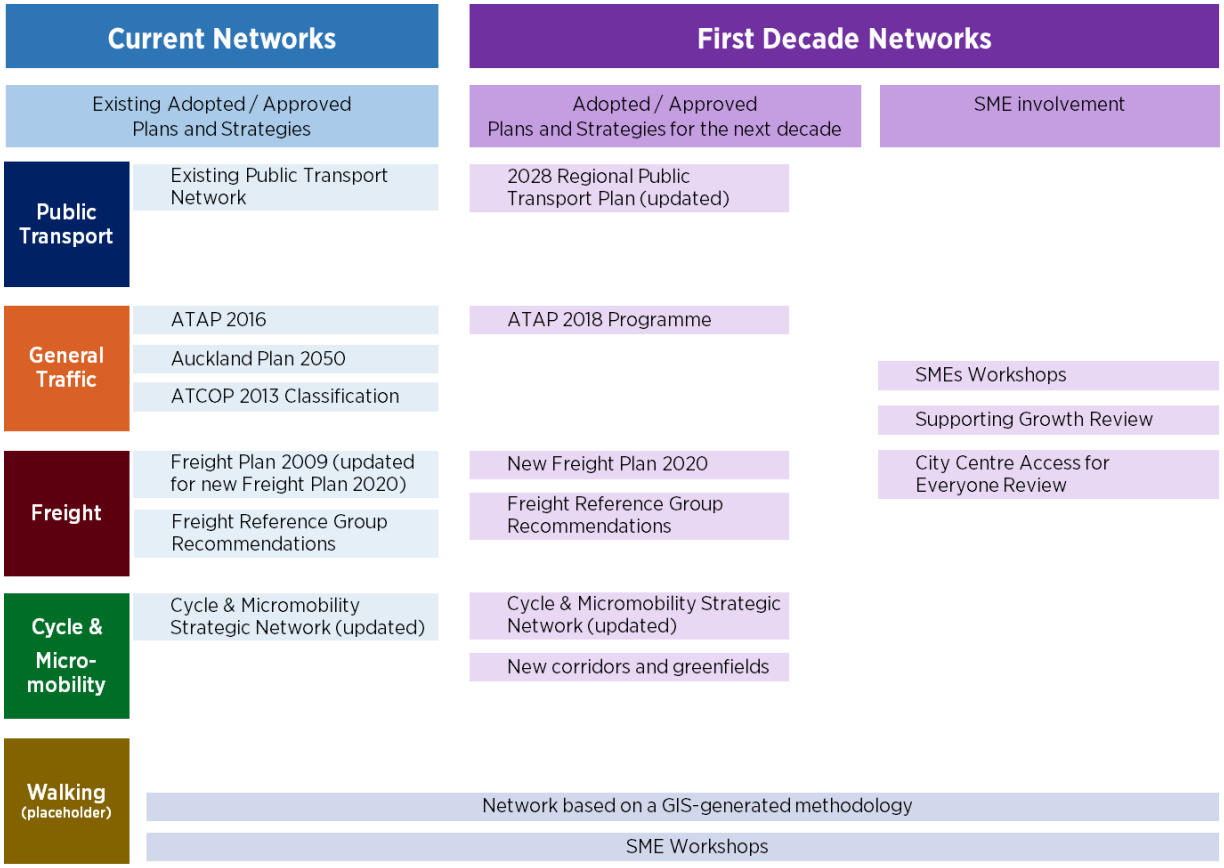


Figure 9: Origin of Strategic Networks (Current and First Decade)

Each modal network is made up of different hierarchy levels, some of which fulfil a strategic function – refer to the figure below. Hierarchy levels were defined through workshops with SMEs.

Furthermore, in order to provide consistency between modes and to allow comparisons to be made between the different strategic modal hierarchies, a common three-level strategic hierarchy was developed[6].

[6] Note that the differences within this hierarchy is explained in section 2.4 of the Auckland Strategic Networks report available here at.govt.nz/futureconnect

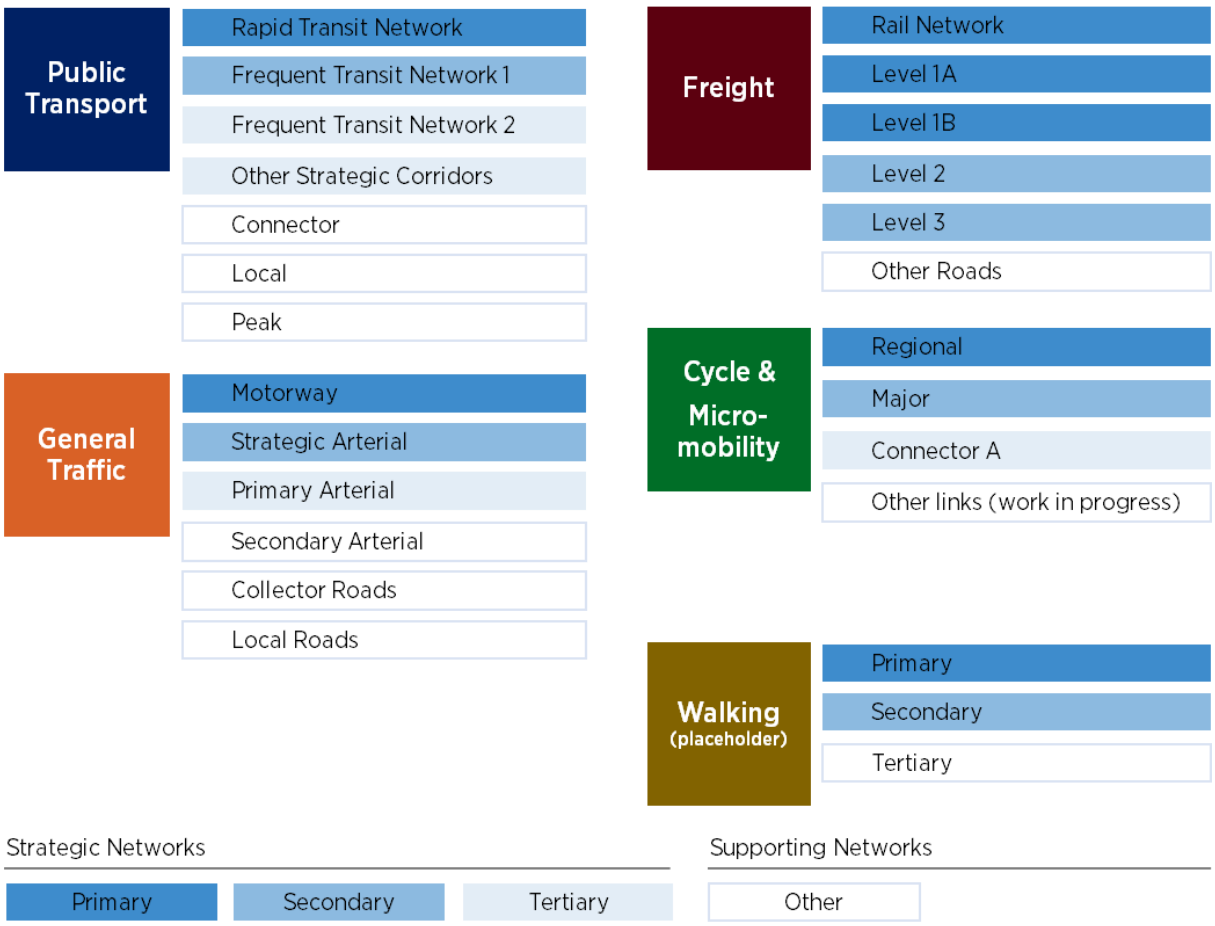


Figure 10: Consistent modal networks hierarchy levels

The definition of each of the modal networks, including strategic and supporting network layers, are outlined in Appendix A.

6. Planning for the next decade

Land use changes anticipated over the next 10 years will be a significant driver of the requirements of the regional transport system to 2031. This section provides an indication of the location of major land use change, the sequencing of that change, and the transport responses needed to support that change.

Integrated planning, as the first step in the intervention hierarchy, can assist in managing the challenges of the transport impacts of both private and public sector development planned over the next decade.

6.1 Land use changes

The map below shows the significant land use changes anticipated over the next 10 to 30 years in Auckland, as outlined in the Auckland Plan. Although the exact sequencing of these sites is subject to change and is dependent on multiple public and private actors, the map provides an indication of the location of significant growth across the Auckland Region over the longer term.

With a focus on the next 10 years, the emerging joint priority growth areas currently under consideration by Auckland Council and central government agencies are likely to trigger significant changes in the transport networks:

- Māngere, Mt Roskill and Tāmaki
- Northcote and Oranga
- North-West growth area
- Drury and Paerata urban growth areas
- City Rail Link stations and surrounds

Future Connect has assumed the impact of land use change in these areas on the generation of future modal trips based on Auckland Forecasting Centre modelling – refer to Section 8.

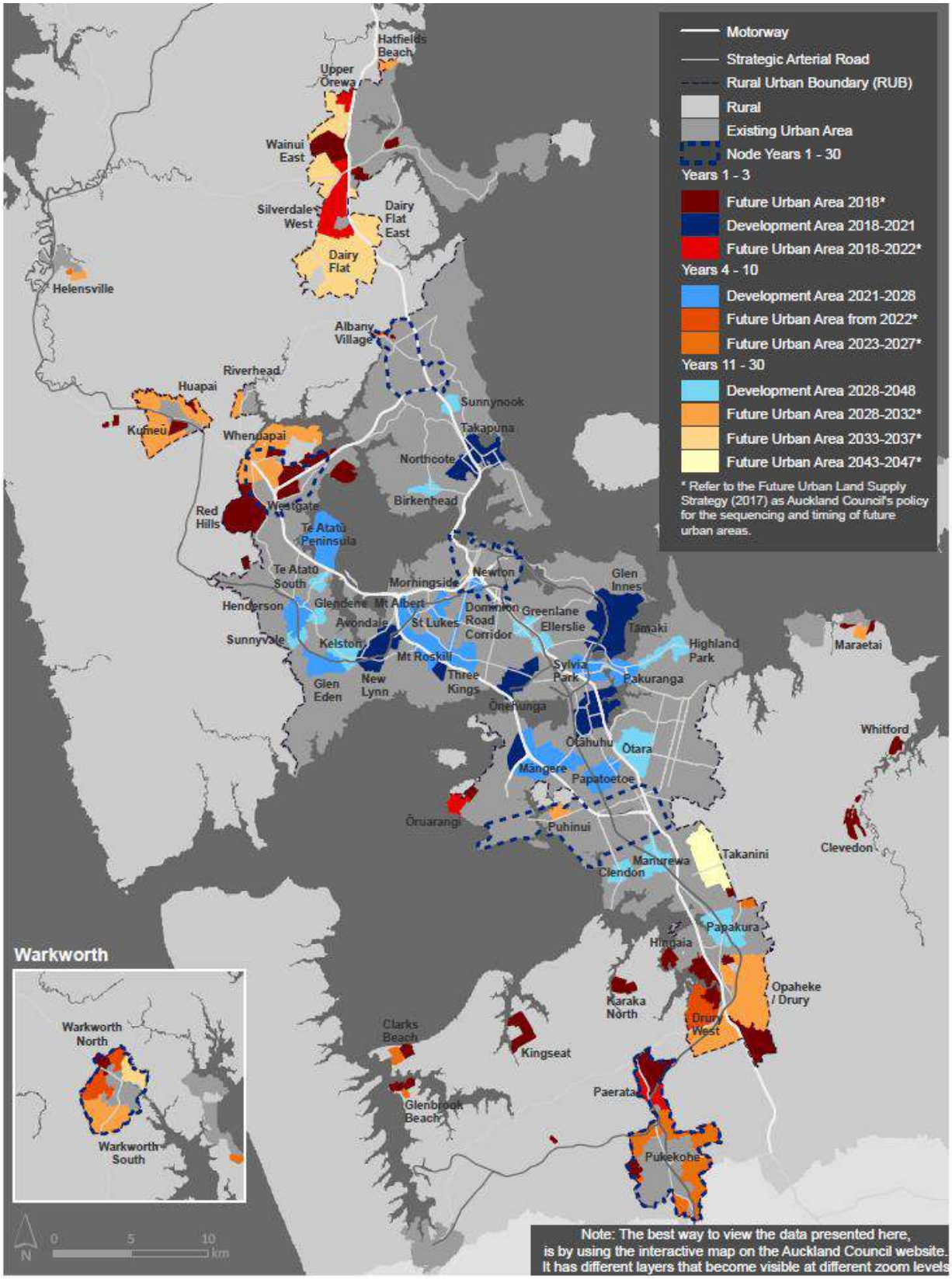


Figure 11: Auckland Plan Development Strategy sequencing, 2018, Auckland Council

6.2 Transport network changes

Over the next decade Auckland's Strategic Networks will need to adapt to respond to the growth challenge and to meet the needs of an evolving region. Ultimately, the Strategic Networks influence where and when significant urban growth can occur, especially in future urban areas.

Broadly speaking, changes to the Strategic Networks in the next ten years result from:

- new infrastructure: railway network upgrades, busway upgrades, new roading projects, cycleways and footpaths
- new public transport services or changes to existing services
- reclassification of existing network links to adjust their function and respond to land use changes and new demands. This can result in parts of the networks being tuned up or tuned down from one hierarchy category to another, which could result in a move from Strategic to Supporting Networks or vice versa.

These changes were agreed through workshops with SMEs, where information from approved plans and programmes were incorporated and updated where necessary.

The table below quantifies the anticipated changes to the Strategic Networks from Current to First Decade horizon.

	Current	First Decade Change	
	Length (Km)	Length (Km)	%
Public Transport			
Rapid Transit Network	130	77	59%
Frequent Transit Network 1	121	13	11%
Frequent Transit Network 2	159	122	77%
Other Strategic PT Corridors	10	11	104%
Total	420	222	53%
General Traffic			
Motorway	158	19	12%
Strategic Arterial	175	-12	-7%
Primary Arterial	361	51	14%
Total	694	57	8%
Freight			
Level 1A	239	17	7%
Level 1B	164	11	7%
Level 2	94	0	0%
Level 3	296	4	1%
Total	793	32	4%
Freight - Rail network	220	-	-
Cycle			
Regional	236	0	0%
Major	555	51	9%
Connector	194	1	1%
Total	984	52	5%
Walking			
Primary	1,154	-	-
Secondary	2,793	-	-
Tertiary (non-strategic)	3,034	-	-
Total	6,981	-	-

Table 4: Current versus First Decade Strategic Network change
Note that network length does not represent real carriageway length as digital networks have been simplified along centre lines for the sake of measurement. Also note that the Walking network length is not directly comparable with other networks at this stage.

Notable changes in the First Decade Strategic Networks can be summarised as follows[7]:

- **Public Transport:** the most significant Strategic Network increase (53%), largely driven by increases in the frequent transit network services and rapid transit network. Projects and services contributing to this growth include (but not limited to):
    - City Rail Link
    - Panmure to Botany Eastern Busway
    - North-western and Airport to Botany Interim Bus Improvements
    - City Centre Bus Improvements
    - Southern Rail stations

- **General Traffic**: a moderate increase (8%) driven mainly by motorway extensions and new arterials supporting greenfield areas. Some roads are being reclassified to respond to land uses changes (e.g. Downtown programme). Projects and corridor improvements contributing to this network change include (but not limited to):
    - Northern Motorway extension - Puhoi to Warkworth
    - New arterials supporting future urban areas (e.g. Matakana Link Road, Penlink, Mill Road)
    - Corridor improvements (e.g. Northern Corridor, SH20B Improvements)

- **Freight:** a moderate increase (4%) in the network mirroring the general traffic network changes with the addition of new links and corridor improvements that support freight movements. Although not quantified in the table above, rail-based freight network is expected to include a series of upgrades over the next 10 years. These upgrades relate to capacity improvements to parts of the Wiri to Quay Park corridor.

- **Cycle & Micromobility:** the Cycle & Micromobility Strategic Network indicates the strategic intent over the long term. The Current and First Decade Cycle & Micromobility Strategic Networks are not an indication of the implementation programme for the next decade. This is where we want to prioritise investment as part of the cycling programme and associated infrastructure projects to create a high level of service for people on bikes or micromobility devices. This network shows a moderate expansion of 5% over the next decade with the development of new corridors or greenfield areas.

- The **Walking** network has been developed through a GIS analysis using a methodology that considers the main pedestrian attractors. It remains the same for the current and first decade horizons, as it is only a placeholder network at this stage. In reality, the walking network is expected to expand significantly due to new urban developments both in greenfield and brownfield areas, as well as, new footpaths built through the regional footpath programme.

  The following pages show maps of the current networks and the changes expected over the first decade for each mode.

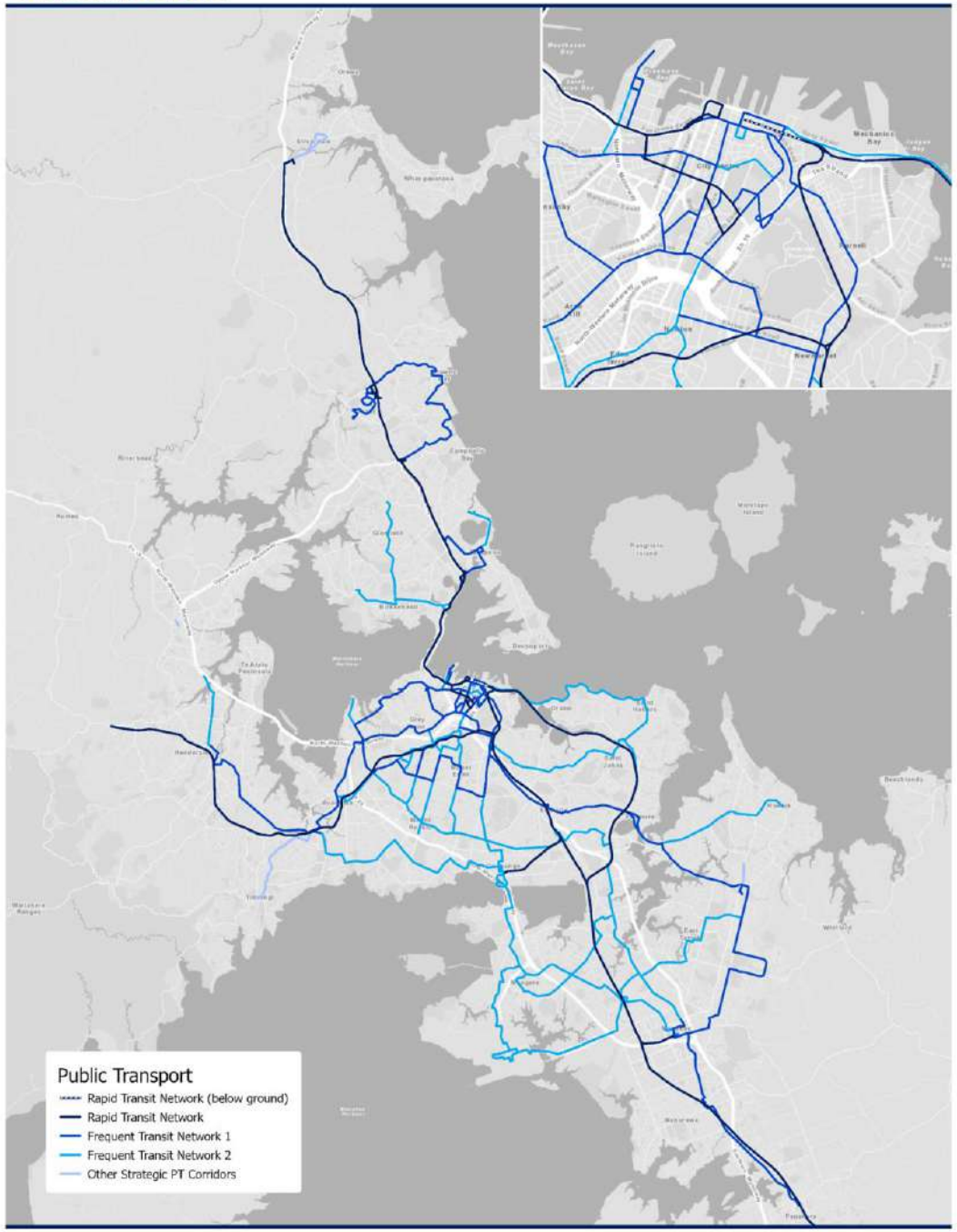
---

[7] Please note:

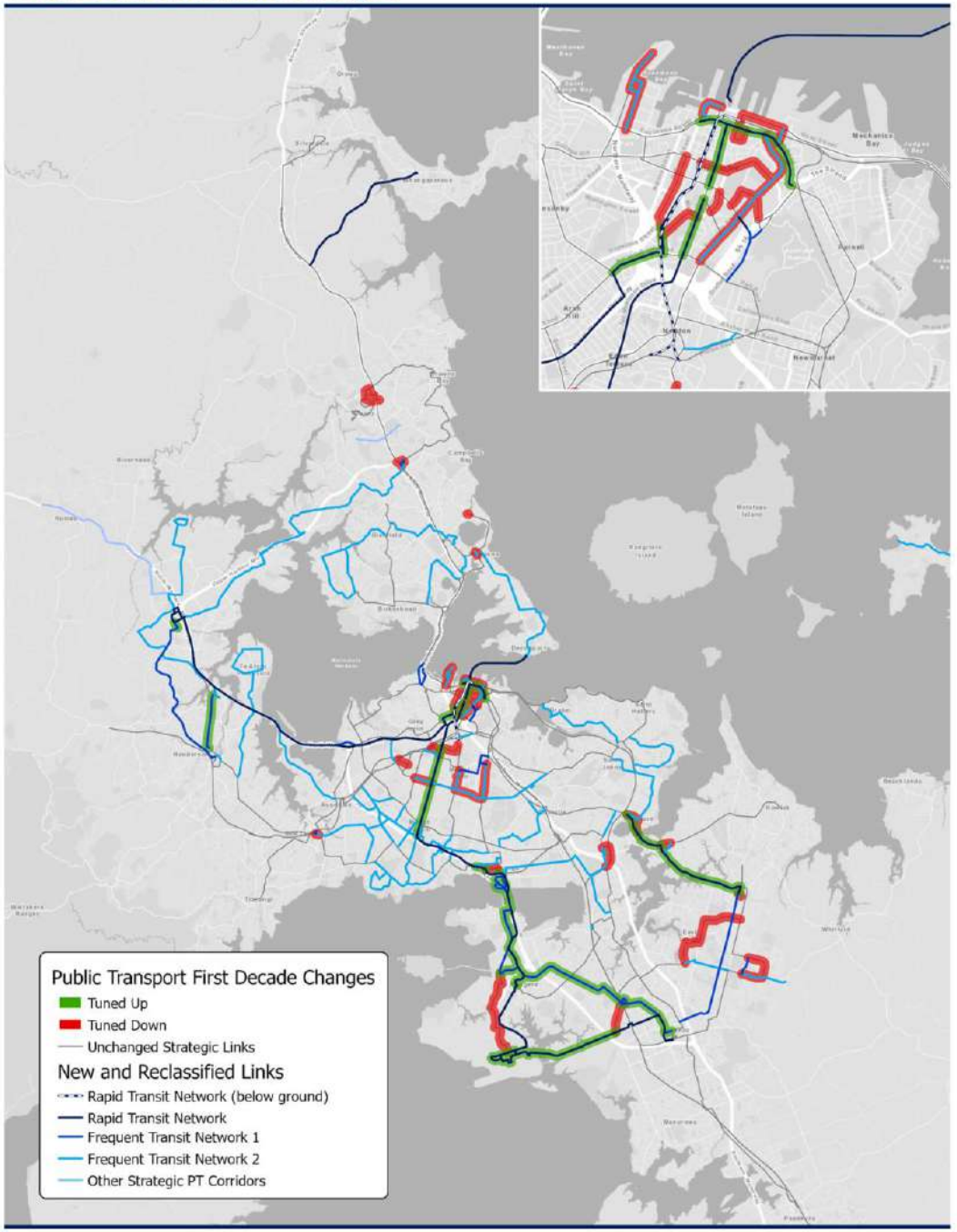
1. Transport projects that are assumed complete over the next 10 years is based on a Auckland Forecasting Centre modelling scenario ATAP2 to 2028 (August 2019). These assumptions do not reflect the draft RLTP 2021-31 programme.
2. The new / upgraded corridors in Warkworth, the North, the North West and South require further investigation, funding, engagement and statutory approvals before a project is confirmed (see Supporting Growth website).

