



Asset Class Management Plan

Rail

2020



Read me first: what it means that this document has been approved for retention by Auckland Council

Status of this document

On 6 May 2026, the New Zealand Government passed the Local Government (Auckland Council) (Transport Governance) Amendment Act. This legislation changed transport decision-making and responsibility for Auckland.

As part of this legislation, Auckland Council was required to review all transport-related and in-force Auckland Transport policies and plans to decide whether to retain, amend or revoke the policy or plan.

On 21 September 2026, Auckland Council approved the retention and transfer of this document to the council. In accordance with the Act, the document continues in effect until it is reviewed, replaced, or revoked.

This document remains in effect but should be considered alongside Auckland Council's current strategic direction and statutory transport planning requirements.

Alignment with Auckland Council group strategic direction and transport planning requirements

Auckland Council current strategic direction provides the wider context for how this document should now be interpreted and applied. This includes relevant Auckland Council strategies, policies, plans, investment decisions, regulatory settings, and local board direction.

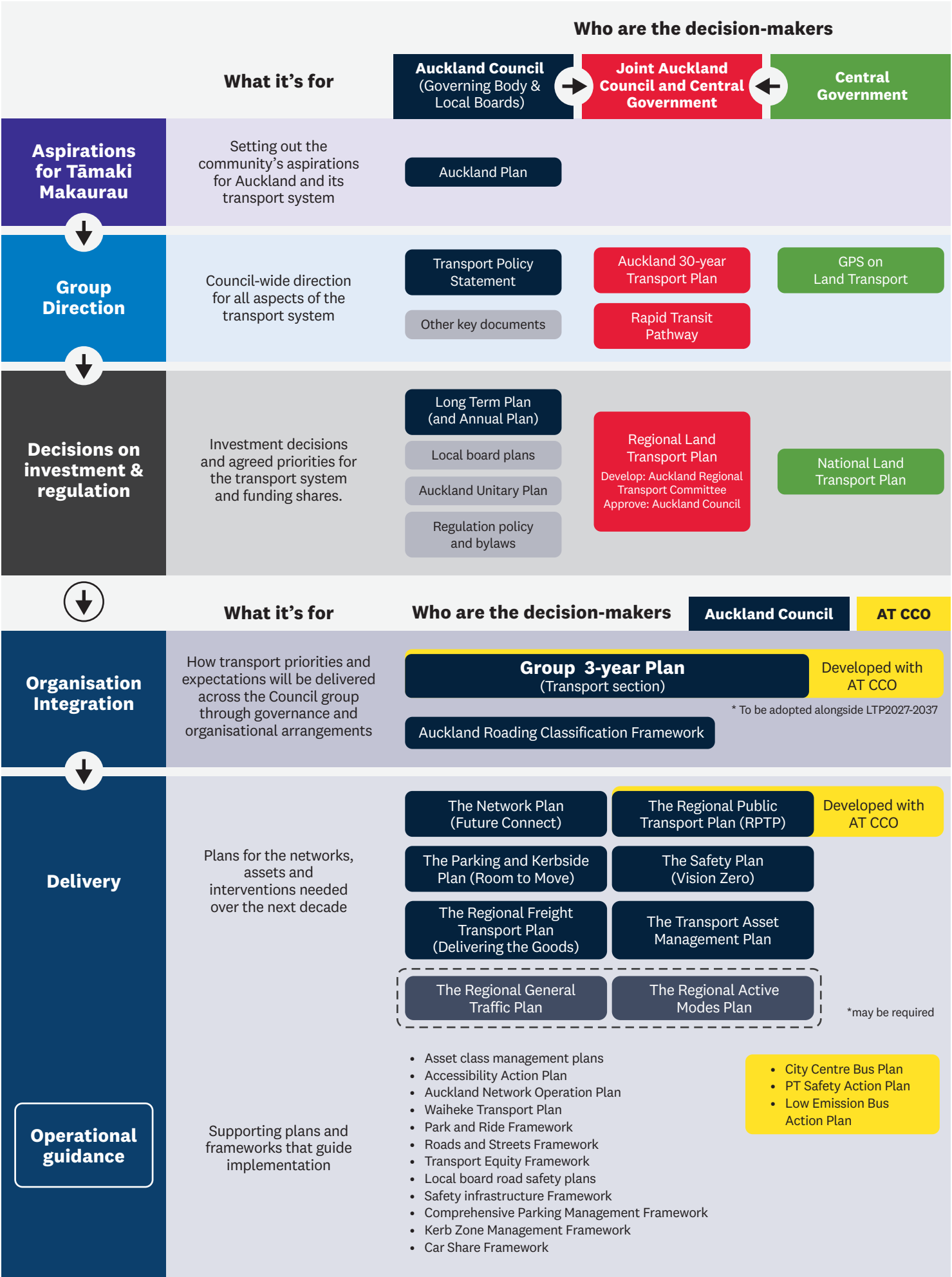
Transport planning is also guided by legislation and related planning documents introduced through the reforms. This includes the Auckland Council Transport Policy Statement, the Auckland Regional Transport Committee, the 30-year Transport Plan for Auckland, the Regional Land Transport Plan, and related transport governance and planning requirements.

The Auckland Council Group Strategic Framework (Transport view), shown below, provides context for how transport-related strategies, plans and frameworks fit together. It is intended as an evolving guide and will continue to be refined as documents are reviewed and updated. The Asset Class Management Plan –Rail was prepared under previous governance arrangements. While it remains in effect, the way it should be interpreted and applied, and its relationship with the broader framework today may differ from how it was originally intended. To ensure accurate interpretation, advice should be sought jointly from Auckland Council's Group Strategy and Transport Policy functions.

Auckland Council Group Strategic Framework

(Transport view)

Simplified view only. Documents often span multiple layers and relationships. Higher-order direction takes precedence. Seek guidance where interpretation is required. Subject to ongoing refinement.



Application within Auckland Council's shared governance model

Auckland Council's shared governance model allocates decision-making responsibilities between the Governing Body and local boards. The transport reform legislation changed how this model applies to transport by assigning additional responsibilities to local boards for local and collector roads, while arterial roads and specific precincts are wholly under the decision-making responsibility of the Governing Body.

The Auckland Roding Classification Framework determines the split in road type and therefore decision making, and shows individual road categories.

By retaining this document, the Governing Body confirmed that it remains part of Auckland Council's approach to transport planning and decision-making. It should be taken into account when Auckland Council plans, funds, regulates, and delivers transport services and infrastructure.

The Allocation of Decision-Making Framework sets out the respective responsibilities of the Governing Body and local boards. Local board decision-making responsibilities for local and collector roads include:

- **Parking and stopping controls:** Such as no stopping restrictions (broken yellow lines), angle parking, time restricted parking, parking zones,
- **Traffic Controls:** Such as community streets (community led play streets), pedestrian crossings, speed humps, speed limits,
- **Road corridor and network access permissions and conditions:** Corridor access approvals for events (excluding Eden Park events that impact arterial roads),
- **Property and landowner (road reserve) decisions:** Such as removal of hazardous encroachments affecting road safety, airspace and subsoil leases,
- **Infrastructure:** Such as footpaths and cycle paths (new or modified), installing monuments, removal of third-party structures.

Where local boards are responsible for decisions covered by this document, they should take it into account when making those decisions. The document does not change or limit local board decision-making powers.

Asset class
management plan

Rail

December 2020

Draft



Rail Asset class management plan
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SharePoint link: [Rail ACMP](#)

Status of document: Draft December 2020

Published date: TBA

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1 About this plan

This asset class management plan explains how Auckland Transport will manage Auckland's rail assets over the coming 10 years.

It draws on what we know about the activities and costs required to manage these assets in the past, to plan how we will continue to manage them in the future.

The plan describes, in depth, the assets it covers, and how we will maintain and develop those assets to provide the services that Auckland needs. This includes information about:

- the asset network
- the levels of service the assets provide
- the impacts of growth and demand
- how we manage risk
- how we manage the assets throughout their lifecycle and the investment needed to enable this
- how we plan to improve particular assets and why.

Auckland's transport system is currently being managed as 'one network', as a collaboration between Auckland Transport, the New Zealand Transport Agency (NZTA) (for the region's state highways) and KiwiRail (for the rail system). Auckland Transport's rail network is managed as a layer within this one network approach, enabling it to be integrated with other transport modes, including road, bus and ferry.

1.1 How this plan fits in our asset management framework

Auckland Transport manages a significant network of transport assets. Together, they provide safe, efficient and effective transport services for the Auckland region.

Auckland Transport develops plans for these assets to ensure that the network and its services are efficiently managed.

There are two levels of plans:

- an overarching network-level asset management plan, which acts as an umbrella plan, capturing all of the network's requirement
- asset class management plans, which focus on the requirements of each of the 15 asset classes. These asset class management plans are designed to be used in conjunction with the asset management plan.

Figure 1-1 shows how this asset class management plan fits into Auckland Transport's overall asset management planning.

