Auckland Rapid Transit Plan

[Front cover to have map of the different modes that make up rapid transit]

Contents

Summary

i. Purpose and strategic guidance

Rapid transit provides fast, frequent, and reliable high-capacity access along strategic corridors that are physically separated from other modes and unaffected by congestion. Rapid transit is the backbone of Auckland's public transport network and is critical to supporting and shaping its growth and urban form.

Auckland needs to significantly expand and upgrade its rapid transit network over the coming decades if we are to be successful in enabling, supporting and shaping the city's growth while quickly and significantly reducing emissions, and avoiding increasing congestion. Development of the rapid transit network will be the most substantial investment in Auckland's transport system over the next few decades.

The Auckland Rapid Transit Plan (ARTP) sets out how the region's rapid transit network is intended to develop over time, and the steps we need to take to make the most of this major investment. By acting as the 'link' between high-level plans, such as the Auckland Plan and the Auckland Transport Alignment Project (ATAP), and project investigation, design and delivery, the ARTP will help ensure implementation of Auckland's rapid transit network is undertaken in a coherent and appropriate way that maximises benefits for Auckland and reduces uncertainty for individual projects.

Three "roles" and seven "objectives" for rapid transit will help inform future decision-making – providing a level of consistent strategic guidance across all projects to ensure they all work towards common goals:

Roles of rapid transit:

1. Support and shape a quality compact urban form
2. The public transport network's backbone
3. Provide space-efficient access to opportunities

Rapid transit objectives:

1. Increase access to opportunities, especially to major and growing employment areas
2. Increase people throughput on Auckland's most critical corridors
3. Increase the share of travel unaffected by traffic congestion
4. Increase public transport's mode share, especially for medium and longer journeys, to reduce greenhouse gas emissions
5. Enable an integrated, efficient and effective public transport network
6. Focus most housing and employment growth in centres, and development nodes and areas
7. Support high quality integrated urban communities

Auckland has only begun to develop a true rapid transit network relatively recently. Significant upgrades and expansion of the current network – which includes the passenger

rail system and the Northern and Eastern busways – will be needed over time to fulfil these objectives.

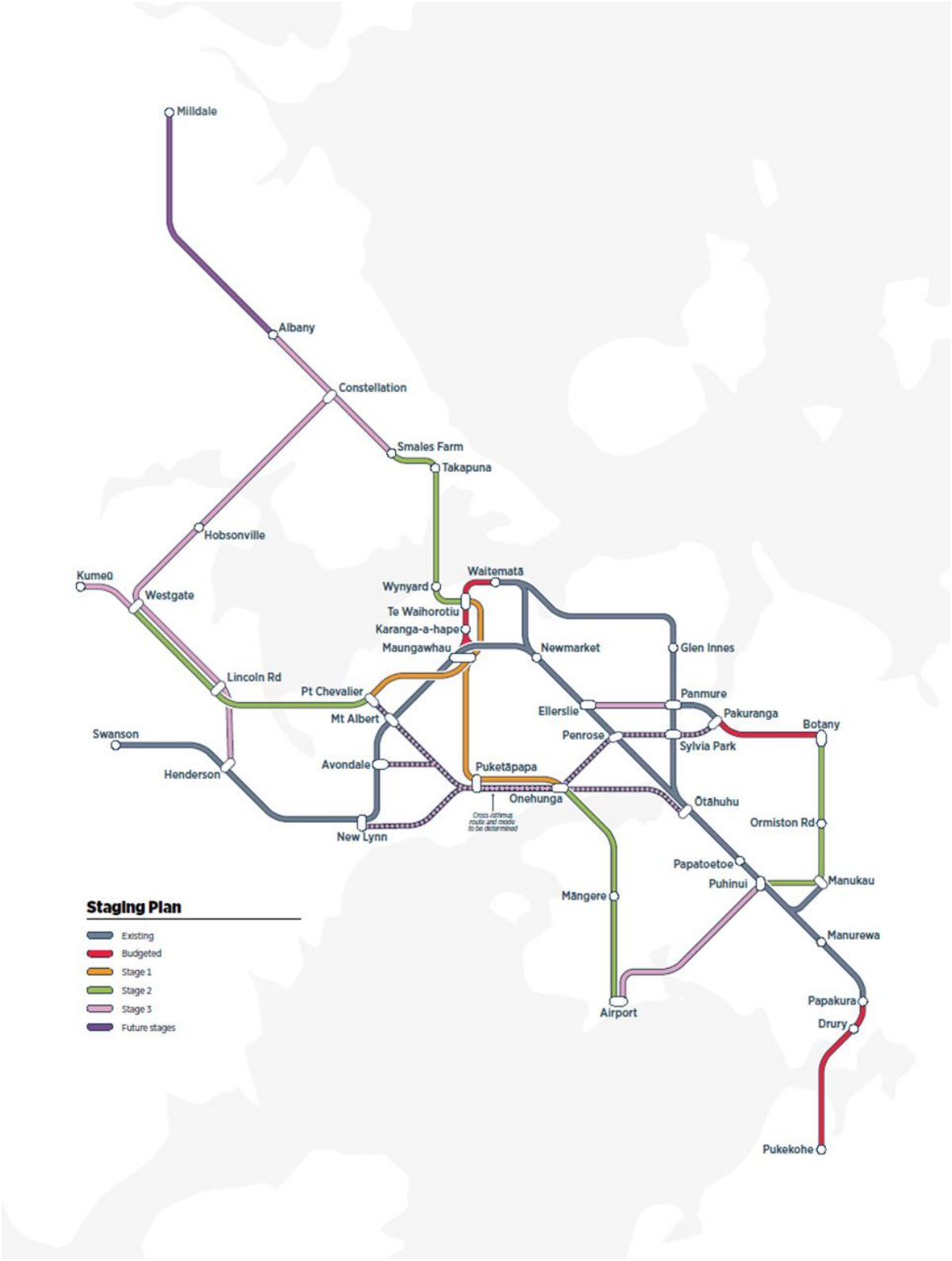
ii. Our future rapid transit network

A combination of heavy rail, light-rail and bus rapid transit corridors will make up Auckland's future rapid transit network. The map below shows the 'likely mode' and connections for the rapid transit network. Final project design (including final mode choice) will be confirmed for future corridors through project-specific business cases.

This network will be progressively implemented over time. This includes at the corridor level, where in some cases interim upgrades should be made ahead of longer-term investments or

where some sections should be built ahead of others. Interim upgrades may include introducing bus services ahead of investment in another mode, or temporary infrastructure to enable service improvements ahead of more significant investment.

The map below shows how this network should be implemented in four key phases over the next 30 years and beyond. This will also be refined with inputs from future business case work.



Getting the most value from Auckland's rapid transit system will require well-coordinated integration with the rest of the transport system, as well as supportive land-use policies and plans. This will enable the greatest number of people possible to have good access to rapid transit, as well as helping to shape the way Auckland grows over time.

Critical actions needed over time to improve access to Auckland's rapid transit network are:

- Actively enable, support and encourage growth and development into areas within an easy walk of rapid transit stations.
- Improve access via walking, cycling micro-mobility, and other public transport services, to rapid transit stops and stations.
- Continue to improve the frequency, reliability and extent of other parts of Auckland's public transport network, particularly where they provide access to rapid transit.
- Provide and manage park and ride facilities in accordance with the Auckland Parking Strategy'.

iii. How we'll get there

Rapid transit is already the largest area of planned transport investment in Auckland, with several major projects underway and substantial funding committed over the next decade.

In order to deliver Auckland's future rapid transit network more efficiently and effectively, however, steps need to be taken to:

- Clarify roles and responsibilities of different agencies and organisations involved in rapid transit planning, design, delivery and operation.
- Urgently progress route protection for future rapid transit corridors, to minimise future costs and provide more certainty to the public.
- Confirm funding arrangements for rapid transit investments from central government, local government, private-sector contributions (including from developments), and other potential sources.

1. Introduction

1.1. Auckland Context

Successful large urban areas around the world rely heavily on rapid transit to shift very large numbers of people efficiently, reliably and sustainably. Successive transport plans and strategies for Auckland over many decades have emphasised the need for the region to develop a world-class rapid transit system rather than rely only on the motorway network.

Looking to the future, rapid transit will need to play an increasingly critical role in moving people around Auckland, and in supporting the region's growth and development. Compared to many large cities around the world, Auckland has only recently started to develop a rapid transit network.

- The rail network serves large parts of central, west, south and east Auckland. It has provided passenger services for well over a century but has been substantially upgraded over the past 20 years to rapid transit standard. Electric trains were progressively implemented from 2014 to 2015.
- The Northern Busway opened in 2008, connecting the North Shore with the city centre and beyond.
- The first stage of the Eastern Busway, between Panmure and Pakuranga, was opened in late 2021.

Together, this network carried over 26 million passengers in 2019 with use growing strongly prior to the COVID-19 pandemic.

Expanding and upgrading Auckland's rapid transit network will be the region's most significant transport investment over the coming decades. To make good investment decisions and fully realise its value, the rapid transit network needs to be well planned and integrated within the broader public transport system, and highly aligned with land use planning and aspirations.

1.2. Purpose of this plan

1.2.1. What this plan is

The Auckland Rapid Transit Plan (ARTP) bridges the gap between high level plans (such as the Auckland Transport Alignment Project (ATAP), the Auckland Plan 2050, the Auckland Regional Public Transport Plan (RPTP) and project-level planning and design work.

The ARTP does not replace the need for individual projects to progress business cases and do detailed planning work on specific corridors. It can help these projects by providing:

- A starting point for their work,
- A common point of reference which they can test alternatives against, and
- A way to check on the implications for the wider network of decisions they make (such as about the type of vehicles they use, or the alignment of their corridor).

The plan also helps decision-makers (such as elected representatives on Government and Council) to understand the implications decisions on one corridor may have for the wider network, and outcomes for Auckland generally.

It will take many decades to fully implement the rapid transit network outlined in the ARTP, meaning an enduring, evidence-based plan is important to ensure a consistent approach is maintained over time.

By providing a clear long-term view of how this network should develop over time, the ARTP will help ensure the design and implementation of individual corridors and projects come together in a coherent way. This will deliver the best possible value and useful, connected rapid transit network The ARTP provides this view by outlining at a network level:

- The role and objectives of rapid transit within Auckland's wider public transport network, including its contribution to outcomes identified in higher-level plans and strategies.
- The future network's corridors and their likely modes and connections.
- Timing and staging for this network, including any interim improvements.
- How to improve access to rapid transit, including land-use integration.
- Key implementation steps.

Auckland Council, Auckland Transport and Waka Kotahi have partnered to develop this plan. The process also involved the Ministry of Transport, KiwiRail, and other key agencies with an interest in transport investment in Auckland.

1.2.2. Future updates to this plan

The ARTP will be regularly updated to reflect progress on the development of Auckland's rapid transit network. Future versions may include:

- Findings from project-level business cases, such as mode, corridor alignment and station locations.
- Changes to land use planning policies and regulations that influence when and where rapid transit is needed, and the levels of demand corridors are expected to cater to.
- Progress on the network's development, including the opening of new corridors, confirmation of route protection of future corridors (by designating the land that will be needed) and the completion of extensions or upgrades to existing corridors.
- Any changes to the funding, regulatory or wider planning context for rapid transit that need to be reflected in the ARTP.

Updates will be completed as required to ensure the ARTP stays relevant and can continue to provide consistent long-term direction to the development of Auckland's rapid transit network.

2. Rapid transit in Auckland

2.1. What is rapid transit?

Rapid transit is defined at a high level in the Government Policy Statement on Land Transport (GPS) and the National Policy Statement on Urban Development (NPS-UD) as:

A quick, frequent, reliable and high-capacity public transport service that operates on a permanent route (road or rail) that is largely separated from other traffic.

This Plan elaborates on the above definition to emphasise the role of rapid transit as the core of Auckland's wider public transport network and its importance in shaping the region's growth and urban development.

The Auckland Rapid Transit Plan's definition of rapid transit is:

Rapid transit provides fast, frequent, and reliable high-capacity access along strategic corridors that are separated from other modes and unaffected by congestion. Rapid transit is the backbone of Auckland's public transport network and is critical to supporting and shaping its growth and urban form.

Key characteristics of rapid transit are relatively universal across different cities worldwide.

Characteristic	Explanation
Integrated with other public transport	Rapid transit forms part of the frequent public transport network, within a wider overall network of public transport services.
Provides fast, frequent, reliable and high-capacity service	A dedicated corridor and large vehicles enables rapid transit to provide a high capacity, highly attractive service that is competitive with private vehicles.
Easy and intuitive to use	Rapid transit provides a high-quality customer experience that is simple to understand, especially for new or infrequent passengers.
Total priority to ensure reliability and resilience	Rapid transit needs to always operate reliably, regardless other factors affecting the transport network. To achieve this reliability and resilience, rapid transit usually operates in corridors that are physically separated from other modes.
Tailored to a corridor's needs	The mode, distance between stations and scale of infrastructure should be tailored to the likely scale of demand and characteristics of a corridor, while still effectively integrating with the wider network.
Shapes and supports urban form	The speed and reliability of rapid transit makes areas near stations more attractive places to live, work and visit, supporting higher density and mixed-use development.