Public Transport Strategic Network

Current Network

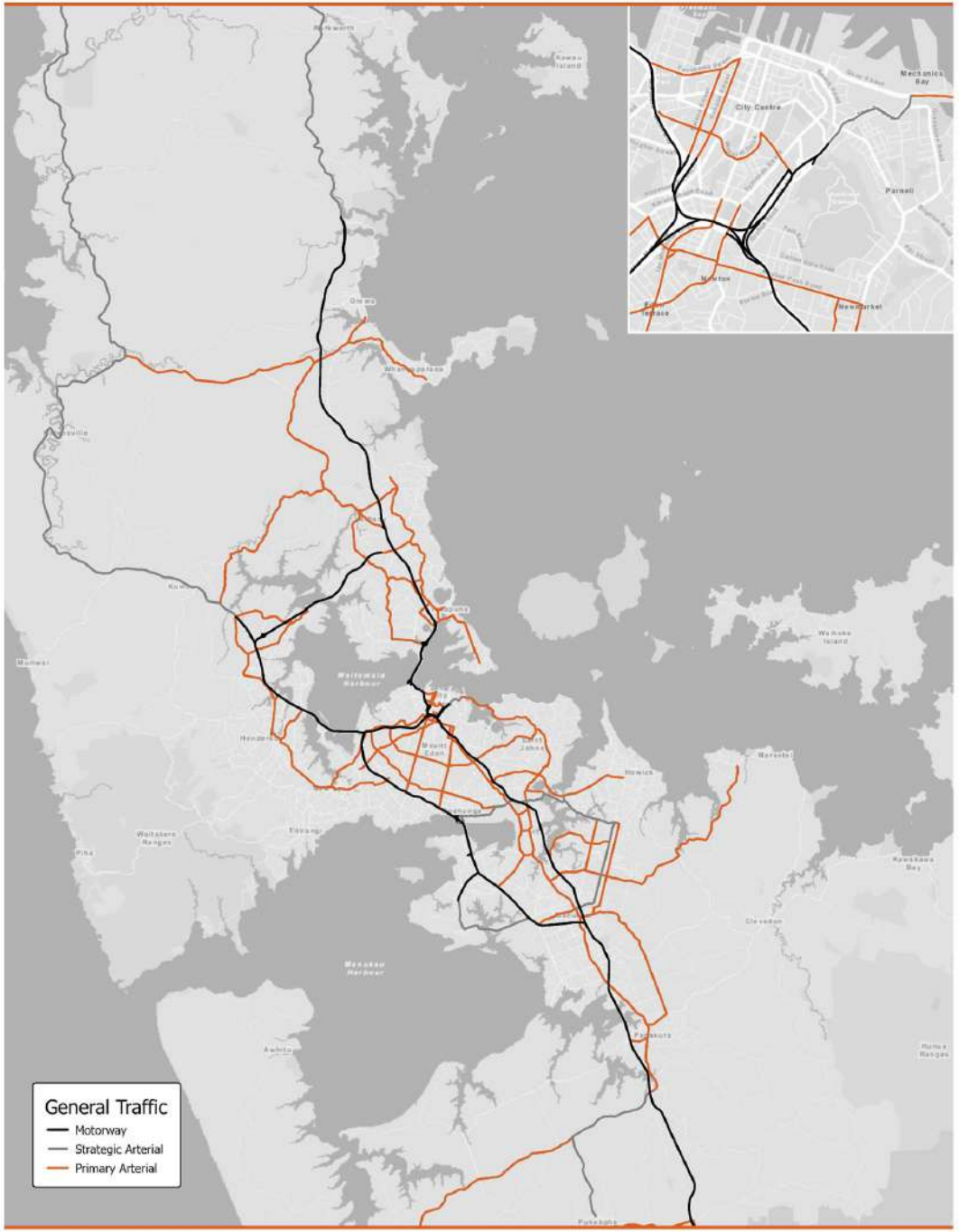


First Decade Network Changes

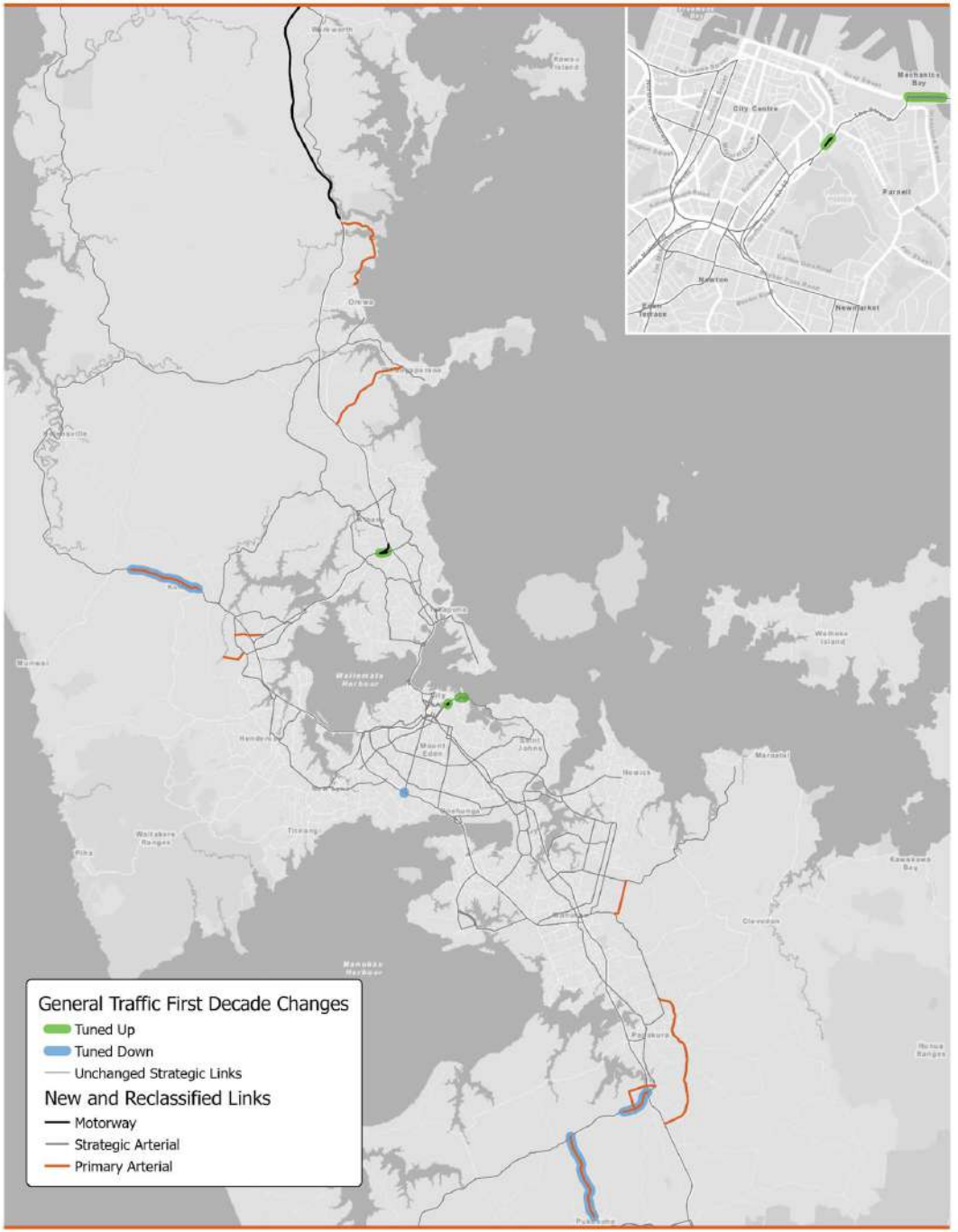


General Traffic Strategic Network

Current Network

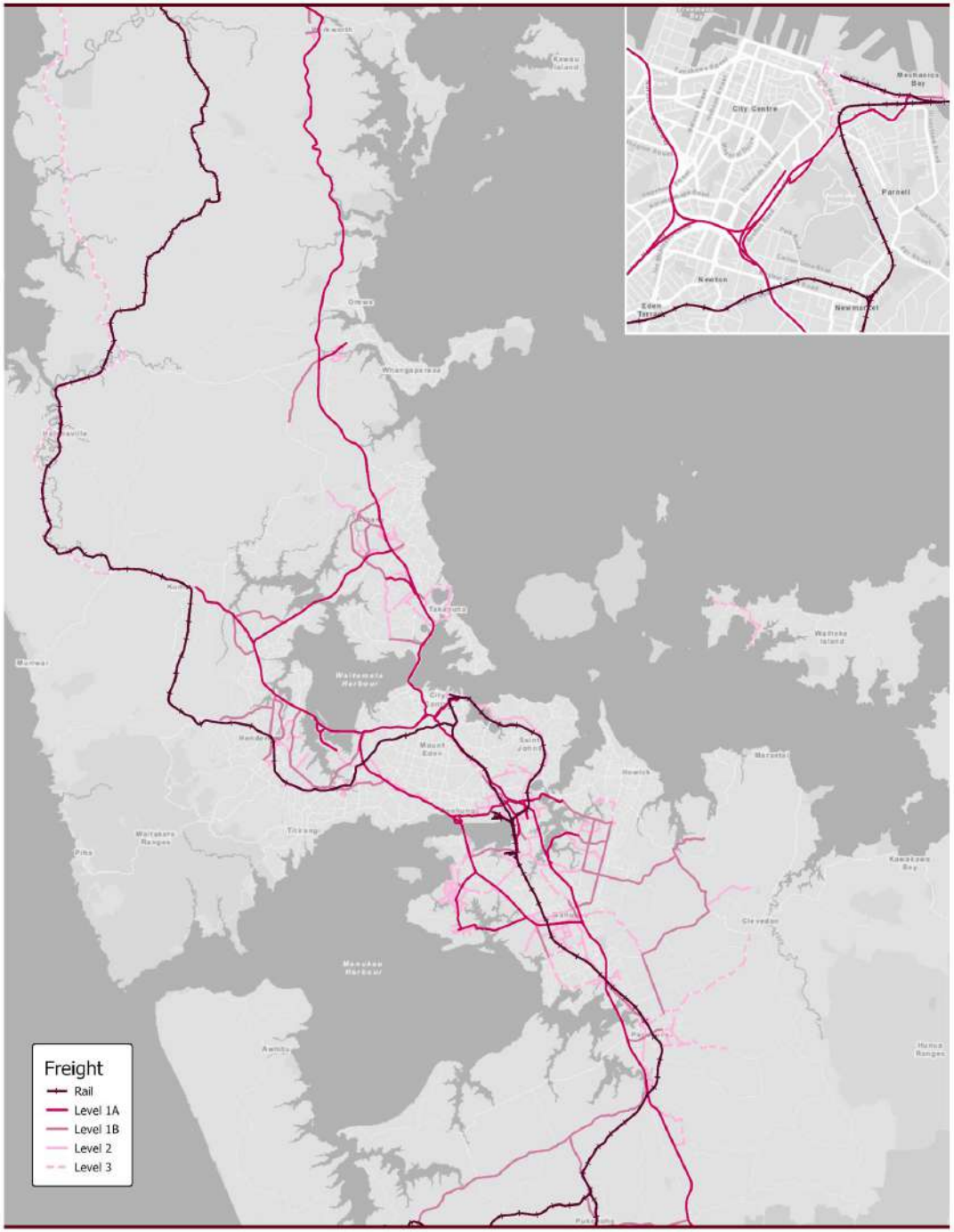


First Decade Network Changes

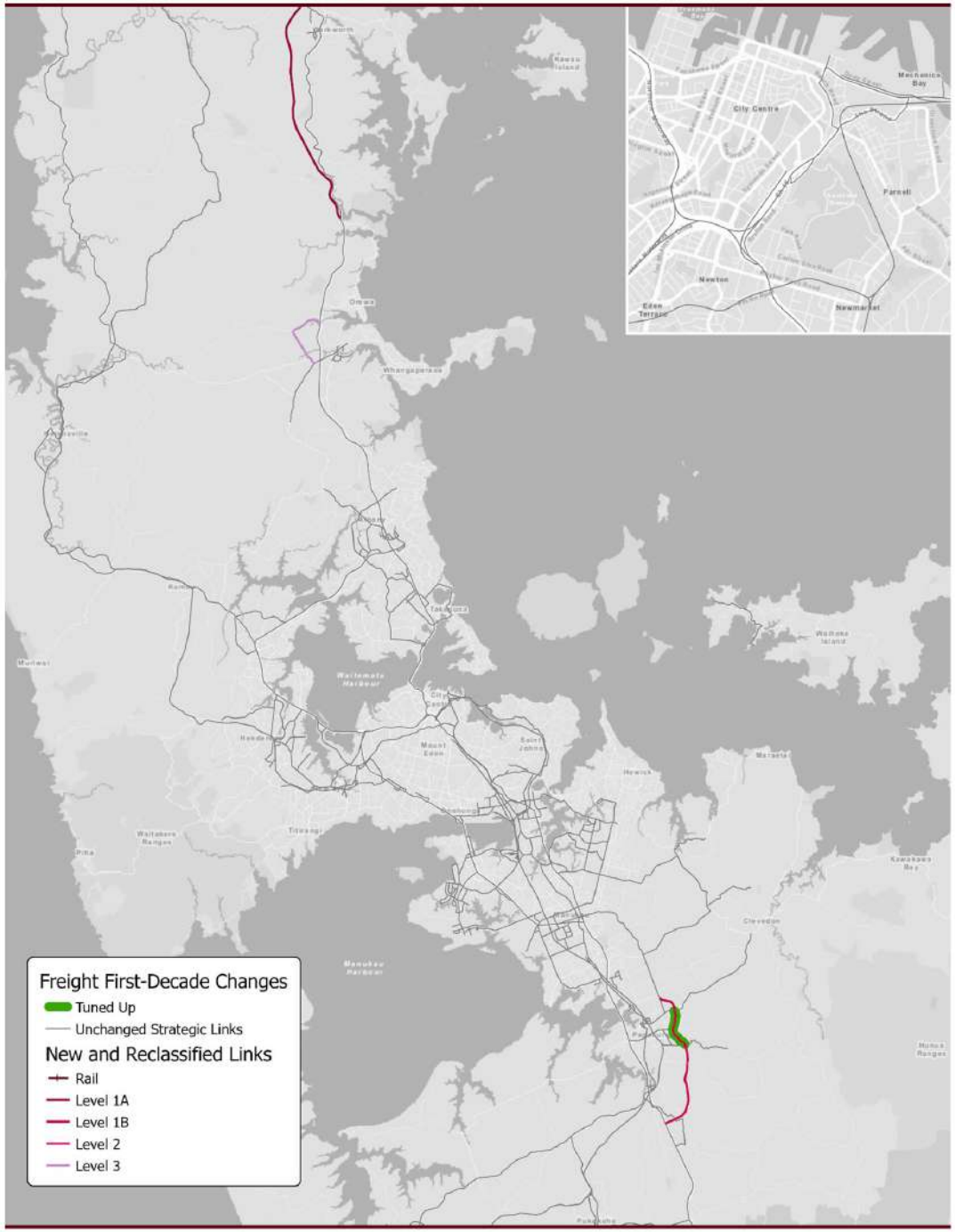


Freight Strategic Network

Current Network

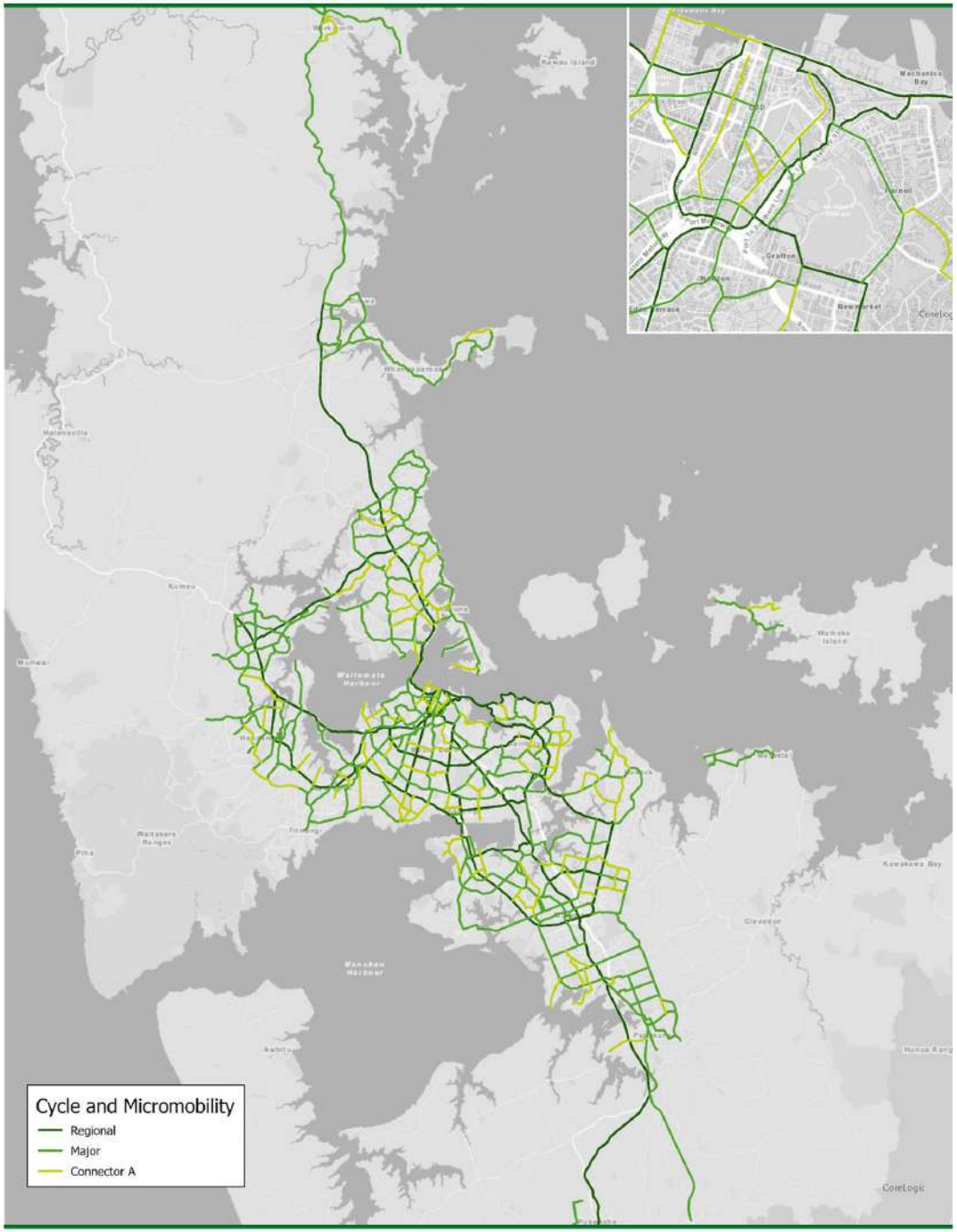


First Decade Network Changes

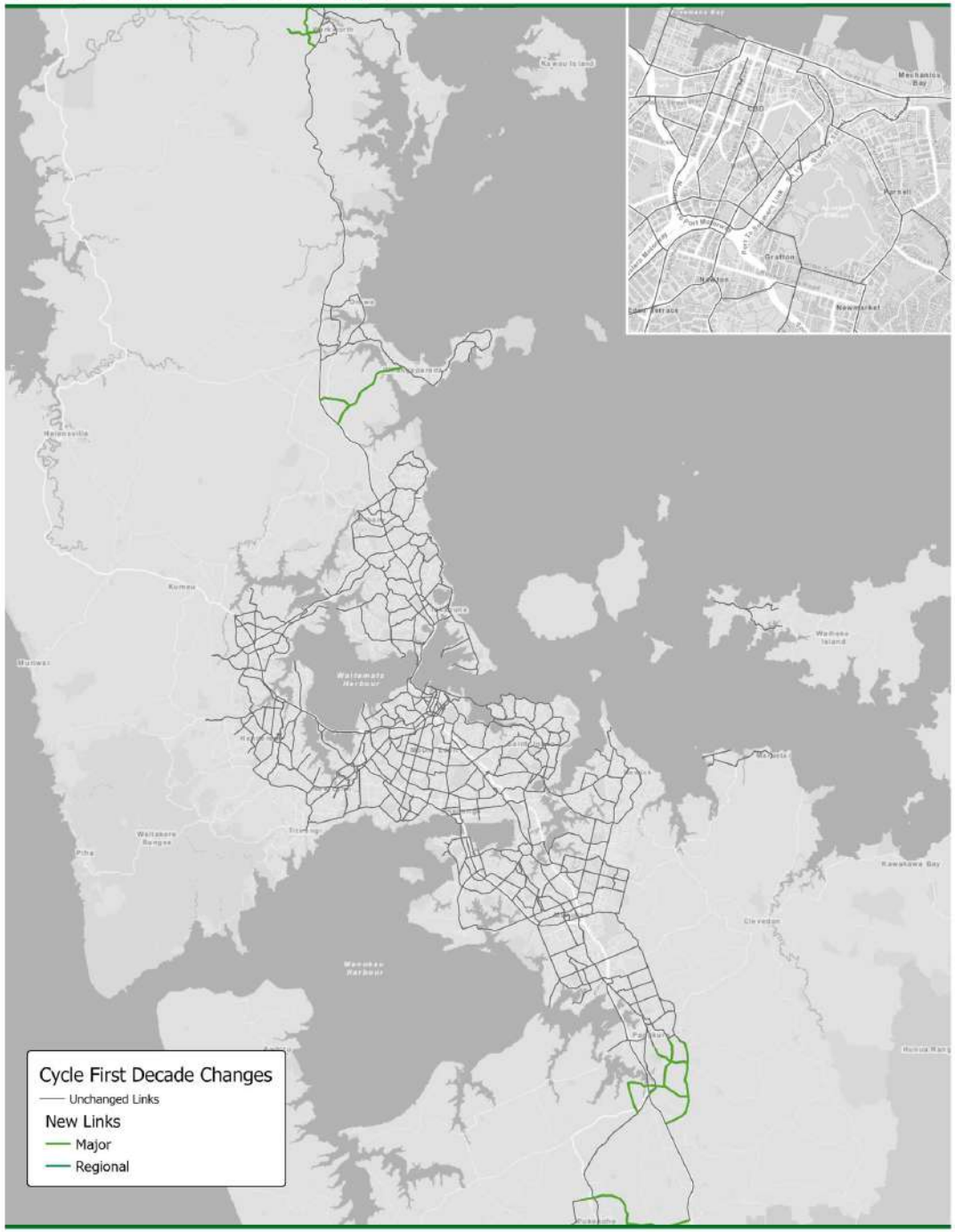


Cycle & Micromobility Strategic Network

Current Network

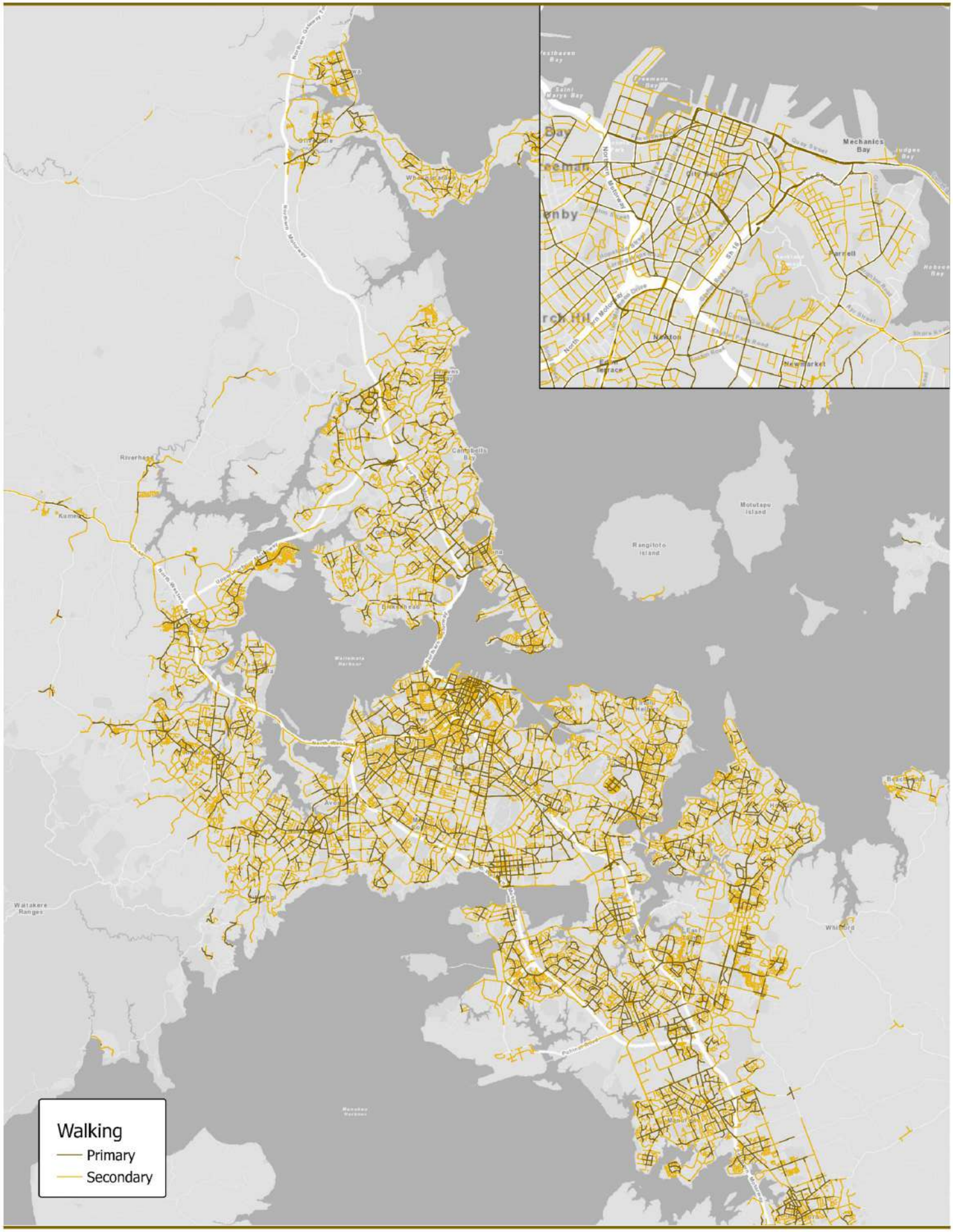


First Decade Network Changes



Walking Strategic Network *(placeholder)*

Current & First Decade Network



6.3 First decade Integrated Strategic Networks

All the Strategic Networks in the main urban areas for the first decade future are shown in an integrated map below. Due to the significant coverage of the Walking Strategic Network, this has not been represented in the integrated map below. The walking network can be viewed in the online Mapping Portal[8].

This map reveals that there are often multiple Strategic Networks present on the same corridor. This highlights the need for adopting an integrated approach to transport planning, resolving any conflicting modal priorities that may be present.

This map also shows the geographical distribution of the Strategic Networks, and where these are denser or where there are gaps. As expected, there seems to be a direct correlation between the location of centres and the density of the Strategic Networks. This is especially visible around east Auckland with only a handful of centres and generally less dense Strategic Networks.

The first decade Strategic Networks are used as the basis for the Deficiency & Opportunity Mapping analysis described in Part III.

[8] Future Connect Mapping Portal is available here at.govt.nz/futureconnect

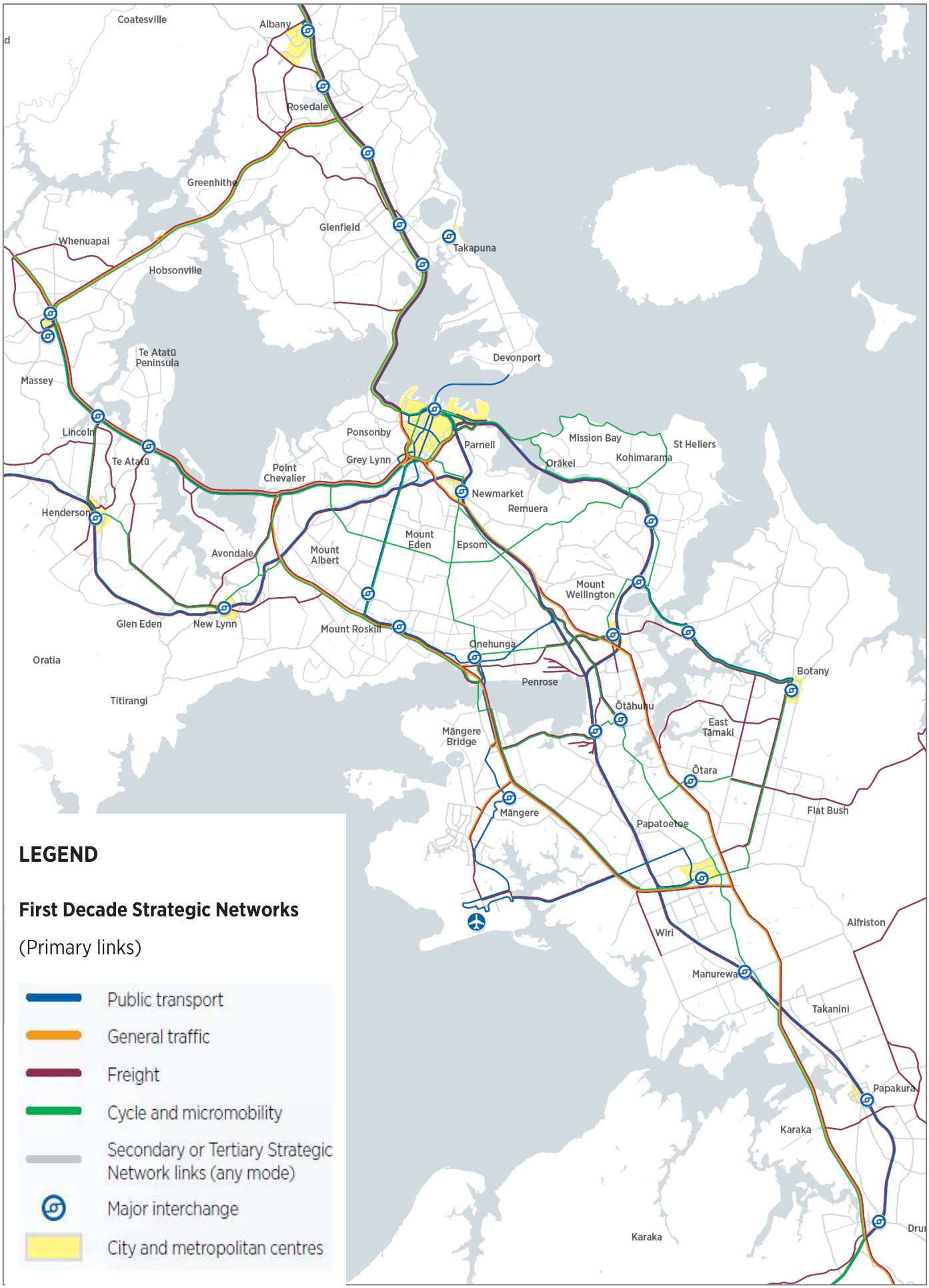


Figure 17: First decade integrated Strategic Networks (excluding walking)

3.0
Focus area development

PART III: FOCUS AREA DEVELOPMENT

To understand the most significant problems and opportunities affecting the regional transport system, deficiencies and opportunities have been mapped on the first decade Strategic Networks. These deficiencies have then been used to establish Indicative Focus Areas for future planning and investment.

This section outlines the methodology and key outputs developed to identify Indicative Focus Areas. The main components are:

- **Deficiency & Opportunity Mapping**
    - Deficiencies and opportunities on the First Decade Strategic Networks for all modes and two intermodal problems (safety and the environment)
    - Maps of ranked deficiencies and opportunities, which are ranked based on network hierarchy and the severity of the deficiency.
- **Indicative Focus Areas**
    - Corridors and areas with the most substantial deficiencies that affect multiple modes or problems present opportunities for targeted action
    - Indicative Focus Areas provide supporting evidence for planning and investigation, including RLTP prioritisation, existing programmes and projects, and development planning
    - For those that are not already being investigated, Indicative Focus Areas will guide new and ongoing business case and programme investigations (e.g. new Connected Communities corridors).

7. Methodology

Problems and opportunities on the First Decade Strategic Networks have been investigated through a four-step process:

1a Develop Deficiency & Opportunity Indicators (or key proxies) for each mode / problem based on the ILM (Figure 2)

1b Define criteria for high, moderate and low deficiencies for each Deficiency & Opportunity Indicator

2 Rank deficiencies and opportunities based on their relative importance on the Strategic Network hierarchy and the level of the Deficiency or Opportunity

Key Output: Ranked Deficiency & Opportunity Maps (First Decade)

