

Auckland Rapid Transit Baseline



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1. Executive Summary

What is the Auckland Rapid Transit Baseline?

This Baseline document provides a definition for rapid transit within Auckland's context, and sets out the role rapid transit plays in Auckland's transport and urban development. Objectives underpin these roles, both at a network and individual corridor level.

The current status of individual corridors that make up the planned rapid transit network is also set out, along with the transport and urban form outcomes the corridors are expected to support. In pulling together this information the document acts as an agreed Baseline on the current state of Auckland's rapid transit network and the necessary next steps in its development.

The Baseline has been produced in partnership between Auckland Council, Auckland Transport, and Waka Kotahi NZ Transport Agency. Further work on an Auckland Rapid Transit Plan will build on the work of the Baseline.

What is rapid transit and why is it important in Auckland?

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.

The Baseline's definition builds on what is outlined in the GPS and the NPS-UD to provide more detail that is relevant in the Auckland context. This added detail emphasises that rapid transit in Auckland operates on strategic corridors and is not affected by congestion. It also emphasises rapid transit is the core of Auckland's wider public transport network and will play a key role in shaping the region's growth and urban development.

The Baseline's definition of rapid transit is that:

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 Auckland's growth and urban form.

The roles rapid transit is expected to play within the transport network and in relation to land use planning and development are touched on in this definition. Internationally, rapid transit plays a variety of different roles depending on the context of the urban area it is in. The Baseline makes clear that in Auckland, rapid transit is expected to support the Auckland Plan 2050's vision for the future growth of the city. This means rapid transit will focus on:

- supporting and shaping a quality compact urban form
- the public transport network's backbone
- providing more space-efficient access to opportunities.

Objectives have been developed to clearly articulate the desired outcomes that will come from rapid transit effectively performing these roles. These Objectives have been linked to the wider system planning objectives that Auckland Transport uses in its network planning. They are then supported by measures that enable performance against the Objectives to be quantified. The seven Objectives are for rapid transit in Auckland to:

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

Achieving these Objectives will result in rapid transit playing a more important role in the lives of more Aucklanders. It will offer them a fast and reliable public transport option to access a wider range of opportunities and supporting a greater mix of housing across the city. This will also mean greater use of public transport and an associated reduction in transport-related greenhouse gas emissions.

Why is a Baseline needed?

Rapid transit's importance to Auckland's future is underscored by the significant existing and planned investment in it, across multiple agencies. This investment forms the largest single part of new capital investment planned for transport in Auckland. \$7.6 billion for rapid transit improvements was included in the 2021 Auckland Transport Alignment Plan (ATAP) and Regional Land Transport Plan 2021 (RLTP) programmes. Investment in rapid transit also influences other parts of the investment programme (for example, road connections to access stations). Changes to plans for rapid transit therefore have significant flow-on effects for the planning of other investments, and the transport system as a whole.

Rapid transit also has significant impacts on, and interfaces with, land use planning. The Auckland Plan sees rapid transit as critical to achieving its goals for the region's future development and desired transport outcomes. Zoning in the Unitary Plan was planned to enable residential and commercial intensification around the existing rapid transit network. The recently released National Policy Statement on Urban Development (NPS-UD) will require Council to enable greater intensification around both existing and planned rapid transit.

Multiple agencies are involved with the development on Auckland's rapid transit network. These include Auckland Council, the Ministry of Transport, Waka Kotahi New Zealand Transport Agency, and KiwiRail. Beyond the high-level network plans in ATAP and the Auckland Plan there has not been a consistent understanding, agreed between agencies, of what these agencies are collectively working towards in developing the rapid transit network, or how this will be done.

This Rapid Transit Baseline is the first step towards developing this consistent understanding and agreed way forward. It provides an overview of the current status of rapid transit in Auckland, as well as planning for its future development, and lays a foundation that an Auckland Rapid Transit Plan can build on.

What is the current status of planning for rapid transit?

There are three major rapid transit projects currently under construction in Auckland: the City Rail Link; the Northern Busway's extension; and the Eastern Busway's construction. These projects alone will significantly expand the existing rapid transit network and represent over \$5 billion of investment.

Planning is underway for a range of other projects, including major expansions of the network to new corridors (such as the City Centre to Māngere project), extensions to the existing network (such as expanded the electrified rail network to Pukekohe), 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, the Ministry of Transport, 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. Objectives for all corridors have been developed to articulate how they will contribute to the overall objectives for rapid transit in Auckland.

Assessing the history of work on these projects has shown where the Baseline can add value and save time in the planning phase. The lack of a consistent understanding around the intentions for the future development of the rapid transit network has resulted in some duplication of work on the business cases for many current projects. This Baseline will ensure that future investigations have an agreed vision to refer to. This will be important given there are several conceptual corridors (such as between Onehunga and New Lynn) where no detailed planning work has been undertaken but where work will be required in future.

Future planning will also need to address issues that current business case work has found hard to determine answers to. This primarily relates to how corridors will integrate with each other, such as within the City Centre. Such answers can only be determined at a network planning level, as opposed to at a project level. This is a key issue that an Auckland Rapid Transit Plan must help to resolve.

What are the next steps beyond this Baseline?

Work has begun on an Auckland Rapid Transit Plan to address issues around network integration and provide more detail around prioritising and staging the development of the network. Like this Baseline, the Plan is being developed collaboratively by Auckland Council, Auckland Transport, and Waka Kotahi. Other agencies, including the Ministry of Transport and KiwiRail, will also be involved.

The Auckland Rapid Transit Plan will build on the high-level plans of ATAP and the Auckland Plan, as well as this Baseline, and develop a detailed plan for the development of Auckland's rapid transit network over the next three decades. It is expected to be completed in late 2021.

2. Context

Rapid transit plays an increasingly critical role in moving people around Auckland and in supporting the city's growth and development. Auckland's current rapid transit network comprises the electrified heavy rail network between Swanson and Papakura, as well as the Northern Busway:

- 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 decade. Electric trains were progressively implemented from 2014 to 2015.
- The Northern Busway opened in 2008 and connects the North Shore with the city centre and beyond. In doing so, the Busway provides the dedicated infrastructure for several bus routes, including core Northern Express services that also use the Auckland Harbour Bridge and local roads to the south of the busway, and bus shoulder lanes between Constellation and Albany stations.

Together, this network carried over 26 million passengers in 2019 with use growing strongly prior to the COVID-19 pandemic, which impacted usage during 2020.

Significant plans to expand and upgrade Auckland's rapid transit network are being progressed. City Rail Link, an extension of the Northern Busway to Albany and the first stage of the Eastern Busway between Panmure and Pakuranga are all under construction. Planning is also well advanced to expand the rapid transit network on the City Centre to Mangere and Northwest corridors, as well as to extend rail electrification to Pukekohe (allowing direct and more frequent services).

The rapid transit network's development has been the focus of recent planning work, including the Auckland Transport Alignment Project (ATAP). This work focuses on how rapid transit will support wider objectives for the transport network, such as mode shift, climate change and spatial priorities. ATAP, and the Regional Public Transport Plan 2018 (RPTP) include detail of how the rapid transit network will develop over the next decade. Beyond this time period there is less clarity about future direction. ATAP's long-term direction is shown in a high-level network diagram, with minimal detail about how and why these corridors should be developed.

Developing Auckland's rapid transit network will be the most significant transport investment in the region over the coming decades. It needs to be well planned and integrated within the broader public transport system and with Auckland's growth aspirations. This makes getting clarity on long-term planning at a network level critical, which cannot be achieved through project-level business cases alone.

This document – the Auckland Rapid Transit Baseline – is an important step towards providing network-level clarity about how rapid transit in Auckland will be developed over time, while retaining the flexibility to respond to different future scenarios.

Together with subsequent network planning, this Rapid Transit Baseline will provide a link between high-level plans like Future Connect and the Auckland Plan 2050 with project-level business cases and funding plans. To do this, the Rapid Transit Baseline report:

- defines rapid transit
- details the role rapid transit needs to play in supporting Auckland's future success

- outlines key objectives which will be used to measure success
- summarises the ‘current situation’, including both existing rapid transit infrastructure and services as well as the current state of rapid transit planning
- identifies key issues that need to be addressed through future network planning.

Figure 2-1 - Map of urban form and rapid transit network shows the existing rapid transit network and its relationship to existing and planned urban areas.

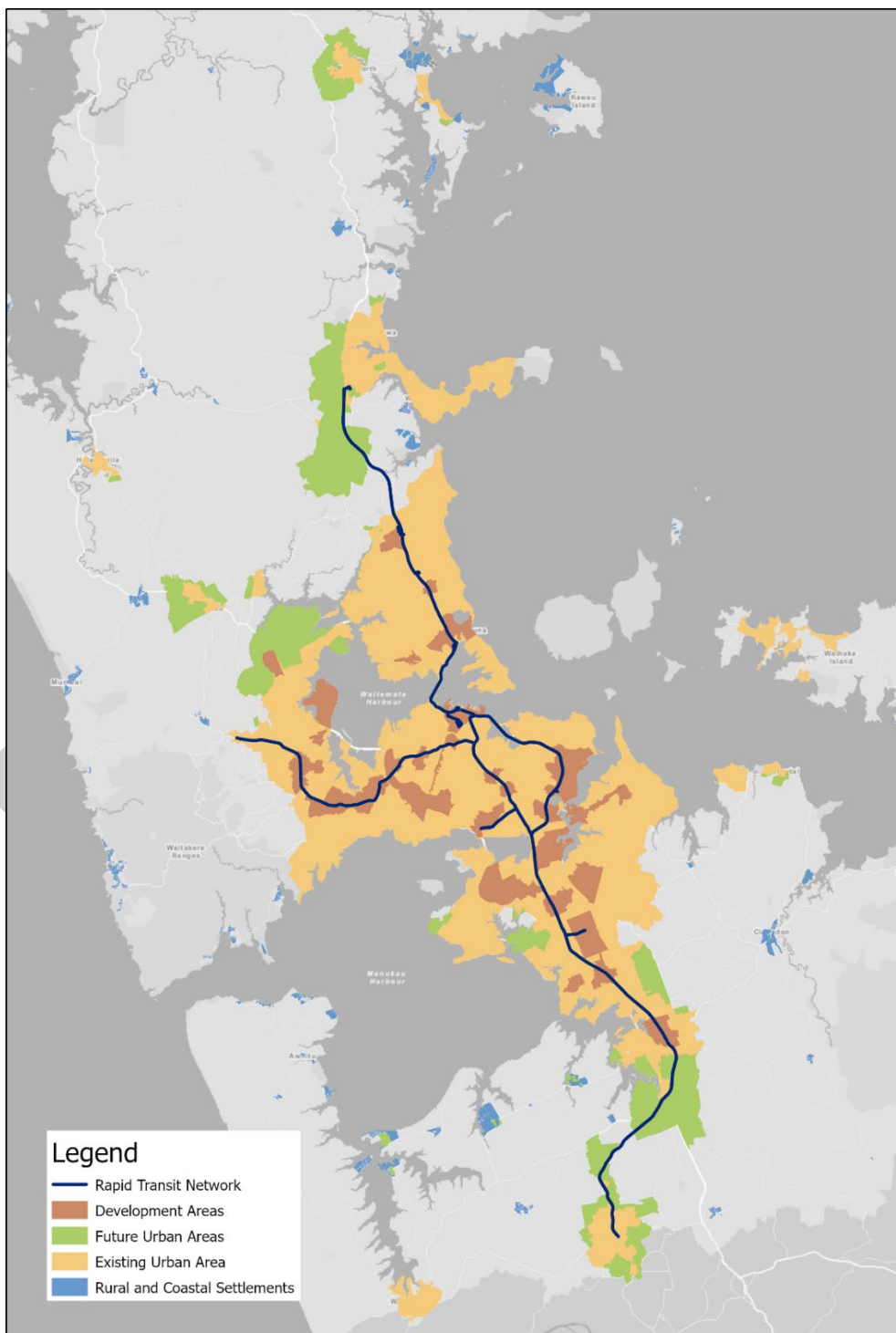


Figure 2-1 - Map of urban form and rapid transit network

3. Defining Rapid Transit

There are a variety of different forms of rapid transit around the world, which makes a clear definition important.¹ The purpose of this section is to establish a common understanding of what is meant by rapid transit in the Auckland context. As agreed by Auckland Council, Auckland Transport and Waka Kotahi, in Auckland:

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 Auckland’s growth and urban form.

The key elements of this definition are discussed in more detail throughout this section. An assessment of Auckland’s current rapid transit network, in relation to these characteristics, can be found in section 6.1. The rest of this section discusses the ideal characteristics of rapid transit.