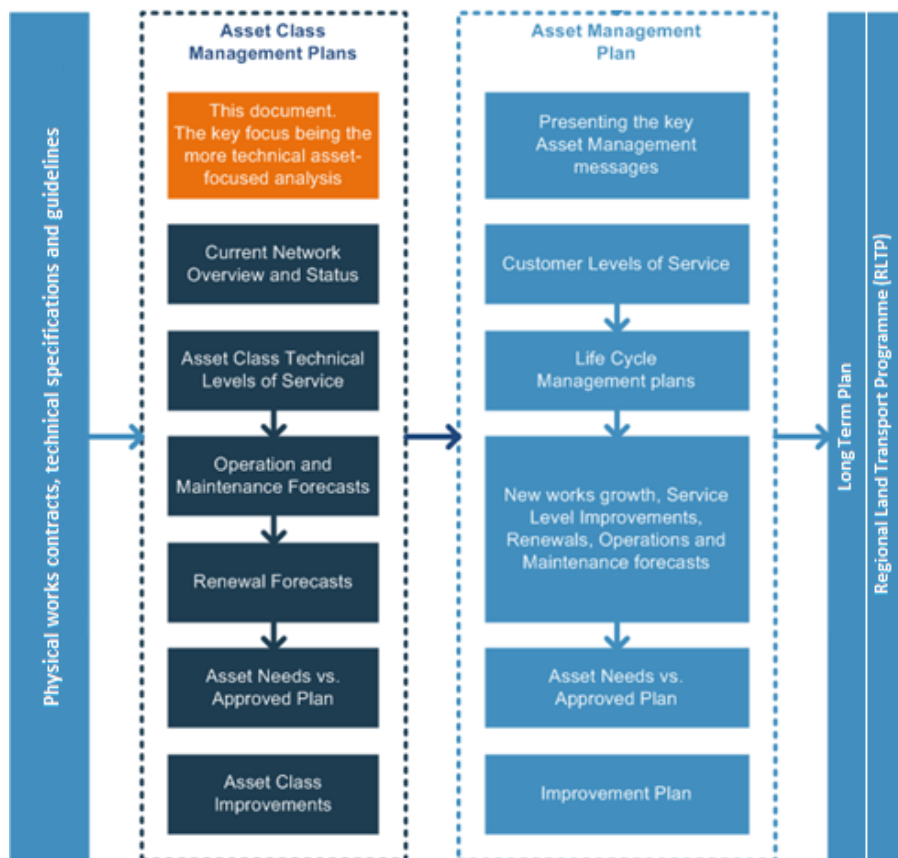


Figure 1-1: Asset management planning document framework

1.2 Relationship to regional and national plans

Auckland Transport's asset class management plans and asset management plan feed into Auckland Council's and the government's asset management regimes. Together, they enable Auckland Transport to deliver a strategic response to:

- the Auckland Plan, which sets out a comprehensive 30-year strategy for Auckland's growth and development
- the Government Policy Statement on Land Transport, which sets out the government's priorities for investment in land transport over the next 10 years
- the Auckland Regional Land Transport Plan 2018–2028, which is a 10-year investment programme of works for transport in Auckland. The regional land transport plan was developed by Auckland Transport, together with the NZTA and KiwiRail to respond to the growth and other challenges facing Auckland over the next decade.

Figure 1-2 shows how the various strategic and planning documents work together.

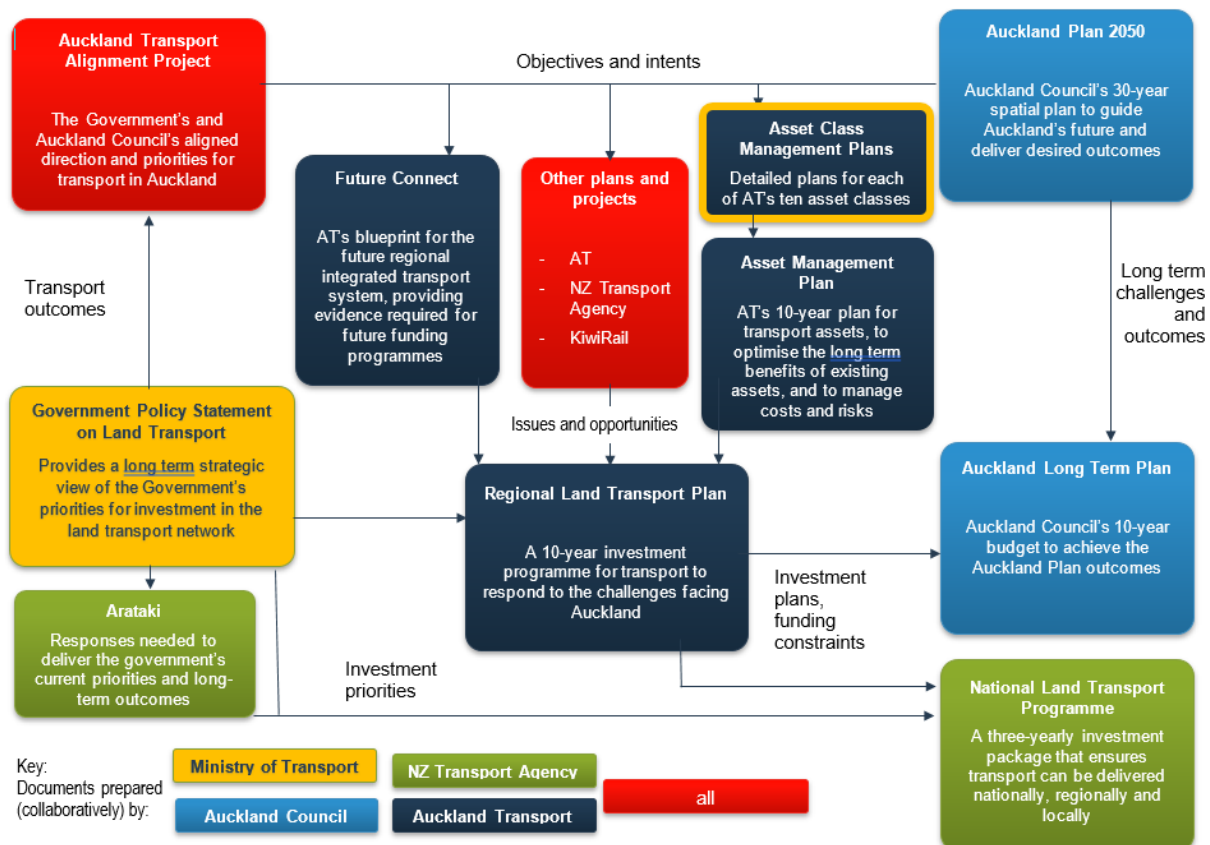
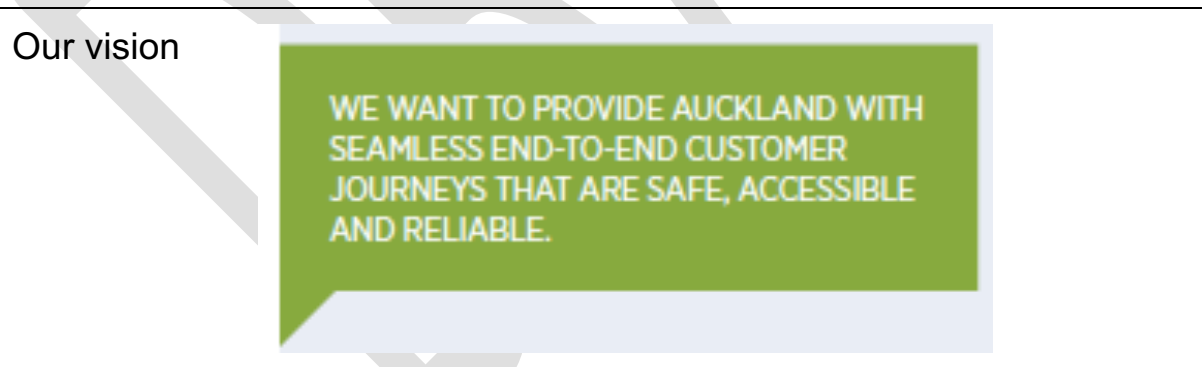


Figure 1-2: National and regional transport asset management planning documents

Rail assets also contribute to the objectives of the broader public transport system, as set out in the [Regional Public Transport Plan](#). The plan's vision and focus areas are set out in Figure 1-3.



Our focus areas



Figure 1-3: Regional Public Transport plan – vision and focus areas

2 Assets covered by this plan

In this section we outline the number and classes of the assets covered by this plan, and provide an overview of their current condition, age, performance and valuation.

Although Auckland Transport also owns fibre-optic cabling in the rail corridor, these assets are managed under the Traffic Systems, Signs and Markings Asset Class Management Plan.

2.1 Numbers and components of assets

Responsibility for managing the assets that make up Auckland's passenger rail network is shared between Auckland Transport and KiwiRail.

KiwiRail, which is the trading name for The NZ Railways Corporation, owns the national rail corridor and is the rail safety authority. KiwiRail assets in Auckland include the rail corridor land, the track, signalling systems, structures and the assets created in the Auckland Electrification Project.

Auckland Transport owns and maintains rail stations and electric passenger trains on the network, and is also responsible for stabling yards used for electric passenger trains and for the train servicing depot at Wiri.

Auckland Transport pays an annual access fee to KiwiRail in return for access to the network for Auckland Transport Metro passenger rail services.

KiwiRail assets are sometimes referred to as 'below track', and Auckland Transport assets as 'above track'. Auckland Transport's rail assets, as recorded in the 2020 asset valuation, are listed in Table 2-1.

		Number
	Rail stations	38 + 2*
	Electric three-car train sets (also referred to as electrical multiple units or EMUs)	59**
	Diesel three-car train sets (also referred to as diesel multiple units or DMUs)	10
	Stabling yards	4
	Wiri depot and stabling yard	1

Table 2-1: Rail asset inventory as at 30 June 2020

* Mt Eden and Puhinui stations are closed for redevelopment

**AT's fleet of 57 electric train sets has been in service since 2015. By 30 June 2020, two new electric train sets were in service as part of a further order of 15 train sets which will bring the total to 72 EMUs by June 2021 as set out in Section 2.4.3.

Rail assets, and their current values from Auckland Transport's 2020 asset valuation, are shown in Table 2-2. The depreciated values shown in the table align with those in Auckland Transport's fixed asset register.