3 Combine individual deficiency and opportunity maps into a Combined Deficiency & Opportunity Map which shows where there are overlapping deficiencies and opportunities

4a Identify the Indicative Focus Areas, which is based on the Combined Deficiency & Opportunity Map

4b Cross-reference the Indicative Focus Areas with existing and legacy projects

Key Output: Indicative Focus Areas (First Decade)

The output and methodology, developed in collaboration with SMEs, follows a structured and repeatable GIS based process. The outputs are data driven and provide a shared evidence base for future investigations, and guidance for plans and programmes.

8. Deficiency & Opportunity Mapping

Building on the problems identified in the ILM (Figure 2), Deficiency & Opportunity Indicators (Appendix B) were selected to surface the most critical problems and opportunities on the Strategic Networks. These indicators were based on suitable and available data for each mode and intermodal problem:

- Public Transport
- General Traffic
- Freight
- Cycle & Micromobility
- Walking
- Safety
- Environment

Modelling and future indicators

The indicators combine both current and future data to highlight where issues are expected on the network in the next 10 years. Future data is based on forecasts from a modelling scenario ATAP2 to 2028 (Auckland Forecasting Centre, August 2019) – refer to Appendix B to note which indicators are based on future forecasting data. Note that these assumptions do not reflect the full draft RLTP 2021-31 programme.

Note also that the modelling of volume / capacity ratio change over the decade is different for Public Transport as it allows for unconstrained vehicle loading limits. This helps surface opportunities to provide for additional network demand over the decade.

8.1 Environment and Safety

The Environmental and Safety problems identified by the ILM (Figure 2) pertain to negative consequences or vulnerabilities of the transport system as a whole.

Safety problems and opportunities are intermodal in nature rather than pertaining to a single modal network, and were therefore mapped to all of the Strategic Networks (besides the draft Walking Network).

Environmental problems and opportunities cover a wide range of issues from overall sustainability, future network resilience, to negative externalities directly from the transport system. Key indicators were developed from suitable and available data in consultation with SMEs and mapped to the Strategic Networks as appropriate to the indicator.

A key indicator related to the Environment problem not mapped to the transport networks, but best shown for the region, relates to cumulative harmful emissions that accelerate climate change. The graph below illustrates the continued dominance of car-based carbon dioxide emission trends predicted over the next three decades.

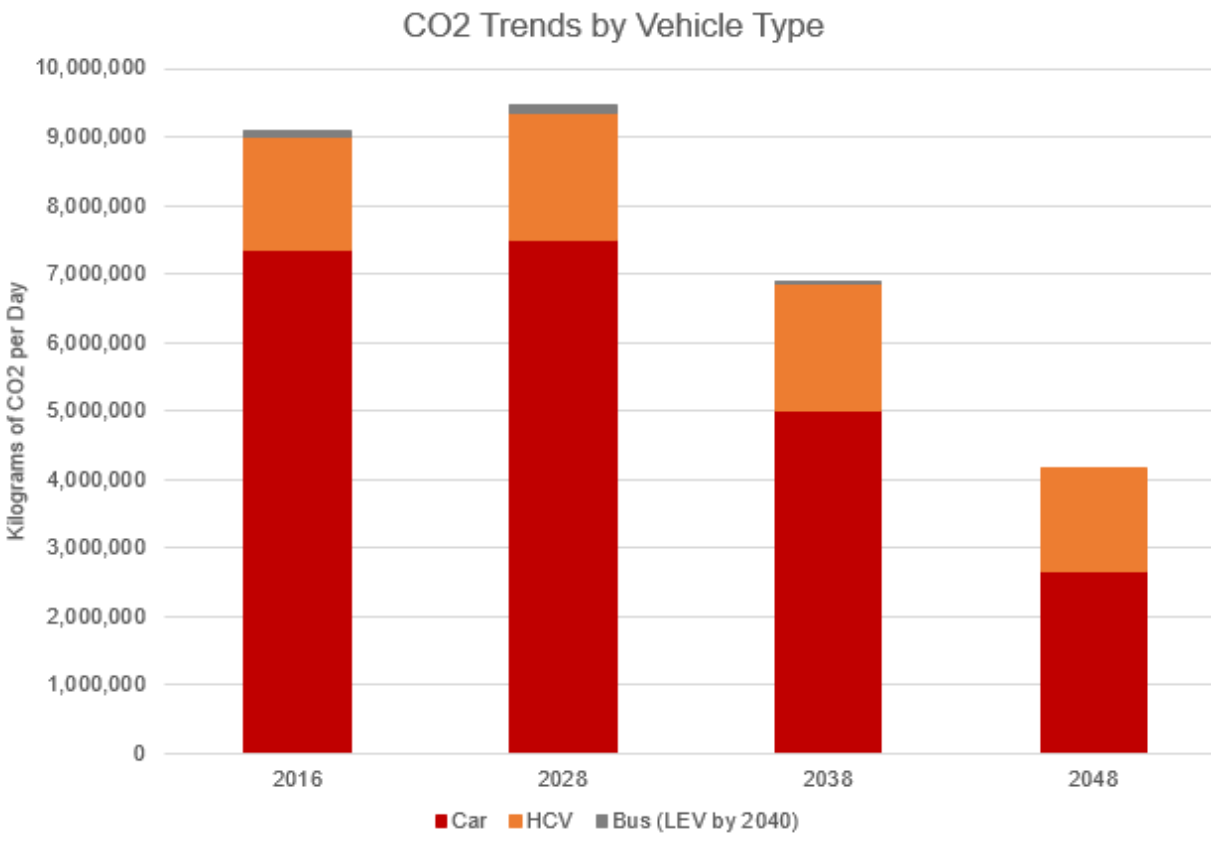


Figure 18: Carbon Dioxide trends by Vehicle Type 2016-2048[9]

8.2 Problem deficiency and opportunity summaries

The following pages outline the steps taken to create the Ranked Deficiency & Opportunity Mapping. This includes a summary of the deficiency / opportunity methodology and ranked deficiency / opportunity map for each mode and problem, including:

- a description of the Deficiency & Opportunity Indicators used (refer to Appendix B for the origins of each indicator);
- criteria for medium and high deficiencies / opportunities (with further links not considered deficient for this analysis);
- the Ranking Matrix that is used to rank deficiencies / opportunities based on their relative importance on the Strategic Network hierarchy and the severity of the deficiency;
- the Ranked Deficiency & Opportunity Mapping, which is the resultant GIS output which highlights first and second priorities; and
- a description of the key findings.

Although the following pages provide an overview, all deficiency and opportunity analysis outputs can be found in the Future Connect Mapping Portal[10].