3.1 Rapid transit is public transport

Rapid transit is a form of high-capacity public transport moving large numbers of people throughout the day. Together, multiple rapid transit services form the rapid transit network (RTN). Rapid transit services operate at high frequencies throughout the day (at least every 15 minutes) and are therefore part of the frequent public transport network.

What distinguishes rapid transit from the frequent network and wider public transport network is the higher quality experience it provides customers. Its service characteristics and corridor design, discussed in more detail below, mean rapid transit can move large numbers of people quickly, and efficiently. For this reason, rapid transit is the core of the wider public transport network, supported by other public transport services. Other forms of transport, including walking, cycling and park and ride can also support access to rapid transit.

Figure 3-1- Rapid Transit Network within the wider public transport network illustrates the relationship between the rapid transit, the frequent transit network, and the overall public transport network. These layers are defined in the RPTP.

¹ The National Policy Statement on Urban Development and the 2021 Government Policy Statement on Land Transport define rapid transit 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.” The definition in this document is consistent with the national level definition but provides further detail relevant to Auckland.

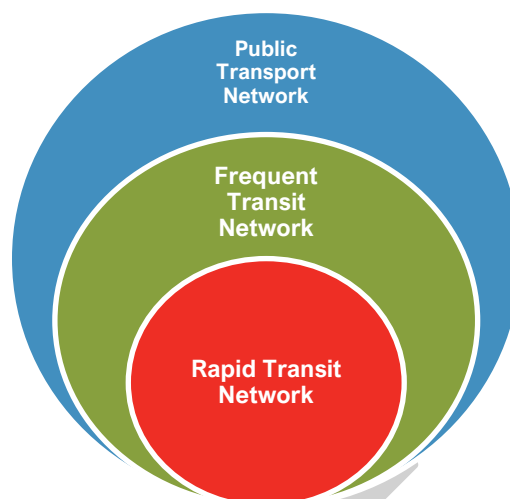


Figure 3-1- Rapid Transit Network within the wider public transport network

Further detail on how the various layers of the public transport network work together is outlined in section 4, on the Role of Rapid Transit.

3.2 Rapid transit is defined by its service characteristics

Rapid transit is:

- **Fast** – rapid transit services offer time-competitive travel with private vehicles, particularly at peak times. This does not require rapid transit to always be *faster* than travel by private vehicle. It does mean travel times must be close enough that other advantages of rapid transit (such as its reliability) make it a highly attractive option. To achieve this characteristic, rapid transit is generally faster than other public transport services, through provision of a dedicated corridor and wider spacing between stops.
- **Frequent** – rapid transit services form part of the frequent public transport network, and therefore operate at frequencies that enable users to ‘turn up and go’ at most times of day, seven days a week.² These high frequencies enable rapid transit to quickly shift large numbers of people and allow for efficient connections between different public transport services.
- **Reliable** – rapid transit services operate with very high levels of reliability and are unaffected by other parts of the transport network. They have priority over other traffic through a dedicated corridor and/or priority at intersections. High reliability helps make rapid transit services competitive with private vehicles. Reliability complements frequency, by ensuring even spacing between services and predictable departure times, which enhances the customer experience.

² A true ‘turn up and go’ frequency would be a minimum of every 10 minutes. Currently, some rapid transit services only achieve this during the peak. The RPTP aspires for the entire rapid transit network to achieve this minimum frequency by 2028. The current definition in the RPTP is at least every 15 minutes, between 7am and 7pm, 7 days a week.

- **High capacity** – the combination of high frequency and large vehicles able to carry many people means that rapid transit corridors can move significant numbers of people per hour in a relatively small amount of space.

These characteristics combine to result in a user experience that is ‘rapid’. Users do not have to wait long for their service to arrive and once on-board they get to their destination with minimal delays. This makes rapid transit an attractive option for a wide range of trips, encouraging significant mode shift from private vehicles and helping shape urban form and development.

3.3 Rapid transit is easy to use

Rapid transit is also intuitive and easy to use, providing a high-quality customer experience that is simple to understand, especially for new or infrequent passengers. This ease of use is a result of:

- **Services forming a legible network** – routes on the Rapid Transit Network are easy to understand. They have a simple, regular service pattern rather than multiple variations.
- **Consistent stopping patterns** – rapid transit services have easily identifiable stations that make it easy to determine where they stop. Services stop at every designated station, without users needing to request a stop.³
- **Clear wayfinding** – the Rapid Transit Network has clear and consistent branding and wayfinding, which helps users navigate it. The infrastructure that supports rapid transit, including stations, shelters and vehicles, help users to identify it.
- **Easy boarding** – features like off-board ticketing and all-door boarding mean that Rapid Transit services are easy to board. This accommodates large numbers of people using them and reduces dwell times which helps ensure service reliability.
- **Accessibility** – all stations and vehicles are accessible, ensuring the Rapid Transit Network is easy to use for all, regardless of age or ability.

3.4 Rapid transit has total priority

A key aspect of rapid transit is its ability to always operate reliably, regardless other factors affecting the transport network. In order to achieve this reliability, rapid transit usually operates in corridors that are physically separated from other modes. This results in total priority that enable services to run more quickly, frequently, and safely than other public transport services.

These dedicated corridors may operate at-grade, above or below ground, or in a combination. Corridors typically avoid conflicts where they cross another transport corridor through grade-separation. Where rapid transit corridors cross others at-grade, the rapid transit corridor should have priority by way of signal pre-emption (such as level crossings on the rail network).

³ Some forms of bus rapid transit, including Auckland's Northern Busway, do require users to request a stop.

This provides the priority that ensures services can continue at speed and without impacting reliability. Grade separated crossings are generally preferred to reduce risks to other users and minimise the chances of service disruption.

At-grade corridors may be on-street in urban areas, but only where this does not affect the quality of service or have unacceptable safety risks. Generally, this requires dedicated lanes and priority at intersections, although ‘time-segregated’ running may also be an option.⁴

3.5 Rapid transit can use a range of modes and technologies

Rapid transit can be provided by a range of types of public transport modes or technologies, including trains, buses, and ferries. Any mode that provides high-capacity services that can be fast, frequent and reliable can form part of the rapid transit network. Certain modes may be more suitable for an individual corridor, depending on the characteristics of and demand expected from that corridor.

Examples of rapid transit modes are:

- **Bus** – buses running frequently with high levels of priority on dedicated busway corridors are rapid transit. Auckland’s Northern Express bus services are a good example of bus rapid transit.
- **Light Rail** – light rail vehicles are modern trams that generally operate at higher capacity than Auckland’s historic trams. When operating frequently and with sufficient priority 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 Metro** – a rail-based mode that with 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 trains. Because of this, light metro can be driverless, which reduces operating costs compared to heavy rail. Vancouver’s SkyTrain system is a form of light metro transit.
- **Heavy Rail** – trains are a typical form of rapid transit, given most railways are dedicated corridors with high levels of priority. Not all train services are automatically 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.
- **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. 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.

⁴ Time segregated running is where sections of space are shared by rapid transit and other modes, and access to these sections is controlled (e.g. by traffic signals) to dedicate the space to rapid transit operations when required

The infrastructure required to achieve total priority varies depending on the mode and network design. This means modes have different effects on the rest of the transport network and the city's urban form.

3.6 Rapid transit shapes and supports the city's urban form

Well designed and fully integrated rapid transit plays a significant role in positively shaping and supporting a city's urban form. The speed and reliability of rapid transit services can significantly increase the level of access to opportunities in areas around stations. Improved access makes areas within a convenient walking distance of rapid transit stations attractive places to live, work and visit. This can increase land value in a way that supports higher density development and a wider mix of uses.

Rapid transit's ability to efficiently move large numbers of people to key locations can also enable higher density development within walking distance of stations. An attractive service that supports a high public transport mode share in an area can mean less need for investment in private vehicle infrastructure. This reduces the amount of land needed for roads and car parking, which supports higher density land use.

Realising the full potential of a rapid transit network requires urban form and rapid transit to be planned and delivered in an integrated way. The location and design of rapid transit stops, provision of walking and cycling networks, local amenities, land use zoning and urban design controls are all important factors that will influence Rapid Transit's ability to shape the urban form and maximise mode shift to public transport.

The National Policy Statement on Urban Development 2020 (NPS-UD) recognises the importance of good accessibility in supporting "well-functioning urban environments". The NPS-UD requirement for 'tier 1 local authorities' (including Auckland) to enable development of at least six storeys within a walkable catchment of rapid transit stops is a key mechanism in linking intensification with good accessibility. This applies around both current and planned stops, reflecting that rapid transit decisions shape future growth and do not only respond to existing land use.

3.7 Rapid transit should be tailored to a corridor's needs

The service characteristics outlined above are fundamental to any service being considered rapid transit. Total priority in a corridor is critical to ensuring these characteristics can be delivered. These characteristics are common to all services across the rapid transit network. At an individual corridor level, however, rapid transit can and should be tailored to meet the unique characteristics and demands of the corridor. These include:

- *Distance between stops.* Generally, stops are located closer together in higher density areas and further apart in lower density areas. Some corridors may have many important locations to serve which results in close stop spacing. Other corridors may have fewer important locations, resulting in more widely spaced stops. Operating patterns may enable some services to skip some stops, in order to achieve faster travel times between key destinations.

- *Mode/technology.* A variety of modes can be used for rapid transit, as outlined above. Choosing the right mode involves considering:
 - existing and future demand – this includes assessing existing land use patterns (as the generator of demand) and the potential for growth and any related development patterns
 - how to optimise existing infrastructure – including complementary public transport services and routes, and the potential for through-route services to existing rapid transit corridors
 - impacts on urban form – different technologies will have different impacts on urban form and amenity, due to their associated infrastructure. Depending on the context of the local area and the infrastructure, these impacts can be positive or negative.
 - value for money – costs to accommodate different modes will vary considerably depending on how infrastructure will be designed to address the above considerations. Value for money should always be thought of as part of these other considerations.
- *Phased implementation.* Some corridors may not immediately justify a full rapid transit solution but would benefit from an improved service that builds towards rapid transit over time. These interim improvements can be staged to appropriately cater to and induce demand, and should:
 - be of an appropriate scale
 - deliver parts of the intended long-term corridor
 - be future-proofed
 - deliver appropriate value over the timeframes they are planned to be in place.

3.8 Assessing a service under this definition

Table 1 below provides an example of how a service can be determined as rapid transit or not, based on meeting the definition within this section. It shows that whether services are rapid transit or not is determined by a combination of service characteristics and the infrastructure supporting the service.

Frequent bus route	Peak time bus lanes, but without priority through intersections	No	A lack of priority through intersections, a lack of all-day priority and a lack of physical separation from other traffic means that these services are not considered rapid transit.
Frequent bus route	Mixture of separate busway, shared traffic lanes and on-street bus lanes	Partly	The section of the corridor operating as a fully separated busway meets the definition of rapid transit, but the overall service does not. This is due to sections of shared running with other traffic meaning speed and reliability are affected by congestion.
Heavy rail service operating mainly at peak times with limited off-peak and weekend services.	Dedicated rail corridor	No	For rapid transit to fulfil its role as the backbone of the public transport network, it needs to operate frequently at all times of day, not just during the peak.
On-street modern light-rail with frequent service	On-street dedicated right-of-way with absolute priority at intersections	Yes	Although the service runs on street, the absolute priority at intersections, the dedicated right-of-way and high all-day frequencies mean this service is classified as rapid transit.

Table 1 - Worked example of assessing if a service meets the definition of rapid transit

An assessment of Auckland’s existing rapid transit network against the definition is in section 6.1.

4. Role of Rapid Transit

Rapid transit systems in major urban areas around the world have many similarities in the roles they play within the transport system and overall urban structure. Typically, rapid transit serves the busiest public transport routes, allowing large volumes of people to move efficiently along the most critical corridors and to the highest intensity locations.

Because urban form varies between different cities, the role of rapid transit in responding to that urban form also varies in cities around the world. For example:

- Perth's rail-based rapid transit system focuses predominantly on serving existing land-use and travel patterns, efficiently moving large volumes of people from low-density suburbs to the city centre.
- Vancouver's 'Skytrain' rapid transit system has played a key role in shaping the city's growth patterns with many stations surrounded by high density buildings and mixed-use development. The Skytrain has a greater focus on meeting all-day demand and serving secondary centres, reflecting Vancouver's urban form pattern.
- In very large cities, multiple rapid transit systems can work in an integrated way to meet the different travel needs of the city. Paris, for example, has a Metro system, which serves shorter trips within the inner area while the RER serves longer distance trips to the outer urban area. Tram lines also fill gaps in these other networks.