	Number	Replacement value (\$ millions)	Depreciated value (\$ millions)	Annual depreciation (\$ millions)
Rolling Stock	59 EMU, 10 DMU	\$578.8	\$453.7	\$31.1
Rail station	40 (38 open, 2 temporarily closed)	\$657.1	\$541.8	\$25.2
Stabling	10	\$10.8	\$5.2	\$0.4
Depot	4	\$110.8	\$84.7	\$3.6
Park and Ride Rail	18 (at 16 stations)	\$7.3	\$6.0	\$0.1
Total rail assets		\$1,364.8	\$1,091.3	\$60.6

Table 2-2: Rail asset inventory and valuation, 2020

Source: Auckland Transport asset valuation 2020 and 2017

*Britomart, Puhinui and Mt Eden stations were not revalued in 2020 and are included in this total at their 2017 value

2.1.1 Rail stations

There are 40 rail stations on the [Auckland Transport Metro map](#) of which two, Puhinui and Mt Eden, are temporarily closed for redevelopment. There is also a backup station at The Strand stabling yard, in case of disruptions at Britomart. Some stations have multiple platforms, for example the Penrose station serves both the Southern and Onehunga lines, and the Papakura station serves both electric and diesel trains.

The rail station is the public interface of the rail system. The most important function of a rail station is the safe and efficient movement of people on and off the trains, and the link with the rest of the customer's overall journey. Each rail station is also part of a community, and should be located, designed and managed to enhance the community it serves.

All rail stations provide waiting passengers with safe access to trains, along with protection from the sun, wind and rain, CCTV and help points, AT Hop (electronic fare payment) ticket stations and timetable information.

Patronage on rail is highly concentrated at the main stations. Over a quarter of all passenger movements (26.5%) are at Britomart, and half of all passenger movements are at the top six stations (Britomart, Newmarket, Panmure, New Lynn, Ellerslie and Otahuhu).

AT uses the patronage at rail stations to assess the criticality of the station and to prioritise renewals projects.

Table 2-3 lists all 40 stations in order of their patronage during 2018/2019. Although more up-to-date figures are available, the 2018/2019 patronage is more valid for this comparison because it is not impacted by Covid-19. Further information on the priority of Auckland Transport's rail station assets is included in Section 5.3, on criticality.

Station	Passengers boarding	Passengers alighting	Total passenger movements	Passenger movements, % of total	Major transport hub or interchange?
Britomart	5,743,896	5,587,337	11,331,233	26.5%	Hub, interchange
Newmarket	2,070,637	2,115,604	4,186,241	9.8%	Hub, interchange
Panmure	908,683	957,256	1,865,939	4.4%	Hub, interchange
New Lynn	785,407	870,751	1,656,159	3.9%	Hub, interchange
Ellerslie	659,166	648,846	1,308,012	3.1%	
Otahuhu	640,297	665,638	1,305,935	3.1%	Hub, interchange
Papakura	648,324	618,497	1,266,822	3.0%	Hub, interchange
Papatoetoe	599,730	575,151	1,174,881	2.7%	
Manukau	574,937	563,620	1,138,556	2.7%	Hub
Middlemore	580,470	547,567	1,128,037	2.6%	
Sylvia Park	548,285	554,676	1,102,961	2.6%	
Glen Innes	521,089	525,596	1,046,685	2.4%	
Grafton	445,787	587,373	1,033,160	2.4%	
Henderson	456,784	517,796	974,580	2.3%	Hub
Manurewa	401,317	398,771	800,087	1.9%	Hub
Penrose	366,959	391,118	758,077	1.8%	
Glen Eden	369,393	342,913	712,305	1.7%	
Avondale	353,770	341,521	695,291	1.6%	
Kingsland	304,706	329,461	634,167	1.5%	
Puhinui*	307,476	304,250	611,726	1.4%	
Sturges	330,111	278,045	608,155	1.4%	
Mt Eden*	272,022	334,639	606,661	1.4%	
Mt Albert	286,448	292,181	578,629	1.4%	
Pukekohe	240,654	231,631	472,285	1.1%	Hub, interchange
Onehunga	228,294	225,465	453,759	1.1%	
Greenlane	221,234	224,579	445,814	1.0%	
Baldwin Ave	230,137	212,310	442,448	1.0%	
Swanson	220,211	218,459	438,670	1.0%	
Homai	228,358	206,774	435,132	1.0%	
Sunnyvale	215,942	188,749	404,691	0.9%	
Parnell	182,495	205,696	388,191	0.9%	
Ranui	206,158	177,498	383,655	0.9%	
Fruitvale Rd	192,305	175,810	368,115	0.9%	
Takanini	186,929	175,913	362,842	0.8%	
Meadowbank	188,786	171,298	360,083	0.8%	
Orakei	191,017	162,849	353,866	0.8%	
Morningside	166,964	166,009	332,973	0.8%	
Remuera	169,859	162,086	331,945	0.8%	
Te Papapa	93,845	88,097	181,941	0.4%	
Te Mahia	54,020	51,072	105,092	0.2%	
Total	21,392,902	21,392,902		100.0%	

Table 2-3: Auckland Transport rail stations – in descending order, based on 2018/2019 patronage

Ten of the stations listed in Table 2-3 are designated as major transport hubs. These have enhanced facilities, including toilets, a staffed ticket and information office, lifts and escalators, and serve as a rail/bus interchange. Puhinui station is currently closed for redevelopment and will reopen as a hub and interchange serving south Auckland and providing for a rapid bus service to Auckland Airport.

There are six stations (to become seven when the Puhinui interchange is complete) where bus interchange facilities are managed as part of the rail station. Bus assets at these interchanges are included in this asset class management plan, and not the Bus Asset Class Management Plan.

2.1.2 Closed stations

Auckland Transport has permanently closed the stations at Waitakere, Helensville, Waimauku and Huapai. The three stations at Helensville, Waimauku and Huapai were operated on a trial basis from July 2008 to [November 2009](#), but averaged only 43 passengers per day across the three stations. The Waitakere rail station had weekday patronage of around [100 people per day](#). This service was replaced with a bus service to Swanson and Henderson, along with enhanced Swanson park-and-ride facilities in [July 2015](#).

AT has also closed the Mangere, Southdown and Westfield stations on the Southern Line in order to improve the spacing of stations and provide a faster, more reliable rail service.

2.1.3 Electric trains

Auckland Transport owns 59 three-car electric train sets (also referred to as electric multiple units or EMUs), with a further 13 train sets on order. The electric trains are manufactured in Spain by Construcciones y Auxiliar de Ferrocarriles (CAF).

The first of these electric trains went into service on the Onewunga line in 2014, and the full first tranche of 57 trains was in service in July 2015. The second tranche of 15 trains is arriving during 2020 and 2021, with two trains in service at the time of AT's Annual Report in June 2020.

Auckland Transport owns the trains themselves, and the on-board elements of the signalling, radio and automatic vehicle locator system, which is used for real-time passenger information. The main signalling system for the Auckland rail network is owned by KiwiRail.

These electric trains have a replacement value of close to half a billion dollars (\$472 million), as shown in Table 2-5.

Auckland Transport's contract with CAF includes the maintenance of the EMUs until 2026. This work is carried out in the maintenance depot which was constructed by Auckland Transport at Wiri.

Rolling stock	Replacement value (\$ millions)	Depreciated value	Annual depreciation
Diesel trains	\$3.0	\$3.0	\$0.6
Electric trains 2015 order			
Electric trains 2020 order as at 2020 Annual Report	\$19.5	\$19.5	\$0.6
Diesel trains	\$3.0	\$3.0	\$0.6
Rolling stock total	\$578.8	\$453.7	\$31.1
EMU cost per unit including onboard equipment	\$9.76		\$0.29

Table 2-4: Rolling stock - valuation

Source: Auckland Transport Asset valuation 2020

2.1.4 Diesel trains

Auckland Transport still owns 10 two-car diesel trains (also referred to diesel multiple units or DMUs) that are used to run services from Papakura to Pukekohe.

The DMUs were manufactured between 1982 and 1985 and originally used on the Perth network. These units were near the end of their useful life when they were purchased for use on the Auckland rail network in 1993. Around the time of the Britomart's opening in 2003, the fleet was refurbished to its current blue and yellow livery and interior.

The DMUs continue to provide a punctual and reliable service to Pukekohe, but over time they have become increasingly expensive to maintain. In the 2017 valuation, the book value of these trains was set to zero.

Replacing these vehicles required a decision on the future of the Southern rail line beyond Papakura. Agreement to electrify the Southern rail line to Pukekohe was reached through the Auckland Transport Alignment Project in 2018. Central government agreed to fund the electrification of the line, with KiwiRail implementing the project, and Auckland Transport procuring additional electric trains.

KiwiRail received funding for the [Papakura to Pukekohe Electrification Project](#) as part of the Government's New Zealand Upgrade Programme and physical works have begun. Once electrification is complete, Auckland Transport's diesel trains will be retired from service.

2.1.5 Additional trains on order

Auckland Transport has procured an additional 15 three-car EMU sets, two of which went into service in [June 2020](#). The remaining 13 new EMU sets are due to go into service in the 2020/2021 financial year, bringing the total train fleet to 72 sets.

The new three-car EMU sets will mean that more peak services can be operated as six-car sets, reducing crowding. The new train sets also create the extra capacity needed to allow for maintenance and refurbishment of the existing fleet of 57 EMUs.

The estimated rail fleet numbers used in this asset class management plan are shown in Table 2-6. For simplicity, the calculations in this AMP assume that train numbers are constant within each financial year, although in practice a single order of trains will arrive in NZ and be commissioned one by one, over a period of several months.