A variety of different modes and technologies can deliver rapid transit service, including buses, light rail vehicles, metro vehicles, trains and ferries. More detail is provided in Section 3.3.

In all cases, the characteristics of the services are more important that the type of vehicle used to provide it. For example, a train service that operates at a low frequency is not rapid transit.

2.2. Role of rapid transit in Auckland

Auckland's geographic layout and urban form help define the role rapid transit needs to play in supporting the region's success. A small number of connections between different parts of Auckland concentrates many trips onto a few corridors, which act as bottlenecks and create congestion, particularly for longer-distance journeys.

Forecast growth has the potential to worsen these current challenges. Auckland's population has doubled since the over the last four decades to approximately 1.7 million people in 2022, and is projected to approach 2.5 million around 2050. Without major change to people's travel behaviour, this growth is forecast to significantly increase travel demand over the next 30 years, potentially resulting in an extra 400,000 peak time trips and 2 million more daily trips across all modes.

Auckland's transport challenge is greater than just accommodating growing travel demand. Transformational change is required in many areas, especially to significantly reduce greenhouse gas emissions and private vehicle travel. Rapid transit has a major role to play in this transformation, through meeting a substantial share of growing travel demand and shaping a more sustainable urban form.

Key roles for rapid transit are shown in the table below:

Supporting and shaping a quality compact urban form	**The public transport network's backbone**	**Providing space-efficient access to opportunities**
• Supporting successful and productive centres and major employment areas. • Encouraging a greater share of growth in areas with better travel options. • Ensuring new 'greenfield' areas have good travel options as they grow. • Encouraging transit-oriented developments in new and existing areas.	• Quickly, efficiently and reliably moving people along routes with high levels of demand. • In inner areas, meeting strong demand for travel along major corridors into the city centre and between other major centres. • In outer areas, acting as the key connection to and between major centres, other parts of the region and to major public transport hubs.	• Enabling Aucklanders to benefit from the region's growth by providing fast, high-capacity and reliable access to opportunities. • Moving large numbers of people across key transport bottlenecks and into highly constrained areas. • Delivering long-lasting access improvements that can be maintained over time even as demand increases.

2.3. Rapid transit objectives

These objectives clarify the outcomes sought from expanding and upgrading Auckland's rapid transit network, helping to inform future planning work and business case development.

1. Increase access to opportunities, especially in major and growing employment areas

Increasing the number of people able to easily and reliably access major and growing employment centres is important for Auckland's economic productivity and overall prosperity. The evolution of Auckland's economy towards service-sector employment means future job growth is likely to be focused in a few key centres. Enabling safe and efficient access to these centres enables workers to realistically consider a wider range of job opportunities, and employers to draw on a wider variety of potential employees.

Rapid transit's capacity, speed and reliability means it has a unique role to play in significantly increasing the number of people who can easily access these centres – especially from outer parts of Auckland that currently have relatively poor access and often also have higher levels of deprivation. These communities often have a high proportion of Māori and Pasifika residents; the development of the rapid transit network should consider how access to opportunities for these groups can be improved.

Rapid transit's extremely high 'space efficiency' (i.e., number of people moved compared to the amount of space required to move them) is the only way significantly more people can access major centres while also enabling these centres to become more people-focused, high-quality places.

Measures:

- Number of people within 45 min PT travel time of key centres.

- Total number of jobs people can access within 45 mins by PT.
- Mode share of trips to key centres.

2. Increase people throughput on Auckland's most critical corridors

Auckland's geography splits the city into several sub-regions, linked by only a few transport connections. Travel demand is funnelled into these links, creating bottlenecks that result in congestion, poor travel reliability and ultimately much lower levels of access for many parts of Auckland, especially outside the isthmus.

Ongoing population and employment growth are placing increased pressure on Auckland and its most critical transport corridors.. Adding road capacity to these corridors is generally extremely costly and often unacceptable or infeasible due to environmental and/or community impacts.

Rapid transit's ability to move large numbers of people along narrow corridors means it is uniquely suited to significantly increasing the throughput of people in these most essential parts of Auckland's transport system.

Measures:

- People-moving capacity along key corridors.
- Person movement per hour along key corridors

3. Increase the share of travel unaffected by congestion

Congestion leads to delays and highly variable travel times that adds cost and undermines quality of life. Reducing the impact of congestion on people's lives is a key component of improving accessibility and overall wellbeing.

Because it operates on dedicated corridors, rapid transit can still provide a fast and highly reliable travel option even when other parts of the transport network are under strain and highly congested. As a growing share of people use rapid transit, the impact of congestion on Auckland will reduce as more and more people are unaffected by it in their travel.

Measures:

- Per capita annual delay from congestion.
- Share of travel on rapid transit compared to other modes.
- Service reliability and punctuality (passenger weighted).

4. Increase public transport's mode share, especially for medium to long journeys, to reduce greenhouse gas emissions

The combination of rapid population growth, few opportunities to add road capacity within existing urban areas and the need to reduce emissions makes it critical to dramatically increase the share of travel by public transport, walking and cycling (mode shift). Reducing Aucklanders' reliance on the private vehicle is an essential part of enabling easy, safe and sustainable access to opportunities.

If population growth simply translates into increased vehicle travel, then the result will be more congestion, poorer access to opportunities, higher emissions, a less healthy and safe population, and overall a poorer quality city for residents, businesses and visitors.

Rapid transit has a critical role to play in supporting mode shift, particularly for medium and longer journeys, thereby helping to reduce transport emissions. The speed, reliability and

service quality of rapid transit makes it strongly suited to achieving mode shift, especially compared to other forms of public transport. High quality design, including universal access to stations that feels safe for all passengers throughout the day and night, is key to encouraging more people to use these services.

Measures:

- Share of travel by public transport (overall, on key corridors, to key locations).
- Vehicle kilometres travelled (total and per capita).
- Public transport ridership (total and per capita).

5. Enable an integrated, efficient and effective public transport network

As the backbone of the public transport network, rapid transit needs to be properly integrated with other public transport services, to ensure it can successfully perform this role. This means that network design and ticketing need to enable transfers between rapid transit and other services. Key interchanges must also be designed to minimise transfer times between services. Where two rapid transit corridors intersect, interchanges should enable particularly easy transfers between services.

As the rapid transit network expands, it should increasingly carry a greater share of all public transport trips. A greater portion of these trips will involve transfers from other services. Passenger journeys on rapid transit will, on average, be for longer distances than those of on other services, reflecting rapid transit's role in carrying medium to long distance trips.

Measures:

- Proportion of all public transport boardings on rapid transit services.
- Share of public transport journeys involving transfers to rapid transit.
- Share of rapid transit journeys involving a cycling connection.
- Share of rapid transit journeys involving a walking connection.
- Average passenger kilometres per service kilometre.
- Average transfer time between services at key interchanges.
- Safe and universal access to stations.

6. Focus most housing and employment growth in centres, nodes, and development areas[1]

The Auckland Plan 2050 and the Auckland Unitary Plan are based on a quality compact approach to growth. This approach focusses most growth within the existing urban area and enables the greatest amount of change to occur in and around centres, and in nodes and development areas. Accommodating a significant proportion of Auckland's future growth in these locations is important for protecting rural areas from urban encroachment, managing infrastructure costs, supporting liveability and wellbeing and reducing environmental impacts.

Areas that have access to rapid transit will be able to support redevelopment to higher densities. This is because these locations will have better access to opportunities and be more attractive places to live, making them suitable for higher density development by both the public and private sectors. Rapid transit is particularly important in supporting high intensity employment areas, by creating large 'pools' of employees who can travel to the centre of employment in a reasonable amount of time and with a high level of reliability

[1] As described in the Auckland Plan.

Rapid transit also reduces the amount of space that needs to be dedicated to carparking by providing high quality travel options. This means that space which would have otherwise been required for parking can be developed instead for housing, businesses and other activities. For employment centres, rapid transit's spatial efficiency also means that they can be more intense, supporting higher productivity through agglomeration.

Measures:

- Proportion of new dwellings within walking and cycling distance of rapid transit.
- Proportion of commercial development within walking and cycling distance of rapid transit.
- Proportion of metropolitan and town centres within walking distance of rapid transit.
- Proportion of major public facilities (including universities, hospitals, large shopping centres) within walking distance of rapid transit.

7. Support high quality integrated urban communities

For Auckland to be an attractive place for people to live, work, play and visit, it is important for the city's growth and development to be accommodated in a way that creates high quality integrated communities. This means a variety of uses and housing types, and easy walkable access to travel choices, services and other opportunities.

Rapid transit needs to support, and not detract from, the creation of high-quality integrated communities. To do this effectively, consideration needs to be given to the location, design and access to stations, so they can act as hubs that help build a sense of community identity. Stations should be a focal point for development, helping to deliver 'transit-oriented developments'. This is a focus of the National Policy Statement on Urban Development (NPS-UD), which requires the land within a walkable catchment of rapid transit stations and stops to allow for buildings of at least six stories.

Higher intensity mixed use development, community facilities, public spaces and walking and cycling connections should be comprehensively planned with rapid transit to create well-functioning urban environments that support safe, resilient and accessible neighbourhoods and communities.

Careful design also needs to help ensure rapid transit corridors avoid or minimise the negative impacts they might have on communities, including through creating severance or potential noise and visual impacts on communities from rapid transit infrastructure. The type and scale of infrastructure that is appropriate may vary depending on the context of the surrounding environment; for example elevated structures may not be suitable in residential areas, due to amenity concerns.

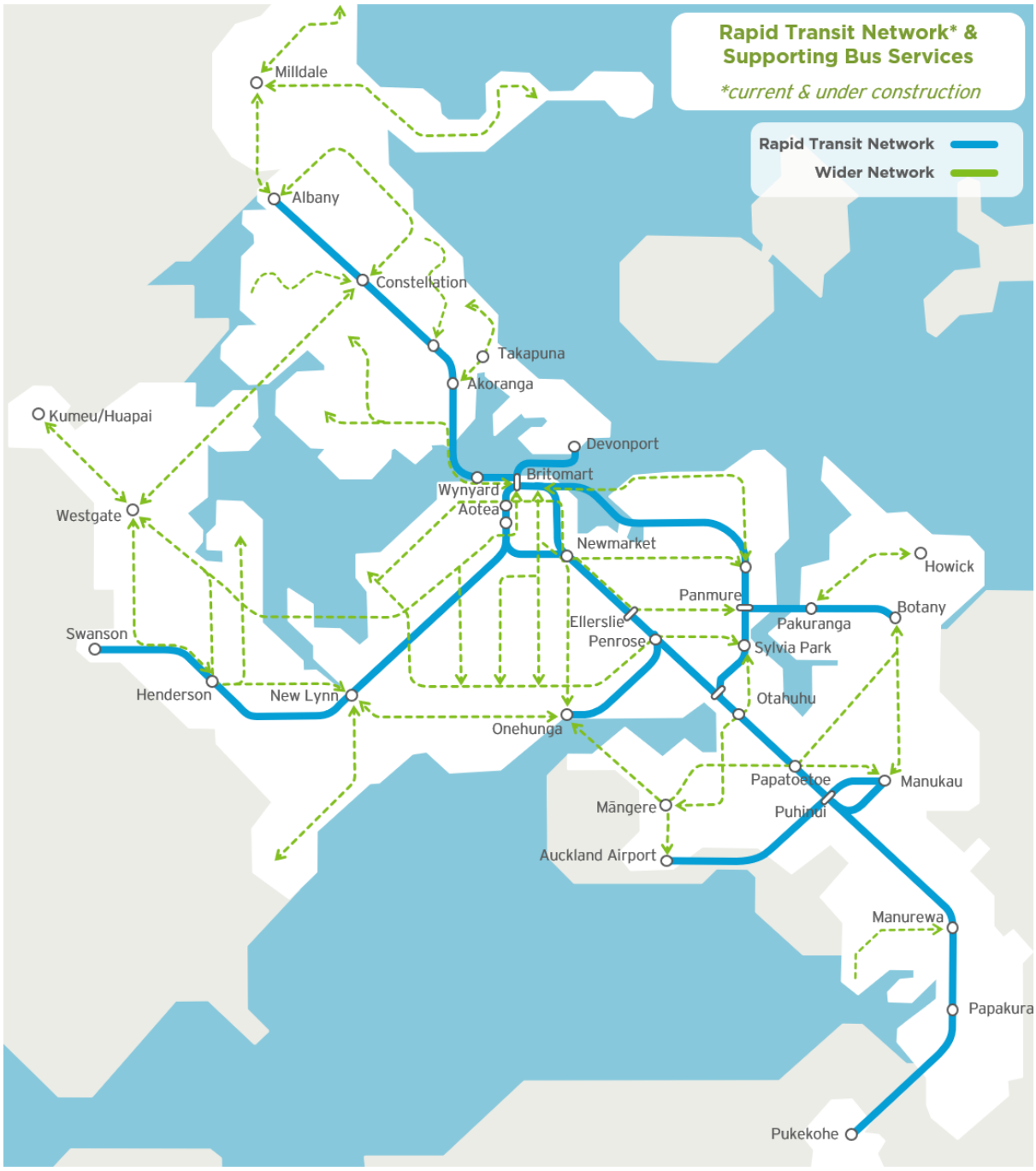
The procurement of rapid transit projects also presents an opportunity to further invest in communities, by way of social procurement. Hiring local businesses to support the development of infrastructure helps to develop skills and knowledge, and support the local economy, including Māori and Pasifika communities.