The similarities and differences of rapid transit around the world illustrates the need to apply rapid transit in a way that meets the characteristics of the city. This includes geography and current land-use patterns, as well as future growth plans and desired transport outcomes. This section sets out the various roles that Rapid Transit is expected to play within Auckland.

4.1 Rapid Transit's Role in Auckland

Auckland's harbours and topography constrain the number of possible connections between different parts of the region. Combined with the city's current and planned land use patterns, this layout concentrates large numbers of trips onto a few corridors, creating major bottlenecks and severe congestion for many longer distance journeys. This helps to define the role rapid transit needs to play to support the region's future success

Auckland's forecast growth will add to the region's transport challenge. Auckland's population has doubled since the mid-1980s to around 1.7 million and is projected to approach 2.5 million by 2050. This growth is forecast to increase travel demand over the next 30 years, resulting in an extra 400,000 peak time trips and 2 million more daily trips across all modes.

Accommodating this scale of travel demand growth will be very challenging. The motorway network is now largely completed, and previously protected transport corridors are now fully utilised. Adding new connections or widening existing roads and motorways is becoming progressively more expensive and will have a negative impact on communities. Furthermore, this approach often just transfers bottlenecks to somewhere else on the network rather than eliminating them.

Auckland's scale of growth also creates exciting opportunities to reshape the city to be more vibrant, prosperous, inclusive and sustainable. Through the Auckland Plan 2050, Auckland's focus is on achieving a 'quality compact' urban form where:

- vibrant centres allow people to easily access opportunities and their daily needs and provide businesses with a diverse and growing customer and employee catchment.
- increased supply of a range of housing choices is available in areas close to good travel options and with good access to employment and service opportunities.
- newly developed urban areas have multi-modal transport options early in their development, enabling more sustainable travel habits and making more efficient use of land.

The combination of Auckland's constrained geography, substantial population growth, limited opportunities to add road capacity, and support for a 'quality compact' urban form define a fundamental role for rapid transit in the region's future success.

The following parts of this section outline the different roles rapid transit must play in supporting Auckland's future success. These are:

- supporting and shaping a quality compact urban form
- the public transport network's backbone
- providing more space-efficient access to opportunities.

4.2 Supporting and shaping a quality compact urban form

Rapid transit has a key role to play in delivering a quality compact urban form by supporting successful centres. It does this by making redevelopment of existing urban areas attractive and feasible by improving access to them and helping ensure new urban areas have multi-modal travel options as they grow. This role is most critical in supporting major centres, but smaller centres located along rapid transit corridors can also benefit from this support.

Successful major centres (the city centre and metropolitan centres) need to be easily accessed by large numbers of people. This means they must be well connected to residential areas, but also to other major centres. This access supports and enables the productivity gains that come from highly specialised employment and the agglomeration benefits that arise from many businesses operating in close proximity to each other.⁵

Space is always at a premium in high-density centres, requiring trade-offs between public amenity, buildings, and movement. This means rapid transit's ability to move large numbers of people efficiently is most needed in major centres (compared to smaller centres). Reducing reliance on private vehicles for access to these centres also means that space otherwise required for car access and parking can be used more productively (such as for housing, businesses, or open space).

⁵ Remy Prud'homme and Chang-Woon Lee (1999) 'Size, Sprawl, Speed and the Efficiency of Cities' *Urban Studies* Vol. 36, No. 11, 1849-1858

Rapid transit can also support successful smaller-scale centres (such as town centres) by improving access to these locations. Over time, increased housing density in and around centres will support a wider mix of uses (such as cafes and local services) without a substantial increase in space dedicated to car parking and access. The access afforded by rapid transit means these smaller centres have the potential to grow in size over time. This may enable them to play a more important role in the hierarchy of Auckland's centres in the future.

Both within and outside of centres, large-scale redevelopment to higher densities needs to be accompanied by mode shift towards public transport. This will avoid increased densities resulting in more congestion, which is important given the difficulty of adding road capacity in existing urban areas. Rapid transit's ability to provide a highly attractive and reliable travel option means it is a proven way of supporting mode shift. Rapid transit also makes areas more attractive to live in due to the access it provides, which is critical to the market success of higher density developments.

Helping to ensure new 'greenfield' urban areas have multi-modal travel options as they grow is another key task for rapid transit. These areas are usually located at the edge of the existing urban area and typically have the longest average trip lengths. If they become car dependent, the effects will be felt right across Auckland through significantly more congestion on major roads and higher emissions. Therefore, it is critical for greenfield growth areas to have a high public transport mode share early in their development. Rapid transit is essential to achieving this, given the long trip lengths from these areas to key employment areas.

Greenfield areas close to rapid transit also provide excellent opportunities to create 'transit-oriented developments', where higher densities and a mix of uses are focused around stations. Transit-oriented developments support the use of rapid transit by increasing the number of people living and working within walking distance of stations. At the same time the stations can act as focal points for the community, creating vibrant, liveable and prosperous neighbourhoods. This provides an increased catchment that supports the use of rapid transit.

Rapid transit is most effective in delivering successful outcomes when stations, walking and cycling infrastructure, local amenities and urban planning and design controls are planned and delivered comprehensively. Not considering these factors together can result in lower than expected ridership, unrealised development potential or both, significantly undermining the benefits from rapid transit investment.

4.3 Being the public transport network's backbone

The rapid transit network is the core of the wider public transport, as noted in the Definition section. It forms part of the wider frequent transit network, and together these services act as Auckland's strategic public transport network.

Other services are designed to support the frequent transit network, either by connecting to or complementing it. Connections between services expand the reach of rapid transit services. This means that rapid transit sits at the top of a 'hierarchy' of public transport services, providing the highest quality service and customer experience. This is illustrated in Figure 4-1, on the next page.

ASPIRATION				
SERVICES LAYER	RAPID 	FREQUENT 	CONNECTOR 	OTHER SERVICES (Local, rural-township, peak only, school, Total Mobility, on-demand services)
Defining feature	CORE – ALL DAY NETWORK			SUPPORTING NETWORK
Minimum hours of operation	5.30am – 11.30pm			No minimum
City Centre Services	10 minutes		20 minutes	Driven by need
Minimum Headway	10 minutes		20 minutes	
Non-City Centre services	7am-7pm, 7 days	10 minutes		
Minimum Headway	Outside those times	20 minutes	30 minutes	
Achieving Efficiency and Reliability	Dedicated Right of Way	Whole-of-route bus priority	Priority measures	Limited priority measures

Figure 4-1 - Public Transport Service Layers (source: Auckland Transport Regional Public Transport Plan 2018)

Fulfilling its role as the backbone of the public transport network requires rapid transit to perform a variety of functions that vary across the region. These functions include:

- quickly, efficiently and reliably moving people along the routes where high levels of demand result in other forms of public transport struggling to operate effectively
- in inner areas, meeting strong demand for travel along major corridors into the city centre and between other major centres. This eases pressure on the rest of the public transport network
- in outer areas, acting as the key connection to and between major centres, other parts of the region and to major public transport hubs. Other forms of public transport cannot provide this function as effectively as rapid transit.

Figure 4-2 below illustrates how the rapid transit network functions as the backbone of a wider network. Local bus services connect to rapid transit services as key interchanges, and rapid transit then provides longer-distance connections, particularly to the city centre. In some areas, particularly the central isthmus, local buses provide these connections to the city centre.

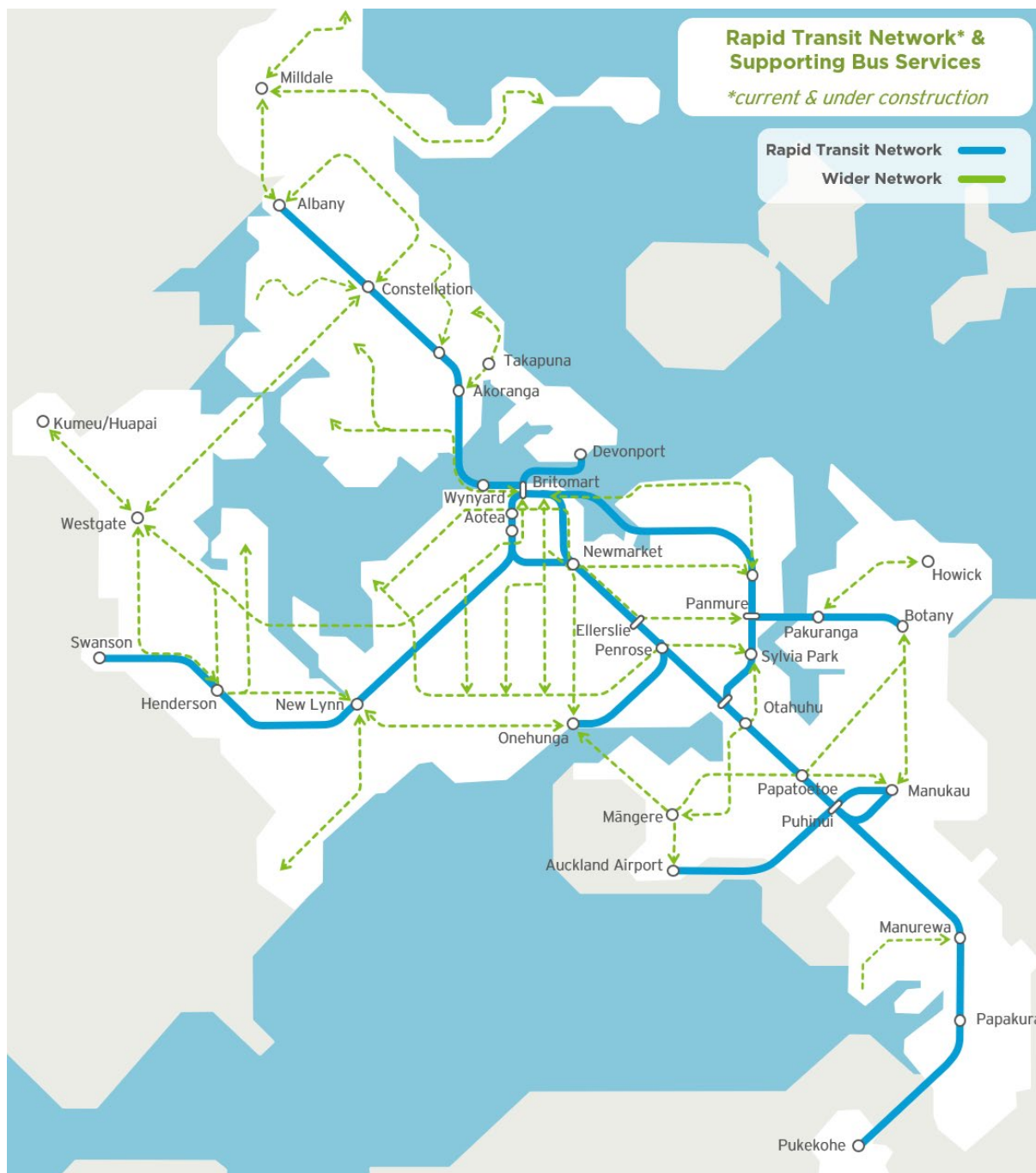


Figure 4-2 – Schematic map of rapid transit within public transport network

4.4 Providing space-efficient access to opportunities

Safe, reliable and sustainable access to a wide variety of economic and social opportunities within a reasonable travel time is fundamental to the success of Auckland and the wellbeing of residents and visitors. For Aucklanders to benefit from the region’s growth, they need to be able to easily reach the new opportunities that growth provides them. This could be a more suitable and higher paying job, a better educational opportunity, important social connections, recreation, business customers, cultural institutions and more.

Auckland’s layout makes providing good access to opportunities challenging. Travel demand is channelled into a limited number of key corridors for trips between major sub-regions (north, west, central, east and south). Existing land-use patterns also focus travel demand into some locations (including the city centre, major centres, and Airport area). Many of these corridors are already under significant pressure at peak times, which will only increase further in the future as Auckland’s population continues to grow.

The ability to move people in relatively few vehicles and in relatively little space (per person) becomes increasingly important in these situations, where many people need to be moved along a constrained corridor or where many people are trying to access an important location.

Compared to the capacity of a single lane of traffic (800-2,000 vehicles per hour), rapid transit offers the potential to move vastly more people. The numbers possible vary depending on the mode’s capacity, and service frequency. This is outlined in Figure 4-3 below. The bars show the approximate numbers of passengers per hour that can be moved on different systems at a given number of vehicles per hour (the numbers within the bars). These numbers are a guide only and vary depending on the specific vehicle technology used. Anticipated demand is a key factor in determining the appropriate mode and vehicle capacity for a rapid transit corridor.