The expanded fleet will enable a fully electric service from Papakura (currently the southernmost station on the electric network) to Pukekohe, when the KiwiRail project to electrify the rail network to Pukekohe is delivered. Additional trains will also be needed in time for the opening of the City Rail Link in 2024.

	2018/ 2019	2019/ 2020	2020/ 2021	2021/ 2022	2022/ 2023	2023/ 2024	2024/ 2025	2025/ 2026	2026/ 2027	2027/ 2028	2028/ 2029	2029/ 2030	2030/ 2031
EMUs	57	57	72	72	72	82	94	94	104	118	118	118	118
DMUs	10	10	10	10	10	10	10	0	0	0	0	0	0

Table 2-5: EMUs and DMUs – forecast numbers, 2018/2019 to 2030/2031

Source: Estimate prepared for draft 2021 Regional Land Transport Plan

2.1.6 Stabling

Auckland Transport has four stabling yards, located at The Strand, Henderson, Papakura and Pukekohe. The Pukekohe site is currently used for stabling Auckland Transport's 10 diesel trains, and will be expanded and upgraded to support the rollout of the electric service to Pukekohe.

The replacement value of the four stabling yards used to house Auckland Transport's train fleet is just over \$10 million, as shown in Table 2-7.

Stabling yard	Replacement value (\$millions)	Depreciated value (\$millions)	Annual depreciation (\$millions)
Henderson stabling site	\$3.7	\$2.2	\$0.2
Papakura stabling site	\$2.4	\$1.7	\$0.1
Pukekohe stabling site	\$1.3	\$0.8	\$0.1
The Strand stabling/ backup station	\$3.5	\$0.6	\$0.1
Total stabling yards	\$10.8	\$5.2	\$0.4

Table 2-6: Stabling yards – valuation

2.1.7 Wiri depot

The Wiri depot, a maintenance and stabling facility for electric trains, was officially opened in [July 2013](#) and was used for testing and configuring Auckland's first electric train, which went into service in [April 2014](#).

The purpose-built facility comprises a maintenance building, rail track sidings, stabling for 28 trains, and a train wash and platform for cleaning. There is also a locally-operated points system, so all train movements can be controlled on-site. The replacement value of the Wiri depot is over \$100 million, as shown in Table 2-8.

EMU depot	Replacement value (\$millions)	Depreciated value	Annual depreciation
Wiri depot	\$110.8	\$84.7	\$3.6

Table 2-7: Wiri depot (including stabling) – valuation

2.2 Age of assets

The redevelopment of Auckland's rail network builds on a long history of rail in Auckland. The oldest stations in continuous use are on the Southern line and opened between 1873 and 1875. Some heritage station assets from the early days of rail in Auckland are still managed by Auckland Transport including historic station buildings at Glen Eden and Swanson, the old signal box in Remuera, and the Parnell station building (relocated from Newmarket). These heritage assets have been renovated and are currently in very good condition.

Most of Auckland Transport's rail station assets have been refurbished or created since the opening of Britomart in 2003. The dates of creation of the major assets (platforms and shelters) are shown in Table 2-9.

Year	Stations redeveloped
2003	Britomart
2006	Glen Eden, Glen Innes, Henderson , Homai , Kingsland, Manurewa, Middelmore, Mount Eden , Orakei , Papatoetoe , Penrose (Southern Line), Remuera , Sunnyvale
2007	Sylvia Park
2008	Fruitvale, Meadowbank, Ranui, Swanson
2009	Ellerslie, Sturges Rd
2010	Avondale, Baldwin, Grafton, Greenlane, New Lynn, Newmarket, Onehunga, Papakura, Penrose, Te Papapa

Year	Stations redeveloped
2011	Manukau, Morningside
2012	Mt Albert
2014	Panmure
2016	Otahuhu
2017	Parnell
2018	Pukekohe, Takanini, Te Mahia
2020	Mt Eden and Puhinui stations are currently closed for redevelopment and Britomart is operating in a temporary configuration while the City Rail Link is constructed.

Table 2-8: Opening dates of refurbished rail stations

Sources: AT asset register; [The ARTA Years 2004-2010](#), [Wikipedia](#); [Opus 2017 valuation](#)

The first of Auckland Transport's EMUs went into service in April 2014 and the current full fleet of 57 trains was in service by July 2015. The second order of 15 electric trains is being delivered in 2020 and 2021, with the first two trains going into service in June 2020.

2.3 Condition of rail stations

Rail stations are a key part of the customer experience on the rapid transit network and need to be maintained to a high level of service. Assets identified as being in poor condition (condition grade 4) need to be scheduled for renewal, and there should be no assets in very poor condition (condition grade 5).

Figure 2-2 shows the current condition distribution of Auckland Transport's rail station assets. Almost half of all rail station assets, by value, are in very good condition and there are no assets in unknown condition.

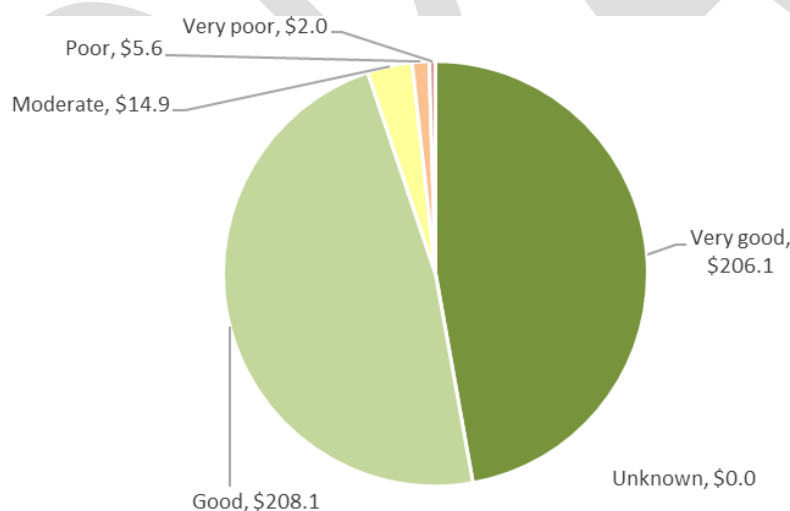


Figure 2-1: Rail station asset condition

The condition data shown in Figure 2-2 is based on annual inspections at each station and confirms that the great majority of rail station assets are in very good or good condition. In most stations, assets identified as being in poor condition are scheduled for renewal in the current year. Some assets were in very poor condition at the time of inspection, due to vandalism or extreme events, but these will be promptly replaced.

2.4 Useful lives of rail station assets

For the purposes of valuation and depreciation, rail stations have an expected useful life of 60 years. This useful life of 60 years applies to a range of station buildings and components including:

- train stations
- rail access bridges
- heritage stations
- train stabling
- train tracks
- the EMU depot.

For asset management purposes, an average useful life of 60 years is not helpful, as some components of rail stations have a shorter useful life. For example the interior finish of a rail station is expected to last 30 years, as shown in Table 2-11.

Asset component	Expected useful life (years)
External fabric	61
Interior finishes	30
Structural	60
Exterior works	39
Services	23
Special	29

Table 2-9: Expected useful lives of rail station components

2.5 Condition of rolling stock

Auckland Transport's contract with the supplier (CAF) of the original 57 EMU trains includes the maintenance of these EMUs until 2026. The contract is a build and maintain contract, with CAF responsible for maintenance over this period. The more recent purchase of 15 additional EMUs is on a similar contract

As a result, responsibility for condition inspections and asset management planning for the EMUs is also currently with CAF. It is a contract condition that rolling stock assets must be maintained in condition grade 1 (very good) or 2 (good). CAF reports that this condition is met for all EMU components.

Responsibility for monitoring the asset condition of the EMUS will shift to Auckland Transport within the timeframe of this plan. This issue is considered further in Section 6.1, on the lifecycle management plan for rolling stock,.

KiwiRail maintains the 10 DMUs on behalf of Auckland Transport. These units continue to provide a reliable service, but are well past the end of their expected useful life, and will be retired from service when the rail track from Papakura to Pukekohe is electrified.

2.6 Useful lives of rolling stock

Auckland Transport's EMUs have an expected useful life of 35 years, provided they are well maintained, with periodic overhauls.

3 Levels of service

This section describes the levels of services that Auckland Transport aims to provide from its rail assets. The levels of service stipulate how the assets are expected to perform in key areas.

The rail network exists to provide a customer service, and succeeds when the customer experience is good. Good public transport has benefits not only for the customer directly, but for all users of the transport system, through improved safety and reduced congestion.

AT will adopt a new set of public transport targets in its 2021 Regional Land Transport Plan, revised in light of the impact of Covid-19. The data and targets in this section reflect the pre-Covid situation.

3.1 Levels of service framework

Auckland Transport's levels of service framework links customer outcomes, network level of service, asset performance and financial requirements for Auckland Transport's rail assets, in order to develop levels of service for them, as shown in Figure 3-1.

The starting point is customer outcomes, which provide a clear direction for how the overall network should be managed. This in turn indicates what standard each asset must perform to and the funding required to keep all of the assets in the network performing in line with customer requirements.

The levels of service framework is available through [SharePoint](#).

CUSTOMER Rail customers are safe and comfortable	NETWORK Level of service to provide a safe rail network for customers	ASSET Assets are of a standard suitable to meet customer needs and contribute to achieving patronage goals	FINANCIAL Funding is provided to pay for work programmes needed for assets to perform their required service
- Customer satisfaction with rail stations and trains - Customer safety	Rail stations and trains: - support safe and seamless customer journeys - provide customers with shelter, seating and customer information - deliver actual and perceived safety. Measured by: - rail patronage - rail customer satisfaction.	Assets requirements is for: - rail stations and trains meet safety and crime prevention design requirements - rail stations and trains are clean and well maintained. These assets need to be sustained by work programmes of: - operations - maintenance - renewals - capital improvements.	Funding work programmes on rail assets: - operations - maintenance - renewals - capital improvements.