Measures:

- Resident satisfaction surveys.
- Proportion of people walking and cycling to stations.

2.4. Rapid transit projects including a social procurement approach. Our existing network

Auckland's current rapid transit network includes services on the electrified heavy rail network between Swanson and Papakura, as well as the Northern and Eastern busways. Key rapid transit projects across Auckland are also currently in various stages of development, as shown below.



Schematic map of rapid transit within public transport network

Major rapid transit projects currently under construction in Auckland include City Rail Link, Northwestern interim bus improvements, and upgrades to the rail network. Planning is underway for further improvements, including major expansions of the network to new corridors (such as the City Centre to Māngere project), and steps towards future investment (such as Airport to Botany project).

These projects are currently led by a range of organisations, including Auckland Transport, Waka Kotahi, Auckland Light Rail, and KiwiRail (with support from other organisations). These projects under investigation are focussed on expanding the existing rapid transit network to support growth, improve access to centres, and offer alternatives to congested corridors.

Key Rapid Transit Projects

Phase of development	Projects (as of late-2022)
Under construction	▪ City Rail Link ▪ Northwest interim bus improvements ▪ Rail electrification (Papakura to Pukekohe) ▪ Third main (Westfield to Wiri)
Detailed design & procurement (funding approved)	▪ Eastern Busway (Pakuranga to Botany)
Business case development (detailed)	▪ City Centre to Māngere ▪ Airport to Botany corridor ▪ Northern Busway enhancements
Business case development (indicative)	▪ Northwest rapid transit ▪ North Shore rapid transit (as part of the Waitematā Harbour Connections project) ▪ Rail network development plan

2.5. Future network development

Improvements to Auckland's rapid transit network that are already under construction or have had their funding approved will significantly improve the reach, capacity, frequency and efficiency of this network. However, substantial further improvements are required if Auckland's rapid transit network is to fulfil the role required of it in the future.

Key areas of focus for further improving the rapid transit network have been identified as:

- Expanding the rapid transit network to serve large parts of Auckland that currently have worse access to opportunities via public transport compared to other parts of the region, especially:
    - northwest Auckland
    - the wider Māngere area
    - southeast Auckland
    - future greenfield growth areas
- Increasing public transport capacity, especially:
    - into the city centre generally

    - between the North Shore and the city centre
    - in the central isthmus
    - to Auckland Airport
- Improving access to the rapid transit network and better integrating it with wider transport networks
- Fully realising urban development opportunities around the rapid transit network

Our approach to these issues is covered in the subsequent chapters of this plan.

3. Developing the plan

3.1. Introduction

The Auckland Rapid Transit Plan's network was developed through progressively answering the following questions:

- What rapid transit corridors are likely to be needed in Auckland over the next 30 years?
- What is the likely mode for each corridor to be used as the starting point for future business case development?
- How should delivery of the rapid transit network could be sequenced over time?
- How can we manage uncertainty about growth patterns and future demand levels?
- How can the various agencies responsible for the delivery of the network work together to achieve the best outcome?

3.2. Identifying and assessing rapid transit corridors

The first step in developing this Plan was to identify which corridors in Auckland will need to make up the rapid transit network over the next three decades. As discussed in the previous section, rapid transit has a particular role to play within Auckland's wider public transport and transport networks, supporting transport and urban growth outcomes. Rapid transit also requires significant investment to deliver, meaning that it should only be used in corridors that really need it.

The 2018 ATAP report outlined a 'potential future rapid transit network' for Auckland that was the starting point for this analysis.

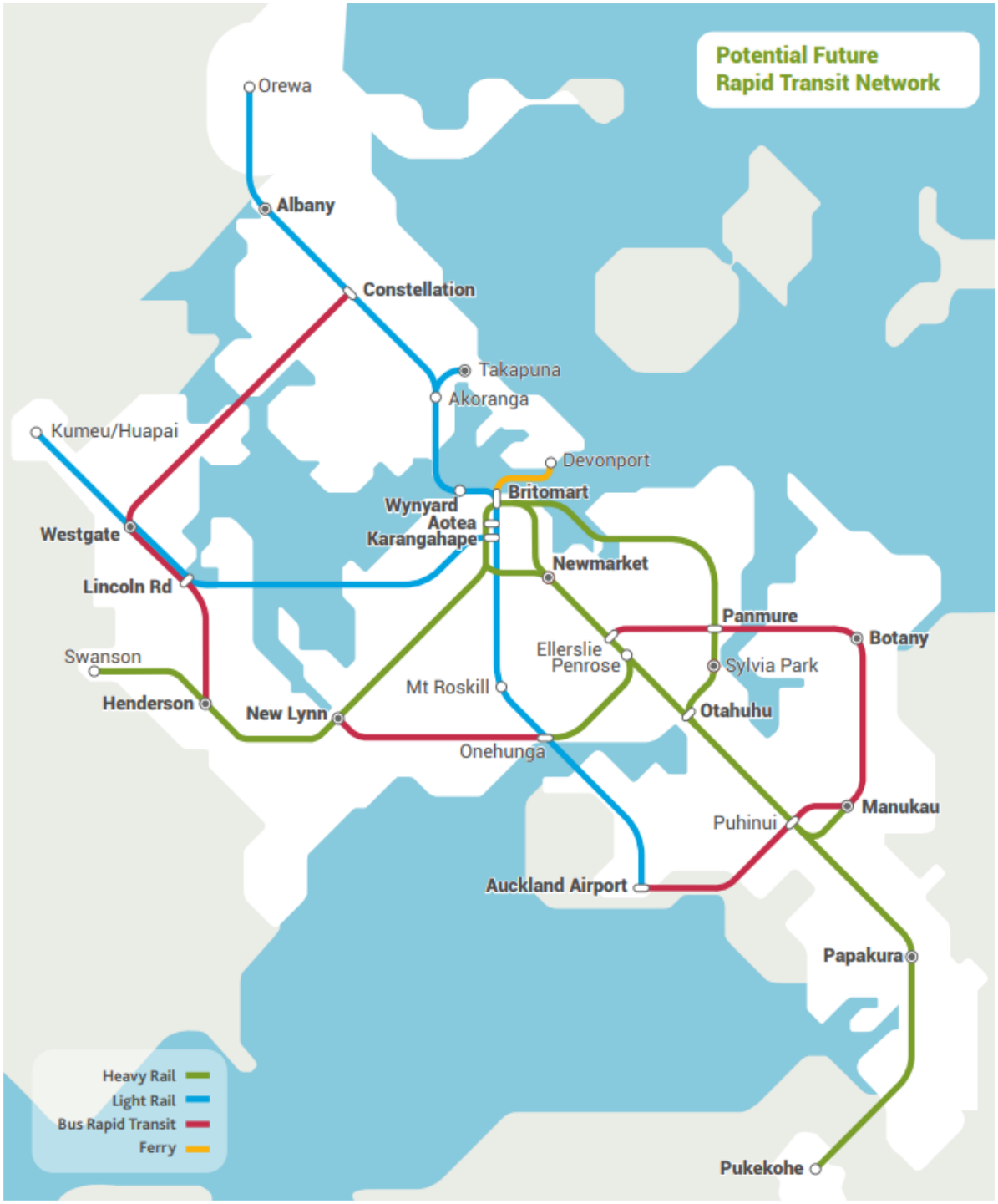
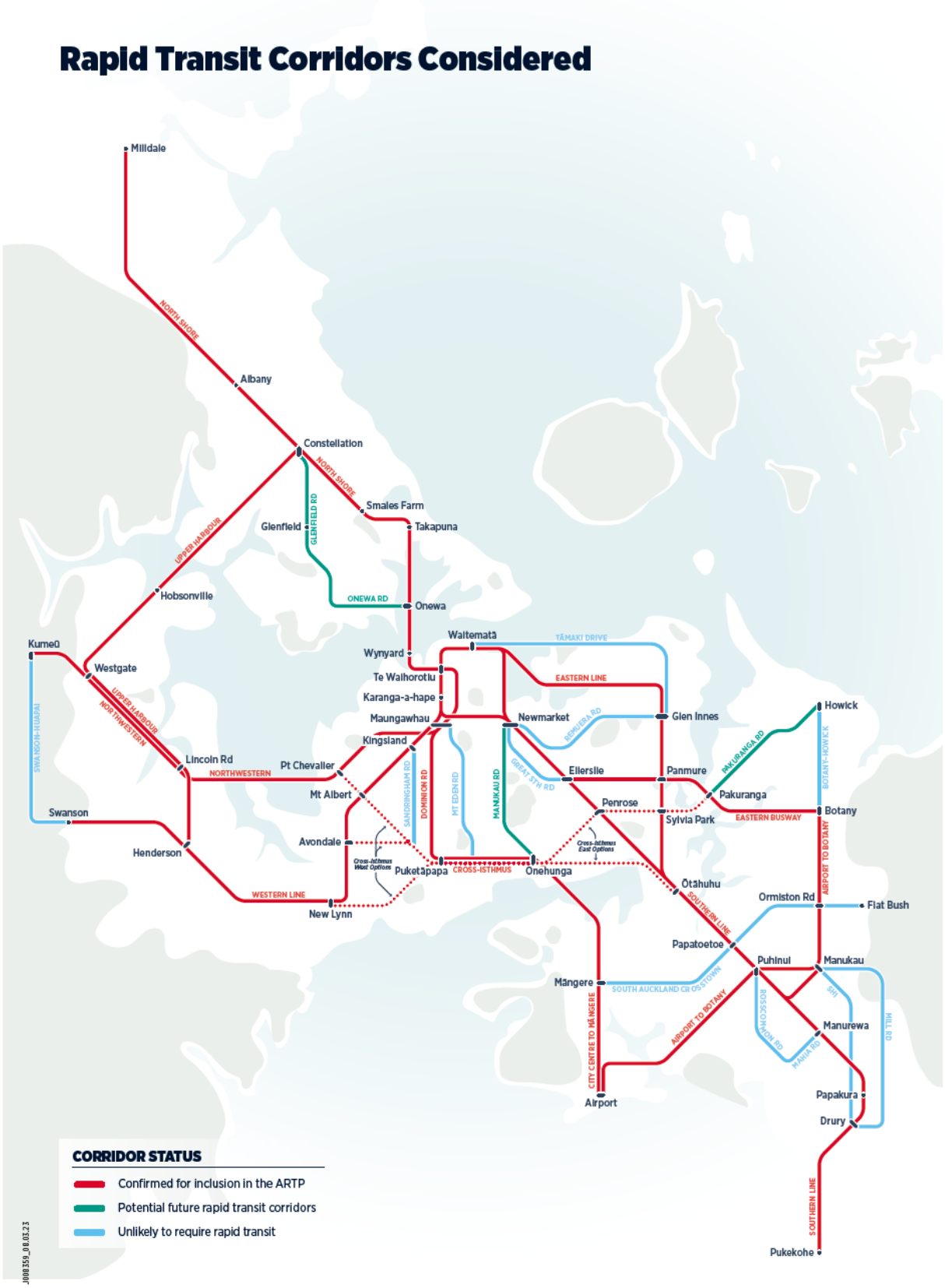


Figure 1 - ATAP 2018 potential future rapid transit network

Potential changes to this network were tested, including both whether corridors identified in this map should be retained and whether any corridors should be added or amended. Key criteria used to test the suitability of corridors for rapid transit were based on the objectives identified in the previous section:

Rapid transit objective	Criteria for assessing whether corridor should be part of the rapid transit network or not
Increase access to opportunities, especially to major and growing employment areas.	• Connections to major population and employment areas • Opportunity to address significant deficiency in access to opportunities
Increase people throughput on Auckland's most critical corridors	• Forecast corridor demand by public transport • Forecast corridor demand across all modes
Increase the share of travel unaffected by congestion	• Current and forecast levels of congestion
Increase public transport mode share, especially for medium to long journeys, and reduce greenhouse gas emissions	• Opportunity to achieve mode shift to public transport • Current mode share levels
Enable an integrated, efficient and effective public transport network	• Potential for improved public transport network efficiency and effectiveness • Connections to other rapid transit corridors
Focus most housing and employment growth in centres, nodes and development areas	• Scale of growth potential in corridor • Number of metropolitan centres, major employment areas and development areas served by corridor
Support high quality integrated urban communities	• Potential to support transit-oriented development opportunities in new and existing urban areas



The assessment allowed corridors to be sorted into three categories, which informed the creation of network options in the next phase of assessment:

Status	Corridors
Confirmed for inclusion in the ARTP	• Existing heavy rail network (Swanson to Pukekoke) with future upgrades to capacity • North Shore (City Centre to Hibiscus Coast) • City Centre to Māngere • Northwest (City Centre to Kumeū-Huapai) • Eastern Busway (Ellerslie-Botany) • Airport to Botany • Upper Harbour • Crosstown
Potential future rapid transit corridors	• Onewa and Glenfield Roads • Pakuranga Road • Manukau Road
Unlikely to require rapid transit for the foreseeable future	• Sandringham Road • Mt Eden Road • Tāmaki Drive • Remuera Road • Great South Road • State Highway One (Manukau to Drury) • Mill Road • Southern Auckland crosstown (Māngere to Ōtara and Flatbush) • Manurewa (Rosscommon and Mahia Roads) • Airport to Botany northern extension (to Howick or Highland Park)

Corridors assessed being unlikely to need rapid transit for the foreseeable future are still likely to need other public transport improvements over time, such as improved bus priority, enhanced service levels, and better customer facilities.