[9] Source: ATAP2 update August 2019 modelled scenario based on regional baseline investment and land use scenario with VEPM6 fuel use and emissions assumptions

[10] The Portal can be found here at.govt.nz/futureconnect

Note that links have been included in the First Decade methodology which show the strategic intent of forward planning. For example, Airport to Manukau (SH20B) / the North West motorway for Public Transport, and the new road Penlink for General Traffic. These decisions affect the link's assigned hierarchy layer in the deficiency and opportunity analysis, which follows.

Also note that 'Opportunity' indicators are distinguished from 'Deficiency' indicators by revealing where opportunities to improve modal outcomes might lie.

Section 9 describes how the different ranked deficiencies and opportunities have been used to create the Indicative Focus Areas.

Public Transport – First Decade Deficiency and Opportunity Ranking

Indicators and Ranking

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.

High

1. AM Speed LOS F (<30%); or
2. AM travel time reliability LOS F (>100%); or
3. Over capacity (≥85%) in 2018 and worsening in 2031; or
4. Significant absolute and relative volume increases from 2018 to 2031 (≥ 90th percentile); or
5. Crossings intersect with freight or general traffic strategic network

Moderate

1. AM Speed LOS E (≥30% & <40%); or
2. AM travel time reliability LOS E (≥70% & <100%); or
3. Under capacity (<85%) in 2018 to over capacity (≥85%) in 2031; or
4. Moderate absolute and relative volume increases from 2018 to 2031 (≥80th & < 90th percentile); or
5. Crossings intersect with PT, Cycle or Walking strategic network

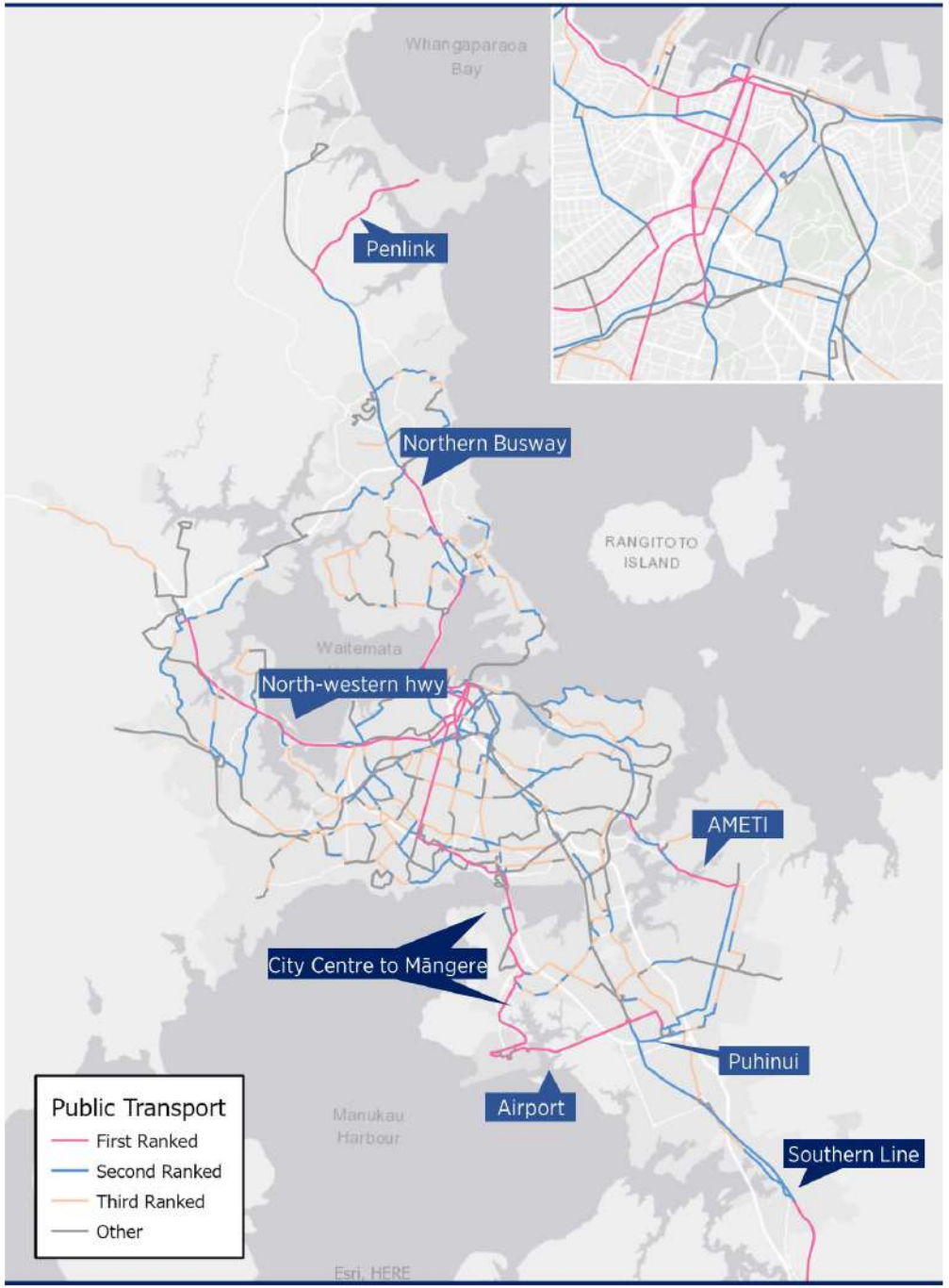
Hierarchy	Ranking Matrix		
RTN	4	2	1
FTN 1	5	3	2
FTN 2	5	3	2
Other Strategic Corridors	6	4	3
	Low	Moderate	High
	Deficiency		

% Of PT Strategic Network	
1	15%
2	27%
3	23%
Other	36%

Key Findings

Top ranked deficiencies and opportunities: Bus services on the Northern Busway and Penlink (RTN), North-Western motorway (RTN), Airport to Botany, and from Pakuranga to Botany (likely to be resolved by AMETI Eastern Busway).
Rail links along the Southern Line (near growth areas and Puhinui Station) as well as City Centre to Māngere light rail.

Ranked Deficiencies and Opportunities



General Traffic – First Decade Deficiency and Opportunity Ranking

Indicators and Ranking

1A. Morning peak speed level of service

The AM peak median travel speed relative to the posted speed limit.

1B. Productivity level of service

The amount of people travelling down a road in private vehicles and buses during the peak hour relative to the target productivity.

2. Morning peak travel time reliability level of service

The AM peak travel time relative to typical travel time.

3. Morning peak volume/capacity (V/C) ratio change (2018 VS 2031)

Traffic volume relative to a road's capacity, with 85% being considered a maximum acceptable V/C ratio.

High

1. AM speed & productivity LOS F (<30%); or
2. AM travel time reliability LOS F (>100%); or
3. Over capacity (≥85%) in 2018 and worsening in 2031

Moderate

1. AM speed & productivity LOS E (≥30% & <40%); or
2. AM travel time reliability LOS E (≥70% & <100%); or
3. Under capacity (<85%) in 2018 to over capacity (≥85%) in 2031

Hierarchy	Ranking Matrix		
Motorway	3	1	1
Strategic Arterial	4	2	1
Primary Arterial	4	2	2
	Low	Moderate	High
	Deficiency		

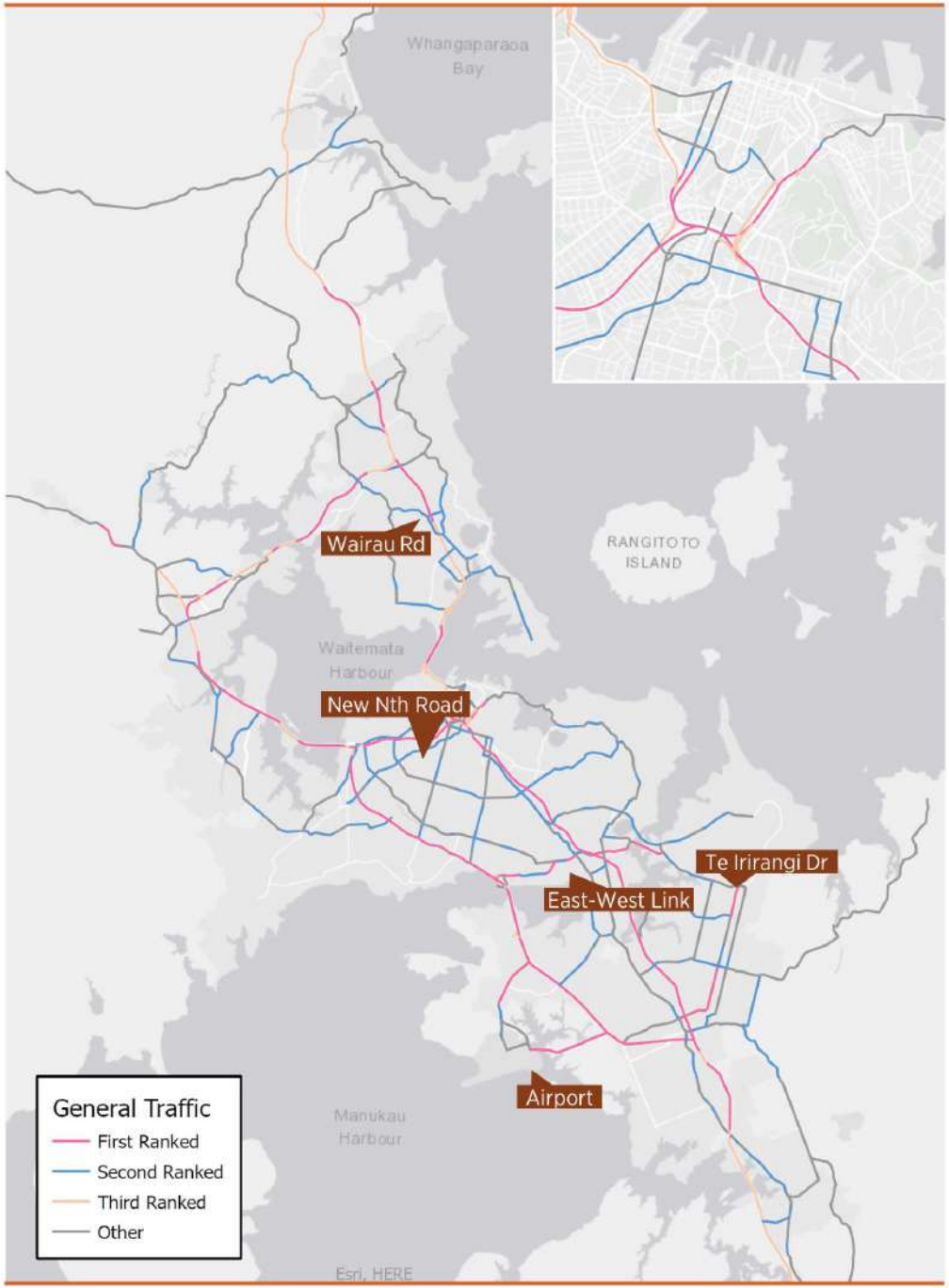
% Of GT Strategic Network	
1	14%
2	19%
3	12%
Other	55%

Key Findings

First ranked deficiencies and opportunities: Motorways including City Centre and airport access (SH20), Te Irirangi Drive, and the East-West link.

Second ranked deficiencies and opportunities: Key arterials such as Great North Road, New North Road, Edmonton Road, Great South Road, Remuera Road, Lake Road, Wairau Road and Taharoto Road.

Ranked Deficiencies and Opportunities



Freight – First Decade Deficiency and Opportunity Ranking

Indicators and Ranking

1. **Speed level of service**
   The median travel speed relative to the posted speed limit.
2. **Morning peak volume/capacity (V/C) ratio where proportion of heavy vehicles ≥ 10% (change 2018 vs 2031)**
   Traffic volume relative to a road's capacity, with 85% being considered a maximum acceptable V/C Ratio.
3. **Heavy vehicle volume increases (2018 vs 2031)**
   The forecast percentage change in heavy vehicles.

High

1. Interpeak speed LOS D/E/F (<50%) on Level 1 Network; or
2. Over capacity (≥85%) in 2018 and worsening in 2031; or
3. Significant absolute and relative volume increases from 2018 to 2031 (≥ 90th percentile)

Moderate

1. AM Peak speed LOS E/F (<40%) on level 1/2 network; or
2. Under capacity (<85%) in 2018 to over capacity (≥ 85%) in 2031; or
3. Moderate absolute and relative volume increases from 2018 to 2031 (≥80th & < 90th percentile)

Hierarchy	Ranking Matrix		
Rail and Level 1 A	3	2	1
Level 1B	3	2	1
Level 2	4	3	2
Level 3	4	3	3
	Low	Moderate	High
	Deficiency		

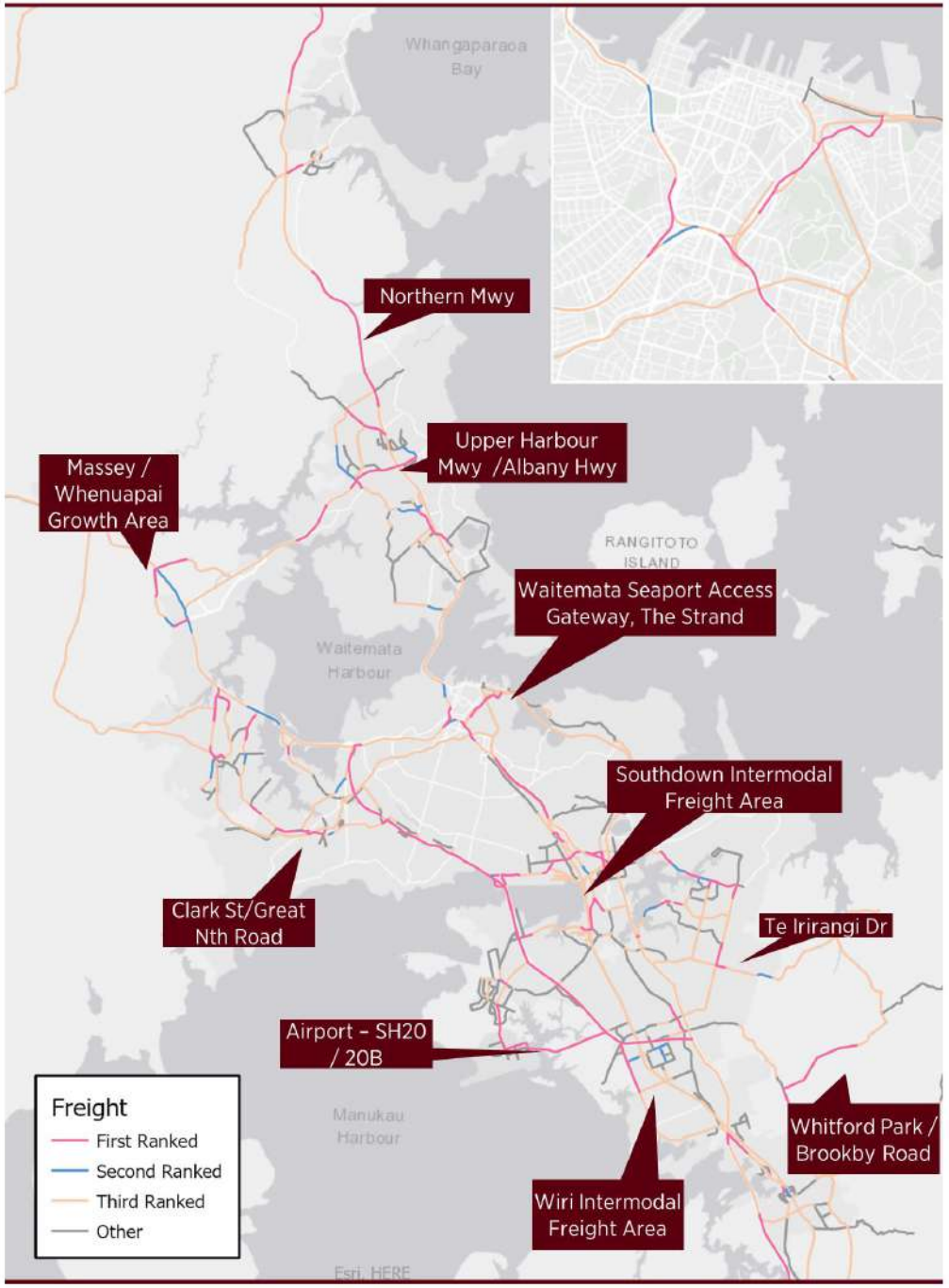
% Of Freight Strategic Network	
1	13%
2	2%
3	53%
Other	32%

Key Findings

Top ranked deficiencies and opportunities: constrained access to key freight centres including Port/City Centre, Airport, Southdown (Otahuhu/Onehunga) and Wiri Intermodal freight hubs, North Harbour.

Further deficiencies affect freight movement supporting current and future industrial and growth areas including Brookby Road, Whitford Park Road, Te Irigangi Drive and around Westgate.

Ranked Deficiencies and Opportunities



Cycle and Micromobility – First Decade Deficiency and Opportunity Ranking

Indicators and Ranking

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. **Priority Investigation Areas**
   Priority areas for investigation according to the Cycling Programme Business Case or Urban Cycleways Programme, without appropriate infrastructure in place already.

High

1. No / unprotected existing facilities on roads with high volume/speed environment; or
2. First Decade Priority Investigation Areas (Cycling Programme Business Case or Urban Cycleways Programme)

Moderate

1. Inadequate shared path widths or shared paths with driveways; or
2. Other Cycling Programme Business Case Links

Hierarchy	Ranking Matrix		
Regional	3	2	1
Major	3	2	1
Connector A	4	3	2
	Low	Moderate	High
	Deficiency		

% Of Cycle Strategic Network	
1	24%
2	18%
3	48%
Other	10%

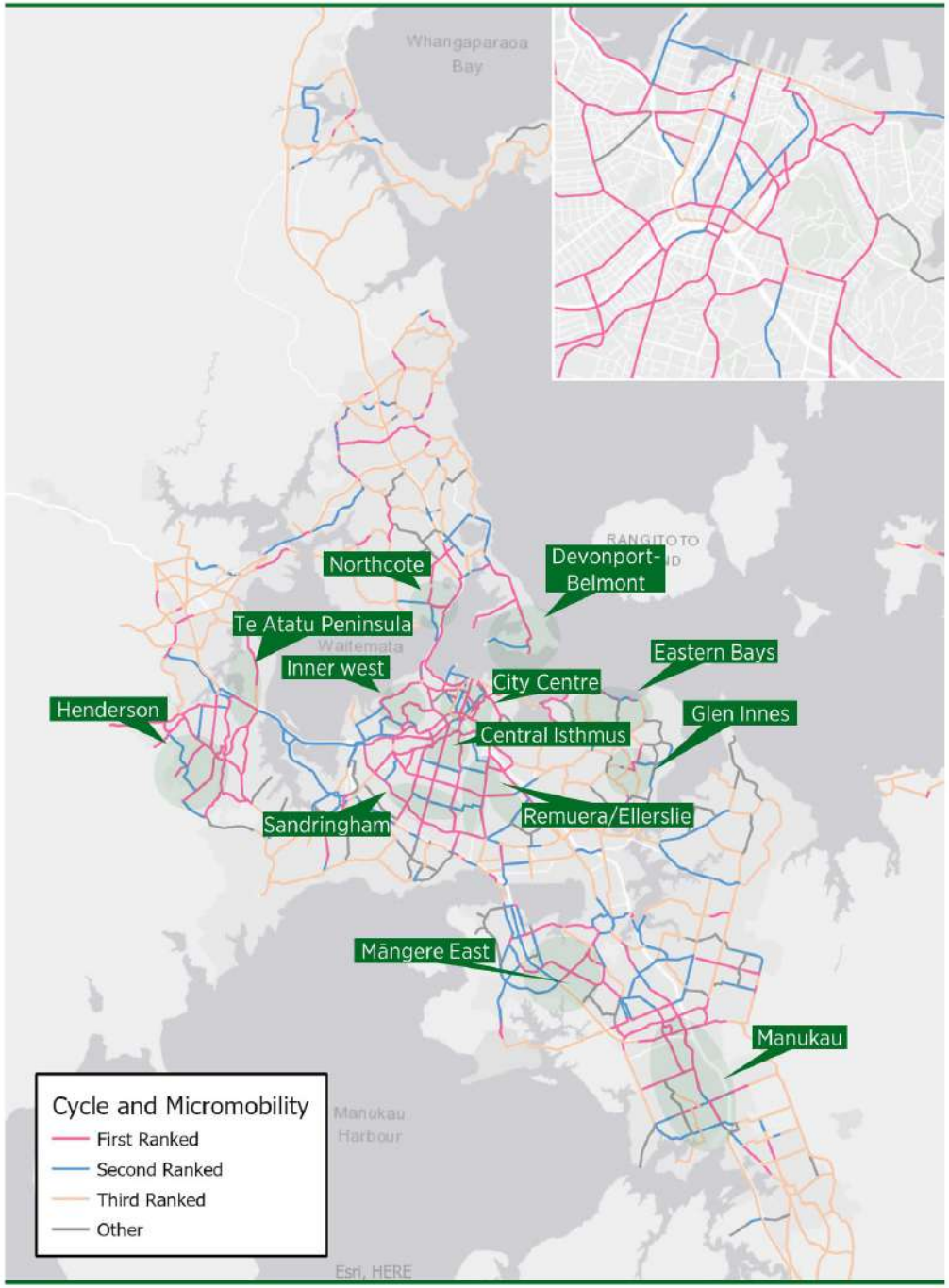
Key Findings

As the cycle network is more dense and lacks the maturity of other networks there is a high prevalence of deficient links. Highlighted in green on the map: all Cycling PBC Investment Areas funded by the 2018-2028 RLTP (including additional areas for consideration by 2031).