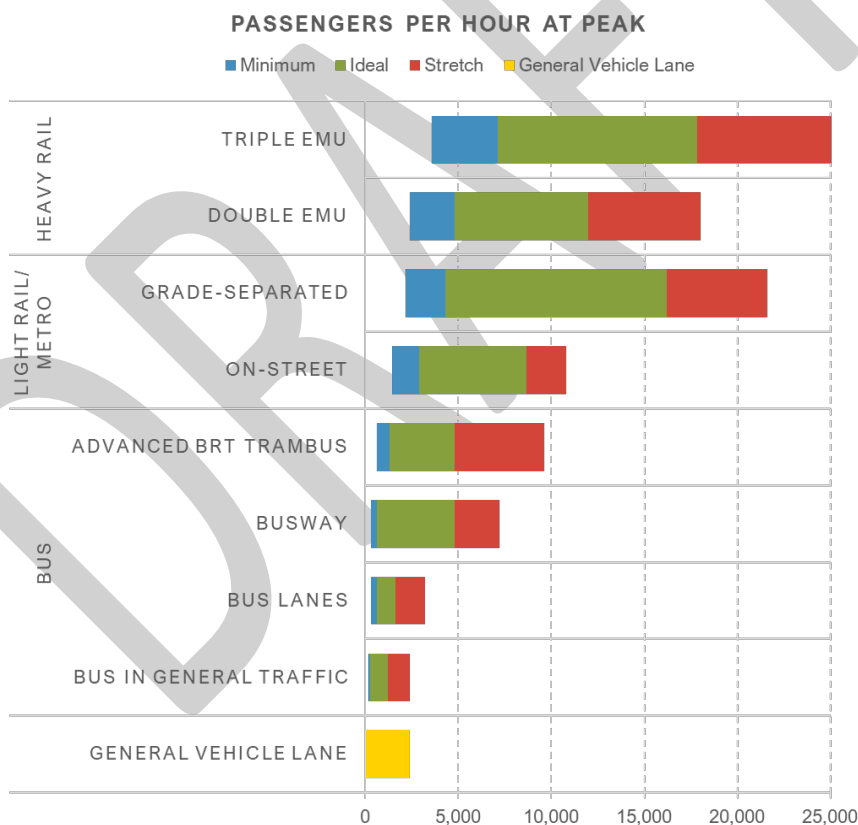


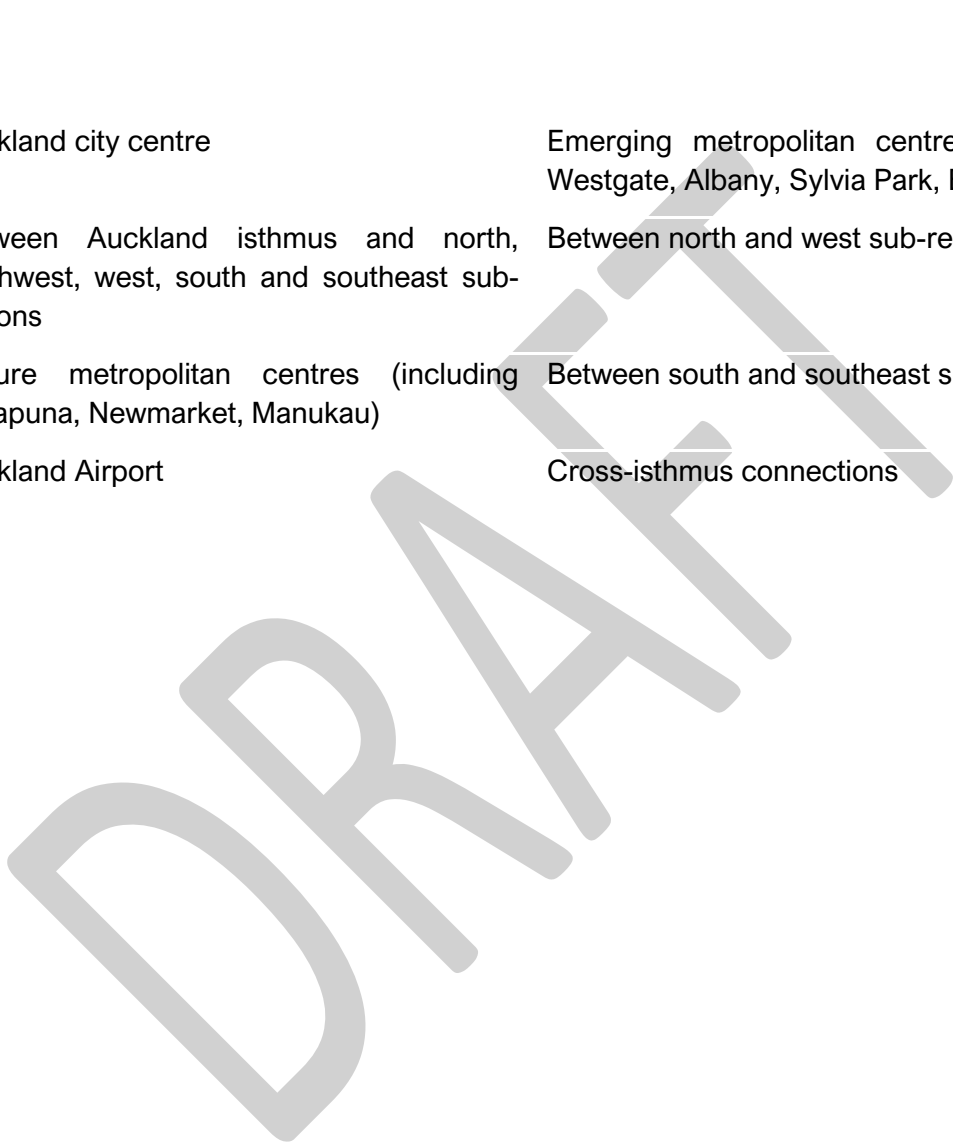
Figure 4-3 – Approximate passengers per hour that can be carried by different public transport modes.

Rapid transit’s dedicated corridors allow these access improvements to be maintained over time, even as demand grows (at least until services have extremely high demand levels). This contrasts with most other forms of transport, where growing demand leads to congestion and poor reliability and a gradual reduction in service quality over time.

Current and future corridors and locations within Auckland that are under the greatest pressure, and therefore have the greatest need for space efficient access that rapid transit delivers, are outlined in **Error! Reference source not found.** below. Rapid transit can play a significant role in addressing these constraints.

Table 2: Areas with existing and emerging access constraints

Auckland city centre	Emerging metropolitan centres (including Westgate, Albany, Sylvia Park, Botany)
Between Auckland isthmus and north, northwest, west, south and southeast sub-regions	Between north and west sub-regions
Mature metropolitan centres (including Takapuna, Newmarket, Manukau)	Between south and southeast sub-regions
Auckland Airport	Cross-isthmus connections



5. Rapid Transit Objectives

5.1 Summary

The objectives outlined below clarify the outcomes sought through the development of rapid transit networks. These objectives will inform future planning work and business case development.

The overarching objective is that rapid transit effectively performs its required role in the transport system, and the public transport network, to support and shape a successful Auckland. The specific objectives that support these roles are:

1. Increase access to opportunities, especially in major and growing employment areas
2. Increase people throughput on Auckland's most critical corridors
3. Increase the share of travel unaffected by congestion
4. Increase public transport's mode share, especially for medium to long journeys
5. Enable an integrated, efficient and effective public transport network
6. Focus most housing and employment growth in centres, nodes, and development areas⁶
7. Support high quality integrated urban communities

The objectives link with the transport system planning objectives used in Auckland, which underpin the development of Future Connect, ATAP and the RLTP. These system planning objectives, and the rapid transit objectives that support them, are:

- **Connecting** – Better connecting people, places, goods and services (supported by objectives 2 and 3)
- **Travel Choice** - Accelerating better travel choices for Aucklanders (supported by objectives 1, 3, 4 and 5)
- **Growth** – Enabling Auckland's growth through a focus on intensification in brownfield areas and some managed expansion into emerging greenfield areas (supported by objectives 6 and 7)
- **Sustainability** – Improving environmental resilience and sustainability of the transport system and significantly reducing the greenhouse emissions it generates (supported by objective 4).

⁶ As described in the Auckland Plan.

- **Safety** – Make the transport system safe by eliminating harm to people (supported by objective 4.)

The rest of this section outlines each objective in more detail.

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Objective 1: Increase access to opportunities, especially to major and growing employment areas

Increasing the number of people able to 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 is contributing to future jobs growth focused in a few key centres. Enabling safe and efficient access to these centres is critical to expanding the number of workers, and the variety of skills, within a reasonable travel time of these key locations. In doing so, it enables workers to reach these new job opportunities.

Due to its speed, reliability and service quality, rapid transit has a unique role to play in significantly increasing the number of people who are able to easily access these centres. 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 – which is also critical to their success.

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.

Objective 2: Increase people throughput on Auckland's most critical connections

Auckland's geography splits the city into several sub-regions, divided by water, topography, and linked by only a few connections. Travel demand is funnelled into a limited number of corridors, creating bottlenecks that result in congestion, poor travel reliability and ultimately much lower levels of access for areas outside the Auckland isthmus.

Ongoing population and employment growth are placing increased pressure on Auckland's most critical transport corridors, including the small number of connections between major sub-regions. 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. In some cases, this will involve 'upgrading' busy existing public transport routes to a higher capacity mode to achieve improved service quality. In other cases, rapid transit should be introduced as an attractive travel alternative to reshape travel demand along key corridors.

Measures:

- Capacity along key corridors.
- Person movement per hour along key corridors.

Objective 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. This means they will be able to time their trips more precisely and reduce 'buffer times' where people travel earlier than desired to compensate for poor reliability.

Measures:

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

Objective 4: Increase public transport's mode share, especially for medium to longer journeys, to help reduce emissions

The combination of rapid population growth and few opportunities to add road capacity within existing urban areas makes it critical to 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, meaning it has a key role to play in reducing 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, 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 per capita – link to measure around CO₂ emissions.
- Public transport ridership (total and per capita).

Objective 5: Enable an integrated, efficient and effective public transport network

As the core of the public transport network, rapid transit needs to be properly integrated with other public transport services, as well as walking and cycling networks, 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 easy transfers between the corridors.

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 be 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.

Objective 6: Focus most housing and employment growth in centres, nodes and development areas

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, thereby increasing land values and potentially improving the feasibility of higher density development. 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

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 distance of rapid transit.
- Proportion of new dwellings within cycling distance of rapid transit.
- Proportion of commercial development within walking distance of rapid transit.
- Proportion of commercial development within 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.

Objective 7: Support high quality integrated 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'. Higher intensity mixed use development, community facilities, public spaces and walking and cycling connections should be comprehensively planned with rapid transit to create 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. Some forms of rapid transit infrastructure, like elevated structures, should only be used very sparingly due to these negative impacts.

Measures:

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

6. Current Situation

6.1 Existing rapid transit network

Auckland’s relatively young rapid transit network is a result of significant investment in infrastructure and service levels over the past 15-20 years. Today, the rapid transit network comprises services on the electrified heavy rail network between Swanson and Papakura, as well as the Northern Busway.

Prior to the impacts of Covid-19, use of the rapid transit network was growing strongly, as people were attracted to these high-quality services. This is shown in Figure 6.