Figure 3-1: Level of service framework for rail assets

Auckland Transport's key stakeholders all have different expectations of the levels of service that the transport network will provide. We consult regularly with stakeholders in order to better understand these expectations and what is required to provide them with a better experience.

Table 3-1 sets out our key stakeholders, their areas of specific interest, and how we consult or communicate with them.

Stakeholders	Areas of interest and expectations	Consultation or feedback method used
Rail customers	The main improvements suggested by public transport users: - more frequent services - reduced fares - improved punctuality and reliability	- Auckland public transport satisfaction survey - Auckland Transport research panel findings
Transport customers (commercial)	The main improvements suggested by commercial road users: - improve traffic flow - improve public transport to reduce single occupant vehicle travel and congestion	Auckland road user satisfaction survey – commercial
Auckland residents and ratepayers	Aucklanders want: - public transport, but it must be convenient, reliable and quicker - to walk and cycle (including to rail stations), but it must be safe - better transport, but they have mixed views on how to raise the additional investment required - current funding to be reallocated more favourably towards public transport, walking and cycling.	Feedback on Auckland Council's Draft Long-Term Plan 2018, as summarised in the Auckland Regional Land Transport Plan
Auckland Council	- Increase rail patronage - Deliver the outcomes in the Auckland Plan - Provide value for money	- Auckland Transport's annual Statement of Intent - Elected member liaison team
Local boards	- Improve local rapid transit (the rail network, and also the Northern Busway) - Improve walking and cycling connections to rapid transit - Outer (rural and semi-rural) local boards favour extending the rapid network, e.g. electric rail to Pukekohe	Elected member liaison team
Other council-controlled organisations	Integrated planning, including: - for the CBD, with Waterfront Auckland and Auckland Council Property Ltd - for events, with Auckland Tourism, Events and Economic Development	- Direct liaison - Joint working groups
NZTA and Road Efficiency Group	- One network framework requirements - Deliver government policy statement outcomes - Provide value for money	- National One Network Road Classification levels of service requirements as stipulated by the Road Efficiency Group - Direct liaison - Non-voting member on Auckland Transport's board
KiwiRail	Auckland Transport rolling stock and station assets are well maintained and meet appropriate safety standards	Direct liaison.
Ports of Auckland and Auckland International Airport Ltd	- Rail network reliability for carrying freight - Integrated planning - More travel options to Auckland Airport	Liaison with industry groups
Mana whenua	Mana whenua want: - a good relationship with Auckland Transport - Auckland Transport to recognise te ao Māori (the Māori world view) - a set of overarching principles for te ao Māori - Auckland Transport to use te reo Māori in bilingual signs and announcements and to spell and pronounce Māori place names correctly - the Mauri Model method (Māori values) reflected in prioritisation	- Independent Māori Statutory Board - Tamaki Regional Mana Whenua Forum - Tamaki (Treaty Negotiations) Collective - Auckland Transport Māori relationships team engagement with runanga, iwi and hapu authorities
Industry and customer groups (including the Road Users Forum, Business Forum, and walking and cycling advocates)	- Integrated planning - Network efficiency and reliability - Specific network improvements - Access to properties	Direct liaison and through industry groups
Utilities (e.g. Watercare, Telecom, Vector)	- Corridor access - Programming	Direct liaison and through industry groups
Adjoining councils	Provide for a rail service from Hamilton	Direct liaison

Stakeholders	Areas of interest and expectations	Consultation or feedback method used
Rail operator	• Customer service experiences • Public transport demand • Network performance • Scheduling, ticketing and information systems • Service subsidies	Through commercial franchising model

Table 3-1: Key stakeholders and their expectations

3.2 How we measure levels of service

In general, three types of levels of service are measured – each type focusses on different aspects of an asset's performance.

- Governance key performance measures:
 - are high-level indicators related to governance relationships, such as the statement of intent between Auckland Transport and Auckland Council
 - are established through agreements with our key stakeholders, based on past performance and the impact on decision-making (i.e. alignment with government policies, and the need to achieve a sustainable balance between risk tolerance, available funds and standards of service).
- Customer levels of service:
 - describe what key stakeholders can expect when using the services
 - are mainly related to the performance of assets
 - are established from customer consultation and feedback, benchmarking among peer groups, the One Network Road Classification and industry best practice.
- Technical levels of service:
 - describe the standards of operation, maintenance and renewal activities that relate to an asset or group of assets
 - relate mainly to the condition and operating environment of the assets
 - ensure assets are preserved
 - help deliver on customer expectations
 - build data confidence
 - are established using accepted thresholds of asset condition, operational standards, availability of funds and industry best practice.

3.3 Governance key performance measures

Auckland's rail network carried 21.39 million trips in 2018/2019, representing 21 per cent of all public transport trips in the region.

Rail makes a significant contribution to achieving the performance measures in Auckland Transport's Statement of Intent, as set out in Table 3-2.

Performance measure	2018/19 actual	2019/20 Statement of Intent	2020/21 target	2021/22 target	2022/23 target
Improve access to frequent and attractive public transport					
Total public transport boardings	100.8	103.6	60.6	62.5	64.0
Total rail boardings	21.39	22.30	12.7	12.9	13.1
Total annual boardings on rapid or frequent public transport networks	21.5% growth compared with 9.1% for total boardings	Increase at faster rate than total boardings	Increase at faster rate than total boardings	Increase at faster rate than total boardings	Increase at faster rate than total boardings
The percentage of public transport trips that are punctual	97.0%	95.0%	95.5%	97.0%	95.0%
Improve customer experience and stakeholder engagement					
The percentage of passengers satisfied with public transport services	91%	87%	85-87%	85-87%	85-87%
Make the best use of existing transport networks					
Average AM peak period lane productivity across 30 monitored arterial routes	32,863	27,500	30,000	30,000	33,000
Manage the impacts of the transport system on the environment					
Electric trains contribute to this objective. Retiring diesel trains from service will also contribute.					
Value for money					
The percentage of the total public transport cost that is recovered through fares	43.4%	36%–42%	36%–42%	43.4%	36%–42%

Table 3-2: Rail network's contribution to key performance measures

Source: Auckland Transport draft Statement of Intent 2019/2020

3.4 Customer levels of service

The overall customer experience of the rail network is made up of:

- service attributes (punctuality, travel time, safety, convenience, value for money)
- rail station attributes – see Figure 3-2 and Figure 3-3
- vehicle attributes – see Figure 3-4
- ease of getting information (about routes, timetables, delays and disruptions)
- public transport system attributes (service design, operating hours, complaint handling).

Rail stations form part of the overall customer experience of the rail network, but Auckland Transport's public transport customer satisfaction survey showed that these assets are less important to

customers – that is, they are less closely correlated with overall satisfaction – than service, information and public transport system attributes.

Current customer satisfaction for rail stations is shown in Figure 3-2.

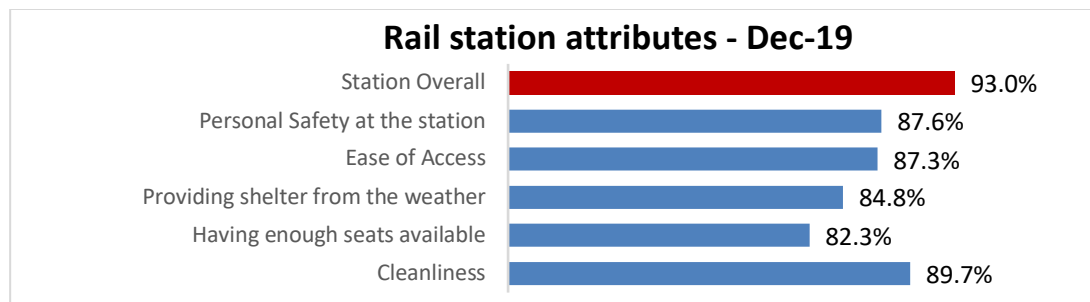


Figure 3-2: Customer satisfaction with rail stations

Source: Public transport customer satisfaction survey, Gravitas/Auckland Transport

Satisfaction with rail stations has shown a long-term trend of improvement, as shown in Figure 3-3.

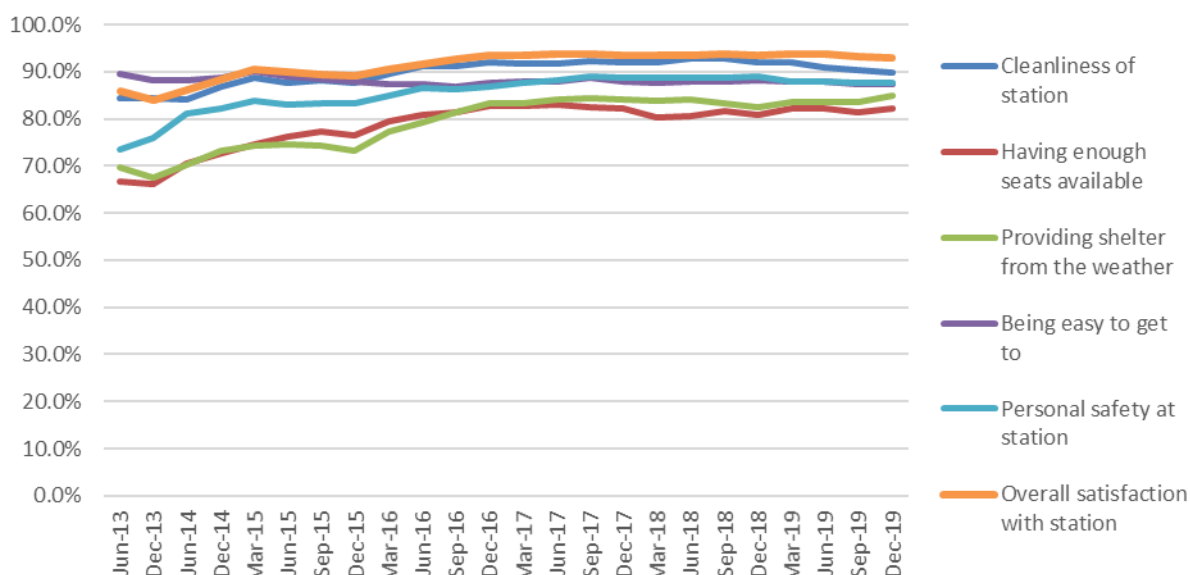


Figure 3-3: Trends in customer satisfaction with rail stations

Two aspects of rail stations – having enough seats available and providing shelter from the weather – have improved the most over time, but remain the lowest ranked features.