First ranked deficiencies and opportunities cover most of the Cycle Network due to funding uncertainties.

Second ranked deficiencies and opportunities cover unprotected painted cycle lanes and shared paths, where there are potential modal conflicts between vehicles and people walking.

Ranked Deficiencies and Opportunities



Walking – First Decade Deficiency and Opportunity Mapping *(Note: Placeholder Network and Indicators)*

Indicators and Ranking (under development)

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.

High

1. Does not have a footpath on at least one side (Primary and Secondary), or does not have a footpath >1.8 m on at least one side (Primary); or
2. Multi-lane roads with high volume / high speed environment (4+ lanes, >12,000 vpd, >50kph)

Moderate

1. Does not have a footpath >3 m on at least one side (Primary), or does not have a footpath >1.8 m on at least one side (Secondary); or
2. Wide roads with moderate volume / speed environment (3 lanes, 6,000 - 12,000 vpd, 30-40 kph)

Note: The 'footpath width' deficiency map requires careful interpretation due to limitations of the underlying data. Deficiencies may be flagged incorrectly for corridors with a dual carriageway or off-road pedestrian walkways. Since these links technically do not have a footpath on either side, they will come up as deficient even where appropriate walking facilities are present.

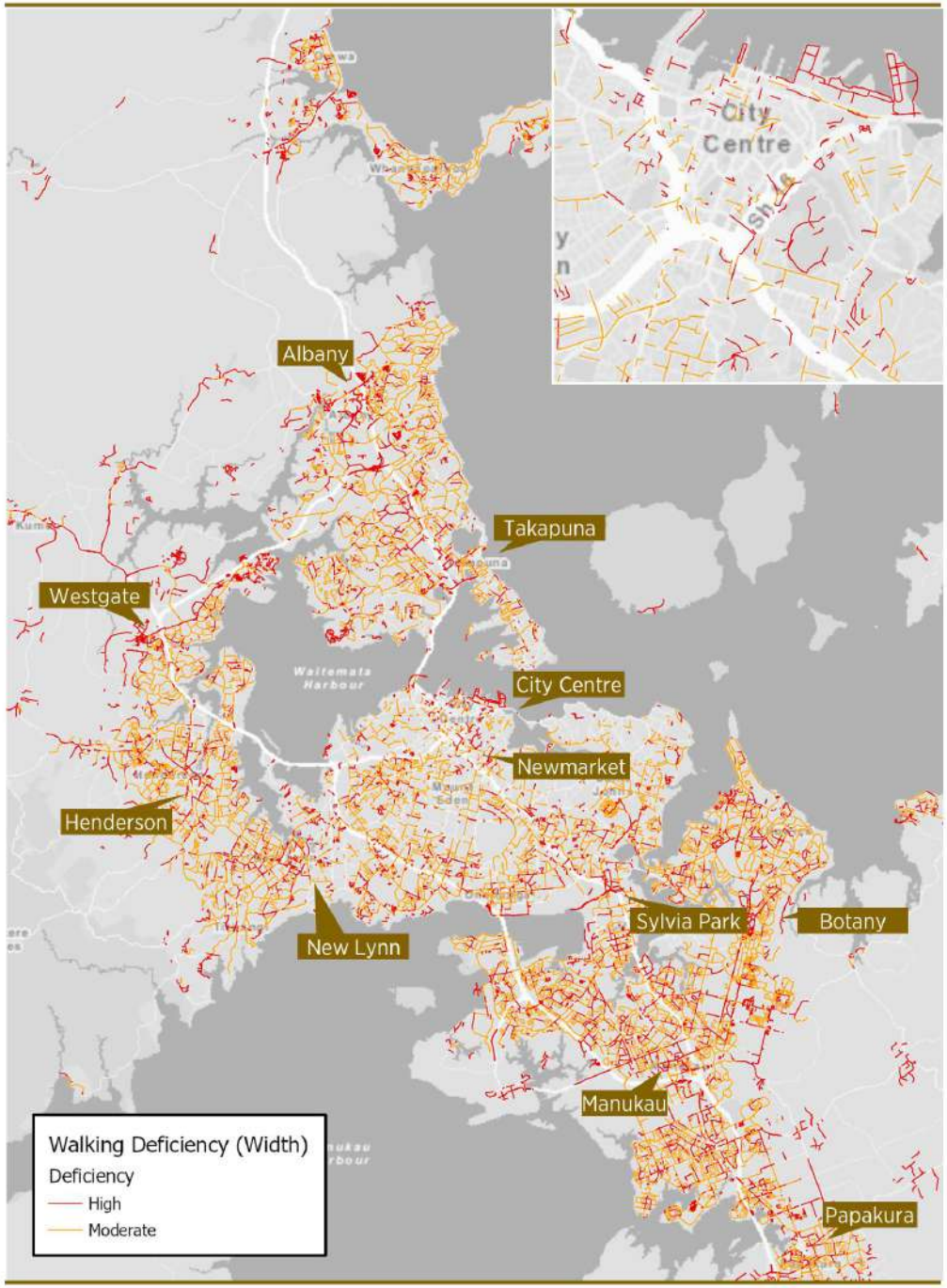
Under development

The Walking Network is still under development, and is not incorporated in the Integrated Network and the Combined Deficiency Map used to develop Focus Areas. Speed data in the Pedestrian Severance indicator requires updating.

Key Findings

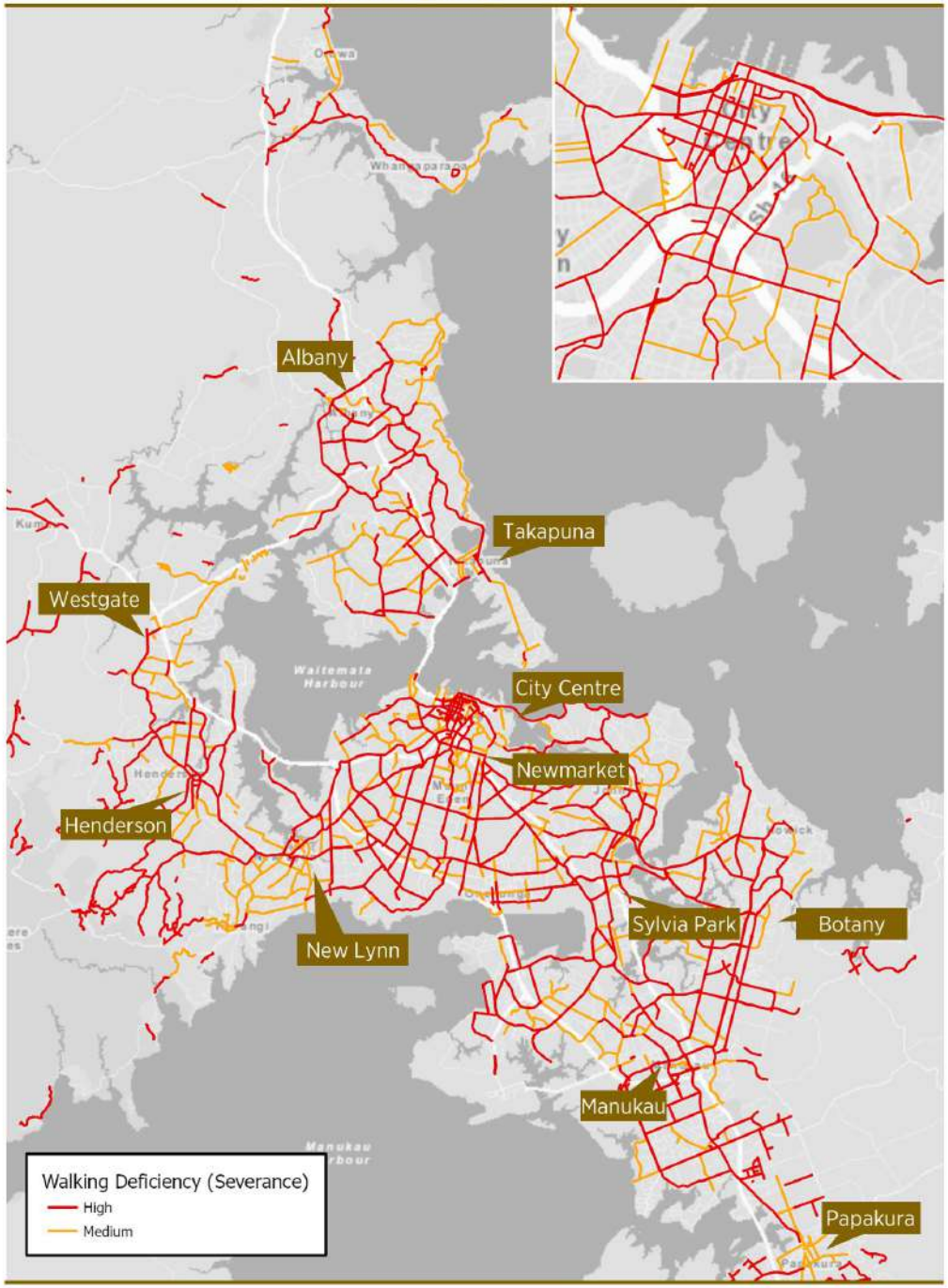
High and moderate deficiencies affect: a large number of urban/metro/local centres and arterials scattered throughout the wider Auckland region.

Footpath Width deficiency map



Walking – First Decade Deficiency and Opportunity Mapping *(Note: Placeholder Network and Indicators)*

Pedestrian Severance deficiency map



Safety – First Decade Deficiency and Opportunity Ranking

Indicators and Ranking

1. **Urban KiwiRAP collective risk corridors**
   Safety risk allocated to a corridor based on the number of deaths and serious injuries in the last 5 years.
2. **Active Road User aggregated corridor risk level**
   A measure of relative risk to active road users. Higher classification where network presents higher risk to people using active travel modes based on the number of DSIs in the past 5 years.
3. **Difference between posted speed and safe & appropriate speeds**
   Where the difference between the posted speed and the Waka Kotahi recommended 'safe and appropriate speed' flags a risk.

High

1. High and Medium-High risk corridors; or
2. Active Road User Corridor Risk High or Medium-High; or
3. Speed difference ≥10 kph near metro/town centre

Moderate

1. Medium risk corridors; or
2. Active Road User Corridor Risk Medium; or
3. Speed difference ≥10kph

Mode	Ranking Matrix		
PT	4	2	1
GT	5	3	2
F	5	3	2
Cycle	4	2	1
	Low	Moderate	High
	Deficiency		

% Of all Strategic Networks	
1	18%
2	28%
3	8%
Other	46%

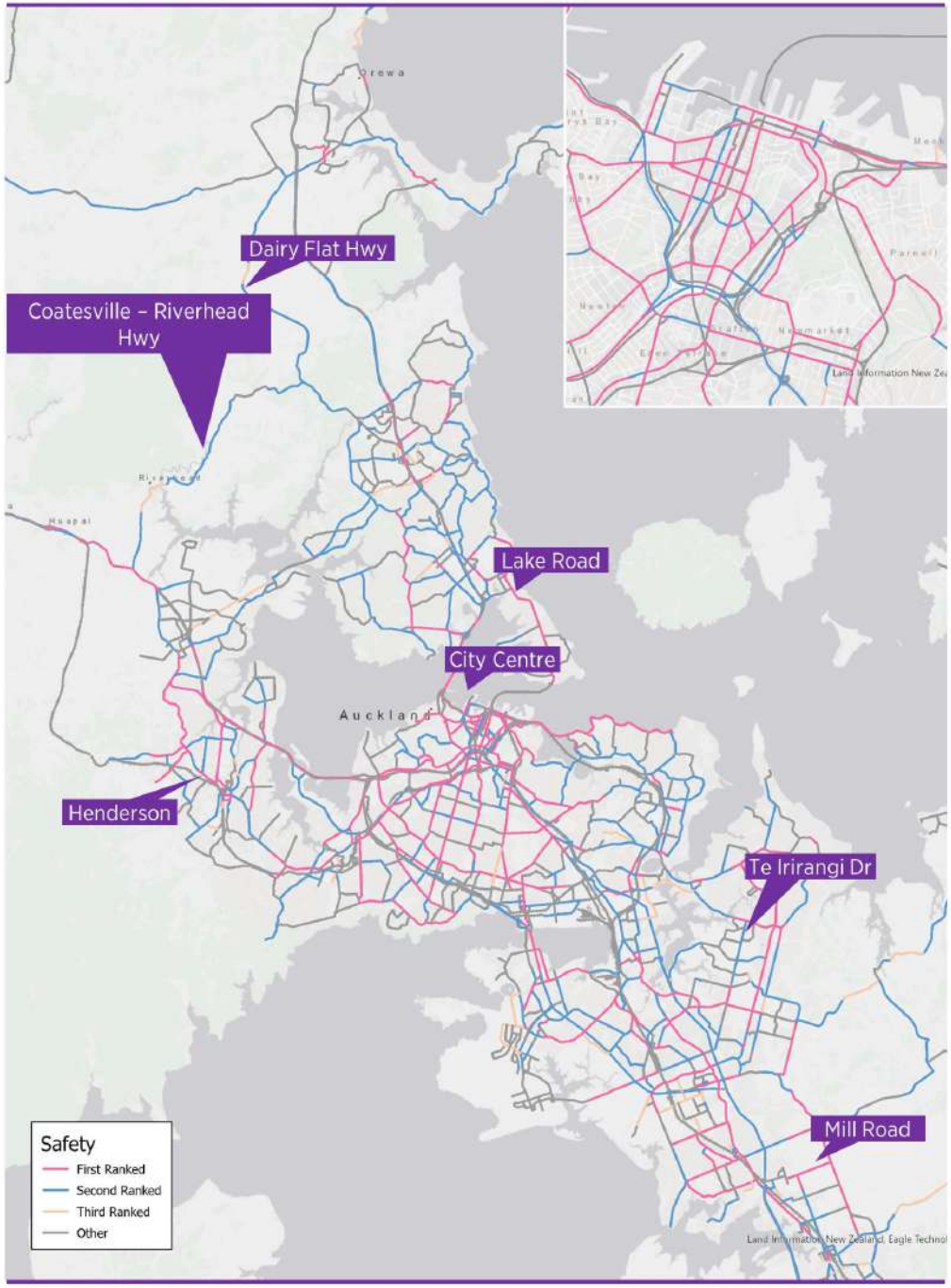
Key Findings

First ranked deficiencies and opportunities affect primary mixed-use urban arterials and related centres, particularly the city centre – areas where there are a large number of conflicts between vehicles and vulnerable road users.

Second ranked deficiencies and opportunities affect a large number of secondary arterials and collectors.

All of these corridors have a high number of deaths or serious injuries per annum relative to other similar road types in the region.

Ranked Deficiencies and Opportunities



Environment – First Decade Deficiency and Opportunity Ranking

Indicators and Ranking

1. **Stormwater run-off**
   Strategic Network links where high vehicle volumes, forecast for 2031, discharge pollutants into sensitive (or high quality) receiving environments.

2. **Coastal Inundation Threat Areas**
   Strategic Network links where there is a coastal inundation threat due to probability of storm events and 1m sea level rise

Note: Deficiencies mapped to PT, General Traffic and Freight Strategic Networks.

High

1. Links with > 20,000 vehicles per day (2031) within sensitive areas; or
2. Links within coastal inundation threat areas

Moderate

1. Links with >10,000 vehicles per day (2031) within sensitive areas
2. N/A

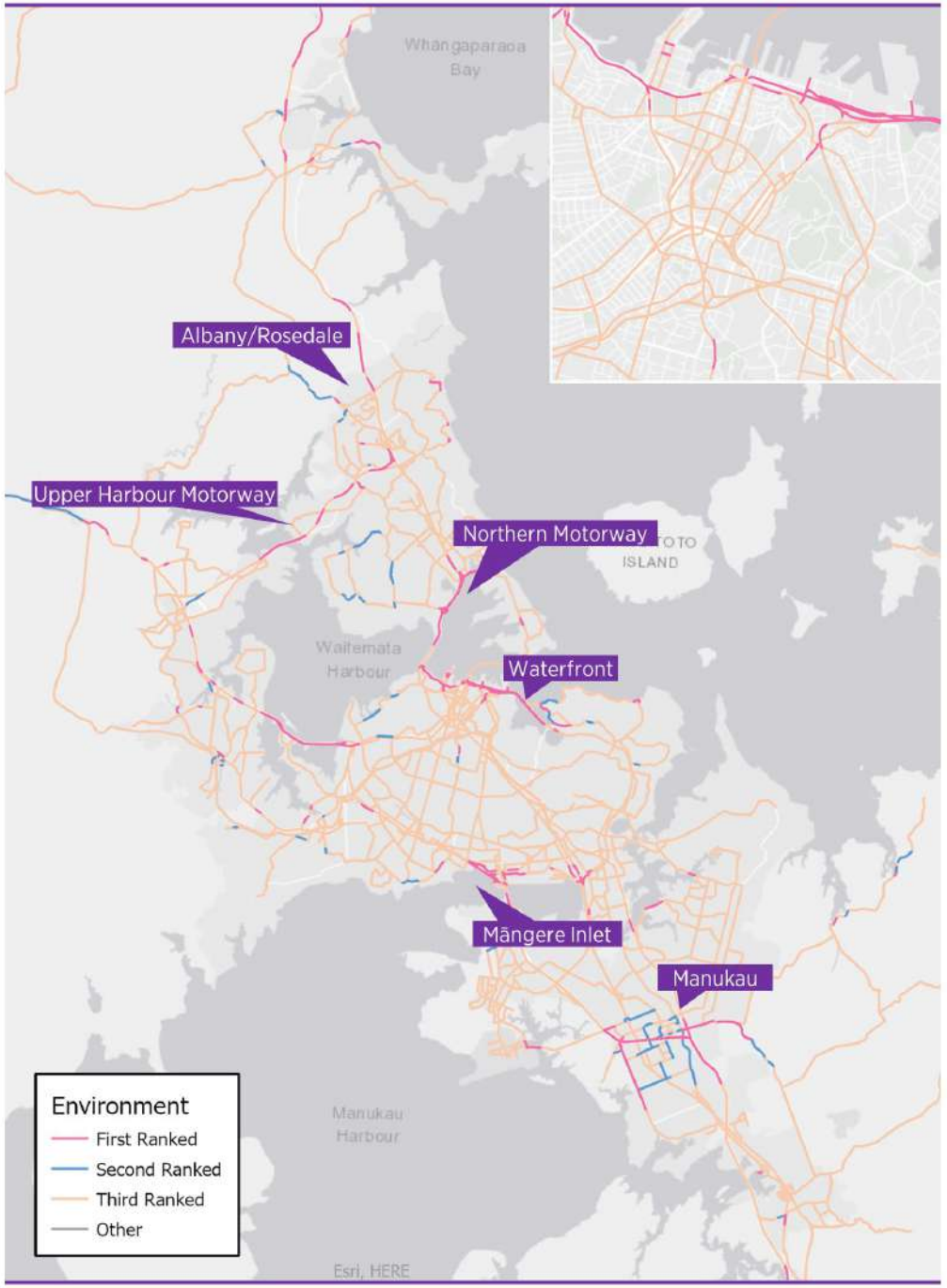
Mode	Ranking Matrix		
PT	3	2	1
GT	3	2	1
F	3	2	1
	Low	Moderate	High
	Deficiency		

% Of PT/GT/F Strategic Network	
1	10%
2	3%
3	87%
Other	0%

Key Findings

First ranked deficiencies and opportunities affect the City Centre waterfront, including the Eastern Railway Line and Northern Motorway, roads and railways around the Māngere Inlet, the Upper Harbour Highway, and local roads and Motorways around Manukau, Albany, Rosedale.

Ranked Deficiencies and Opportunities and Opportunities



9. Indicative Focus Areas

Indicative Focus Areas have been created by aggregating the ranked deficiencies and opportunities for each mode / problem on the Strategic Networks. Areas or corridors with high ranking deficiencies and opportunities for two or more modes / problems have been ringfenced to become Indicative Focus Areas for further investigation that could lead to future projects. The steps outlined below produce the Combined Deficiency & Opportunity Map and Indicative Focus Areas.