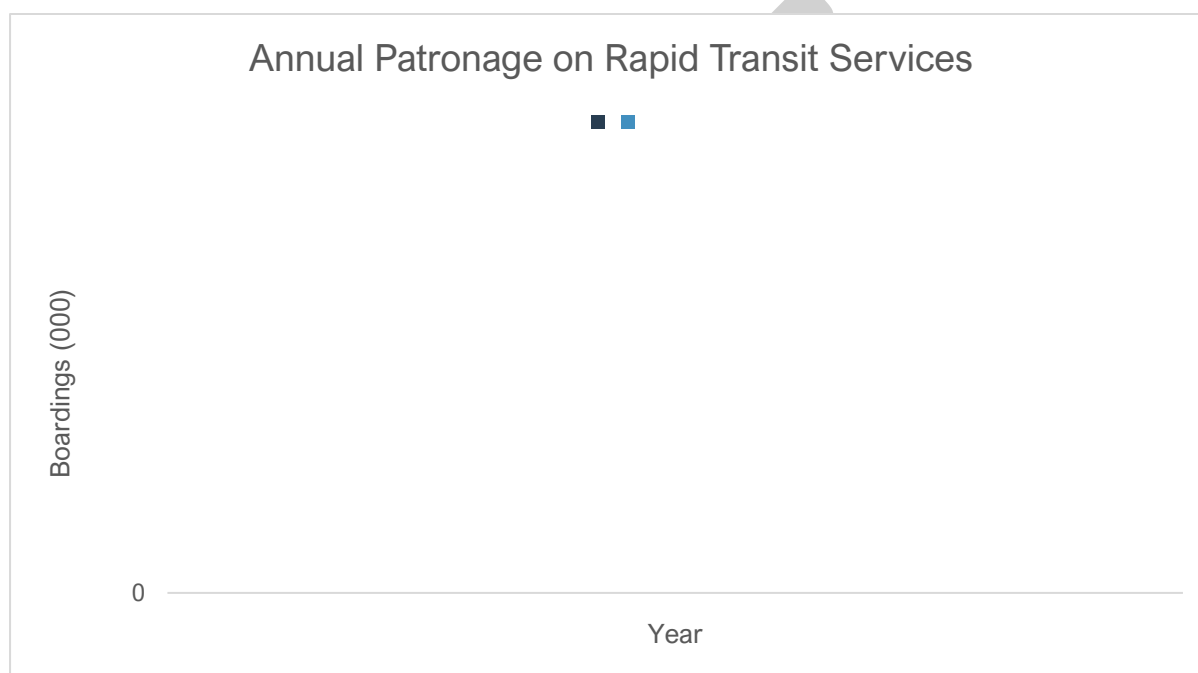


Figure 6-1: Annual boardings on Auckland’s rapid transit services, 2010-2019

The Northern Busway was opened in 2008 and serves several bus routes, including the core Northern Express services. These services also use the Auckland Harbour Bridge and local roads to the south of the busway, and bus shoulder lanes north of the busway between Constellation and Albany stations.

The rail network has provided passenger services within Auckland, and beyond, for over a century. Since Britomart station was opened in 2003, the rail network has been substantially upgraded to enable more frequent and reliable services. Electric trains were progressively implemented in 2014 and 2015.

The development of Auckland’s rapid transit network has played a central role in supporting increased ridership of public transport, with a large share of overall ridership growth occurring on rapid transit. Figure 6-2 shows how the rapid transit network’s share of ridership growth was greater than 50% between 2013 and 2018.

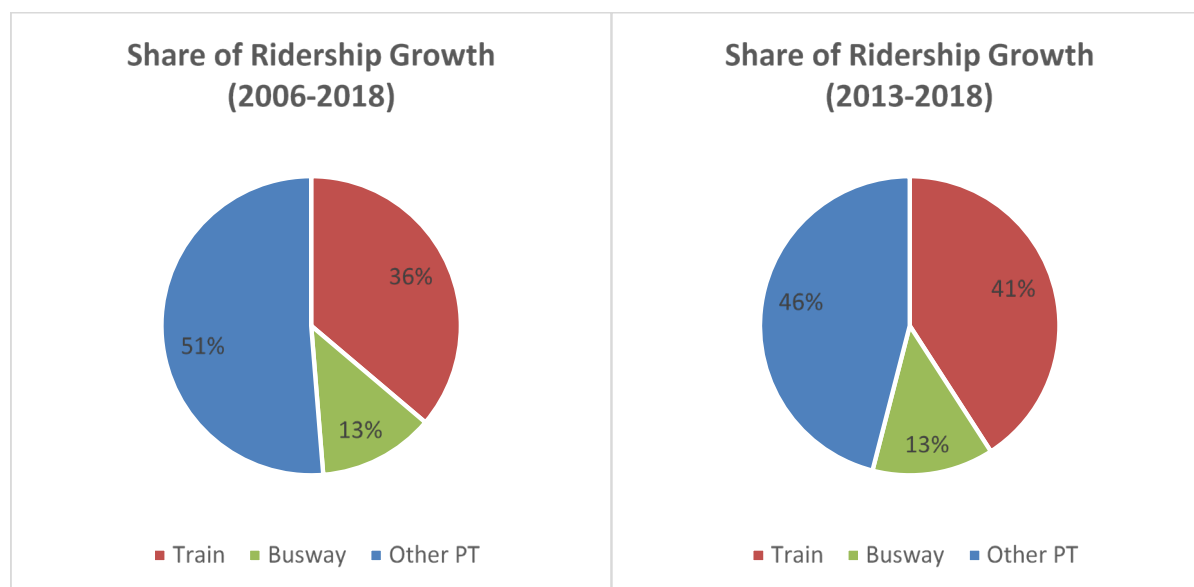


Figure 6-2: Rapid transit's share of ridership growth in Auckland

Improvements to Auckland's current rapid transit network's services and infrastructure are in progress, as shown in Table 3 below.

City Rail Link	3.5-kilometre-long twin rail tunnels linking Britomart Station with the North Auckland Line. Includes two new underground stations and a major upgrade to the current Mt Eden Station.	2024
Northern Busway Extension	Extends the Northern Busway from Constellation Station northwards to Albany Station. Includes an upgrade of Constellation Station and a new station at Rosedale Road.	2023
Eastern Busway	Provides the first stage of a new bus rapid transit corridor, between Panmure train station and Pakuranga. The busway will ultimately be extended to Botany in future stages.	2021

Table 3 - Rapid transit projects under construction

In addition to projects under construction, there are others currently in the planning phase, such as electrification and development of new stations between Papakura and Pukekohe.

These improvements are necessary to enable the existing network to fully perform the roles expected of it, as set out in this Baseline. Improving access to and between Auckland's metropolitan centres, the city centre, and other employment hubs, is a key objective for many of the corridors currently planned or under construction. As these corridors develop, they will also support higher-density development around stations.

As shown in Table 4 below, none of the existing routes that make up Auckland's current rapid transit network fully meet the definition of rapid transit set out in section 3. Many will be addressed by the projects that are already under construction (as shown in Table 3). How to address the remaining deficiencies will be a key consideration for future rapid transit planning.

Service	Fast	Frequent	Reliable	High Capacity	Dedicated Corridor	Shaping Urban Development
Western Line (rail)						
<i>Travel time and off-peak frequency issues will be resolved once City Rail Link and new timetable are operational.</i>						
Southern Line (rail)						
<i>Off-peak frequency issue will be resolved once City Rail Link and new timetable are operational.</i>						
Eastern Line (rail)						
<i>Off-peak frequency issue will be resolved once City Rail Link and new timetable are operational.</i>						
Onehunga Branch (rail)						
<i>Frequency limited by single track.</i>						
Pukekohe Connection (rail)						
<i>Existing shuttle service and associated infrastructure limit speed (due to transfer), frequency and capacity. Electrification will overcome these issues. New stations, part of the New Zealand Upgrade Programme, will help to shape urban development.</i>						
Northern Busway services (NX1, NX2)						
<i>Priority infrastructure does not extend for full length of services. This lack of a dedicated corridor creates delays and reliability issues in the city centre. The impact of these issues on customers is mitigated by the frequency of services. There is limited evidence to date of the busway shaping urban growth, although proposals for intensification near certain stations are emerging.</i>						
 Generally meets requirements		 Deficiencies that will be addressed by funded projects			 Deficiencies that will not be addressed by funded projects	

Table 4 - Assessment of existing rapid transit network characteristics

6.2 Strategic planning

The scale, cost, and long-lasting impacts of rapid transit give it as strategic significance that makes long-term planning especially important. In the Auckland context, a series of strategic planning documents guide more detailed planning, including the Auckland Plan 2050, the Auckland Transport Alignment Project (ATAP), the Regional Land Transport Plan (RLTP), Future Connect, and the Regional Public Transport Plan (RPTP).

To date, only the Auckland Plan and ATAP have set out the long-term rapid transit network in detail. Multiple versions of ATAP since 2016 have all emphasised the importance of Auckland’s rapid transit network to achieving long-term transport and urban form outcomes. ATAP 2018 largely focused on investments out to 2028, but also included a high-level diagram of a ‘potential’ future rapid transit network for Auckland, as shown below in Figure 6-3: ATAP rapid transit network plan below.

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Figure 6-3: ATAP rapid transit network plan

This diagram built on previous versions of ATAP that had identified the most likely future rapid transit corridors but took a step further by identifying the likely appropriate mode for each corridor. ATAP considered that detailed decisions about mode, exact alignment, sequencing and other design matters would need to be addressed through more detailed work, such as network planning and project-level business cases.

Work to date on these business cases has confirmed and advanced the understanding of the need for key corridors, including City Centre to Māngere, the Northwest, North Shore, and

Airport to Botany. Some of this more detailed work has raised key issues with the high level network outlined in ATAP, or has reached key points in project development where more detailed network guidance is required to move forward.

This highlights the need for a more detailed network-level plan, to incorporate the more detailed thinking from business cases while also provide more direction to business cases, particularly on how individual corridors should integrate together. Some business cases will not be able to advance further without an answer to network-level questions, such as how new corridors (such as City Centre to Māngere, Northwest and North Shore) will interact in the city centre.

The remainder of this section discusses each of the rapid transit corridors in the above diagram in more detail (the heavy rail network is discussed as a whole). It provides context, current status, latest findings of current work (where relevant), and a view to the future for each corridor.

Each corridor includes information under the following headings:

- Overview – this section includes a general description of the corridor, its history, and expected demands. Sub-headings cover:
 - Status – whether the corridor is existing, under construction, under investigation (the subject of current business case or pre-construction work), or conceptual (shown on plans only).
 - Mode – the existing mode on the corridor, planned (where funding is committed) mode, or potential mode (where investigations are on-going).
 - Type – radial (routes connecting to the city centre) or crosstown (routes between other key centres or interchanges).
- Transport function – a description of the corridor’s current and planned role in the wider transport network.
- Shaping urban form – how the corridor is expected to respond to and influence land use, now and into the future.
- Objectives – key goals for the corridor to achieve to meet expectations about its transport function and role in shaping urban form. This includes the relevant network-level objective that the corridor objective supports.

The final part of this section then covers interfaces between corridors, outlining locations where multiple corridors meet and issues that need to be considered.

6.3 Rail Network

Overview:

Auckland's passenger rail network operates four lines:

- The Western Line between Britomart and Swanson.
- The Eastern Line between Britomart and Manukau.
- The Southern Line between Britomart and Papakura, with a diesel shuttle providing connections between Papakura and Pukekohe.
- The Onehunga Line between Britomart and Onehunga.

Status:	Existing (electric service on four lines, plus diesel shuttle on one line) Under construction (City Rail Link) – expected opening in 2024. Under investigation (Papakura to Pukekohe electrification and new stations) – targeted opening in 2025.
Mode:	Heavy rail (existing)
Type:	Radial

Auckland's rail network forms the majority of the existing rapid transit network and will continue to play a significant role in its future. Patronage has grown strongly since Britomart Station was opened in 2003. The introduction of electric trains in 2014, and the reorganisation of bus services to better connect with trains between 2016 and 2018, has supported continued passenger growth. Prior to the first COVID-19 lockdown in March 2020, trains were carrying 22 million passengers per year.

The next step change in the rail network will occur when the City Rail Link (CRL) opens in late 2024. This will significantly improve travel times to the city centre from across the network, especially the Western Line. It will also enable trains to operate more frequently during peak times and throughout the day. The extra frequency and capacity provided, combined with improved access, is expected to lead to further growth in patronage.

The CRL's opening will be supported by investment in complementary infrastructure, including:

- a third main line between Wiri and Westfield, which enables increased frequencies. This is funded by the Government's New Zealand Upgrade Programme (NZUP)
- additional trains, to enable increased frequencies, along with upgrades to support their stabling and maintenance
- improvements to signalling and rail network management, to enable more efficient operations

- grade separations and closures of rail level crossings to improve safety and enable increased train movements.

These infrastructure upgrades are part of the Auckland Rail Development Plan (ARDP), which is led by KiwiRail (as the owner of the rail network) with input from Auckland Transport (which plans passenger services) and Waka Kotahi (as a key funding partner and the regulator of rail safety in New Zealand). The ARDP feeds into ATAP and is reflected in the Government's New Zealand Rail Plan.

NZUP is also funding the electrification of the southern line between Papakura and Pukekohe, as well as the construction of new stations in Drury and Paerata. Electrification will remove the need for passengers from Pukekohe to change from the existing diesel shuttle to electric trains at Papakura, and support growth occurring in Drury and Paerata. It is anticipated the electrification and new stations will be complete around 2025.