Customer satisfaction with trains is shown in Figure 3-4. Overall satisfaction is high at 95.2 per cent, with the lowest-ranked attribute being 'having enough seats available'.

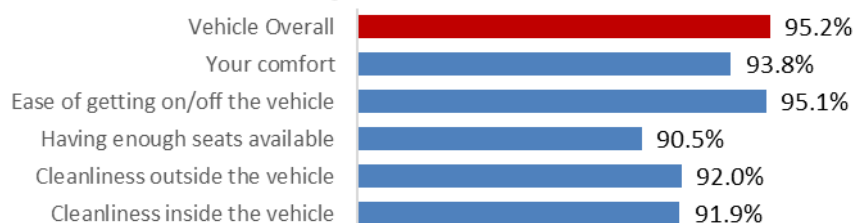


Figure 3-4: Customer satisfaction with trains, December 2019

These customer satisfaction measures contribute to the governance performance measures of total rail boardings, and the percentage of passengers satisfied with public transport services.

3.5 Technical levels of service

The technical levels of service relevant to rail assets are shown in Table 3-3.

Performance or service measure	Current performance	Target performance	Measure unit
Rail stations			
Rail station assets are inspected every 2 years and their condition recorded in AT's core asset management systems	100%	100%	
Rail stations are cleaned daily	100%	100%	
Value of rail assets in poor condition (condition grade 4)	1.1% of rail station assets are in condition grade 4.	Rail station assets in condition grade 4 are renewed within 1 year	Percentage by value
Proportion of rail assets in very poor condition for which renewals are scheduled and funded in coming year	With the exception of some Britomart assets that will be replaced by the City Rail Link, these are scheduled for renewal in the current year		
No rail station assets in condition grade 5	0.4% of rail station assets are in condition grade 5, mainly Britomart assets that will be replaced by the City Rail Link	0%	Percentage by value
Trains			
Electric trains are maintained and components replaced as necessary to maintain all components in good or very good condition, in accordance with the 'build and maintain' contract with CAF. Technical level of service measures to be prepared and agreed with CAF by 2022 to assist in this transition.			

Table 3-3: Technical levels of service measures for rail assets

As part of the rapid transit network, rail stations and trains are maintained to a higher level of service than most Auckland Transport assets. Rail station assets should be renewed once it is found that they are in condition grade 4 (poor). Accordingly, no customer-facing assets in rail stations should be in a condition grade 5 (Very Poor).

4 Growth and Demand

4.1 Factors influencing demand

Prior to Covid-19, Auckland was experiencing a revival of public transport, led by infrastructure investment. The long term (50-year) trends for public transport patronage in Auckland are shown in Figure 7-49, and demonstrate that the last 25 years has shown steep growth for bus, rail and ferry.

The resurgence of rail began in 2003 with the opening of Britomart Station, and rail investments have continued to dominate the public transport capital programme. In 2018 there were over 20 million rail trips, almost all of which were on electric trains served by modern stations redeveloped since 2003.

Milestones for bus services include the opening of the Northern Busway stations in 2005 and the main Busway in 2008, the rollout of AT Hop cards to all bus services from 2014, and the Public Transport New Network which was fully implemented by late 2019.

Auckland now has a public transport network that provides more options and serves more journeys, which has been especially important in view of ongoing population growth and the lack of options to provide for more car travel. Good public transport has benefits not only for the customer directly, but for all users of the transport system through reduced congestion and improved safety. Public transport has important health and environmental benefits and makes more efficient use of limited road space.

The first six months of 2019/2020 continued the trend of growth in patronage but PT use in the 2019/2020 year was impacted directly by the first Covid-19 lockdown as well as indirectly by public concerns about the pandemic. During the first lockdown, the Auckland public transport network continued to provide travel options for essential workers. The PT network reopened in Level 3 with improved safety and sanitation practices, and by June 2020 had recovered to 65% of pre-Covid patronage – only to fall again in the second lockdown. In 2019/2020 there were 82.3 million public transport boardings, down from 100.8 million the previous year.

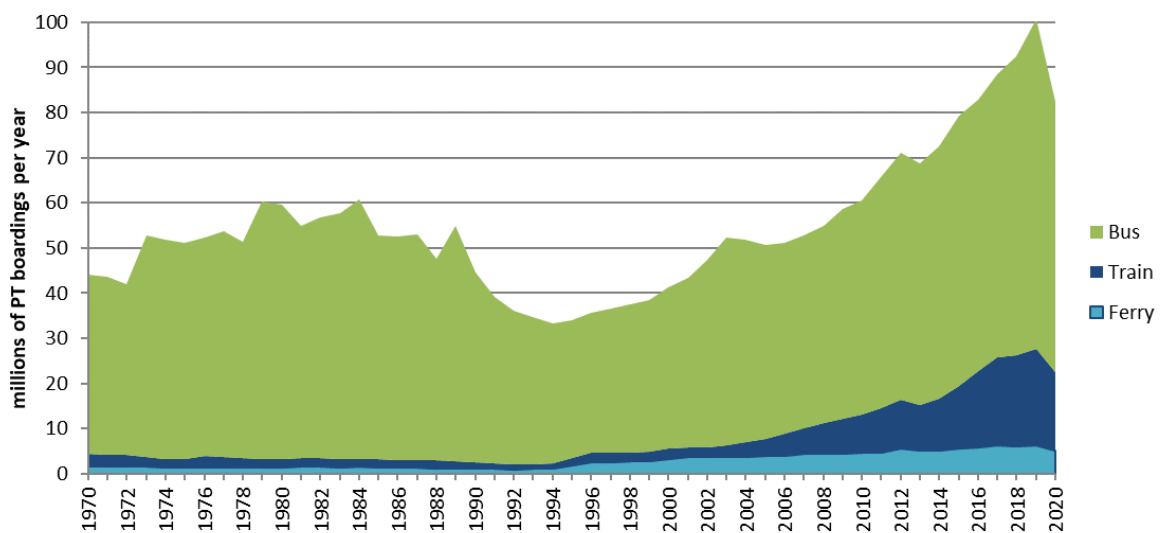


Figure 7-1: 50 years of public transport in Auckland

The long term future of public transport is a strategic issue and is being considered as part of the Auckland Transport Alignment Project. This AMP is based on current published plans and reflects the need to maintain and renew existing assets and to complete currently programmed improvements.

Rail patronage growth is also significant on a per capita basis, as shown in Figure 4-2. From a low of 1.1 trips per person per year in 1993, Aucklanders made 13.2 trips per year on average in 2018/2019. However this dropped to 10.6 trips in 2019/2020 due to the impact of Covid-19.

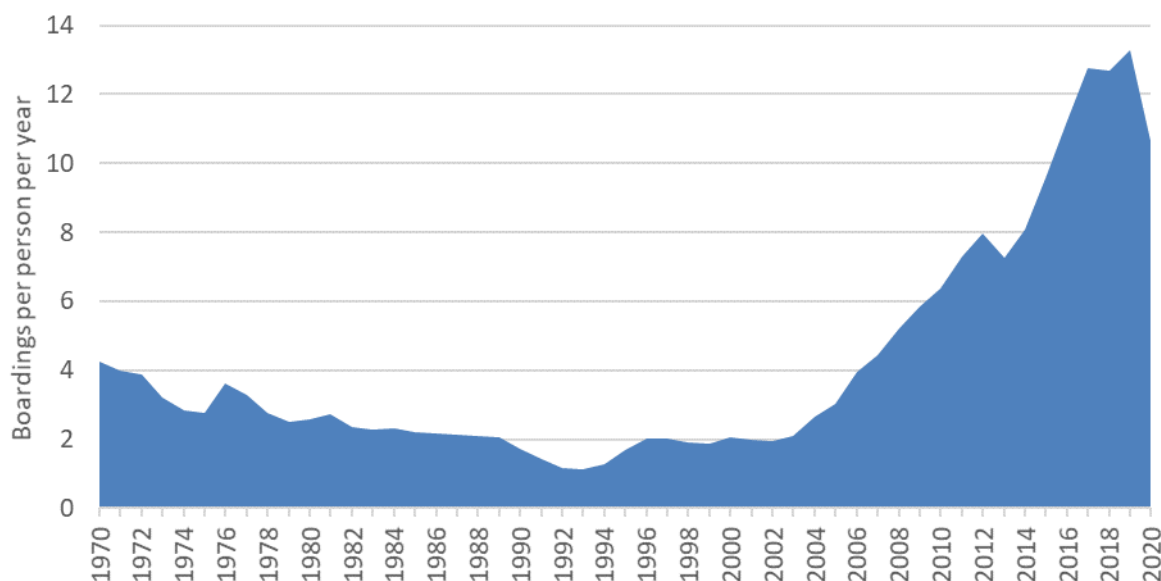


Figure 4-2: Rail trips per person per year

4.2 Demand forecast

Auckland Transport will adopt new patronage forecasts and targets as part of its 2021 Regional Land Transport Plan. This section is based on the forecasts in the 2018 Regional Public Transport Plan.