Note the Walking Strategic Network deficiencies are not included in Indicative Focus Areas, nor in the steps outlined below, due to its placeholder status

1. Combined Deficiency & Opportunity Map

Network links are classified using the amount of Rank 1 deficiencies on a link:

- Category 1 – Rank 1 for 3+ modes / problems
- Category 2 – Rank 1 for 2 modes / problems
- Category 3 – Rank 1 for 1 mode / problem
- Category 4 – Rank 2 for 1+ modes / problems
- Category 5 – No deficiencies

2. Matrix to categorise links based on the amount of first ranked deficiencies

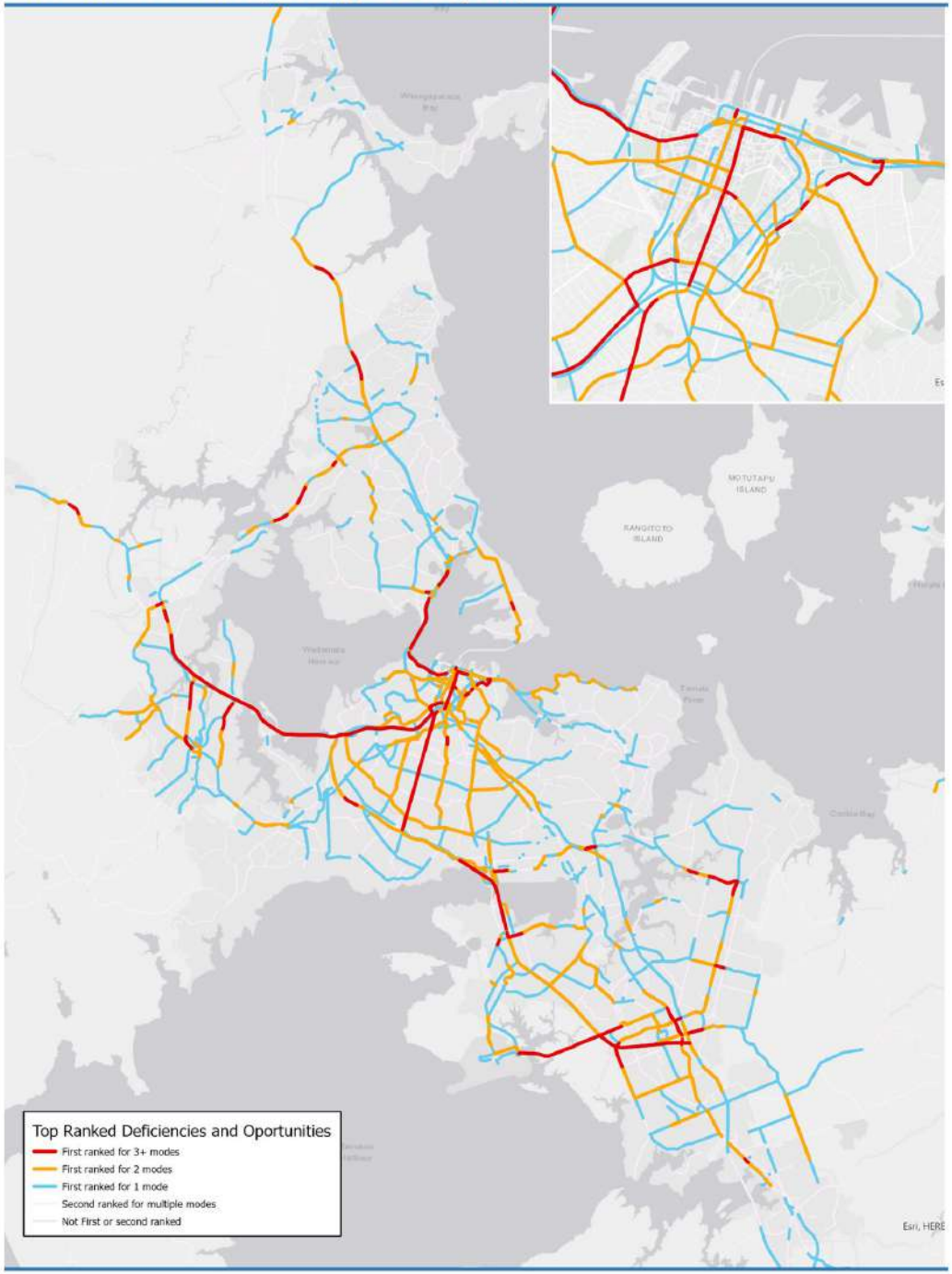
Priority Deficiency Combinations	Top Priority	Second Priority	Rank Order	Priority Area Category	Network Share
Top (x6)	6	0	1	Category 1	3%
Top (x5) + Second (x1)	5	1	2		
Top (x5)	5	0	3		
Top (x4) + Second (x2)	4	2	4		
Top (x4) + Second (x1)	4	1	5		
Top (x4)	4	0	6		
Top (x3) + Second (x3)	3	3	7		
Top (x3) + Second (x2)	3	2	8		
Top (x3) + Second (x1)	3	1	9		
Top (x3)	3	0	10		
Top (x2) + Second (x4)	2	4	11	Category 2	10%
Top (x2) + Second (x3)	2	3	12		
Top (x2) + Second (x2)	2	2	13		
Top (x2) + Second (x1)	2	1	14		
Top (x2)	2	0	15		
Top + Second (x5)	1	5	16	Category 3	24%
Top + Second (x4)	1	4	17		
Top + Second (x3)	1	3	18		
Top + Second (x2)	1	2	19		
Top + Second (x1)	1	1	20		
Top	1	0	21		
Second (x6)	0	6	22	Category 4	25%
Second (x5)	0	5	23		
Second (x4)	0	4	24		
Second (x3)	0	3	25		
Second (x2)	0	2	26		
Second (x1)	0	1	27		
No Top or Second	0	0	28	Category 5	38%

3. Indicative Focus Area Longlist

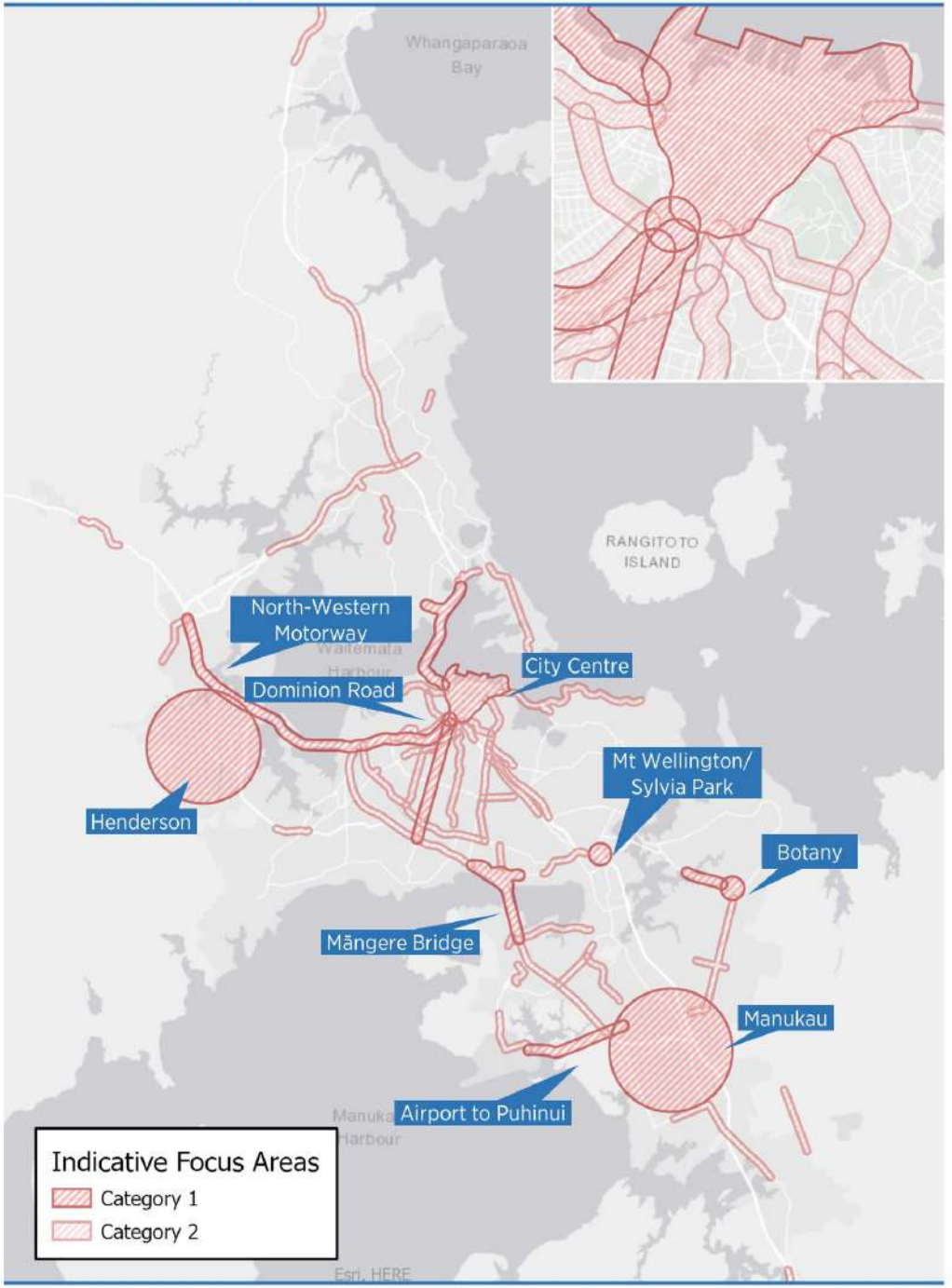
(Category 1 and 2)

Indicative Focus Areas

Combined Deficiency & Opportunity Map



Indicative Focus Areas



Indicative Focus Areas

Name	Type	Category	Top Ranked Deficiencies	2018 RLTP	RLTP Project	Other Plans / Projects
City Centre	Metro Centre	1	All modes and problems	✓	Bus Network Improvements	A4E, CC, CRL, CCMP
Henderson	Metro Centre	1	All modes and problems	✓	Lincoln Road Corridor Improvement,	Cycle PBC
Onehunga Interchange / Mangere Bridge	Corridor	1	All modes and problems	-		NOP - Onehunga Mall / Neilson Street / Church / GSR Freight Study Cycle PBC
Botany	Metro Centre	1	Public Transport, Freight, General Traffic, Safety	✓	AMETI 3	Cycle PBC
Manukau	Metro Centre	1	All modes and problems	✓	CC - Great South Corridor	Cycle PBC, Level Crossing Grade Separation (KiwiRail0
Puhinui Interchange to Airport	Corridor	1	Public Transport, Freight, General Traffic, Environment, Safety	✓	A2B MRT Puhinui Interchange	SH20B to Airport (Waka Kotahi 20 Connect)
North-Western - City Centre to Massey	State Highway	1	Cycle, Public Transport, General Traffic, Environment, Safety	-		North-Western Busway, Cycle PBC, Light Rail North-West (Waka Kotahi(
Newton	Centre	1	Cycle, Public Transport, Freight, General Traffic, Safety	-		Cycle PBC
Mount Wellington / Sylvia Park	Metro Centre	1	Freight, General Traffic, Public Transport, Safety	✓	Sylvia Park Bus Improvements	Mt Wellington Highway - SH1 on Ramp Improvements
SH1 - City Centre to Esmonde Road	State Highway	1	Cycle, Public Transport, Environment, Safety	-		Northern Pathway
Ti Rakau Drive	Corridor	1	Public Transport, Freight, Environment, Safety	✓	AMETI	Cycle PBC
Dominion Road	Corridor	1	Cycle, Public Transport, Safety	-	Dominion Rd- Double Decker Network Mitigation	City Centre to Airport Light Rail
Kumeu / Huapai - Main Rd	Corridor	2	General Traffic, Environment, Safety	-		SGA North West Area
Ponsonby	Corridor	2	Cycle, Safety	✓		Cycle PBC
Esmonde Road	Corridor	2	Cycle, Public Transport, Environment	✓	Lake Road/Esmonde Road Improvements	Cycle PBC
George Bold Memorial Drive / Tom Pearce Drive	Corridor	2	Cycle, Public Transport, Freight	-		SH20A to Airport (Waka Kotahi 20 Connect)
Onehunga Mall	Corridor	2	Cycle, Safety	-		Onehunga Regeneration (Panuku) NOP - Onehunga Mall / Neilson Street / Church / GSR Freight Study
Don Buck Road - Fred Taylor Drive	Corridor	3	Cycle, Safety	-		Supporting Growth - North West
South-Western - Point Chev to Onehunga	Corridor	2	All modes	-		
Sandringham Road	Corridor	2	Cycle, Safety	✓	CC - Sandringham Rd Corridor	Cycle PBC
Upper Harbour Hwy and Constellation Drive	State Highway	2	Cycle, Freight, General Traffic, Environment, Safety	-		Northern Corridor (Waka Kotahi)
Te Irirangi Drive	Corridor	2	Cycle, Freight, General Traffic, Safety	✓	Airport to Botany RTN	
East-West Link	Corridor	2	Freight, General Traffic, Safety	-		East West Link (Waka Kotahi - On Hold)
Great North Road - Glen Eden to New Lynn	Corridor	2	Freight, Safety	-		Cycle PBC
Northern Motorway - Rosedale to Dairy Flat	State Highway	2	Public Transport, Freight, General Traffic, Environment, Safety	✓	Rosedale Bus Station	ATAP Northern Busway Extension Northern Pathway
Northern Motorway - Northern Gateway Toll Road	State Highway	2	Freight, Environment	-		
Northern Motorway - Puhoi to Warkworth	State Highway	2	Freight, Environment	-		Puhoi to Warkworth (Waka Kotahi)
Lake Road	Corridor	2	Cycle, Environment, Safety	✓	Lake Road Corridor Improvements	Cycle PBC
Glenfield Road	Corridor	2	Cycle, Safety	-		
Tamaki Drive	Corridor	2	Cycle, Environment, Safety	-		Mission Bay and St Heliers Speed Management
Great North Road - City Centre to Western Springs	Corridor	2	Cycle, Safety	✓	CC - Great North Corridor	Cycle PBC
Symonds Street / New North Road to Morningside	Corridor	2	Cycle, Safety	✓	CC - New North Corridor	Cycle PBC
Carrington Road / Mount Albert Road	Corridor	2	Cycle, Safety	✓	Carrington Road Upgrade & CC	Cycle PBC
Mount Eden Road - Newton to Balmoral Road	Corridor	2	Cycle, Environment, Safety	✓	CC - Mount Eden Corridor	Cycle PBC
Great South Road - Newmarket to Ellerslie	Corridor	2	Cycle, Safety	✓	CC - Great South Corridor	Cycle PBC
Parnell Road and Manukau Road - The Strand to Royal Oak	Corridor	2	Cycle, Safety	✓	CC	Cycle PBC
Green Lane West	Corridor	2	Cycle, Safety	✓	CC - Green Lane West	
Remuera Road - Newmarket to Market Road	Corridor	2	Cycle, Safety	✓	CC - Remuera Road	Cycle PBC

Indicative Focus Areas						
Name	Type	Category	Top Ranked Deficiencies	2018 RLTP	RLTP Project	Other Plans / Projects
Massey Road - Mangere East	Corridor	2	Cycle, Safety	-		Cycle PBC
Alfriston Road and Great South Road - Manurewa to Papakura	Corridor	2	Cycle, Freight, Safety	-		Cycle PBC
Bader Drive / Orly Ave / Jordan Road	Corridor	2	Cycle, Public Transport, General Traffic, Safety	-		Bader/Idelwind Roundabout. Walmsley Rd/ Donnell Ave intersection improvements, Cycle PBC
Southern Motorway - Newmarket to Ellerslie	State Highway	2	Freight, General Traffic, Safety	-		SH1 Ellerslie Widening Project (Waka Kotahi)
Southern Motorway - Drury	State Highway	2	Public Transport, Freight, Environment	-		NZ Upgrade - Auckland Package (Waka Kotahi)
Southern Motorway - Grafton	State Highway	2	Cycle, Freight, General Traffic, Safety	-		
South-Western Motorway - Favona to Manukau	State Highway	2	Cycle, Freight, General Traffic, Environment, Safety	-		20 Connect (Waka Kotahi)
Gray Ave and Station Road - Middlemore Hospital to Papatoetoe	Corridor	2	Cycle, Safety	-		Intersection Upgrades Cycle PBC
Mill Road - Alfriston to Walters Road	Corridor	2	Freight, Safety	-		Mill Road (Waka Kotahi NZ Upgrade)
Walmsley Road / McKenzie Road/James Fletcher Drive	Corridor	2	Cycle, Freight, Environment, Safety	-		
Beach Road, Browns Bay	Corridor	2	Cycle, Safety	-		
Park Road / Carlton Gore Road	Corridor	2	Cycle, Safety	-		Cycle PBC
Tervois Road / College Hill	Corridor	2	Cycle, Safety	-		Cycle PBC

Table 5: Indicative Focus Areas

9.1 Indicative Focus Areas – Category 1 overview

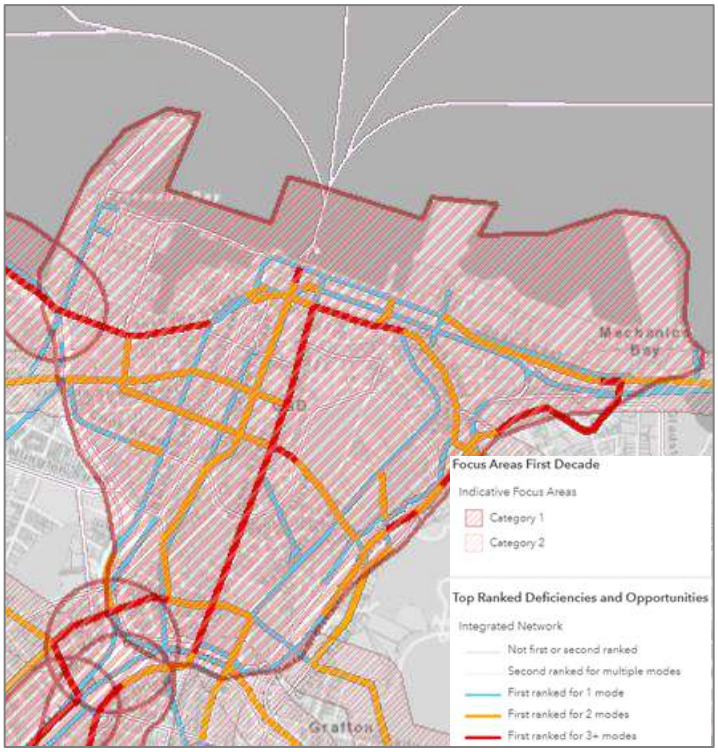
Indicative Focus Areas represent the highest conglomeration of issues for the Strategic Network system in the region over the next decade (based on data compiled by Future Connect). A summary of each Category 1 area or corridor, and the reasons for their significance, is outlined below[11].

Although walking deficiencies were not included in the current analysis as they are under development as part of the placeholder network, significant deficiencies in busy centres are very likely and would need to be considered for further investigation in these areas.

[11] Note that the maps show combined top ranked deficiencies / opportunities for all modes / problems for that Indicative Focus Area, whereas the text provides a description of the origins of that result for each mode / problem.

City Centre

As the busy urban centre of the region it is not surprising that four other Category 1 areas and corridors link directly with the City Centre. The City Centre is severely deficient for General Traffic, Public Transport, Freight, Cycle, Safety and Environment. The nature of deficiencies in the City Centre over the next decade is summarised below.



DEFICIENCIES AND OPPORTUNITIES

General Traffic

Quay Street is speed deficient for general traffic with worsening congestion forecast in the vicinity of on / off ramps from the West (SH16) and the East (SH1). Most major roads in the City Centre are deficient for travel time reliability.

Public Transport

Public Transport has bus speed and travel time reliability deficiencies. Bus congestion is forecast over the next decade on most routes to / from the City Centre.

Cycle

Cycle links lack safe and appropriate facilities mainly along Vincent Street, Grafton Road, and parts of Beach Road. The City Centre as a whole is a high priority investigation area in the first decade (Programme Business Case (PBC) or Urban Cycleways Programme (UCP)).

Safety

There are safety risks along most major routes based on the number of DSIs over the last 5 years. There is a high safety risk for active road users on most roads in the City Centre.

Environment

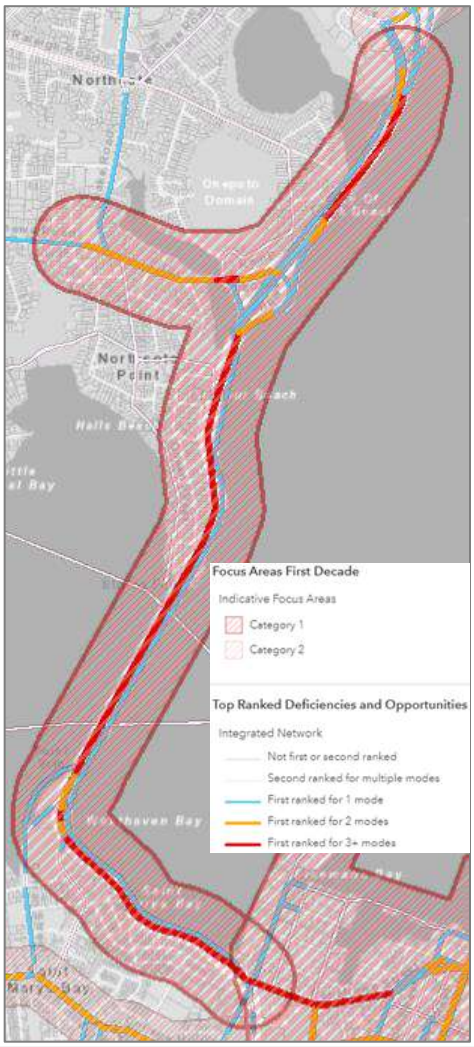
Environmental deficiency is based on a high inundation threat for Fanshawe street and waterfront rail lines accessing Britomart and the Port.

Freight

Freight is deficient mainly on State Highways connected to the City Centre. In particular, forecast volume increases on SH16 slip lane traveling North from the West, and slow access speeds to the Port on SH16.