Once these currently programmed works are complete, Auckland's rail network will have capacity for around 22,000 passengers per hour on trains to the city centre during the peak. This is an increase from around 15,000 passengers per hour in 2020. The maximum capacity enabled by the CRL is 54,000 passengers per hour. Significant further investment will be required to reach this maximum. Elements of this further investment will include:

- additional rolling stock, depots, and supporting facilities
- extending the third main from Wiri to Pukekohe and adding a fourth main line from Wiri to Westfield
- further separations and closures of rail level crossings which will be rolled out as a programme of works
- further upgrades to signalling equipment
- upgrading all stations across the network to enable longer trains which will be undertaken in a targeted programme enabling longer trains on services with limited stops.

These upgrades will occur in progressive steps, each enabling an increase in peak hour capacity. KiwiRail, Auckland Transport and Waka Kotahi are working together to better understand when this investment will be required, to ensure growth in passenger demand can be met. This investment will also ensure the right infrastructure is in place so that KiwiRail can continue to meet demand for rail freight services as passenger demand grows.

Inter-regional trains (such as the Northern Explorer between Auckland and Wellington, or the Te Huia service between Auckland and Hamilton) are not considered rapid transit, given their limited frequency.

Transport function

Rail is a core part of Auckland's transport network, providing for a wide range of passenger trips while also playing a key role in Auckland's freight system. For large parts of East, South and West Auckland, the rail network is the only public transport connection to the city centre, and local buses act as feeder services to key train stations to expand the catchment of the rail network.

Most stations focus on serving their immediate walk-up catchment, with less than 10 per cent of boardings arriving by bus and most boardings resulting from walking, cycling or being dropped off. However, transfers from buses make up a significant proportion of boardings at key interchanges, including Panmure (44%), Ōtāhuhu (44%) and Manukau (32%). Park and rides play a role at some stations, generally in outer parts of the region. This trend is expected to continue in the future as residential intensification results in more people living within walking distance of stations. However, the number of transfers may grow as a proportion of overall boardings at key interchanges.

Auckland's land-use patterns mean the rail network caters for both long-distance trips between outer suburbs and the city centre, as well as local trips over shorter distances. The split of these roles varies by line; the Southern line caters more for longer-distance trips where speed is an advantage, while the Western line has the greatest use for local trips which tend to be shorter distances. This creates a tension on some lines currently; the need to balance both roles mean neither is as well provided for as it could be. In future, infrastructure investment is likely to be required to enable multiple service patterns to operate so that both roles can be better catered for. This would allow long distance trains from the south to run express through parts of the network, skipping stations and thereby reducing travel times, while other trains serving all stops would cater for short distance trips. Passengers could change between these types of services at key interchange stations.

Shaping urban form

Because much of Auckland's rail network dates back to the 19th century, many of Auckland's town centres developed along the Southern and Western lines. Today, this creates a significant opportunity for the rail system to support the redevelopment of these centres to higher densities and a wider mix of uses. 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.

The metropolitan centres of Henderson, New Lynn, Newmarket, Sylvia Park, Manukau and Papakura are all served by the rail network. Boardings at all these stations are higher than most other stations on the network. The boarding profiles of Sylvia Park, Manukau, and Henderson (and the other centres to a lesser extent) show that they are well-used destinations throughout the day. This contrasts with suburban station commuter profiles having most boardings in the morning peak, and most alightings in the evening peak. This shows that the rail network plays an important role in servicing the metropolitan centres for trips other than commuting. The importance of this role is expected to increase over time as these centres further develop and intensify.

Future role and objectives

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 key role of the heavy rail network in the future is likely to be to continue to serve its current catchments.

A combination of population and employment growth in the areas served by rail (including buses that feed into rail), and ongoing mode shift as rail becomes an increasingly attractive travel choice over time through investments like CRL, means higher frequencies and longer trains will be needed to meet future forecast demand and make the most of the CRL. There is also a need, especially in the south, for rail to provide a fast-enough trip for longer distance journeys so that it becomes the primary travel choice for those trips. Reducing conflicts between passenger and freight trains is also an ongoing need.

Overall, the key objectives for the rail network are:

- to enable and support ridership growth and mode shift in parts of Auckland served by the rail network.
- to better support the multiple roles the rail network plays in providing for shorter-distance, longer-distance and inter-city trips on passenger services, as well as increased freight volumes.
- to support redevelopment and intensification around existing train stations (especially in town and metropolitan centres), including best practice transit-oriented developments (particularly where new stations are provided in greenfield growth areas).

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6.4 City Centre to Māngere

Overview

Planned connection between the City Centre and Auckland Airport via Mount Roskill, Onehunga and Māngere.

Status: Under investigation – targeted opening in late-2020s

Mode: Light rail or light metro (potential)

Type: Radial

The City Centre to Māngere corridor has been the subject of multiple investigations since the mid-2010s. Initial work was led by Auckland Transport, before being handed to Waka Kotahi for further business case development. This work investigated a potential surfaced-based light rail corridor.

The proposed transit corridor was intended to address existing and growing bus congestion issues on Dominion Road and surrounding corridors and support intensification of the central Auckland isthmus. It would also significantly improve access to Māngere, where high-quality public transport options are limited and potential for significant redevelopment exists. The corridor would also provide a single-seat ride from the city centre to Auckland Airport.

In 2019, the Ministry of Transport led a ‘parallel process’ that assessed bids from both Waka Kotahi and New Zealand Infra to develop alternative ways to provide rapid transit in the corridor, including considering funding and financing arrangements. Both bids developed were based on a light metro system, which would provide faster end-to-end travel times but have different local transport and urban development outcomes from the previous light rail schemes. In 2020 Cabinet agreed to end the parallel process and re-tasked the Ministry with developing options for public sector-led delivery of rapid transit in the corridor. This work is ongoing.

Transport function

Dominion Road, Symonds Street and Wellesley Street⁷ are some of the busiest bus corridors in New Zealand. A step-change in public transport capacity and efficiency is required to meet on-going ridership growth and alleviate current and forecast bus capacity constraints in the city centre. Without this, increased travel times to and around the city centre will negatively impact Auckland’s productivity. Upgrading the corridor to rapid transit will address these issues.

The wider corridor will also improve access to growing employment areas, including at and around Auckland Airport, the wider Onehunga area, and the City Centre. Without a major increase in the number of people accessing the airport by public transport, the road network will not be able to function effectively, and the success of this critical employment area will be

⁷ When not affected by CRL construction activity.

placed at risk. Access to the airport is constrained given there are only two corridors that connect it to the wider transport network, neither of which provide well for public transport.

Improved public transport access to the airport is primarily intended to serve workers in the wider precinct. The rapid transit corridor will also provide an attractive and reliable “one seat journey” between the city centre and airport for travellers. While single-seat options between the two locations do exist, these are subject to congestion and therefore unreliable travel times. The objective for this single-seat connection is therefore to ensure it is reliable, with end-to-end journey time somewhat less important given these trips will be a relatively small proportion of trips along the corridor (approximately four per cent in the morning peak).

Shaping urban form

Previous work has highlighted that the provision of rapid transit in this corridor can unlock significant growth potential along its route, especially:

- Employment growth at both ends of the corridor: in the city centre and at the Airport. Access constraints to the city centre, and poor travel choices to the Airport, are both expected to constrain employment growth in these two critical locations over time.
- Housing growth along the corridor, particularly at Māngere, Onehunga and Mt Roskill where there are major public landholdings and significant redevelopment potential.

Providing a step-change in improved access along this corridor, combined with significant investment by Kāinga Ora in Mt Roskill and Māngere and 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 upgrade the streetscape amenity of the various centres on the route, supporting their role as key community hubs and helping to encourage intensification along the corridor.

Corridor Objectives:

Objectives for this corridor were outlined in ATAP 2018 as:

- Alleviate current and forecast bus capacity constraints in the city centre.
- Improve access to growing employment areas, particularly at and around Auckland Airport.
- Unlock significant growth potential along the corridor, especially around Mangere, Onehunga and Mt Roskill.
- Provide an attractive and reliable “one seat journey” between the city centre and airport for travellers.

6.5 Northwest

Overview

Planned connection between Kumeū, Westgate, Point Chevalier and the City Centre.

Status:	Existing limited bus priority lanes (on motorway shoulders and Great North Rd)
	Under investigation (interim bus improvements) – targeted opening in mid-2020s
	Conceptual (light rail) – no anticipated date for opening
Mode:	Bus rapid transit (planned for interim)
	Light rail (potential)
Type:	Radial

The need for a step-change in the quality of public transport available to Auckland’s north-western suburbs has been recognised at a strategic level over the past decade. A rapid transit corridor alongside State Highway 16 will enable fast, frequent and reliable service, supported by connections with a reorganised local bus network.

Auckland Transport previously investigated the appropriate mode for this corridor. An indicative business case suggested a busway was the most appropriate mode, because it could be more easily staged (however this business case did not look at city centre constraints). ATAP 2018 determined that light rail provided a better long-term solution and could integrate with the proposed City Centre to Māngere corridor, while also highlighting that staging options and shorter-term bus improvements should be investigated in more detail.

Recent work has focused on developing an interim bus-based solution, which can be implemented quickly in advance of further work on the corridor. This will give buses greater priority, and implement interchanges at Lincoln Road and Te Atatū, enabling a reorganisation of the local bus network to connect with motorway-running buses.

The Government’s COVID-19 Recovery and Relief Fund has allocated \$50 million to support this interim solution, which will be operational by the mid-2020s. Future demand will exceed the capacity this interim solution will enable, so work must continue on the permanent solution.

Transport function

State Highway 16 is a critical corridor for the Northwest of Auckland. There are a number of centres and suburbs located along this corridor, such as Te Atatū, Massey, Westgate, West Harbour, Hobsonville, Whenuapai and Kumeū that are far from other rapid transit services and have limited public transport options available. This has led to low public transport mode share in the area, and over-reliance and congestion on the motorway.

A rapid transit corridor will enable fast, frequent and reliable services to complement the State Highway’s function, increasing transport choices for the northwest. While the motorway currently has some bus shoulder lanes that operate at peak time, these do not enable an attractive public transport service. Buses cannot stop in the shoulder lanes to provide access to destinations or connections to other services. This means an efficient connected network cannot operate in the area. As such there are no high frequency services available all-day, and public transport does not provide direct connections to key destinations.

New interchanges on the rapid transit corridor will enable a connective and more frequent network, improving access not only to the City Centre but also to key destinations across the northwest. This will make public transport more attractive for a wider range of trips. Journeys to the City Centre in particular will be much more attractive once the corridor is in place.

Shaping urban form

A lack of attractive public transport options has led to the northwest being historically low density and reliant on private vehicles. Recent developments, particularly in Hobsonville Point, have begun to shift to denser housing typologies. 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 typologies, as well as providing residents with mode choice and the ability to avoid congested road corridors.

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, including Kumeū and Point Chevalier. Appropriate intensification will also be enabled around other stations along the corridor, which will provide amenity that supports the functioning of the stations as key assets in their communities.

Corridor Objectives

Objectives for this corridor were outlined in ATAP 2018 as:

- Support substantial growth along the corridor and in the broader northwest part of Auckland.
 -
- Address the projected decline in employment access in the west
- Provide an opportunity for travellers to avoid projected congestion along State Highway 16 and to improve the productivity of this corridor
- Improve the frequency, connectivity and efficiency of public transport in this part of Auckland
- Support increased mode share of public transport system in this part of Auckland.

6.6 North Shore

Overview

Existing bus rapid transit corridor between Hibiscus Coast, North Shore, and the City Centre.

Status:	Existing (Constellation to Akoranga)
	Under construction (Albany to Constellation) – targeted opening in 2023
	Conceptual (Milldale to City Centre) – no anticipated date for opening
Mode:	Bus rapid transit (existing)
	Light rail or light metro (potential)
Type:	Radial

The northern busway is one of Auckland’s most successful public transport corridors, and the Northern Express bus rapid transit services are the busiest bus services in the region (measured by annual boardings). Services currently have a dedicated corridor between Constellation and Akoranga stations, within sections of bus lanes operating on the approaches to the Harbour Bridge and also within the City Centre. Work is currently underway to extend the physical busway to Albany Station.

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. This significance will only increase as the population of its catchment increases. Te Tupu Ngātahi, the Supporting Growth Alliance, has been investigating the future extension of the rapid transit corridor to Milldale, via the future urban zone of Dairy Flat. In the interim, bus shoulder lanes along State Highway 1 will enable an improvement in the reliability of the existing services to Hibiscus Coast station.