The next few years represent a period of consolidation and construction for the rail network. Major capital investments include the City Rail Link, electrification of the Papakura to Pukekohe line and construction of a separate rail freight line (the “Third Main”) from Westfield initially to Wiri (the junction with the Manukau branch line) and in the long term further south.

The City Rail Link is forecast to create a further step change in rail patronage from its opening in 2024. However in the early years of the coming decade the majority of patronage growth is forecast to be on bus, and in particular the frequent bus network.

By 2023/24, Auckland Transport expects PT patronage to increase to around 120 million, with around 30 million of those trips being on rail as shown in Figure 4-3.

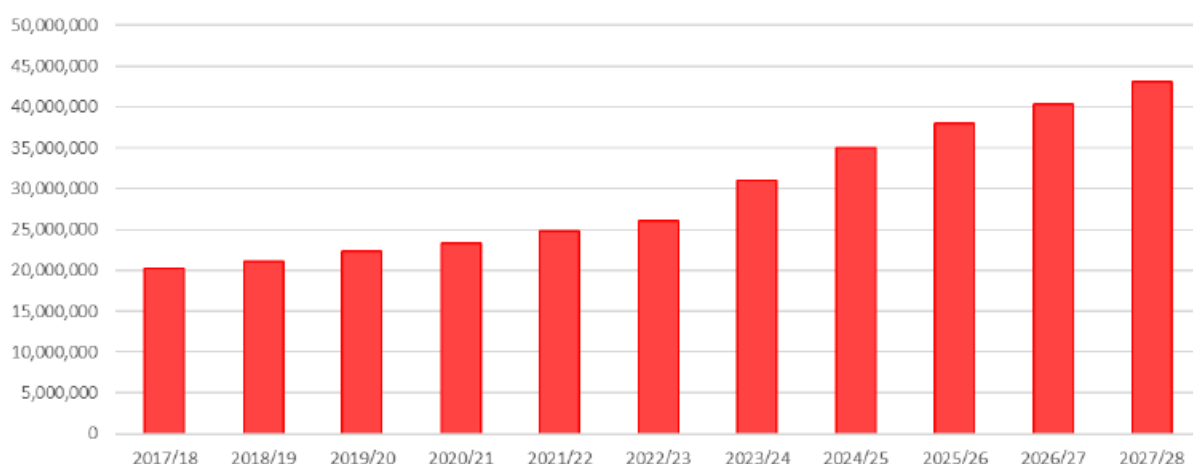


Figure 4-3: Projected patronage growth on rail 2017/18 to 2027/28

Source: Draft Auckland Transport Regional Public Transport Plan

4.3 Demand impact on assets

Growth in public transport patronage has few negative impacts and many positive ones. This includes positive impacts for asset management.

Although peak rail capacity remains very constrained until the City Rail Link opens, Auckland Transport plans to increase the frequency of off-peak and shoulder peak services and to deploy more six-car train sets at peak times. This will mean that overall patronage can grow, without increasing crowding at rail stations. Also, the presence of customers at all hours makes vandalism less likely and gives improved personal security.

There will still be some cases where patronage growth leads to the need to extend or duplicate shelters at an existing rail station, however this is a relatively simple, low cost project.

Overall, rail stations currently provide a good level of service, with over 90% customer satisfaction, and it is estimated that increased rail patronage prior to the opening of the City Rail Link will not increase either the maintenance or operational costs of existing rail stations.

The City Rail Link is forecast to at least double the capacity of the rail network, with far-reaching implications for existing stations as well as costs for the new, underground stations.

4.4 Major programmes to meet demand

The [City Rail Link](#) is NZ's largest infrastructure project and will more than double the capacity of Auckland rail services and improve transport outcomes in Auckland. The project consists of a 3.45 km new underground metro rail link, from Britomart Station via two new stations, Aotea and Karangahape Road, to a reconfigured Mt Eden Station connecting to the Western rail line.

The KiwiRail project to electrify the rail line to Pukekohe and the Auckland Transport/KiwiRail [Southern Rail Upgrades](#) will enable rail to play a much greater role in meeting the current and future travel needs of the south Auckland community and supporting planned growth in Drury, Paerata and Pukekohe.

Additional trains will enable more services, deployment of 6-car sets where crowding is currently an issue, and the provision of a fully electric service to Pukekohe once electrification is complete.

4.5 Consequential opex

Annual operating costs for future infrastructure are estimated in Table 4-1. Please refer to Auckland Transport's [Regional Land Transport Plan](#), [Regional Public Transport Plan](#) and project updates for project details including completion dates.

Project	Opex impact	Source for opex impact	Date	Notes
Puhinui station	0.64 million	Estimate based on Panmure Station	Included from 2022/23	
Additional electric trains (EMU Rolling Stock)	\$3.0 million	Based on current unit costs	Included from 2021/ 2022	Forecast train numbers are set out in Table 6-1
Stabling yards Wiri depot	\$0.3 million	Proportional increase (based on capex) when new EMUs arrive	“”	
Electrification of Papakura to Pukekohe line (KiwiRail project)				
Drury, Paerata stations open	0.52 million	\$0.26 million average actual 2018/19 for “ordinary” stations)	2024	
Diesel 3-car trains (DMUs)	3.8 million	Current DMU operational costs	Ends 2024	

Table 4-1: Estimated consequential opex from capital projects – Rail

The consequential opex cost of the City Rail Link is **not** included in this plan. It is expected to be very significant, based on the current opex cost of Britomart which is over \$6 million per year.

4.6 Benefits of rail asset investment

The NZ Transport Agency's economic evaluation manual provides a methodology and process for evaluating the benefits of investment in public transport. A quantitative evaluation of benefits is only required for new capital investment, but an understanding of the wider economic benefits of rail investment also helps to inform renewals and maintenance programmes.

The economic evaluation methodology recognises three categories of benefit from investment in rail assets:

- 1 Benefits to existing rail users, for example greater comfort, reduced travel time or improved reliability
- 2 Benefits to new rail users, as the choice to travel by train can save on vehicle costs, improve access to economic opportunity and is linked to improved health outcomes.
- 3 Road traffic reduction benefits due to reduced congestion, improved safety and better environmental outcomes when more people choose to travel by train rather than by car.

These benefit values support the business case for rail investment. Increasing rail patronage generates economic benefits including reduced traffic congestion, a better travel experience for users, and overall health and environmental benefits.

5 Risk management

5.1 Why we manage risk

Auckland Transport manages risks across all of its functions so it can achieve its objective of 'easy journeys' for all transport users.

Risk management is crucial for achieving the right balance between the costs of delivering services and the levels of service provided. This inter-relationship, and the trade-off involved, is illustrated in

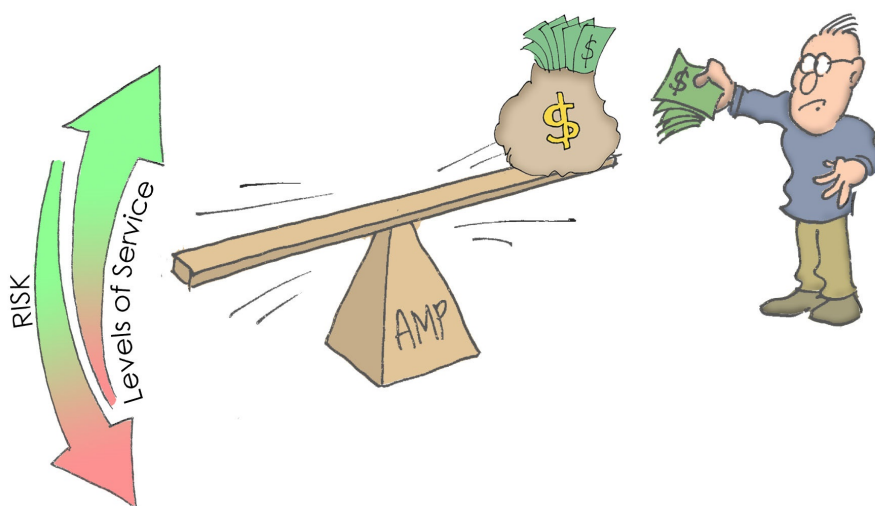


Figure 5 1.

Figure 5-1: Relationship between levels of service, cost and risk

Auckland Transport's Enterprise Business Plan has two key outcomes related to risk:

- undertake a risk-based approach to delivering safe transport initiatives in the community
- increase resilience of the current transport network to support response to disruption and provide for continuity.

Asset management is one of 15 key risks that Auckland Transport has recognised in its Organisational Risk Management Framework. The organisation's risk appetite with respect to asset management is defined in Table 5-1.

Key risk	Appetite Low – Mod – High	Risk appetite statement
Asset management		We have a low appetite for events which may adversely affect our critical assets.
		We have a moderate risk appetite for events which may adversely affect how we maintain our assets at a good operating level.

Table 5-1:Auckland Transport risk appetite for asset management

Source: AT Organisational Risk Management Framework (Section 2.3: Risk Appetite and Tolerance)

5.2 How we manage risk

Auckland Transport divides its risk management activities into three groups:

- planning risks
- service delivery risks and
- management risks.

The key areas of risk within these groups are shown in Figure 5-2, together with the avenues we use to identify risks.