SH1 - City Centre to Esmonde Road

SH1 is the primary link between the North Shore and the City Centre and is severely deficient in Public Transport, Cycle, Safety and Environment. The nature of deficiencies on this strategic motorway link over the next decade is summarised below.



DEFICIENCIES AND OPPORTUNITIES

Public Transport

Public Transport is deficient in bus travel time reliability from Esmonde Road to Fanshawe Street in the City Centre with bus volumes forecast to increase on the Westhaven on-ramp heading North.

Cycle

Cycle links along the route and connecting links form part of a high priority investigation area in the first decade (PBC or UCP). Note that the Northern Pathway project is planned to link North Shore to the City Centre.

Safety

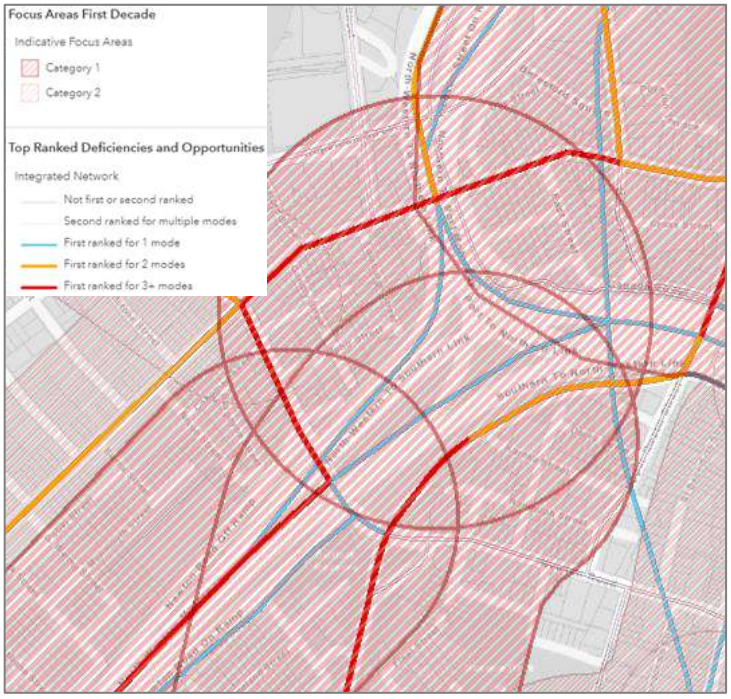
Safety risks are present along the full length of the route based on number of DSIs over last 5 years.

Environment

Environmental deficiency on the North Shore is related to stormwater run-off into sensitive receiving environments, and inundation threats around Onewa and Esmonde Road interchanges. On the Isthmus, there is an inundation threat along the SH1 waterfront section.

Newton

Newton interfaces with the City Centre and two other Category 1 corridors (North-Western Motorway and Dominion Road). This junction area is severely deficient for General Traffic, Public Transport, Freight, Cycle and Safety. The nature of deficiencies in this suburb over the next decade is summarised below.



DEFICIENCIES AND OPPORTUNITIES

Public Transport

Public Transport is deficient for bus travel time reliability towards the City Centre from the West on the North-Western Motorway. Bus volume increases are forecast to be high along Ian McKinnon Drive and Pitt Street.

General traffic

General traffic has travel time reliability deficiencies on Great North Road, Newton Road, and Karangahape Road. This deficiency also affects SH16 to SH1 heading south, and SH1 access both to / from the City Centre.

Freight

Increases in heavy freight vehicles are forecast to be high on the North-Western Motorway north bound.

Safety

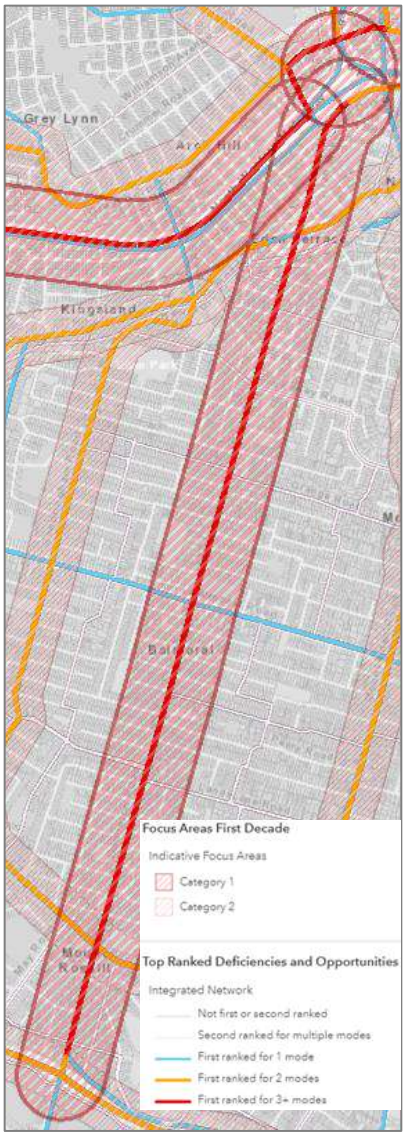
Newton Road, Karangahape Road, and Ponsonby Road have high safety risks based on the number of DSIs over the last 5 years. There is a particularly high safety risk for active road users on these routes.

Cycle

Cycle links on all main routes form part of a high priority investigation area in the first decade (PBC or UCP).

Dominion Road

Dominion Road is severely deficient for Public Transport, Cycle and Safety from Ian McKinnon Drive to SH 20. The nature of deficiencies on this strategic link over the next decade is summarised below.



DEFICIENCIES AND OPPORTUNITIES

Public Transport

Public Transport is deficient for travel time reliability on Denbigh Avenue link from the West. Forecast PT volume change on Dominion Road is high over the next decade. Note that Dominion Road is planned for future RTN.

Cycle

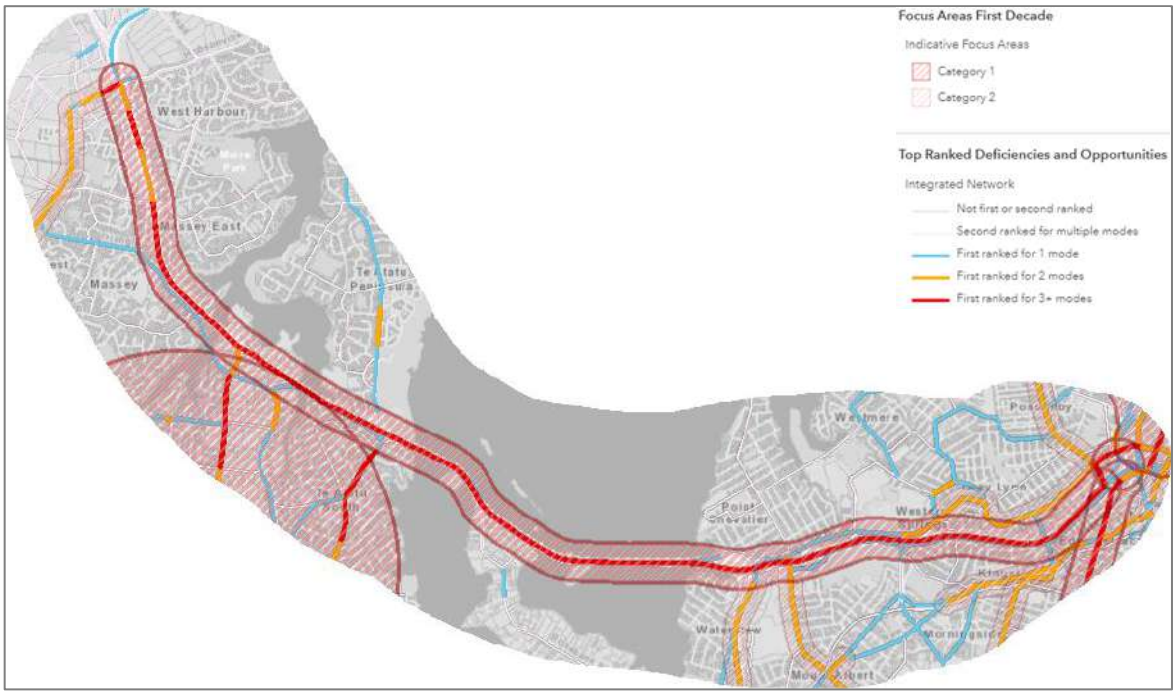
Cycle is deficient in safe and appropriate facilities around Dominion Road overpass with New North Road, with the entire route a high priority investigation area in the current decade (PBC or UCP).

Safety

There is a high safety risk based on the number of DSIs over the last 5 years. Most of the route presents a high safety risk for active road users. There are differences between posted and safe / appropriate speed limits around Dominion Road overpass with New North Road and Ian McKinnon Drive.

North-Western Motorway – City Centre to Massey

The SH16 primary motorway link between West Auckland and central areas is 16 kilometres long and has severe deficiencies for General Traffic, Public Transport, Cycle, Safety and Environment. The nature of deficiencies on this strategic motorway link over the next decade is summarised below.



DEFICIENCIES AND OPPORTUNITIES

General Traffic

There is poor travel time reliability especially between Lincoln and Rosebank Road interchanges. Congestion increases are forecast over the next decade between Royal Road-Lincoln Road, Rosebank Road-Point Chevalier and Mountain View Road to Newton Road.

Public Transport

There is a deficiency in bus speed level of service on the motorway between Rosebank Road to Mountain View Road, and travel time reliability from Mountain View Road into the City Centre. Forecast PT volume change over the entire route is high over the next decade. Note that the North-Western Motorway is planned for future RTN.

Cycle

Two sections of the motorway fall into high priority cycle investigation areas in the current decade (PBC or UCP) – Te Atatu interchange to Waikumete stream and Carrington Road to Newton Road.

Safety

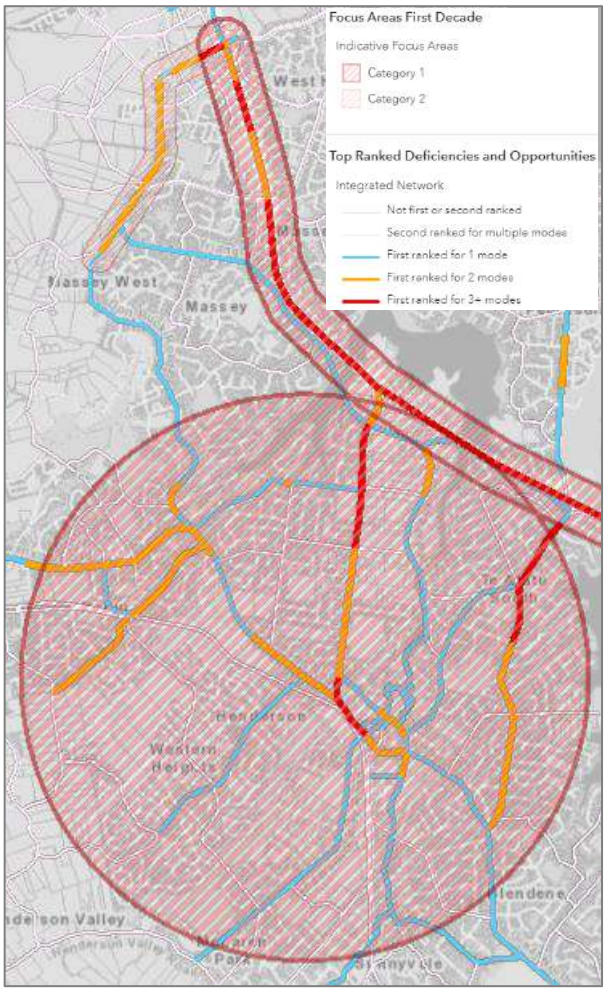
The motorway has a high safety risk based on the number of DSIs over the last 5 years along the entire route.

Environment

Environmental deficiency along the motorway relates to stormwater run-off into sensitive receiving environments along sections of the motorway, and the whole length of the causeway. In addition, there is an inundation threat between Rosebank and Te Atatu peninsulas.

Henderson

Henderson is a metropolitan centre that is severely deficient for Public Transport, General Traffic, Freight, Cycle, Safety and Environment. The nature of deficiencies over the next decade is summarised below.



DEFICIENCIES AND OPPORTUNITIES

Public Transport

There is a deficiency in bus speed level of service along Te Atatu Road and Edmonton Road on approach to the motorway. Very poor bus travel time reliability on major routes including Great North Road, Sel Peacock Drive, Henderson Valley Road and Lincoln Road. The rail crossing at Bruce McLaren Road / Railside Avenue intersects with the strategic freight network.

General Traffic

There is a poor speed level of service, with particular bottlenecks on Te Atatu Road and Lincoln Road. Poor travel time reliability is widespread on major routes including Rathgar Road and Swanson Road. Congestion is forecast to worsen over the next decade between Te Atatu Road-Edmonton Road and in the vicinity of Lincoln / Triangle Road intersection.

Freight

Freight vehicles experience a poor speed level of service on various sections of Lincoln Road and Central Park Drive on approach to SH16. Similarly, poor speed level of service on parts of other main routes: Edmonton Road, Great North Road and Te Atatu Road. Forecast increases in congestion around the intersection of Lincoln Road / Central Park Drive and approach to SH16 on Te Atatu Road.

Cycle

There is a lack of safe and appropriate facilities on Te Atatu Road on approach to SH16 and its intersection with Edmonton Road. Similarly, there is a lack of safe facilities along Universal Drive and Central Park Drive / Triangle Road. The entire Henderson area is a high priority investigation area in the first decade (PBC or UCP).

Safety

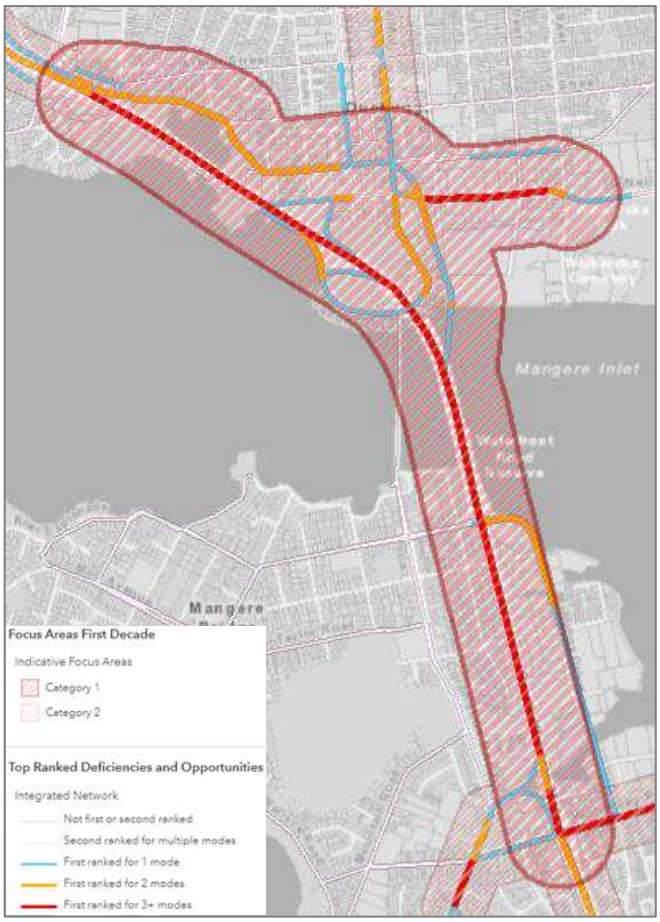
There is a high safety risk based on the number of DSIs over the last 5 years along Sel Peacock Drive, Metcalfe Road, Swanson road, Lincoln Road, Te Atatu Road and Great North Road through the urban centre. Te Atatu Road, Triangle Road, Sel Peacock Road and roads adjoining Westcity mall present a high safety risk for active road users.

Environment

There is stormwater run-off into sensitive receiving environments on a section of Sel Peacock Drive and Don Buck Road. A section of Universal Drive is subject to inundation.

Onehunga Interchange / Māngere Bridge

The Indicative Focus Area includes the Onehunga rail station, the intersection of Neilson Street / Onehunga Mall Road and links across the harbour to Mangere Bridge. It is severely deficient for General Traffic, Public Transport, Freight, Cycle, Safety and Environment. The nature of these deficiencies over the next decade is summarised below.



DEFICIENCIES AND OPPORTUNITIES

General Traffic

There is poor travel time reliability on Neilson Street from Onehunga Mall Road heading East and Selwyn Street between Church and Neilson Street. Congestion is forecast to increase over the next decade on sections of Neilson Street.

Freight

There is a poor speed level of service for freight vehicles on Neilson Street connecting to Onehunga Mall Road, as well as, the SH20 on / off-ramps. Congestion is forecast to increase over the next decade on parts of Neilson Street, SH20 and the on / off-ramps.

Public Transport

Forecast PT volume changes anticipated over the next decade on Princes street, Onehunga Mall Road to Mangere Bridge will make PT deficient. Note that the link from Onehunga to Māngere Bridge is planned for future RTN.

Cycle

There is a lack of safe and appropriate infrastructure on Onehunga Mall Road.

Environment

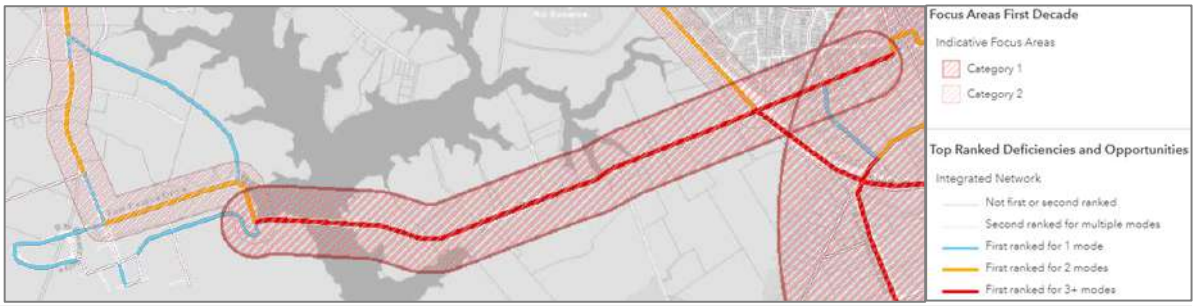
There is stormwater run-off into sensitive receiving environments on the south side of SH20 near Mangere Bridge. There is also an inundation threat along sections of Neilson Street and Onehunga in the vicinity of the motorway on / off ramps.

Safety

There is a high safety risk based on the number of DSIs over the last 5 years on sections of Mahunga Drive / Onehunga Mall Road accessing SH20 and all the way along the motorway.

Puhinui Interchange to Airport

SH20B is the primary motorway link from the East to the Airport and is severely deficient for General Traffic, Public Transport, Freight, Safety and Environment. The nature of deficiencies on this strategic link over the next decade is summarised below.



DEFICIENCIES AND OPPORTUNITIES

Public Transport

The entire route is deficient as PT volumes are forecast to change significantly over the next decade. Note that the route is planned to deliver significant PT service improvements within the decade (Airport to Botany Rapid Transit and Puhinui Station Interchange).

General Traffic

SH20B is forecast to have worsening congestion between the Airport and SH20 interchange.

Freight

Freight heavy vehicle volume increases are forecast over the decade between Airport and the SH20 interchange.

Safety

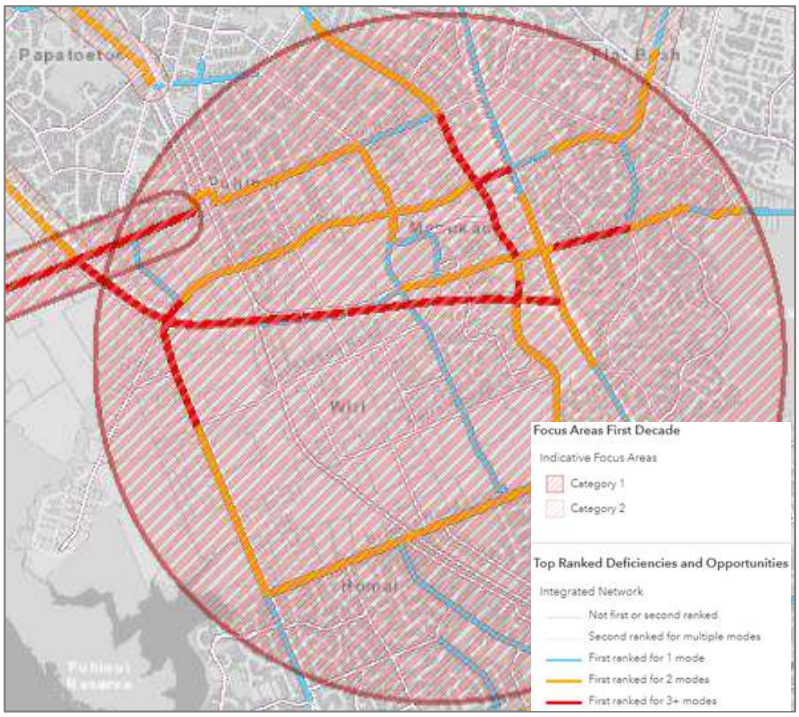
There is a high safety risk based on the number of DSIs over the last 5 years along most of the route.

Environment

There is stormwater run-off into sensitive receiving environments around the Puhinui Road bridge and approach to Airport, and immediately East of SH20 / Puhinui Road interchange.