Recent work by Waka Kotahi and Auckland Transport has confirmed previous expectations that the busway in its current form will eventually run out of capacity, likely in the late 2020s. Even with upgrades to the busway, the scale of growth in the wider North Shore and Hibiscus Coast will require a higher-capacity mode within the next 20 years. Over 12,000 people per hour are expected to use the corridor in the 2050s, the highest forecast demand of any rapid transit corridor in Auckland.

Further work is required to determine the exact mode, route and timing of this new connection. It may complement the existing busway, rather than replace it. A new connection may be able to directly serve the Takapuna metropolitan centre. How the North Shore corridor interacts with the rest of the rapid transit network in the City Centre is also a key question further work must answer.

Transport function

The North Shore has very few strategic transport corridors, given its geography and history of development. This concentrates many trips onto State Highway 1. The current busway provides a high-capacity and congestion-free alternative to this corridor.

The busway relies on feeder bus services to extend its catchment to cover the wider North Shore. Transfers from local buses make up a third of boardings at all the stations on the busway, and over two-thirds at Akoranga, Sunnynook and Constellation stations. Park and rides at the northern stations also contribute significantly to patronage. The existing stations have limited walk-up catchments due to their proximity to, and the severance created by, the motorway. This is expected to change over time as the surrounding areas intensify and new stations north of Albany are better integrated with surrounding development.

The current corridor focuses primarily on trips to-and-from the wider city centre (including Ponsonby and Newmarket). One route from the upper East Coast Bays uses the busway to Smales Farm, before travelling to Takapuna. A future rail-based corridor may include Takapuna, which would enable the corridor to be used for more trips within the North Shore. The extension to the Hibiscus Coast will also provide access from that area to the metropolitan centres of Albany and Takapuna.

Shaping urban form

Growth on the North Shore has been strongly influenced by its transport connections across the Waitematā Harbour. Initial development relied on ferries to access the city centre, before the opening of the Harbour Bridge in the 1950s and construction of the Northern Motorway enabled greater levels of development. Without significant accompanying investment in public transport the majority of the North Shore, and more recently the Hibiscus Coast, developed as low-density suburban areas with limited availability and use of public transport.

The construction of the Northern Busway in the 2000s has significantly increased public transport use but its 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.

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

Corridor Objectives

- Provide fast, frequent, reliable and high capacity connectivity along the main north-south 'spine' of the North Shore, and between the North Shore and the isthmus, especially for trips to the city centre.
- Add resilience to the North Shore's transport system and to cross-harbour travel.
- Support the growth of key centres on the North Shore, especially Takapuna and Albany, and the creation of best practice transit-oriented developments in greenfield growth areas around Dairy Flat and Silverdale.

6.7 Eastern Busway

Overview

Planned connection between Ellerslie, Panmure, Pakuranga and Botany.

Status: Under construction (Panmure to Pakuranga) – expected opening in 2021
Under investigation (Pakuranga to Botany) – targeted opening in 2024
Conceptual (Ellerslie to Panmure) – no anticipated date for opening

Mode: Bus rapid transit (planned)

Type: Radial

The eastern busway is a planned 7km radial rapid transit route that will provide a high-quality connection to Panmure station from the wider East Auckland area. Panmure station was upgraded as an early stage of the project in 2014. The first stage of the busway itself is now under construction between Panmure and Pakuranga and will be operational in 2021. The subsequent stages between Pakuranga and Botany are under investigation, with an application to designate the corridor expected in 2021. Construction of these stages is funded by the Regional Fuel Tax.

The busway is being designed for over 4,000 passengers an hour in the peak direction (which will require buses running more frequently than one every minute).

Transport function

A lack of reliable and fast services contributes to East Auckland having very low public transport mode share, relative to the wider Auckland region.⁸ The eastern busway is intended to help address this low mode share, by providing infrastructure that will significantly increase the speed, reliability and attractiveness of services.

The dedicated corridor is being designed as an ‘open’ busway that can be used by multiple different bus routes. This maximises the area that benefits from the busway. Services from both the Ti Rakau Drive and Pakuranga Road corridors will use the busway to access Panmure Station, where many people transfer to the train to access the City Centre and other destinations.

The ability to improve services from multiple corridors is a key reason why an open busway is appropriate for this corridor. Another mode would force people wanting to connect to trains at Panmure to transfer twice and reduce the attractiveness of the network.

Shaping urban form

⁸ 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%.

Much of East Auckland (the area within the bounds of Howick Local Board) was developed during the second half of the 20th Century. It is largely low-density and has a car-based urban form that does not support walkability. Which is partly why the area has low levels of public transport use. This, combined with limited local employment opportunities that requires many residents to commute to jobs outside the area, has resulted in significant congestion on Pakuranga Road and Ti Rakau Drive at peak times. This congestion slows down buses making them a less attractive transport option.

A current lack of transport choices is a key contributor to limiting the attractiveness of these locations for redevelopment. Due to reliance on private vehicles, large amounts of carparking is required in and around the centres which in turn limits land available for development. The Eastern Busway 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.

Extension to Ellerslie

Previous network planning has envisaged an extension of the Eastern Busway from Panmure west to Ellerslie station. No detailed planning work has progressed for this section of the corridor to date. The main service that will use the busway, route 70, continues from Panmure to the City Centre via Ellerslie Panmure Highway and Great South Road.

Bus priority lanes operate for much of this route, for various periods (24 hours in the City Centre, 7am-7pm around Newmarket, and at peak times on Great South Road). Ellerslie Panmure Highway has no bus priority measures. Given the main busway service runs on this section, congestion on the highway can affect the reliability of services on the busway itself.

AT's Connected Communities programme is proposing to upgrade the corridor between Ellerslie and Panmure to include bus priority. This would help to ensure reliability for services using the corridor but will not provide the level of separation required by rapid transit.

Upgrading this section of the corridor to a full busway over time will enable increases in priority and volumes of service. It will provide for improved connections from East Auckland to the rapid transit network at Ellerslie station, as well as the wider Ellerslie employment area. Under the NPS-UD, new rapid transit stops along the corridor would also trigger changes in zoning to enable intensification along Ellerslie Panmure Highway.

Corridor Objectives:

- Increase public transport ridership and mode shift in east Auckland by providing a step-change improvement to service speed and reliability.
- Extend the rail network's catchment into east Auckland through a high-quality bus/rail interchange at Panmure and a fast, frequent and reliable bus journey in east Auckland.
- Help unlock significant growth potential along the corridor, especially at Botany, Pakuranga and Panmure.

6.8 Airport to Botany

Overview

Planned connection between Auckland Airport, Manukau and Botany.

Status: Under construction (interim improvements) – expected opening in 2021
Under investigation (full scheme) – targeted opening in mid-2030s

Mode: Bus rapid transit (planned)

Type: Orbital

This is a planned rapid transit corridor connecting key destinations in southeast Auckland. Significant planning work has progressed on this corridor over the past two years, confirming bus rapid transit as the preferred mode due to demand and stage-ability. This work has also led to the development of a phased programme that integrates delivery of the rapid transit corridor with planned road improvements to State Highway 20B.

The first phase of improvements, which includes an upgraded bus/train interchange at Puhinui station and new transit lanes between Manukau and the Airport, is now under construction. This phase will open in 2021. Subsequent phases of improvements to the mid-2030s would see progressive extension of services and implementation of the final infrastructure.

The project is expected to cater to over 2,500 passengers during the peak hour in the 2040s.

Transport function

Auckland Airport is a significant employment area in South Auckland. Access to the airport is constrained given there are only two corridors that connect it to the wider transport network. This leads to congestion at peak times when workers in the airport precinct are changing shifts. Public transport on these two corridors is limited, and while operating frequently it is subject to significant reliability issues caused by the congestion. Variable and slow travel times result in a limited catchment and unattractive service, particularly for workers who commute from a wide area.

A fast, frequent and reliable rapid transit service will significantly improve access to the airport and expand the catchment for which public transport is an attractive option. A connection to the rail network at Puhinui will integrate the airport to the wider rapid transit network. This is primarily intended to cater for the large workforce in the wider airport precinct but will also benefit air travellers.

Reliance on private vehicles is also a characteristic of southeast Auckland. Existing rapid transit connections focus on radial trips towards the City Centre. Local bus connections, especially on trips between the key centres of Manukau and Botany, are indirect, have limited priority and, as a result, are unreliable. 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.

Shaping urban form

Significant potential for intensification exists along the intended corridor, especially in Manukau and Botany metropolitan centres. Substantial public sector investment is planned for Manukau through Kāinga Ora and Panuku led developments. This will bring a greater mix of residential and commercial uses to the area and could be aligned with the implementation of the rapid transit corridor through Manukau, to minimise disruption and maximise the potential for complementary private sector redevelopment in the area.

Rapid transit will support improved use of public transport to access these centres, which will be important as they transition from largely car-dependant centres to locations with a range of transport options. This transition is already underway in Manukau, with recent investments in its train and bus stations, but Botany currently has limited public transport infrastructure. Investment could also support intensification of the more suburban sections of the corridor, particularly along Te Irirangi Drive. This would contribute to increased amenity and more intense land use around the corridor's stops.

Provision of rapid transit to the corridor could also support an intensification of office-based employment in the airport precinct. A lack of transport choices currently suppresses development potential at the airport, as potential employees are put off by the limited and unreliable options. Intensification of uses at the airport will support increased employment in the wider South Auckland area.

Corridor Objectives:

- Improve access to southern Auckland's two major employment areas (Manukau and the airport).
- Provide a connection to the heavy rail network through an upgraded Puhinui station.
- Improve transport options for the highly car dependent southeast Auckland.
- Support major growth opportunities at key locations along the route, particularly around Manukau, Puhinui and Botany.

6.9 Upper Harbour

Overview

Planned connection between Henderson and Constellation stations via Westgate.

Status: Conceptual – no anticipated date for opening

Mode: Bus rapid transit (potential)

Type: Orbital

This is a potential rapid transit corridor that has been previously identified in high-level plans. Previous work by Auckland Transport has also investigated parts of the corridor. Transit lanes on Lincoln Road have been designed to prioritise buses between Henderson and State Highway 16, which will form an early stage of this corridor. This upgrade is expected in the mid-2020s, although an Upper Harbour service may not use Lincoln Road immediately following the upgrade. Previously, Indicative Business Case work on the Northwestern corridor also identified a potential alignment for a busway alongside State Highway 18 between Westgate and Hobsonville Point. There is no date for when this section may be implemented. No detailed work has occurred on the section through Greenhithe.

Transport function

This corridor is intended to provide a high-quality and direct public transport option for trips between the North Shore and West Auckland. It will also serve communities adjacent to the corridor and provide them improved access to radial rapid transit connections. The existing bus service that connects these areas travels on local roads which are not as direct as the motorway and have limited bus priority. This means the service is slow, unreliable compared to services on many arterials with priority, and, as a result, is not seen as an attractive option (particularly outside of peak times). There are limited alternative routes which could be used to make this service more attractive, which is why a dedicated corridor is required.

This orbital corridor will connect three radial rapid transit corridors, the Northern, Northwestern and Western lines. Providing fast and reliable connections between these lines will increase the usefulness of the entire rapid transit network for a wider range of trips.

Shaping urban form

Northwest Auckland is growing quickly, through new developments like Hobsonville. This rapid growth is likely to continue, as future urban areas at Whenuapai, Red Hills and Kumeu-Huapai are developed. 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. This means the corridor has a key role to play in supporting these areas as significant centres for residential and employment growth.

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 unless 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 to reduce pressure on key transport links to other parts of Auckland.

Corridor Objectives:

- Provide a fast, frequent and reliable rapid transit connection between West Auckland and the North Shore.
- Enable, support and shape high quality growth and development outcomes in Henderson, Westgate, Albany and near stations along the corridor.
- Improve access to employment and other opportunities, especially from West Auckland to the North Shore.

DRAFT

6.10 Southern Isthmus

Overview

Potential connection between New Lynn and Onehunga via the southern Auckland isthmus.

Status: Conceptual – no anticipated date for opening

Mode: Bus rapid transit (potential)

Type: Orbital

This is a potential rapid corridor that has been previously been identified in high-level plans. Little detailed planning has been undertaken to identify its exact route. These plans have envisaged a bus rapid transit corridor. Other options could be possible, depending on how the wider rapid transit network develops and if there is a potential for this corridor to share their infrastructure.