3.3. Identifying mode

The choice of vehicle technology (and its associated corridor characteristics) – usually referred to as 'mode' – is an important decision that significantly impacts on corridor capacity, required level of investment, urban development outcomes and network integration. While the final mode decision for a corridor should occur through a robust business-case process, because the choice of mode for one corridor affects other rapid transit corridors, a 'network view' is critical. This network view should act as the starting point for more detailed, project-specific, analysis. Project specific analysis needs to make a compelling case for a different mode to what is signalled in this Plan.

	Bus Rapid Transit

	Buses running frequently with high levels of priority on dedicated busway corridors (segregated from other traffic) are rapid transit. Auckland's Northern Express bus services are an example of bus rapid transit. Generally, these systems have high-capacity vehicles (such as double-deck or articulated buses) with approximately 100 passengers per vehicle. Current bus rapid transit systems require drivers to operate.
	**Light Rail** Light rail is a medium-capacity rail system, with the ability to operate both on- and off-street (but always with priority). Light rail vehicles are modern trams that generally operate at higher capacity than Auckland's historic trams. When operating frequently and with priority along their corridor and at intersections they are a form of rapid transit. New systems in Seattle, and several cities across Australia, are good examples of this mode as rapid transit. Light rail vehicles generally carry around 200 to 400 passengers per vehicle, but this can vary with design.
	**Metro** Metro is a medium-to-high-capacity rail system, always operating in a dedicated right-of-way (with no on-street running). Metro generally has a capacity between that of light and heavy rail. It has an exclusive corridor, unlike heavy rail trains which may share a dedicated corridor with freight and long-distance passenger trains. Because of this, metro can be driverless, which reduces operating costs and enables higher operating frequencies when compared to heavy rail. Vancouver's SkyTrain system is a form of light metro transit. Metro capacities can vary significantly with design, but an appropriate system for Auckland's context would like carry around 400 to 600 passengers per train.
	**Heavy Rail** Heavy Rail is form of rapid transit, given most railways are dedicated corridors with high levels of priority. Not all train services are rapid transit; some are too infrequent to be considered as such. Auckland's suburban trains are rapid transit, but its inter-city trains to Hamilton and Wellington are not. Heavy rail can be a high-capacity system, when there is a limited sharing of track with freight and other trains and trains are operated frequently. Auckland's current trains carry 750-1,100 passengers per vehicle (varying by length). Auckland's rail system requires drivers but there is potential for future automation.
	**Ferry** Ferries can operate with high levels of priority unless there is a significant level of other traffic operating on the waterway. Ferries can offer a fast and reliable travel option that can be attractive where land-based routes are significantly longer. Geographic features, including channel depth, coastal topography and tides, also influence the viability of ferries as a mode. High frequencies and a core role in the overall public transport network are key

	conditions for ferries to be considered rapid transit. The SeaBus service in Vancouver is an example of a rapid transit ferry service.

Rapid transit modes use vehicles of different sizes, and are able to operate at different frequencies (i.e. the number of services per hour). With higher capacity modes generally requiring much greater levels of investment, the most appropriate mode should generally be matched to the expected corridor demand, while also taking into account:

- Possible future growth in that demand,
- Aspirations for the future urban form of the area,
- Interconnectivity to the rest of the network, and
- The need to provide a level of service that is attractive to customers.

A summary of the ultimate 'corridor capacity' of these modes is shown in the diagram below:

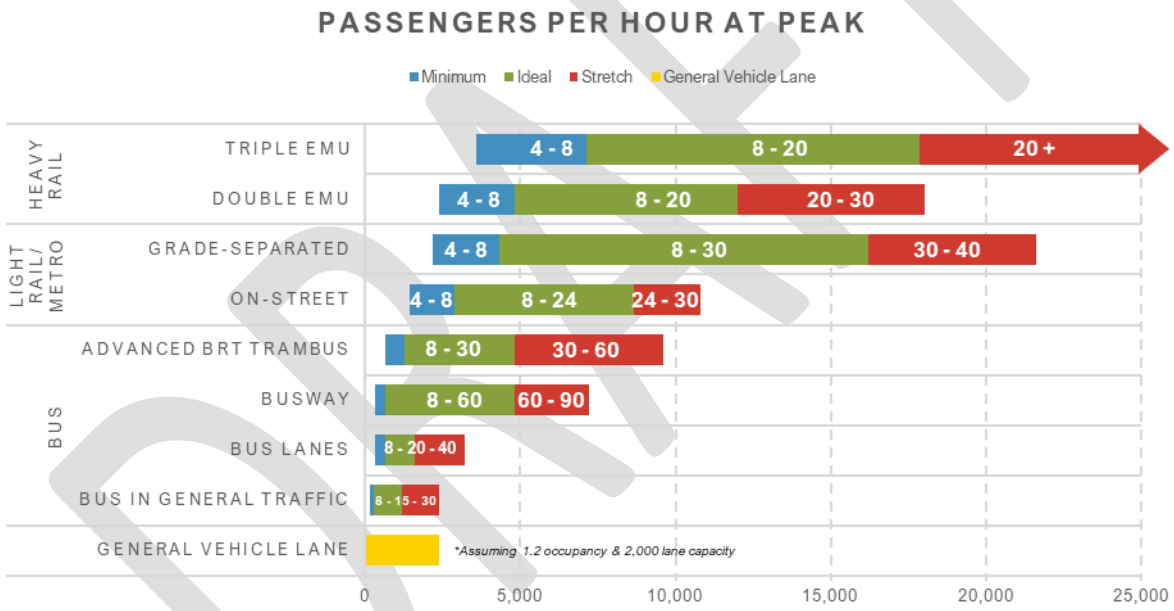


Figure 3.3-1: Corridor capacity per mode

The figure above highlights that at some levels of demand there is flexibility to either serve a corridor with a lower frequency of higher capacity vehicles (e.g., rail-based) or a higher-frequency of lower-capacity vehicles (e.g., buses). In these cases, more detailed analysis is required to understand the maximum frequency of vehicles that are able to operate in a corridor efficiently and effectively. This analysis needs to consider the entire corridor, including stops/stations and capacity at each end for terminating and 'turning around' vehicles. Space for depots and vehicle storage must also be considered.

Projected demand is not the only factor that should drive mode choice. In setting out proposed modes for each part of the network, the ARTP's decision-making process also considered:

- Integration with existing and other planned corridors

- Alignment with land use plans and growth aspirations
- Cost and value for money

3.4. Determining sequencing

Implementing Auckland's rapid transit network will need to be sequenced over time, not just for affordability reasons, but also for reasons of practical deliverability, maximising land use integration opportunities, the need to response to changes in demand over time and to ensure value for money.

Sequencing decisions need to be made around:

- Which corridors should be sequenced ahead of others
- Which parts of corridors should be sequenced ahead of other parts of the same corridor
- Opportunities for 'early interim improvements' ahead of major construction.

Key factors guiding sequencing decisions included:

- Severity of existing issues – This relates not only to where there might be overcrowding of existing public transport, but also where current service quality is relatively poor, mode share is low and reliance on cars is causing the most significant issues.
- Alignment with growth planning – Both in greenfield growth areas and regarding the timing of major development plans in the existing urban area.
- Practical considerations around deliverability – This includes considering what sections can realistically be constructed separately or need to be constructed together.

Four phases have been identified in this plan. The sequencing refers to full completion of the corridor, noting that early interim improvements may be appropriate and necessary well ahead of these timeframes, to help address existing access issues, build up demand for the future service, and help with reducing emissions. Sequencing of specific corridors is outlined in section 4.3.

Phase	Explanation
1	Projects that are under construction or have confirmed funding.
2	Corridors that are the next priority for implementation after currently funded projects. Typically, these will address very high priority/urgency issues and align strongly with short-to-medium term growth plans.
3	Corridors that are expected to be required over the next 30 years under current growth plans but address less urgent deficiencies or where planning has not yet identified a preferred approach.
4	Corridors that will likely not be required within the next 30 years, unless growth patterns change from what is currently planned, but that are expected to be needed later.

3.5. Managing uncertainty

The ability to manage uncertainty is critical to the success of long-term plans, such as those set out in the ARTP. This plan will need to adapt and evolve over time, as new information and new trends emerge. Regular updates to the ARTP are planned, to ensure the impacts of decisions on individual projects are taken into account. Uncertainty around the future does not

negate the need for long-term planning and plans like the ARTP can play a role in reducing uncertainty.

Key areas of uncertainty that are highly relevant to this Plan include:

- Uncertainty about where and when **growth and land use intensification** will occur. As planning rules become much more enabling of growth and development, the number of different ways Auckland could grow over time increases significantly. The timing and location of growth play a major role in determining the likely level of travel demand, potentially impacting on where rapid transit may be needed, what the most suitable mode could be, and what the most appropriate timing for implementation is.
- Uncertainty about the impacts of new **technology**. Transport technology continues to develop and change around the world, especially through the greater use of automation and connectivity. Technological change in the decades to come may create new forms of rapid transit, provide opportunities to increase service quality or efficiency on existing rapid transit services, or may result in changes of demand that impact the type of rapid transit suitable for a corridor.
- Uncertainty around **travel patterns** and behaviour. The COVID-19 pandemic illustrates how travel patterns can change dramatically, through increased working from home, much lower levels of travel, and a much greater use of online shopping or other activities. How long it takes for these travel patterns to return to normal – if they ever do – is extremely uncertain. The extent to which people continue to regularly work from home, especially for office jobs usually located in major centres, will have a significant impact on the likely future demand for rapid transit and therefore the timing and necessity of these investments. While major centres may have reduced commuter demand, however, they remain critical destinations for other trip purposes (including access to education, shopping, health services, and entertainment) and so are likely to always require public transport provision.
- Uncertainty around **funding availability** to progress rapid transit. Less available funding would mean progress occurs more slowly and there may be a greater reliance on low-cost, interim improvements. More available funding would allow faster implementation, which is likely to be particularly necessary to achieve the very transformational emissions reduction goals set by the government and Auckland Council.

While the future is highly uncertain, requiring a level of flexibility to adapt to changing circumstances, it is also important to not be paralysed by uncertainty and make no progress – especially when Auckland is pursuing transformational change in areas such as reducing vehicle travel and emissions. Uncertainty can be managed through a combination of:

- Testing network options against a variety of growth scenarios, to understand how changes to growth affect demand on different rapid transit corridors, and therefore their potential mode or timing. The timing of some corridors (including the outer ends of the Northwest and North Shore corridors) is highly dependent on when growth occurs, whereas other corridors (like the Eastern Busway) are much more focused on addressing existing deficiencies and therefore less impacted by future growth patterns.

- Balancing a clear direction about how Auckland's rapid transit network should grow over time with future flexibility for project-level work to refine the exact location, design, technology and timing of corridors.
- Promoting the 'progressive implementation' of rapid transit, where appropriate, so that a series of smaller-scale investments over time incrementally work towards delivering a rapid transit corridor, rather than relying on a single, very large, investment.

4. Auckland's long-term rapid transit plan

4.1. Introduction

This section outlines the long-term rapid transit network that the development of the ARTP has identified.

Parts of this network, particularly the heavy rail network, is already in place. The delivery of the remaining corridors, and upgrades to the existing network, will be phased over the next 30+ years. We expect most of this network will be in place by the early 2050s, although this timeframe may change depending on how the city develops and demand changes over time.

The network shown in this section is a refinement of the high-level network plans shown in both the Auckland Plan 2050 and past ATAP documents. While it is largely similar to the network indicated in previous plans, it has been developed through a much more robust process, providing greater confidence about how Auckland's rapid transit network should develop over time.