Manukau

Manukau is a metropolitan centre that is severely deficient for General Traffic, Public Transport, Freight, Cycle, Safety and Environment. The nature of deficiencies over the next decade is summarised below.



DEFICIENCIES AND OPPORTUNITIES

Public Transport

There is poor bus speed / travel time reliability on some central links. The most significant deficiency is the forecast PT congestion on Puhinui Road, Lambie Drive and Te Irirangi Drive, which all provide access to / from the centre.

General Traffic

There are travel time reliability deficiencies on various routes around the centre, including SH20 and SH1.There are also speed and productivity deficiencies within the centre.

Freight

Freight vehicles experience a poor speed level of service along Great South Road. Congestion is forecast to increase on SH20. Notable increases are also forecast for heavy vehicles on SH20, and in the Wiri area.

Cycle

There is a lack of safe and appropriate infrastructure throughout the centre. The Manukau area is also a high priority investigation area in the first decade (PBC or UCP).

Safety

There is a high safety risk on Browns Road, Great South Road, Cavendish Drive and Puhinui Road based on the number of DSIs over last 5 years. There is also a high safety risk for active road users, especially on Great South Road, and parts of Cavendish Drive and Roscommon Road. There are differences between posted and safe / appropriate speed limits on sections of road within central Manukau.

Environment

There is stormwater run-off into sensitive receiving environments along SH20 and SH1, Roscommon Road and Redoubt Road.

Mt Wellington / Sylvia Park

Sylvia Park area is a metropolitan centre that is severely deficient for General Traffic, Public Transport, Freight and Safety. The nature of deficiencies for this centre over the first decade is summarised below.

DEFICIENCIES AND OPPORTUNITIES

General Traffic

Mount Wellington Highway / Sylvia Park Road and South-Eastern Highway are deficient for travel time reliability. Congestion is forecast to increase over the next decade on South-Eastern Highway and SH1 in vicinity of the on / off ramps.

Freight

Mount Wellington Highway is severely deficient for speed level of service, and congestion is forecast to worsen on SH1 in the vicinity of the on / off ramps.

Public Transport

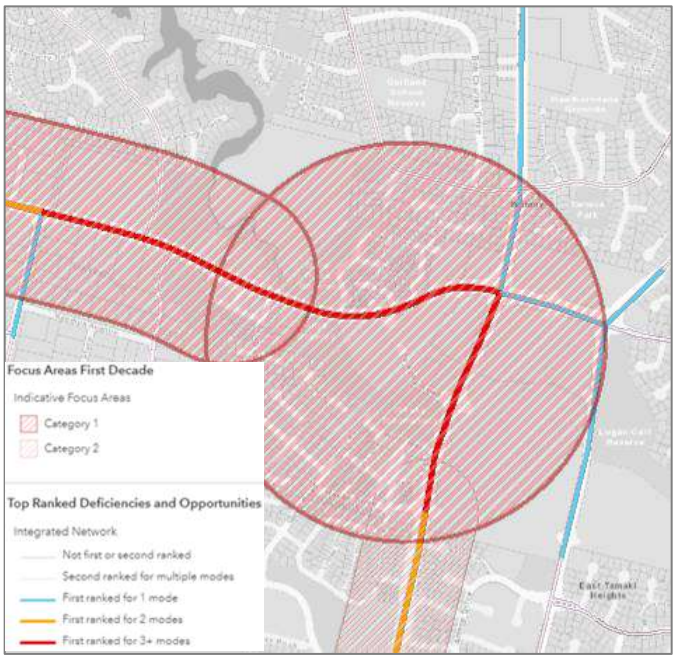
There is a high deficiency in bus speed level of service on Waipuna and Carbine Roads.

Safety

There is a high safety risk based on number of DSIs over last 5 years along SH1, South-Eastern Highway and sections of Mount Wellington Highway.

Botany

The Botany area is a metropolitan centre that is severely deficient for General Traffic, Public Transport, Freight and Safety. The nature of deficiencies for this centre over the next decade is summarised below.



DEFICIENCIES AND OPPORTUNITIES

Public Transport

There is currently a high deficiency in bus speed level of service along sections accessing the centre's bus stops. There are also forecast increases in PT volumes along Te Irirangi Drive.

General Traffic

There is deficiency for speed / productivity and travel time reliability along Ti Rakua Drive and Te Irirangi Drive. Congestion is also forecast to increase over the next decade along Te Irirangi Drive.

Freight

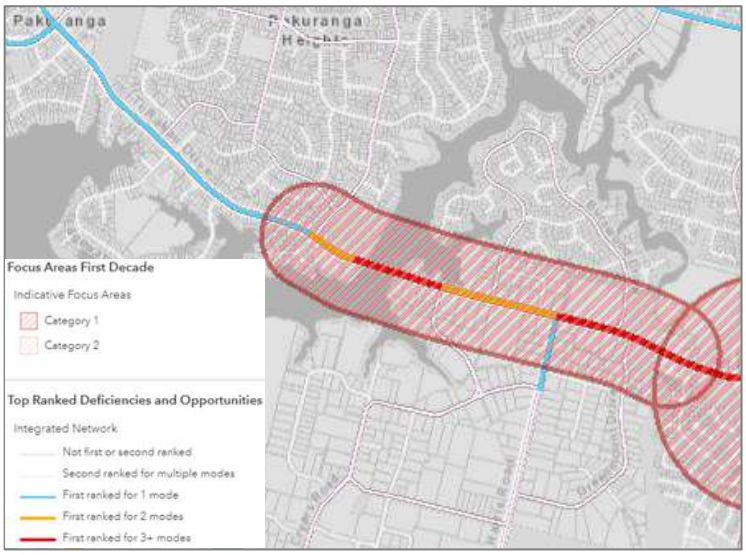
Ti Rakua Drive / Te Irirangi Drive are deficient for speed level of service.

Safety

There is a safety risk based on number of DSIs over last 5 years along Ti Rakau Drive and Te Irirangi Drive south of Town Centre Drive intersection. All major roads in the metropolitan centre have been identified with high safety risk when comparing posted speed limits to safe / appropriate speeds.

Ti Rakau Drive

Ti Rakau Drive is severely deficient for Public Transport, Freight, Safety and Environment from Botany to Gossamer Drive. The nature of deficiencies on this strategic link over the next decade is summarised below.



DEFICIENCIES AND OPPORTUNITIES

Public Transport

Ti Rakau Drive is deficient for bus speeds along the whole route. There are also high forecast increases in PT volumes west of Harris Road. Note that Ti Rakau Drive is planned for future RTN.

Freight

Ti Rakau Drive is deficient for speed level of service east of Harris Road into Botany centre. There is also forecast congestion between intersections Gossamer Drive and Trugood Drive.

Safety

There is a safety risk based on number of DSIs over last 5 years along Ti Rakau Drive from Tamaki river bridge into Botany centre and Te Irirangi Drive south of Town Centre drive intersection.

Environment

There is stormwater run-off into sensitive receiving environments in the vicinty of Tamaki river bridge.

9.2 Strategic Rationale

Where necessary, a RASF assessment, together with key outputs from Future Connect for the same corridor or area, will be the starting point for the development of a 'Strategic Rationale' document (currently under development). This process is designed to ensure a clear rationale and strategic alignment will underpin a new project, including future investigations and business cases, acting as the starting point for any project or programme (i.e. what is the problem, and what is the desired state).

When feeding into the Strategic Rationale, the Future Connect system planning tool will be expanded over time to include additional quantitative and qualitative information, including the following information (as appropriate):

- greenhouse gas emissions
- mode share by area
- growth and development areas
- route underutilisation
- access to jobs
- socio-economic deprivation
- customer complaints
- walking deficiencies
- plans and projects (internal / external)
- plus additional sources of information as they become available.

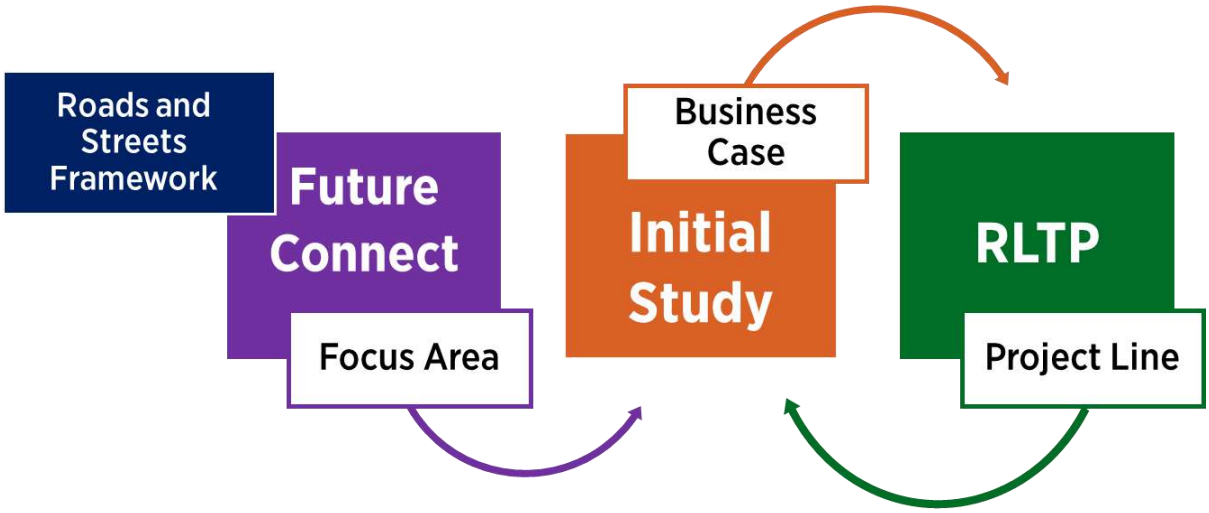


Figure 19: Future Connect handover process

10. Conclusion

Future Connect has been developed to achieve better decision-making that delivers on AT's strategic transport objectives and those of its partners. The key outputs of Future Connect helped to guide the development of the draft RLTP 2021-31 investment programme. The Strategic Networks, and associated information, will provide a core planning reference across all modes to guide and streamline network planning. The Indicative Focus Areas also provide the highest priority areas and corridors for future investigation that could lead to future projects. Many of the highlighted Indicative Focus Areas already have projects associated with them. This means investment is planned in the appropriate places to support the problems identified by Future Connect.

10.1 Next steps

Future Connect supports the public consultation of the draft RLTP 2021-31 investment programme by providing:

- information covering the development of the Strategic Networks, the Deficiency & Opportunity Mapping methodology and resultant Indicative Focus Areas, together with background information (this report), and
- a Strategic Case, which provides a strategic assessment of problems facing Auckland's transport system (under development).

The results of public consultation and the decisions of the RLTP 2021-31 once adopted will be reflected in the final Future Connect First Decade report (V1.0) to be published mid-2021. The RLTP will be supported in Waka Kotahi's business case process by a Strategic Case, which will provide strategic assessment of the problems facing Auckland's transport system[12].

During 2021, Phase 2 of Future Connect will commence focusing on a 20 to 30 year horizon to better integrate and co-ordinate strategic modal network decision-making over time.

[12] Once endorsed, the Future Connect Strategic Case can be viewed here at.govt.nz/futureconnect

Appendix A: Definitions of modal network layers

Definitions of modal network layers
(Strategic and Supporting Networks)

Public Transport Strategic Network

The 'backbone' of the wider public transport network. It is organised around the rapid and frequent services of the Rapid Transit Network (RTN) and Frequent Transit Network (FTN). The Strategic Network also includes corridors where significant volumes of services converge in order to provide key connections ('Other Strategic Public Transport Corridors').

Strategic Network:

- **Rapid Transit Network (RTN)**
  Services operating at least every 15 minutes, on dedicated right-of-ways removed from the congestion of general traffic lanes
- **Frequent Transit Network 1 (FTN1)**
  Services operating at least every 15 minutes with priority measures, providing strategic connections between Metropolitan Centres or Metro and City Centre
- **Frequent Transit Network 2 (FTN2)**
  Services operating at least every 15 minutes with priority measures, which are not as strategic as FTN1
- **Other Strategic Public Transport Corridors**
  Corridors where significant volumes of non-RTN / FTN services converge in order to provide a connection to key public transport hubs

Supporting Network:

- **Connector**
  Services operating at least every half hour, complementing RTN and FTN
- **Local and other**
  Services operating at least every hour, complement RTN and FTN. Other services include school, peak only services

General Traffic Strategic Network

The backbone of the road network, consisting of Motorways, Strategic and Primary Arterials. The network is a vital part of the system, helping provide access to key destinations for people, goods and services.

Strategic Network:

- **Motorway**
  Highest category roads having greatest through movement function providing inter-regional connections
- **Strategic Arterial**
  Roads that predominantly carry through traffic (but many also serve adjacent activities), providing inter-regional connections, and connect areas within a region
- **Primary Arterial**
  Roads that predominantly carry through traffic (but many also serve adjacent activities), and connect principal sectors of the region (not catered for by strategic routes)

Supporting Network:

- **Secondary Arterials**
  Provide movement within the district between key nodes, and connect major nodes within an area. Serve adjacent key activities
- **Collector Roads**
  Collect and distribute traffic from local roads to arterials within an area (and vice versa). Serve adjacent key activities
- **Local Roads**
  Collect and distribute traffic to / from local properties within an area

Freight Strategic Network

The Freight Strategic Network is made up of roads and rail. The main functions are to link major areas of freight generation and attraction; minimise the impact of freight movement on the community; provide roads and routes capable of accommodating the largest vehicles (within normal legal limits); and offer convenient and reliable travel for freight between key locations.

Strategic Network:

- **Rail Network**
- **Level 1A**
  Roads of the highest strategic value to freight movement (motorways, State Highways, arterials)
- **Level 1B**
  Roads of the highest strategic value to freight movement (arterials where competing modes and land uses require active management)
- **Level 2**
  Local freight networks within strategic freight areas, where efficiency of freight movements should be considered
- **Level 3**
  Supporting freight networks connecting to / between strategic freight areas, where impacts of freight movement on land use requires active management

Supporting Network:

- **Other roads**

Cycle & Micromobility Strategic Network

A connected, coherent, and legible network made up of the most important routes that link key destinations.

Strategic Network:

- **Regional**
  Mainly intra-regional routes within Auckland, focusing on longer distance trips, with the potential of becoming inter-regional too
- **Major**
  Key spine connections to the Regional routes and to high trip generators, such as rapid transit stations and metropolitan centres
- **Connector A**
  Connections to Major routes and lower order trip generators, such as neighbourhood centres and clusters of schools or larger schools

Supporting Network:

Note the Supporting Network is under development

Walking Strategic Network (placeholder)

Made up of the key walking routes of high demand (current and latent) to and between major destinations for short trips (up to two kilometres).

Strategic Network:

- **Primary**
  Provides high quality access to adjacent commercial, retail, school and employment land uses, Public Transport Strategic Network, and carries the highest number of people on the network
- **Secondary**
  Key spines providing access to and between major destinations and may carry considerable numbers of people at certain time periods

Supporting Network:

- **Tertiary**
  High quality access streets within residential streets and surrounding major pedestrian generators

Appendix B: 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 / Opportunity	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 (unconstrained) - 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 (unconstrained) - 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), cycle and walking strategic networks	ALCAM	Kiwi Rail
Cycle & Micromobility	Travel Options	Safe and appropriate facility – Current deficiencies	Deficiency	Current	-	No facilities or unprotected facilities in high volume / speeds roads	Inadequate shared path widths or shared paths with driveways	Auckland Cycleway Map + Moderation	AT GIS database
	Travel Options	Priority Investigation Areas	Opportunity	Future	-	First decade priority investigation areas (Cycle PBC or UCP)	Other cycle PBC Links	Auckland Cycleway Map + Moderation	AT GIS database
Safety	Safety	Collective Risk Corridors	Deficiency	Current	-	High & Medium High	Medium	KiwiRAP (2019) – AT GIS	Safety Team
	Safety + Travel Options	Active Road User Aggregated Corridor Risk Level	Deficiency	Current	-	High & Medium High	Medium	KiwiRAP (2019) – 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	Current / Future	-	Links with > 20,000 vpd (2031) within sensitive receiving environments	Links with > 10,000 vpd (2031) within sensitive receiving environments	Unitary Plan layer + ATAP2 MSM model outputs	Auckland Council/AFC
	Environment	Inundation & sea level rise	Deficiency	Current / Future	-	Links within coastal inundation threat areas (moderated for elevation e.g. bridges)	–	Unitary Plan(Natural Resources	Auckland Council
Walking	Travel Options	Footpath width	Deficiency	Current	-	Does not have a footpath on at least one side (Primary and Secondary), or no footpath >1.8 m on at least one side (Primary)	Does not have a footpath >3 m on at least one side (Primary), or no footpath >1.8 m on at least one side (Secondary)	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

Appendix C: Terms and Conditions

The following important disclaimers apply to information available through Future Connect:

1. Future Connect is a 10-year network plan and system planning tool. The purpose is to provide strategic guidance for network planning and investment. It should not be used for other purposes without further consideration.

2. The Future Connect key outputs (i.e. Strategic Networks, Deficiency & Opportunity Mapping and Indicative Focus Areas) should always be independently reviewed and interpreted in the context set out in the Future Connect Report and these disclaimers.

3. While AT makes every reasonable effort to provide information of a quality that best meets the purposes of this publication, the information is provided on an 'as-is' basis. Information can become rapidly out-of-date. Some information has also been sourced from external parties, which has only been subjected to limited verification by Auckland Transport (AT). AT does not provide any warranty regarding the accuracy and completeness of the information. More information about the data sources can be found in the Future Connect Report.

4. Future Connect identifies the **Strategic Networks** for each mode, which provides the context for further decisions about modal priorities across the transport system. Some Strategic Networks may overlap, and it may not be possible to provide for all the modes' planned level of service within the space available.

5. The Strategic Networks are built on certain assumptions regarding the current and future transport networks. All Strategic Networks are subject to change due to a variety of reasons, including further investigation, engagement, statutory approvals, changes to timing of implementation, and funding of services or project delivery. Strategic Networks will be kept up to date in the Future Connect Mapping Portal, although delays may occur.

6. All infrastructure projects undertaken on the **Cycle Network** (Strategic and Supporting) should seek to enhance safety and suitability for cyclists.

    a. Significant projects (over $10m) should provide specific interventions that enhance safety for cyclists and enable improved choices for cyclists of all ages and abilities, unless the interventions are not achievable due to RMA planning requirements or there is a risk to the availability of Waka Kotahi funding for the project as a whole.

    b. For non-strategic projects (i.e. less than $10 million), or for larger projects where specific cycling interventions are not achievable, cycling interventions are not mandatory, but the project design should still seek to enhance safety for cyclists and allow specific cycling infrastructure to be delivered in the future.

7. Where possible, reasonable endeavours should be made to align the renewals and cycling programmes through project coordination (a 'dig once' opportunity). This should occur where project funding provides for the opportunity and is consistent with Waka Kotahi funding requirements; where specific interventions do not materially delay the core renewal works; and where it does not compromise better cycling outcomes to be delivered on another project.

8. The **Deficiency & Opportunity Mapping** provides a review of the Strategic Networks only, and has been created using a data snapshot of historic and forecast data. However, it does not represent 'live' network information and cannot be used to assess the current (month to month) operation of the network. Deficiency & Opportunity Mapping will be updated once every three years, in alignment with the Regional Land Transport Plan (RLTP) planning cycle.

9. **Forecast modelling data** is based on assumptions regarding land use change, population / employment change and project delivery that may be subject to change at any time. More information about these assumptions can be found in the Future Connect Report.

10. The key outputs of Future Connect have been developed to help guide funding and implementation decisions, but it is not an investment plan – that is the role of the RLTP. The Strategic Networks and the ranking of deficiencies and opportunities are not an indication of solution type, project prioritisation, implementation order, or funding allocation (unless committed).

11. Any map / plan is illustrative only. Whilst due care has been taken, AT gives no warranty as to the accuracy and completeness of information in these maps/plans and accepts no liability for any error, omission or use of the information.

12. The Deficiency Indicators used for the Deficiency & Opportunity Mapping (available as background layers) are derived from data provided by: Sensium, Smartrak, Auckland Forecast Centre, Urban KiwiRAP and Waka Kotahi MegaMaps.

GLOSSARY

A4E	Access for everyone
AFC	Auckland Forecasting Centre
ANOP	Auckland Network Operating Plan
ALCAM	Australian Level Crossings Assessment Model
AT	Auckland Transport
ATAP	Auckland Transport Alignment Project
CC	Connected Communities
CCMP	City Centre Masterplan
CRL	City Rail Link
DSI	Death and Serious Injury
FTN	Frequent Transit Network
GIS	Geographic Information Systems
GPS	Government Policy Statement
HCV	Heavy Commercial Vehicle
ILM	Investment Logic Map
LEV	Low Emission Vehicle
LINZ	Land Information New Zealand
LOS	Level of Service
NZTA	Waka Kotahi (New Zealand Transport Agency)
PBC	Programme Business Case
PT	Public Transport
RASF	Roads and Streets Framework
RLTP	Regional Land Transport Plan
RTN	Rapid Transit Network
SC	Strategic Case
SGA	Supporting Growth Alliance
SH	State Highway
SME	Subject Matter Expert
TDM	Transport Design Manual
UCP	Urban Cycleways Programme
V/C	Volume / capacity