Transport function

The southern Auckland isthmus has good radial public transport links to the city centre, which provide frequent services supported by varying levels of bus priority. These offer competitive travel options to the City Centre and fringe, particularly during peak times. Key projects, including Connected Communities and the City Centre to Māngere rapid transit corridor, will further strengthen the priority of these routes and improve their reliability and travel times.

The area's orbital public transport links (to the east and west), however, are not as strong. While there are public transport services connecting to key centres in New Lynn and Onehunga, these are generally not as frequent and not as well supported by bus priority measures as the radial routes. Improving these connections, by introducing a new rapid transit option, will significantly improve travel choices in the area. It will also integrate with the wider rapid transit network in a number of locations, significantly increasing the catchment of the network and thereby making the wider rapid transit network useful for a wider range of trips.

Shaping urban form

There are several major growth areas across the southern isthmus, including New Lynn, Avondale, Mt Roskill, Three Kings, Royal Oak and Onehunga. New and improved radial rapid transit corridors, including the western rail line and City Centre to Māngere, will provide increased access to these areas. Given their significant growth these areas should also be supported by an orbital corridor, to ensure that a wide range of destinations are accessible by public transport. Investment in an orbital corridor will support that in the radial corridors, improving the usefulness of the wider rapid transit network.

Given the significant public land holdings in the area there is potential to integrate this rapid transit corridor with these developments. Integrating stops on the rapid transit corridor with higher-density redevelopment has the potential to maximise the benefits of both investments.

Corridor Objectives:

- To enable a wider variety of journeys by rapid transit by linking together several radial corridors and creating a connected network.
- Enhance access to the New Lynn metropolitan centre from the southern isthmus.
- To support access for the substantial redevelopment opportunities in the southern isthmus.

DRAFT

6.11 Devonport ferry

Overview

Water-based connection between Devonport peninsula and the city centre.

Status: Existing (not operating at rapid service levels)

Mode: Ferry

Type: Radial

Ferries have connected Devonport to Auckland since the 1860s. They have remained a popular way to access the city centre since the opening of the Auckland Harbour Bridge, as they offer a reliable and time-competitive option compared to the often-congested Lake Road and Harbour Bridge.

The ferry currently does not operate frequently enough to be considered rapid transit. It is also privately operated, meaning that Auckland Transport cannot specify its timetable. If the service were to be operated frequently throughout the day, it would be considered rapid transit.

Transport function

The ferry plays an important role in connecting Devonport to the city centre and wider rapid transit network. The only alternative corridor is Lake Road, which experiences congestion and reliability issues. The ferry plays a critical role in relieving pressure on this corridor. The topography of the Devonport peninsula means the ferry service has a large catchment area, supported by the local bus network. These local services connect to the ferry, which enables onwards journeys to the city centre. In this way, it also acts as the backbone of the area's public transport network.

Shaping urban form

Devonport has relied on ferries services since it was founded, and its existing urban form has been shaped by the level of access the service provides. Limited population growth is expected in Devonport under the Unitary Plan. Maintaining the ferry service is key to supporting both the continuing functions of the existing area, which is also a popular tourist destination.

Corridor Objectives:

- To provide an attractive alternative to Lake Road by offering a reliable and competitive travel option, free from congestion.
 - This supports Objective 3: Increase the share of travel unaffected by congestion.
- Act as the backbone of the local public transport network in the Devonport peninsula.
 - This supports Objective 3: Increase the share of travel unaffected by congestion.

6.12 Interfaces between corridors

City Centre

Status: Existing/planned

Corridors: Rail network, North Shore, Northwest, City Centre to Māngere, Devonport ferry

The city centre is where all six radial rapid transit lines will meet in future. It is already a key connection point between train lines and northern busway services, and this will be enhanced once the City Rail Link opens. It is also served by the Devonport ferry service.

A key aspect for work on the three new radial corridors to resolve is how these will interchange with the City Rail Link (CRL). Surface-level rapid transit can offer connections at all three city-centre stations (Karangahape, Aotea and Britomart). A new sub-surface tunnel could connect directly with Aotea Station, which is future-proofed to enable a new east-west tunnel underneath the north-south tunnel being built as part of the CRL.

As the hub of the radial network, it is critical that connections in the city centre work well. This will enable people to make connective trips between corridors, and in-doing so greatly enhance the usefulness of the entire network for a wide range of trip purposes.

Panmure

Status: Existing/planned

Corridors: Eastern line, Eastern busway

Improving connections from East Auckland to trains at Panmure Station is a key reason the Eastern Busway is being progressed. The station and bus interchange were re-built in 2014 in anticipation of the Eastern Busway. The current pedestrian crossing from the southern bus platform to the station entrance may require further upgrades in future, to safely accommodate increases in the number of transferring passengers.

Puhinui

Status: Under construction

Corridors: Eastern line, Southern line, Airport to Botany

Puhinui Station will be a common station on both train lines and the Airport to Botany corridor. It is currently being redeveloped to integrate with both the interim Airport to Botany service, and the full corridor in the future. In the interim, services will call at stops on the western side of the rail line. In the future, a dedicated bridge over the railway will offer improved connections between services.

Manukau

Status: Planned

Corridors: Eastern line, Airport to Botany

Airport to Botany services will stop on Davies Avenue, outside the existing Manukau Station. This area is planned to become bus-only, to improve connections for customers and priority for the rapid transit corridor. This location also provides connections to local bus services.

Botany

Status: Planned

Corridors: Eastern busway, Airport to Botany

Botany station will be the terminus of both corridors, and a key interchange for local bus services. The station will be delivered by the Eastern Busway project, but future-proofed for expansion to accommodate Airport to Botany services. Optioneering processes to select a preferred plan for this station have taken considerable time, as multiple options were considered for how services from the two rapid transit corridors would interact. This included considering if rapid transit services should through-run between corridors. A detail network-level plan for rapid transit would have assisted these considerations.

Onehunga

Status: Potential

Corridors: Onehunga line, City Centre to Māngere, Southern isthmus

Onehunga station is an existing stop on the Onehunga line and is likely to be on the City Centre to Māngere corridor. Depending on its alignment, the southern isthmus corridor could also connect at this location. Integrating these three corridors at a single station would enable connections between the radial and orbital rapid transit corridors, as well as other public transport services, improving accessibility across the network.

New Lynn

Status: Conceptual

Corridors: Western line, Southern isthmus

A station on the western line is a potential western terminus for the southern isthmus corridor. An interchange at New Lynn station, where the local bus network already connects to the rapid transit network, will maximise the usefulness of the new radial corridor. Further work is needed to determine if New Lynn is the best location for this interchange.

Mount Roskill

Status: Potential

Corridors: City Centre to Māngere, Southern isthmus

Depending on the final alignment of these corridors, there may be the potential for a combined rapid transit and local bus interchange in Mount Roskill. This would enable connections between radial and orbital rapid transit services, as well as between feeder bus services.

Exactly how this interface would work needs to be explored further, as it could have significant design implications for both corridors which have not been explored to date.

Auckland Airport

Status: Potential

Corridors: City Centre to Māngere, Airport to Botany

Auckland Transport's previous light rail design incorporated a shared a corridor through the airport with the Airport to Botany corridor. Both corridors will terminate at the airport terminal, and potentially share a common stop at the airport's office precinct. Auckland International Airport Ltd owns the land both corridors will use at the airport, so work must be coordinated to ensure good outcomes.

Constellation

Status: Potential

Corridors: North Shore, Upper Harbour

The eastern terminus of the Upper Harbour line is intended to be Constellation station on the North Shore corridor. Constellation is a major interchange between the existing Northern busway services and local buses and the likely route of the future Northern Pathway walking and cycling route. Integrating another rapid transit line here will have significant spatial implications, but further work is needed to determine what these are.

Westgate and Lincoln

Status: Potential

Corridors: Northwest, Upper Harbour

the Northwestern and Upper Harbour lines are intended to have common stations at Lincoln Road and Westgate metropolitan centre. The lines could share common infrastructure between these stations. This would require either both corridors to operate with the same mode or be built so that two different modes could share a right-of-way. Both stations will be major interchanges with local bus services.

Henderson

Status: Potential

Corridors: Western line, Upper Harbour

The western terminus of the Upper Harbour line is intended to be Henderson Station. Henderson is already a major interchange between Western line train services and local buses. Integrating another rapid transit line here will have significant spatial implications, but further work is needed to determine what these are.

7. Next Steps

7.1 Roles, responsibilities and funding arrangements

The planning, funding and delivery of rapid transit in Auckland requires effort by multiple agencies within central and local government. The complex, city-shaping nature of rapid transit means that a number of organisations need to be involved in the development of projects, but at the moment there is inconsistency and a lack of clarity around the roles and responsibilities of the different organisations. Funding arrangements (i.e. the share of funding provided by different sources) are predominantly determined by which organisation is the project lead, meaning that the lack of clarity around roles and responsibilities also flows through to uncertainty around funding arrangements.

Around the time ATAP 2018 was finalised, the Minister of Transport provided Waka Kotahi with new functions to plan, design, deliver and fund rapid transit. As part of the ‘Future of Rail’ review, KiwiRail’s role as owner of the rail network has been reconfirmed, although Waka Kotahi now have a greater role in funding rail investments. Despite these changes, there is still a lack of clarity and consistency in the planning, design and delivery of rapid transit in Auckland.

The table below illustrates the inconsistent nature of the current situation:

	Project Lead	Funding
City Rail Link	City Rail Link Limited	50% Auckland Council, 50% Crown
Northern Busway Extension (Constellation to Albany)	Waka Kotahi (mainline busway) Auckland Transport (Rosedale station)	Mainline busway: 100% NLTF. Rosedale station: 51% NLTF, 49% Council
Eastern Busway	Auckland Transport	51% NLTF, 49% Council
City Centre to Māngere	Not yet determined	100% NLTF (seed funding only)
Northwest Rapid Transit	Waka Kotahi	100% NLTF (seed funding only)
Pukekohe rail electrification	KiwiRail	NZ Upgrade Programme
North Shore Rapid Transit	Not yet determined	Unclear
Greenfield rapid transit networks	Joint AT/Waka Kotahi	75% NLTF 25% Auckland Council (investigation costs only)
Airport to Botany	Not yet determined	Unclear

Addressing the current lack of clarity and consistency in the role, responsibilities and funding arrangements for rapid transit would deliver several key benefits:

- Ensure that project design and development deliver a ‘best for Auckland and New Zealand’ outcome, rather than one driven by governance or funding arrangements. For example, there is a risk that current arrangements incentivise rapid transit corridors to be located near motorways, so they are considered part of the state highway network.
- Supporting a more mode neutral transport system. Having the roles, responsibilities and funding arrangements for rapid transit more closely aligned to those for state highways will help support more mode neutral outcomes.
- Create significant efficiencies for project planning and delivery, as key policy issues will have already been resolved.
- Support more equitable funding arrangements for rapid transit that reflect the wide variety of transport, urban development and other benefits that these projects create.

7.2 Network planning

This document – the Rapid Transit Baseline – is the first step towards bridging the gap between high level strategic transport and spatial plans (e.g. ATAP, Auckland Plan) and rapid transit project business cases. Further developing this link through work on an Auckland Rapid Transit Plan will help ensure project business cases have better network level guidance on key issues like mode, timing, and outcomes sought including urban form.

Business cases for several major rapid transit initiatives (e.g. Additional Waitemata Harbour Connections, supporting growth investigations for the north and northwest areas) have struggled to reach conclusive positions on these issues because of significant interdependencies with other parts of the rapid transit network, or because their perspective is naturally at a corridor level, rather than a regional ‘network level’ perspective.

Key tasks for an Auckland Rapid Transit Plan:

- Outlining the nature of the problem if Auckland does not invest in rapid transit beyond current committed projects
- Considering the impact of key assumptions and uncertainties on future demand, including:
 - different rates of population and employment growth in Auckland
 - different distribution and location of growth across Auckland
 - different levels of ‘working from home’
 - the impact of different road pricing options on rapid transit demand.
- Testing whether any corridors should be added, removed or amended on the ATAP rapid transit diagram.
- Considering the advantages and disadvantages of ‘strategic level’ mode choice options (e.g. bus, heavy rail, light-rail, light-metro) across different corridors
- Outlining key sequencing choices and triggers for developing Auckland’s rapid transit network

- Guiding decisions about how access to rapid transit stations should be improved over time.

This work is underway, and is needed urgently to inform:

- Key decisions on corridors like City Centre to Māngere and the North Shore that will need to be made in the next 12-18 months
- Further ATAP updates planned to be undertaken in 2021 that focus on the 2030-2050 period
- Consideration of how land-use and spatial planning documents may need to respond to the National Policy Statement on Urban Development.

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