Refinements to this network will be made by future corridor-level work, which can then be reflected in future version of the ARTP.

This section outlines:

- The future corridors of the rapid transit network and their likely mode.
- How the future network will be sequenced.
- A detailed look at each corridor and its future development.
- The regional-level outcomes we expect from this network.

4.2. Corridors and mode

The key features of this network are:

- A well-connected network of corridors linking the main parts of Auckland, especially metropolitan centres with each other and with the city centre. The network extends into key growth areas to the north, northwest and south to provide these emerging parts of Auckland with high quality travel options.
- The heavy rail network, with City Rail Link completed, will continue to serve its existing catchment. Future investment will be required to enable this network to meet forecast demand and improve the quality of service for both freight and passengers (including express and inter-regional services).
- A new light-rail network, serving three corridors to the north, northwest and south (Airport) of the city centre will be introduced. This new network's high capacity will enable it to meet very high forecast demand in these corridors. Services will run through the city centre, so customers can travel directly from the North Shore to the northwest and Airport (and vice-versa).
- Bus rapid transit will largely be focused on 'orbital corridors' which serve trips between ley centres and nodes that have a lower level of forecast demand. It plays a key role in connecting to the rail-based corridors to deliver an integrated network across Auckland.

- An emerging corridor across the southern isthmus that requires further planning work to confirm its extent and mode, but which plays a key role in linking together other corridors and serving a rapidly growing part of the city

4.3. Sequencing

Phase	Corridors Delivered	Comments
1	• City Rail Link and associated works • NZUP rail projects (third main, Pukekohe electrification, Drury stations) • City Centre to Māngere • Eastern Busway (Pakuranga to Botany)	First steps of wider network, largely reflects existing funding commitments
2	• Northwest light rail (City to Brigham Creek) • North Shore light rail (City to Smales Farm) • Airport to Botany bus rapid transit • Second step of heavy rail improvements	Further development of core radial networks and initial progression of orbital corridors. Focus on areas with greatest deficiencies.
3	• North Shore light rail (Smales Farm to Albany) • Crosstown rapid transit (potentially phased) • Upper Harbour bus rapid transit (potentially phased) • Eastern Busway extension to Ellerslie • Third step of heavy rail network improvements	Completing networks within existing urban area
4	• North Shore light rail (Albany-Milldale) • Northwest light rail (Westgate to Kumeu) • Final phases of Crosstown and Upper Harbour corridors (if phased) • Further heavy rail network improvements • Emerging rapid transit corridors (as needed)	Expansion to greenfield areas as required

For many corridors the first step to implementation may be through interim bus improvements, which are not identified above. This approach can help build ridership and public confidence in the network over time, ahead of major investment in the long-term rapid transit infrastructure.

4.4. Corridor details

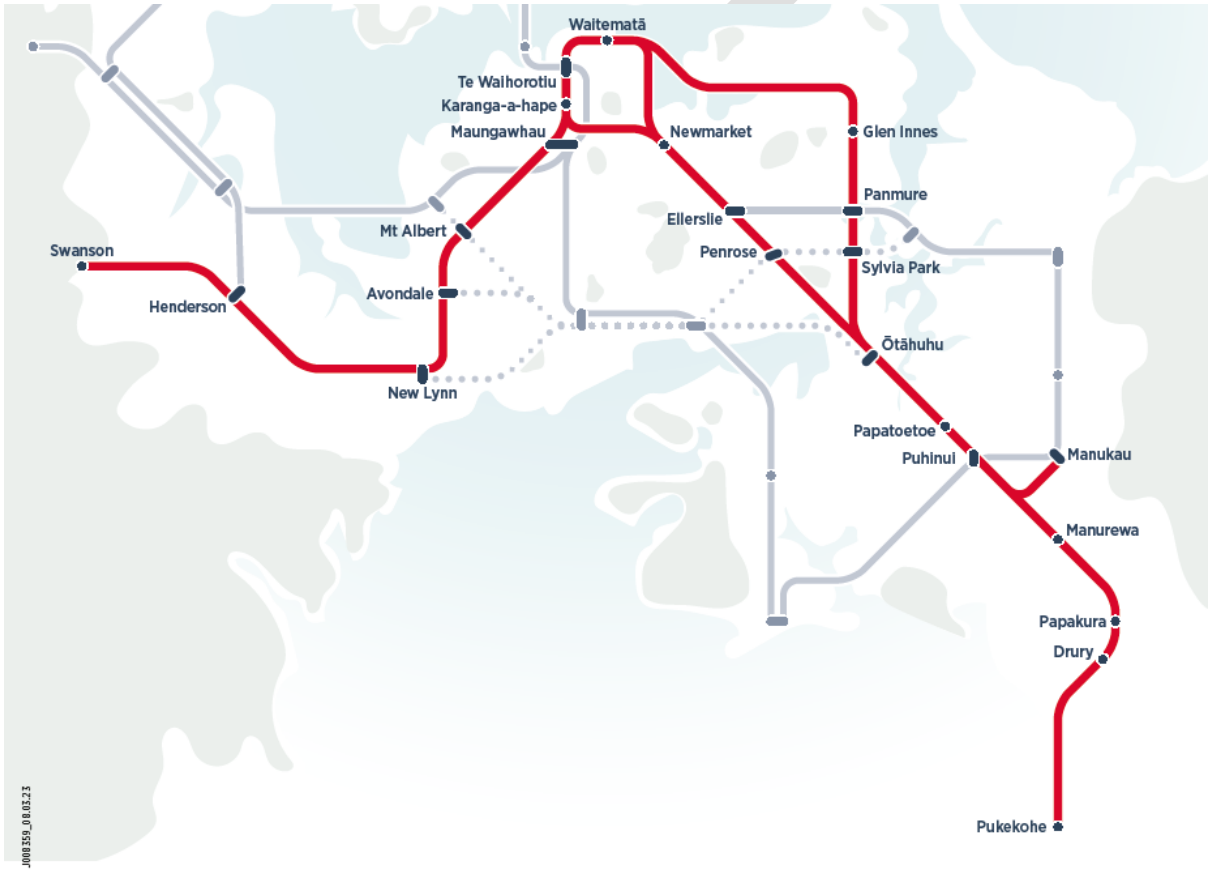
4.4.1. Introduction

This section provides a brief overview of different parts of the rapid transit network, setting out why they are needed and how they are expected to develop over time. For each corridor there is information on:

- The corridor and its strategic role
- The likely future mode, connections, and sequencing of the corridor's delivery.

4.4.2. Rail network

Description and strategic role



Heavy rail forms most of the existing rapid transit network and will continue to play a core role in the future. Ridership has grown strongly over the past 20 years, with Britomart Station, double-tracking of the western line, network-wide station upgrades, the introduction of electric trains, and the reorganisation of bus services to better connect with trains all contributing to continued passenger growth. Prior to the impacts of COVID-19, trains carried 22 million passengers per year in 2019.

For large parts of east, south and west Auckland, the rail network is the primary public transport connection to other parts of Auckland and the city centre, with local buses providing connections to key train stations to expand the catchment of the rail network. Auckland's land-use patterns mean the rail network must cater for both long-distance passenger trips between outer suburbs and the city centre, as well as local trips over shorter

distances. Over time, a growing inter-regional passenger role to Hamilton, and potentially beyond, means the rail network will need to improve its ability to provide for fast longer-trips alongside 'all-stopping' services through investment in additional tracks.

As well as its rapid transit function, Auckland's rail network also plays a critical role in the national freight system. Increased demands from each of these roles over time will likely require separation of metro and freight trains on to separate sets of tracks in the busiest parts of the network (such as the Southern line south of Westfield). This will improve reliability and capacity for both functions, and the infrastructure will also enable more flexibility to operate trains on some tracks while maintaining others.

Many of Auckland's town centres first developed along the rail network, which creates a significant opportunity for the rail system to support the redevelopment of these centres to higher densities and a wider mix of uses. Metropolitan centres like New Lynn, Newmarket and Manukau are playing a growing role as destinations for people using the rail network, which is expected to continue to increase over time as these centres develop. The rail network also passes through rural land in the south that has been identified for urbanisation, creating the opportunity for large-scale, best-practice transit-oriented development.

A major rebuild of the rail network is currently underway, to replace aged infrastructure and ensure the rest of the network is ready to realise the benefits of City Rail Link when it opens. Further investment in the rail network will build on this, guided by the following strategic goals:

- Increasing the passenger rail network's speed and capacity to support mode shift and increased access to opportunities, through enabling and supporting higher train frequencies, express train services and longer trains.
- Enabling growth in rail freight, and improved reliability and resilience of passenger and freight services, by progressively separating these functions.
- Improving safety and customer experience, through ongoing station and access improvements, removing road/rail level crossings, and preventing unwanted access to the rail network.

Auckland Transport and KiwiRail work together to determine the needs of the future rail network and plan how improvements will be made over time.

Mode and Sequencing

Major expansions to Auckland's heavy rail network through the addition of new lines and corridors appears to be extremely challenging, with multiple project-level business cases highlighting the high cost of extending heavy rail to places like the North Shore and Auckland Airport. Therefore, the future role of the heavy rail network is focused on continuing to serve its current catchments.

There is potential for the Onehunga Line's role to change over time as part of developing the Crosstown corridor, but determining when and how this change could occur requires significant further work. As a strategically located town centre, Onehunga will need to served by rapid transit in the future, and the Onehunga line will need to continue at least until an alternative is available.

There is also a potential need to implement the long-protected Avondale-Southdown line across the southern isthmus to further separate passenger and freight services, allowing an increase in both.

Ongoing upgrades are required to the rail network across all phases of this Plan's implementation and beyond. These reflect the latest thinking from the on-going work the Auckland Transport and KiwiRail are progressing together.

Phase One	**Phase Two**	**Phase Three**	**Phase Four**
City Rail Link and associated network upgrades (including trains and stabling). Extension of electrification to Pukekohe and new stations. Initial separation of passenger and freight services on parts of the southern line.	Removal of level crossings from southern line. Further separation of passenger and freight services on southern line. Further trains and stabling. Enabling additional limited stops services on southern line. Signalling improvements to enable increased frequencies.	Platform extensions at selected stations to enable 9-car trains on southern line limited stops services. Further trains and stabling. Removal of level crossings from the western line. First stages of Avondale-Southdown connection. Station upgrades to accommodate increased passenger volumes.	Further additional trains. Further separation of passenger and freight services across network. Further trains and stabling. Platform extensions across the wider network to enable longer trains. Further station upgrades.

4.4.3. City Centre to Māngere

Description and strategic role

This proposed rapid transit corridor links the city centre and Auckland Airport via Mt Roskill, Onehunga and Māngere. The corridor addresses growing bus congestion issues in the city centre, supports intensification of the central Auckland isthmus and Māngere, significantly improves Māngere's access to employment and education, and dramatically improves access to Auckland Airport and its surrounding business areas.

The frequent bus services operating in the central isthmus are some of the busiest bus corridors in New Zealand. A step-change in public transport capacity and efficiency is required to support planned land use intensification in this area, as well as to enable and encourage on-going ridership growth, and help to support mode shift and emissions reduction goals. Such a step change cannot be provided by existing bus services, as this would require a greater volume than the city centre can accommodate. Without this step change, increased travel times to and around the city centre will negatively impact Auckland's productivity and liveability.

The corridor will also improve access to growing employment areas, including at and around Auckland Airport, the wider Onehunga area, and the city centre. Without this major increase

in capacity the road network will be overwhelmed and not be able to function effectively, limiting access to and productivity of these employment areas.

Providing a step-change in improved access along this corridor, combined with significant investment by Kāinga Ora in Mt Roskill and Māngere and Auckland Council in Onehunga, creates a rare opportunity to significantly address Auckland's housing challenges in a way that is well aligned with achieving a quality compact urban form. If growth does not occur here, there will be greater pressure for development at the urban edge and in rural areas of Auckland.

Rapid transit is also expected to trigger upgrades to the streetscape amenity of the centres on the route, supporting their role as key community hubs and helping to encourage intensification along the corridor.

Mode and sequencing

Business case work has confirmed light rail as the preferred mode for this corridor, after considering many bus, light metro and heavy rail options in detail over the past decade. Forecast future demand levels are high (5,000-7,000 passengers per hour in the morning peak in 2050), meaning that bus improvements alone are not a feasible long-term solution.

Some tunnelling is anticipated along the corridor, and the extent and alignment of this will be confirmed by the next phase of design work on the corridor. The next phase will also confirm sequencing of the project, including whether some sections should be staged ahead of others.

This corridor will provide the first stages of infrastructure for the wider light rail network, which will include future expansion to the North Shore and Northwest corridors.

Improvements in this corridor should be sequenced over time as follows:

Phase One	**Phase Two**	**Phase Three**	**Phase Four**
Corridor delivery (potentially staged for constructability)			

4.4.4. Northwest

Description and strategic role

This is a planned corridor connecting Kumeū, Westgate, Point Chevalier and the city centre, running next to State Highway 16 for much of its length.

This corridor serves the northwest part of Auckland, which currently not well served by rapid transit and has little other dedicated infrastructure to support reliable services (as the existing Western rail line does not serve the northwest catchment). As the northwest has relatively few jobs, compared to other parts of Auckland, there is a greater need for quality access to opportunities for its residents. The current lack of rapid transit means that northwest Auckland has relatively low public transport mode share, poor access to employment via public transport, and a very high reliance on a State Highway corridor that often experiences severe congestion.

The Northwest bus improvement project has extended bus shoulder lanes on the Northwestern Motorway and provided new transfer facilities at Lincoln Road, Te Atatū and Westgate. This enables bus service improvements, including the Western Express service from November 2023. These improvements are an interim step towards rapid transit, but will not provide the levels of speed, capacity, reliability or service quality the region needs from a permanent rapid transit solution.

Poor travel choice has contributed to development in the northwest being historically low density, and residents being highly reliant on private vehicles for transport. Significant intensification is enabled within the existing urban area, and large-scale greenfield growth is planned in the future urban areas of Red Hills, Whenuapai and Kumeū. Providing this growth area with good travel options early in its development is important in supporting higher density housing, as well as providing residents with reliable mode choice and the ability to avoid congested roads.

Rapid transit will support the ongoing development of Westgate as a metropolitan centre and key employment node, as well as the intensification of other centres along the corridor, such as Point Chevalier.

Mode and sequencing

Past business case work has identified bus rapid transit and light rail as the modes most likely to be suitable for the corridor.[2] Bus rapid transit has advantages of being more easily staged but provides a less enduring solution and does not integrate as well with future City Centre to Māngere and North Shore rapid transit corridors. Work done for the ARTP's development suggests that light rail should be the focus of further design work, due to the very high level of forecast demand and the significant opportunities for integration with other corridors.

Improvements in this corridor should be sequenced over time as follows:

Phase One	**Phase Two**	**Phase Three**	**Phase Four**
Interim bus improvements	Introduction of a new light-rail connection between the city centre and Brigham Creek (potentially staged for constructability).		Extension of the new light-rail connection from Brigham Creek to Kumeū/Huapai.

4.4.5. North Shore

Description and strategic role

[2] Note that the 2017 Indicative Business Case identified bus rapid transit as the preferred solution but did not investigate city centre constraints, which are a critical factor in driving mode choice.

This corridor links the Hibiscus Coast, North Shore, and the city centre. The Northern Busway currently extends along part of this corridor, between Akoranga and Albany.

As the primary north-south public transport corridor for the wider North Shore and growing Hibiscus Coast area, the North Shore corridor has significant strategic importance in providing fast, reliable and high-capacity travel. This significance will only increase as the population of its catchment increases through intensification of key locations like Takapuna and Albany, as well as the urbanisation of the Dairy Flat future urban area.

The busway in its current form is expected to run out of capacity within the next two decades, even with station upgrades and other efficiency improvements. At least 12,000 people per hour in the citybound direction are expected to use the corridor in the 2050s, among the highest forecast demand of any rapid transit corridor in Auckland.

The Northern Busway's location adjacent to the motorway, bypassing Takapuna and only serving the northeast edge of Albany, has to date limited its impact on the North Shore's urban

form and attractiveness for trips other than those to and from the city centre. Enhancing connectivity for a wider variety of trips, especially access to Takapuna and Albany as the North Shore's two primary centres, is a key long-term goal.

Rapid transit also needs to play a greater role in supporting intensification on the North Shore, especially in the Albany and Takapuna metropolitan centres and at Smales Farm. This will also enable future urban areas near Dairy Flat to develop in way that supports transport choice and quality urban outcomes.

Mode and sequencing

The very high level of long-term demand in this corridor means that a rail-based mode is required as the primary rapid transit connection from the city centre to at least Albany. To enable connectivity through to the City Centre to Māngere and Northwest corridors, and to make use of the current Northern Busway corridor and its geometric constraints, light-rail has been selected as the likely mode. This will be confirmed through upcoming design and business case processes (as part of investigating connections for a range of modes).

The core light-rail corridor may need to be supplemented by continued bus rapid transit services to provide sufficient cross-harbour capacity and to serve parts of the North Shore (e.g. the western North Shore's Onewa Road catchment) that are not easily served by light-rail (and bus feeder routes to light-rail). The busway may also have a key role during the phased introduction of light rail, enabling buses from the northern catchments to continue running before rail is extended to serve them.

Improvements in this corridor should be sequenced over time as follows:

Phase One	**Phase Two**	**Phase Three**	**Phase Four**
Improvements to the Northern Busway system, including increased station capacity and city centre bus priority.	New light-rail connection between city centre and the lower North Shore. Bus priority improvements north of Albany.	Extension of the new light-rail connection from the lower North Shore towards Albany.	Further extension of light-rail from Albany to Milldale via the Dairy Flat future urban area.

4.4.6. Upper Harbour

Description and strategic role

This corridor links north and west Auckland, connecting the Western Line at Henderson with the Northwest rapid transit corridor and the North Shore rapid transit corridor. The corridor is expected to follow Lincoln Road, State Highway 16 and State Highway 18, and will need to be refined by further planning work.

The corridor's key task is to provide a high-quality and direct public transport option for trips between the North Shore and West Auckland. Existing bus services performing this task are relatively indirect, slow and unreliable. This means public transport is generally not seen as an attractive option (particularly outside of peak times).

Northwest Auckland is growing quickly, through new developments at Hobsonville, Whenuapai, Red Hills and Kumeū-Huapai. The Upper Harbour corridor will also improve access to two 'nodes' identified in the Auckland Plan 2050, Westgate and Albany, as well as the metropolitan centre of Henderson.

High quality transport links in northwest Auckland are particularly important because West Auckland has a shortage of jobs compared to its residential population, while major employment opportunities exist on the North Shore. This results in significant commuter flows out of the area, including to the North Shore, which will increase congestion on the existing network until quality alternatives are provided. As well as providing employment access for

people living in the northwest, it is also important for this corridor to encourage more jobs into the northwest (by improving the area's accessibility) and therefore reduce pressure on key transport links to other parts of Auckland.

Mode and sequencing

Bus rapid transit is expected to be the preferred mode for the corridor. Forecast demand is relatively low (compared to other corridors) and well within the capacity of this mode. The route may need to run parallel to the Northwest light rail line between Westgate and Lincoln Road, meaning there may be potential to share infrastructure between these corridors if this can be accommodated in the design.

Improvements in this corridor should be sequenced over time as follows:

Phase One	**Phase Two**	**Phase Three**	**Phase Four**
Lincoln Road bus priority improvements	Potential interim improvements as part of the Northwest corridor's delivery	Corridor implementation (potentially staged for constructability)	

4.4.7. Eastern Busway

Description and strategic role

The eastern busway extends Auckland's rapid transit network into the wider east Auckland area. The first stage of the busway from Panmure to Pakuranga opened in late 2021, with the next phase to Botany confirmed in funding plans. In the longer-term, the busway will be extended west from Panmure towards Ellerslie, to connect with the southern railway line.

A lack of reliable and fast services contributes to east Auckland having very low public transport mode share, relative to the wider region.[3] The busway will be used by multiple bus routes, with a key role being to connect people to Panmure Station, where a transfer to the train provides a high-quality connection to the city centre and other destinations.

Much of east Auckland (especially areas east of the Tāmaki River) developed with a low-density and car-based urban form, contributing to low levels of public transport use. Combined with limited local employment opportunities, the area's car dependency has resulted in significant congestion on Pakuranga Road and Ti Rakau Drive at peak times and overall lower levels of access to employment opportunities.

The corridor will help to support changes to the area's urban form, by enabling improvements to public transport that will support more medium and high-density development, as enabled under the Auckland Unitary Plan. Botany is zoned as a metropolitan centre that can support significant commercial and residential development. Pakuranga town centre can also support a mix of uses at higher densities.

Mode and sequencing

Bus rapid transit is the appropriate mode for this corridor. Forecast demand is within the bounds of this mode, and the busway's ability to be used by routes from multiple corridors (and enable them to connect directly with the rail network) is a key reason this mode is preferred. Another mode would force people wanting to connect to trains at Panmure to transfer twice and reduce the attractiveness of the network.

Building on already completed sections, further improvements in this corridor should be sequenced over time as follows:

Phase One	**Phase Two**	**Phase Three**	**Phase Four**
Pakuranga to Botany busway implementation	Interim bus priority improvements between Ellerslie and Panmure	Extension from Panmure to Ellerslie	

4.4.8. Airport to Botany

Description and strategic role

[3] Howick local board had 6% PT mode share for travel to work, compared to the regional average of 11% at the 2018 census. The average of the local boards of the Auckland isthmus is higher still, at 15%.

This is a planned rapid transit corridor connecting Botany, Manukau, Puhinui Station (for connections to the Eastern and Southern lines and inter-regional services) with Auckland Airport.

Suburbs along this corridor are highly reliant on private vehicles and the area's existing rapid transit connections focus on trips towards the city centre. Local bus connections, especially between Manukau and Botany, have limited priority and as a result are less reliable than areas with quality infrastructure. The rapid transit corridor will improve connections between these centres, offering competitive travel times with private cars. It will also enable reorganisation of the local bus network, with connections between local and rapid services offering improved travel choice.

There is significant potential for intensification along the corridor, especially in Manukau and Botany metropolitan centres. Improved public transport access to these centres will support their transition from being highly car-dependant. Rapid transit will also support intensification of the more suburban sections of the corridor, particularly along Te Irirangi Drive.

Rapid transit will also support employment growth in the airport precinct. Poor transport choices currently limit development potential at the airport, as potential employees are put off

by the limited and unreliable transport options. Intensification of uses at the airport will support increased employment in the wider South Auckland area.

Mode and sequencing

Bus rapid transit is the preferred mode for the corridor, due to demand and stage-ability.

Initial bus improvements have been implemented between Puhinui and Auckland Airport along State Highway 20B, Puhinui Road and Lambie Drive. Further improvements in this corridor should be sequenced over time as follows:

Phase One	**Phase Two**	**Phase Three**	**Phase Four**
Service improvements and targeted bus priority	Corridor implementation (potentially staged for constructability)		

4.4.9. Crosstown

Description and strategic role

This corridor extends across the southern part of the Auckland isthmus, potentially linking rapid transit corridors serving west Auckland with those that serve south Auckland. Further planning work is needed to confirm the corridor's extent at both its western and eastern ends, alongside developing a preferred alignment and mode.

The corridor has the potential to play a critical role in Auckland's overall rapid transit network by linking together several 'radial' routes travelling towards the city centre and enabling a much more connected network. This will significantly improve travel choice and make the wider rapid transit network useful for a much greater range of trips.

This part of Auckland has very significant growth and redevelopment potential. Substantial redevelopment is already underway in many areas, including New Lynn, Avondale, Mt Roskill, Three Kings, Royal Oak and Onehunga. There is also potential to provide connections to Sylvia Park at the corridor's eastern extent. There are also large areas of publicly owned land in the area that could be redeveloped, creating potential to integrate this rapid transit corridor with major redevelopments to maximise the benefits of both investments.

Mode and sequencing

Further planning work is needed to confirm the extent and mode of this corridor. It may be delivered as heavy rail (leveraging investment in a freight connection) as light rail (sharing infrastructure with part of the Māngere corridor), or bus rapid transit if neither of those projects progress.

While forecast demand is likely to be within the capacity of bus rapid transit, heavy rail may be the potential future mode of this corridor. KiwiRail and Auckland Transport's work on the future of the rail network suggests that a rail freight connection via the Avondale – Southdown corridor (which KiwiRail already has a designation that protects the land of) may be needed. This would both provide for future freight demands and reduce conflicts between freight and passenger trains on the inner rail network (especially at Newmarket). If the corridor was built for freight purposes, passenger trains could also use it to improve access between parts of the region.

Part of this future corridor could also potentially use the existing Onehunga Line, which forms part of the existing heavy rail network, or otherwise provide access to the heavy rail network for Onehunga that would mean the existing line could be put to another use. This will be the subject of further investigations as part of these projects

Improvements in this corridor should be sequenced over time as follows:

Phase One	**Phase Two**	**Phase Three**	**Phase Four**
		Corridor implementation (potentially staged for constructability)	

4.4.10. Emerging long-term corridors

Testing of the ARTP included a range of corridors, including some which could form part of the rapid transit network in the future but are not considered to be a priority within the timeframe of this plan. Three of these corridors are the most likely to require rapid transit in the longer-term. Until then, continued improvements to existing bus services on these corridors should be made. Increasing use on these corridors can help to build the case for future rapid transit investment.

1. Onewa Road

This is a key bus corridor for the lower North Shore, serving both the Glenfield Road and Birkenhead areas. The current transit lanes carry more people (primarily on buses) than the regular traffic lanes do at peak times. These lanes are fit for purpose in the short to medium term.

In the longer term, the introduction of North Shore light rail may open up new opportunities to better serve the western part of the North Shore (including Northcote, Birkenhead, Glenfield and Beach Haven areas), improving access to the city centre and other parts of the North Shore.

The best time to undertake further work on this corridor will be when there is greater clarity on the form, function and timing of delivering North Shore light rail.

2. Manukau Road

This corridor serves a range of destinations, including the Newmarket metropolitan centre, Greenlane Clinical Centre, Epsom, Royal Oak, and Onehunga. Land use change in these areas may increase demand to a level beyond which the existing bus services on the corridor will not be able to cope. In the short to medium term, the Connected Communities programme will improve bus services and walking and cycling, but there is the potential for rapid transit in the longer term.

This corridor could potentially connect with the City Centre to Māngere corridor at Onehunga to provide a direct connection towards Auckland Airport and ease pressure on inner parts of that corridor. If built as the same mode, there is potential that services from both corridors could share infrastructure south of Onehunga. At the northern end, significant further planning would be required to determine how best to integrate this corridor with the wider rapid transit network in the city centre.

The best time to undertake further work on this corridor will be after the City Centre to Mangere corridor and the Manukau Road Connected Communities upgrades have been fully implemented.

3. Pakuranga Road

The first stage of the Eastern Busway runs along the southern end of Pakuranga Road. While the rest of the busway will then travel along Ti Rakau Drive, future demand on Pakuranga Road may justify a branch of the busway continue towards Highland Park and Howick. The Connected Communities programme will improve bus priority and provide walking and cycling upgrades, which may be appropriate for the long term. The need for full rapid transit is likely to be driven by land use change generating a need for a higher-quality system.

The best time to undertake further work on this corridor will be after the Eastern Busway and the Connected Communities upgrades have been fully implemented.

5. Accessing rapid transit

5.1. Introduction

Implementing this plan over time will considerably expand the reach, capacity and attractiveness of Auckland's rapid transit network. Upgrades to rapid transit corridors need to be complemented by ongoing improvements to how people access rapid transit stations, whether this access is by walking, cycling, feeder buses, park and ride or other modes. Land-use integration is also a critical part of improving access to public transport, by enabling and encouraging more people to live, work and visit locations that are easily accessible by the rapid transit network.

5.2. Public transport network integration

Over the next decade there will be significant improvements to the wider public transport network, with the City Rail Link, latter stages of the Eastern Busway, and better feeder bus frequency being introduced. Even with these in place, there is still significant room to improve public transport in Auckland.

Investment needs continue to improve the frequent bus network. There should be a strong focus on improving the transfer experience at stations, with recent investment such as Puhinui Station providing a great example to follow.

Depending upon geography, distance from the City Centre, and the location of other rapid transit, a supporting bus network can significantly increase the catchment size around a station. Within the urban area, supporting bus services can usually serve a catchment of up to 5 kilometres around a station. An example of a station with high transfer is Panmure, where over 40% of train passengers transfer from buses.

Stations also act as hubs within the wider public transport network, enable transfers between local buses. At Panmure, more customers transfer between buses than transfer between bus and train. This function needs to be considered when planning new or improved stations.

In the many of cases, the station will be the point at which local buses start or finish their journey. To support this, stations need to:

- Have sufficient bus stops for the number of services arriving and departing from the station
- Separate the layover location (where buses wait between trips) from the active bus stops for dropping off and picking up passengers.
- Ensure that the distance between the bus stops and layover location is kept to as short as practically possible to reduce delays.
- Ensure that there is sufficient layover space to cater for different lengths of breaks, with convenient facilities for drivers to use during these periods.
- Enable top up recharging of bus batteries during longer service breaks.

A well-designed terminus station for passenger and buses enables more efficient and cost-effective bus operations. In additional to operational efficiency, the station must also be designed in a way that integrates it into the surrounding area rather than making it unattractive for customers.

5.3. Improving access to stations

Stations provide customers the means of access rapid transit services, which generally make up the main leg of their journey. For a station to be effective, it should enable a seamless transition between that main leg, and first and last legs of the customer's journey. This means stations should:

- Have universal walking access, bike and micro-mobility facilities, well-designed connections to local buses and other public transport, and (where appropriate) suitable car drop-off and pick-up points.
- A quality customer experience, making the rapid transit network convenient, accessible and attractive.
- Be well integrated with their local areas, creating thriving and sustainable neighbourhoods.

There are different types of stations that serve different strategic functions, based on their role in the network and their location. How customers access their station will vary depending on its context. All stations need to cater for a range of accessibility needs.

Rapid Transit Station Access Study

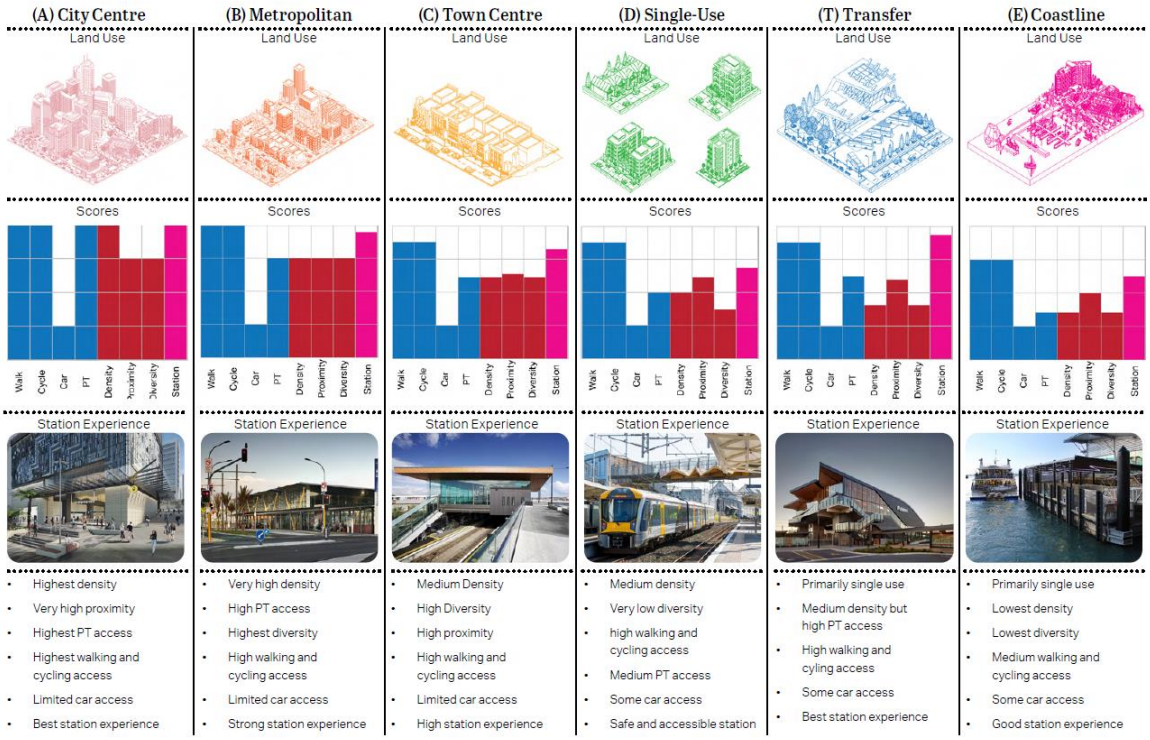
Auckland Transport have assessed existing station access and experience across the rapid transit network, including an analysis of existing facilities, customer experience, the ease of transport access and the land use around each station. The goal of this work was to provide guidance for improving station experience and access, with the long-term aim of improving station access across the network.

This work aimed to identify:

- Deficiencies across the network for access by mode, station experience and land use integration, and priority locations for investment.
- The key function of each station and the associated 'ideal' state for customer experience, access and integration
- How access to transit can be improved for all users, and the high-level steps that need to be taken to enable well-functioning urban environments around rapid transit stations.
- The planning and infrastructure needed to support our growth, climate, transport and urban development aspirations.
- A tool for stakeholders to achieve a common understanding of the current state of the network's stations and starting point from which to take future decisions together.

This study will inform the development of the rapid transit network, including upgrades to existing stations and the design of new ones.

The study classified stations into six typologies, based on the surrounding land use, the expected customer experience, and their function in the wider public transport network. These are shown below.



The way forward for station access

Auckland Transport is developing a business case to seek funding for a range of improvements to accessing existing rapid transit stations across the network. This will aim to bring stations up to the standard envisaged by the typology shown above. This business case will be the basis of a ten-year programme of improvements across all rapid transit stations, as well as ferry terminals.

This programme will consider improved active mode facilities at, to and from existing stations, improved public transport service levels, facilities for private car travel, improved wayfinding and accessibility for all users. It will also consider system-wide interventions such as rideshare, bike-share, car-share, digital solutions, and travel demand management.

This work will also be an opportunity to get alignment between projects being delivered across Auckland by various agencies, and to identify opportunities for a ‘dig once’ approach, to minimise disruption to customers across the network.

New stations delivered by rapid transit projects will be informed by Auckland Transport’s work on station access. They will be expected to meet the standards of the typologies, identified above. While it is up to individual projects to identify the specific locations of future stations, generally they would be expected to serve major destinations (like town centres), key transfer locations (both between rapid transit lines and with the local bus network), and sites of significant planned housing development.

5.4. Rapid transit and inter-regional services

Inter-regional services, that connect Auckland with other regions (including Northland and Waikato), are not part of the rapid transit network. They are not included as the existing inter-

regional services, both public and private, do not operate frequently enough to meet the definition of rapid transit.

Existing inter-regional services often share infrastructure with rapid transit, such as the Te Huia train service between Auckland and Hamilton which shares tracks with AT Metro services (and KiwiRail freight services). Inter-regional buses often stop at or near rapid transit stations, such as Manukau Bus Station.

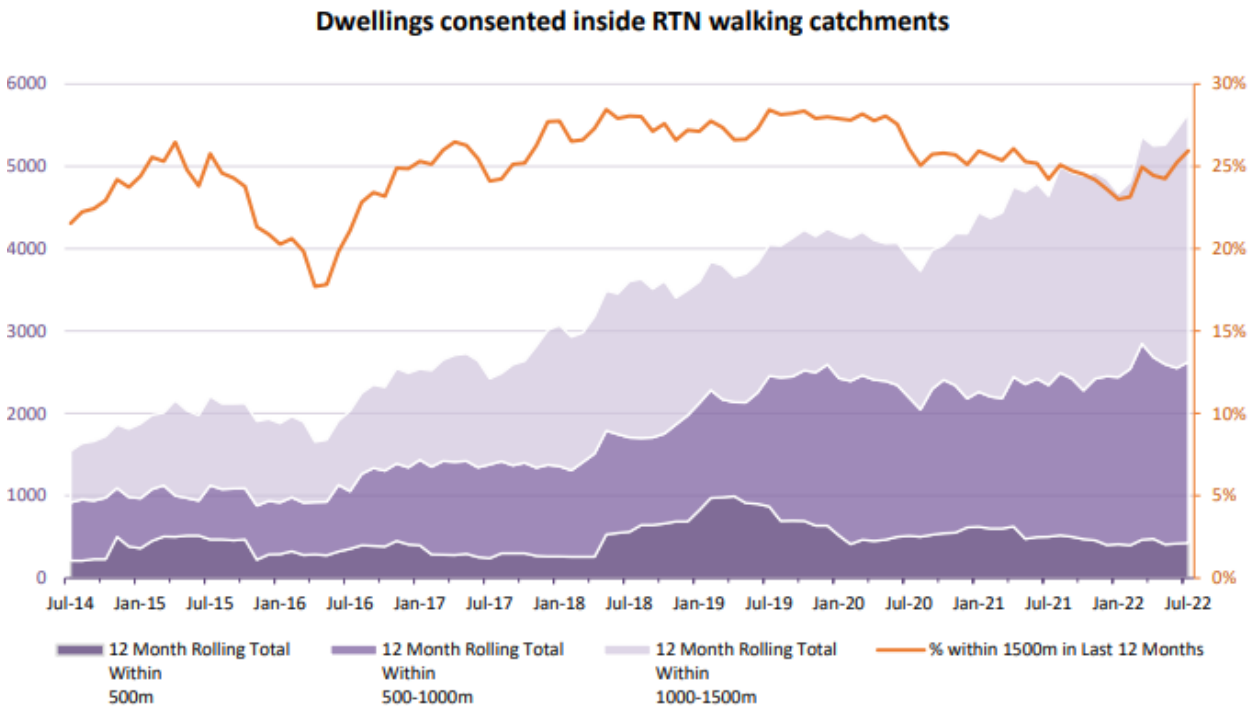
Connections between rapid transit, local public transport, and inter-regional services need to be planned for and encouraged. These different networks are complimentary and support over-arching objectives of increasing the use of public transport and reducing emissions.

In countries with a larger or denser populations, inter-regional services can be considered rapid transit, but this is unlikely to occur in New Zealand in the foreseeable future. Improvements to existing inter-regional services, including trains between Auckland, Hamilton, and other destinations, are being investigated by the Ministry of Transport. Improvements to both inter-regional and rapid transit should be made in a way that is mutually beneficial, where this is practical and efficient.

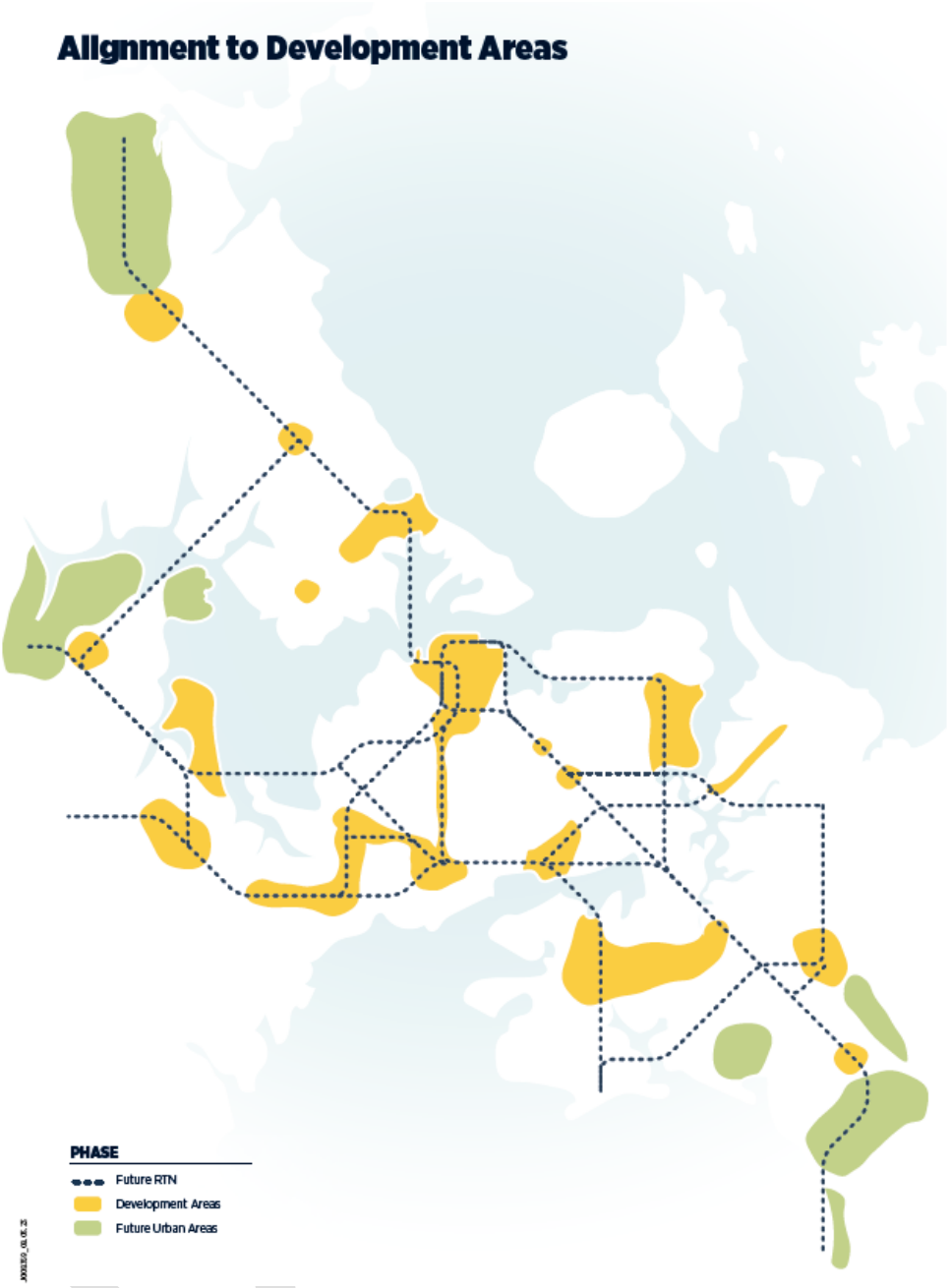
5.5. Land use integration

More intensive urban development is already enabled and encouraged around most of Auckland's rapid transit stations, through higher-density zoning in the Auckland Unitary Plan, and the identification of 'development areas' in the Auckland Plan. In recent years around a quarter of all new dwellings consented have been located within 1500 metres of the rapid transit network:[4]

[4] https://knowledgeauckland.org.nz/media/2453/auckland-monthly-housing-update-09september-2022.pdf



Data sources: Statistics New Zealand and Auckland Council



The National Policy Statement on Urban Development (NPS-UD) enables further intensification around rapid transit stations, by requiring high density zoning allowing development of at least six levels within their walkable catchments.

Building on the NPS-UD, additional steps that could be taken to further encourage growth in locations near rapid transit are:

- Auckland Council and Central Government investigate how financial incentives (e.g., development contributions) should be used to encourage growth close to rapid transit.
- Encouraging public urban development agencies (such as Eke Panuku and Kāinga Ora) to focus on areas close to rapid transit.
- Taking steps to remove other barriers to growth (including non-transport infrastructure constraints) in areas close to rapid transit.

6. Implementing the plan

6.1. Roles and responsibilities of agencies

The planning, funding and delivery of rapid transit in Auckland requires effort by multiple agencies within central and local government. These are complex initiatives that often do not neatly fit into traditional divisions of responsibility across agencies, leading to project-by-project solutions for recent rapid transit projects like City Rail Link (which has been established as a separate entity, jointly funded by the Crown and Auckland Council rather than via Waka Kotahi).

Looking ahead, a clearer and more consistent approach to the planning, funding and delivery of rapid transit is essential if progress in implementing Auckland's rapid transit network is to be accelerated. Rapid transit projects are often extremely complex and significant, requiring deep expertise across a wide range of technical issues. Work by the Ministry of Transport is underway to clarify rapid transit roles and responsibilities, with the outcomes of this work being incorporated into a future update to this Plan.

In the meanwhile, current arrangements will need to continue for existing projects. Strong alignment and collaboration across the different organisations that play a role in rapid transit planning and delivery will continue to be essential, regardless of future arrangements.

6.2. Roles of mana whenua

The iwi mana whenua of Tāmaki Makaurau, as partners with the Crown under Te Tiriti o Waitangi/The Treaty of Waitangi, have an important role to play in the development of the rapid transit network. Central and Local Government agencies work with mana whenua on the development of individual corridors of the network, to ensure that their views and expertise are including in the corridor's planning and design.

Mana whenua recognise the benefits rapid transit has, in providing improved access to opportunities for communities, including hāpori Māori. They support improving access for Māori, including those who are not mana whenua in Tāmaki Makaurau, as well as for Pasifika communities. Mana whenua also support a social procurement approach to the development of the rapid transit network, which should include Māori and Pasifika businesses (including their own).

Mana whenua have their own commercial aspirations and want the rapid transit network to be designed and constructed in a way that supports these aspirations. This may include providing rapid transit access to land they own and which they are seeking to redevelop.

The ARTP's development included engagement with mana whenua, and their input is reflected in this section, as well as other parts of this plan. Mana whenua see their role on rapid transit projects as:

- Being kaitiaki for the environment – advocating for positive environmental outcomes as part of projects. This includes ensuring infrastructure is designed and constructed in an appropriate way and includes aspects that benefit the environment (such as improvements to water quality as part of stormwater treatment systems).

- Having deep knowledge of their local rohe – ensuring that infrastructure and services are delivered in a way that is conscious of and respects the history and culture of the area and its people.

To perform these roles, mana whenua expect to be represented in projects at both:

- A governance level, to enable them be part of decision-making processes and steer the direction of the project.
- A technical or operational level, to understand and contribute to the details of the project's development.

This involvement should recognise and allow for the fact that mana whenua will have diverse views, both within and between iwi and hapū groupings.

As part of their involvement in projects, mana whenua may choose to gift names for infrastructure which reflect the history of the local area, and which contribute to a unique Māori identity for Tāmaki Makaurau. Mana whenua also encourage this to be achieved through the incorporation of Māori design principles. The design of Puhinui, Manukau and Ōtāhuhu Stations are examples of where this has been done successfully.

6.3. Route protection

As discussed in section 4, some level of planning and design work is underway for most of the corridors identified in this Plan. A key focus over the next few years is to complete this work to a level that corridors can be legally protected through statutory planning processes.

In some cases, it may be decades before these rapid transit corridors are fully implemented. Despite this, route protection is important to progress as soon as possible in order to minimise future property acquisition costs and provide a level of certainty to the community about future intentions.

Route protection is usually progressed as part of business case investigations into individual corridors. Once a designation for a future corridor is secured, there is usually a timeframe that works must begin in before the designation needs to be renewed. Once a corridor is under construction or finished, further route protection is not needed. The status of route protection for future corridors is shown in the following table:

Corridors where route protection is progressing (designation applied for)	**Corridors where route protection is progressing** (business case underway)	**Corridors where route protection needs progressing** (no current work underway)
• Airport to Botany • North Shore (Albany to Milldale)	• Māngere • North Shore (city to Albany)	• Crosstown (if not using KiwiRail alignment) • Eastern Busway (Ellerslie – Panmure)

• Northwest (Brigham Creek to Huapai)	• Northwest (city to Brigham Creek)	• Upper Harbour

Potential future changes to the resource management system may make the process of protecting for an enabling rapid transit easier, which would be useful in ensuring the future network can be developed efficiently.

These, or other legislative changes, may also be required to grant powers to agencies to protect for certain kinds of rapid transit. For example, Waka Kotahi currently cannot protect for rail-based rapid transit. These issues will need to be resolved as part of clarifying the roles and responsibilities individual agencies will have in the future network's development.

6.4. Funding

6.4.1. What this plan might cost

Implementing this plan will be the largest area of investment into Auckland's transport system over the coming decades. Estimating costs over such a long time-horizon is extremely difficult and there are many ways in which costs could change over the course of undertaking more detailed planning and design work (such as decisions around whether to tunnel sections of a corridor).

The ARTP therefore does not include a specific estimate or the cost of the full network, however, it is likely to be many of tens of billions of dollars (at current values). This is similar in cost and scale as the development of the motorway network.

Because such significant investment will be needed to implement this plan, careful staging and sequencing is required to help improve affordability over time by smoothing the level of investment. The sequencing outlined in this plan also seeks to provide longer-term certainty to the wider delivery sector, so that capacity and capability can be built up over time – leading to long-term cost efficiencies.

6.4.2. Current funding

Rapid transit was the largest area of investment in both the 2018 and 2021 versions of the Auckland Transport Alignment Project and will continue to be a significant component of overall transport investment plans. ATAP 2021 allocated $7.6 billion for rapid transit over the next decade, broken down as follows:

- Rail network improvements: $4.6 billion
- City Centre to Māngere and Northwest corridors: $1.9 billion
- Eastern Busway: $880 million
- North Shore improvements: $125 million
- Airport to Botany corridor: $76 million

Current funding arrangements for rapid transit projects (that is, the share of funding from difference sources) are generally determined on a 'case-by-case' basis, broadly guided by which organisation is the project lead. ATAP 2021 assumed a higher share of Government

funding for rapid transit projects to reflect their national significance, although affordability constraints have made implementation of this assumption challenging.

6.4.3. Clarifying funding arrangements

Rapid transit's high cost and unclear funding arrangements have led many projects to be funded on a bespoke basis, often including Crown grants. This has led to significant variability between projects, and a lack of certainty the undermines efficient progress on implementing Auckland's rapid transit network.

Rapid transit has several unique characteristics relevant to the development of an enduring funding framework:

- Very large and complex investments that take many years to plan, design and construct
- Generate widespread benefits across many different beneficiaries
- Inter-generational benefits
- Often developed as part of wider urban development programmes
- Often need to be built ahead of demand, to shape urban development and travel patterns
- Funding arrangements are of strong public and political interest

Clarity is required on several matters:

- How funding is split across different sources (e.g., the Crown, the National Land Transport Fund, local share.)
- How to avoid perverse incentives, such as funding arrangements incentivising poor corridor location
- How to provide appropriate levels of longer-term certainty, given the long timeframes for planning and delivery
- How to appropriately explore new funding mechanisms (e.g., value capture)

Government is undertaking a wider review of how transport is funded in New Zealand. The outputs of that work are likely to be relevant for rapid transit and will be incorporated into future updates to this plan.

6.5. What happens next

There is significant work continuing on rapid transit in Auckland. This includes business case work, route protection work, and consideration how future land use will impact on demand. The ARTP will need to be updated regularly in the future to reflect decisions made by these different projects and planning processes.

[*Key next steps to be agreed and presented as a table of actions that need to be taken over the next few years*]