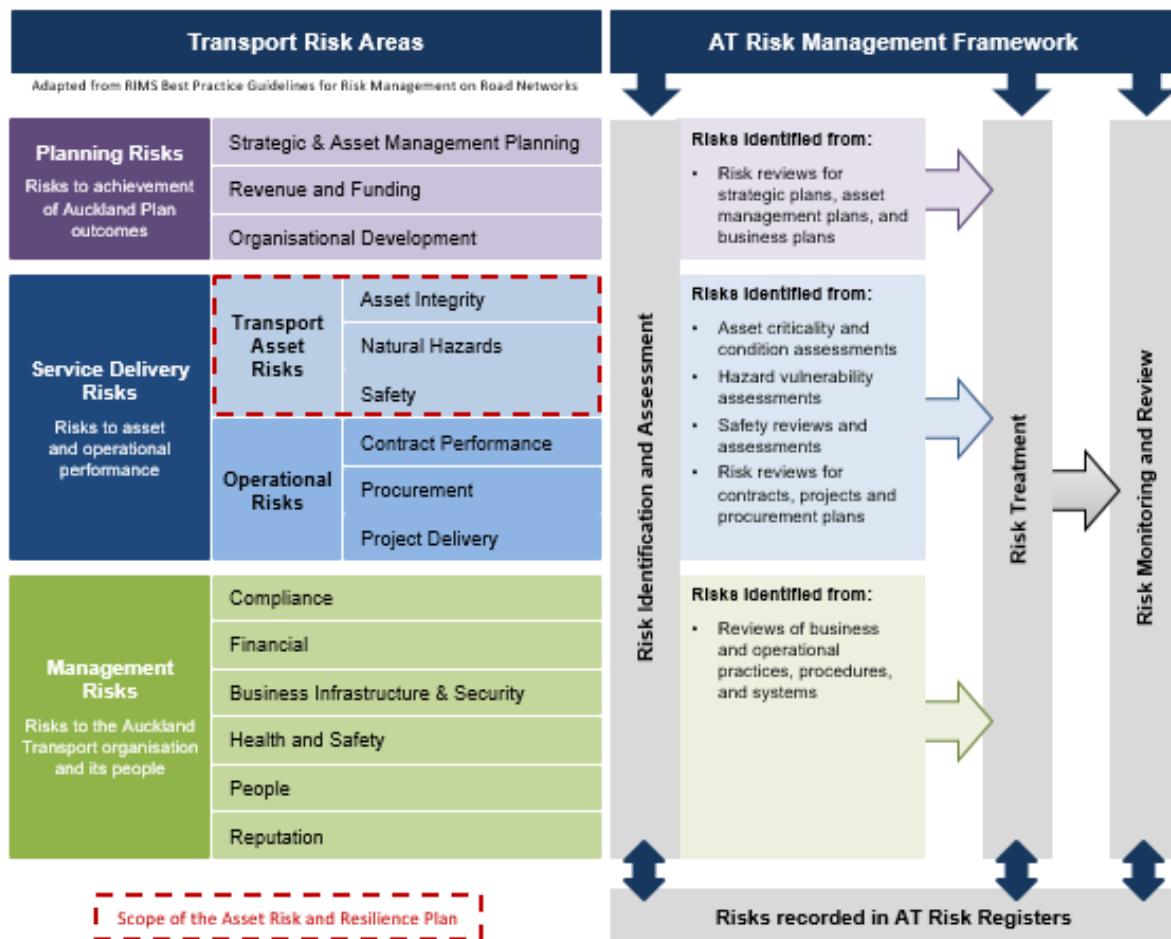


Figure 5-2: Risk management process overview

Auckland Transport's Organisational Risk Management Framework defines the overarching policies and procedures we use to identify, assess, treat and monitor risk, at an appropriate level. The process encapsulated in the framework adopts *AS/NZS ISO 31000:2018 Risk Management – Principles and Guidelines*, enabling a structured risk management approach.

Auckland Transport uses the framework to manage organisational risks across the major functional areas, including safety, business continuity, reputation, customer and asset management.

Through formal risk assessments, we analyse and review key organisational risks and their associated mitigation measures, and report on these to management, with the information used to support risk management initiatives.

Auckland Transport uses Active Risk Manager (ARM) to document, manage and monitor risk information in the organisational risk register. The register provides a central repository for information about

transport risks, with details of the risk owners, mitigation plans, and monitoring and reporting requirements. Our organisational risk management plans are regularly reviewed by the Executive Leadership Team and the Finance, Capital and Risk Committee of Auckland Transport Board.

5.3 Criticality framework and assessments

Auckland Transport has a low appetite for risk events which may adversely affect its critical assets. To help manage this risk, and identify the criticality of particular assets, Auckland Transport has adopted a Criticality Framework for Transport Infrastructure.

The framework defines criticality as ‘a measure of the severity of an outcome’; while critical assets are those that are likely to result in a more significant financial, environment and social costs, in terms of their impact on organisational objectives (International Infrastructure Management Manual, 2015).

The criticality framework provides a systematic and structured approach for carrying out criticality assessments on transport infrastructure assets, in both the road and public transport networks. The approach is a two stage one, looking at an asset's:

- network-level criticality
- asset-level criticality.

The combined results from the network-level and asset-level assessments provide the overall criticality of transport infrastructure assets, and are used to support day-to-day decision-making around lifecycle management, including planning, programming and prioritising maintenance and renewal works, risk management and investments.

5.3.1 Network-level criticality

The network-level criticality of public transport facilities, including rail assets, is assessed based on their patronage, as the number of users reflects the asset's importance in facilitating access and connectivity.

The result of the network-level assessment of rail assets is summarised on a scale of 1 (being ‘vital’) to 5 (being ‘minor’) in Table 5-2.

Network-level criticality	Asset class	Asset name
Level 1	Two major stations	Britomart Newmarket
	Electric trains Wiri depot	
Level 3	Six significant stations	Panmure New Lynn Ellerslie Otahuhu Papakura Papatoetoe
Level 4	12 stations	Manukau, Middlemore, Sylvia Park, Glen Innes, Grafton, Henderson, Manurewa, Penrose, Glen Eden, Avondale, Kingsland Puhinui (closed for redevelopment)
	Four stabling sites	Stabling sites used by electric trains
Level 5	20 stations	All other rail stations

Table 5-2: Critical Auckland Transport rail assets

The above network criticality rankings complement the assessment of road network criticality which is shown in the Auckland Transport corporate GIS layer.

5.3.2 Asset-level criticality

Not all assets at a critical location are critical assets. For example, the pumps that operate decorative water features at Britomart are not critical, while the pumps that remove groundwater clearly are critical, because Britomart sits below sea level on reclaimed land.

For asset level criticality, Auckland Transport adopts a qualitative approach to assessment that considers the potential impact of asset failure on three key factors:

- safety outcomes
- levels of service and efficiency of operation
- cost to repair or replace – i.e. whole-of-life cost.

A proactive assessment of asset criticality is underway for assets within Britomart and Newmarket stations, where the network criticality of the station as a whole has been assessed as level 1 – vital.

For all other rail assets, assets in poor and very poor condition are assessed for their asset criticality based on the specific impacts of asset failure. Both the network level criticality and the asset criticality are then taken into account in prioritising the renewals forward works programme, as set out in Section 6.2.2.

5.4 Asset management risks

Auckland Transport groups asset management risks into three broad categories:

- safety – safety issues arising from the use of assets
- asset integrity – risks associated with the physical status of assets (their condition), design standards and construction quality
- natural hazards – risks arising from exposure to natural hazards and vulnerability of assets.

5.4.1 Safety

Auckland's overall strategy to improve safety is set out in [Vision Zero for Tāmaki Makaurau](#). The strategy was developed collaboratively by the organisations shown in Figure 5-3.



Figure 5-3: Vision Zero for Tāmaki Makaurau participants

The Vision Zero approach challenges all system managers to think proactively about how to reduce the probability of an incident or crash, and how to mitigate the outcomes of crashes by better protecting transport system users from death or serious injury.

The traditional approach to asset safety risks requires asset managers to identify where asset failure or inadequate provision of assets and services could pose a direct risk of death or serious injury to transport users.

Vision Zero challenges asset managers to go beyond the traditional approach. It recognises that the responsibilities of asset managers have expanded to include:

- mitigating complex risks where asset management is one of several factors

- designing and managing assets in ways that mitigate the risk of death or serious injury when accidents do happen.

5.4.1.1 Rail safety risks

Public transport is the safest way to travel. In the past 5 years, only one public transport passenger has died: a bus passenger in 2018. While any death is a tragedy, there have been over 400 million safe public transport journeys over this period.

The real risk of death and serious injury posed by public transport is when pedestrians are involved in crashes with public transport vehicles. In the 5 years from January 2014 to December 2018, seven people on foot were killed by moving trains when crossing railway level-crossings, and 15 people on foot were killed while on the railway corridor. These 22 deaths made up 7.9 per cent of all transport-related deaths in the Auckland Region for this period.

It is close to impossible to stop a train in time to avoid a pedestrian on the rail network – trains are simply too heavy and travel too fast. Reducing train crashes means reducing the opportunities for pedestrians and trains to be in the same place at the same time. This is a shared responsibility between Auckland Transport, KiwiRail and the NZTA, with actions to be implemented in accordance with the Vision Zero strategy.

There are also personal safety risks associated with public transport. Although the risk of death or physical injury while using public transport is very low, customers can still feel uneasy or threatened, and this will make them less willing to use the network, especially at night.

5.4.2 Asset integrity

Asset integrity risks include the risk of assets physically failing, having their function disrupted or providing reduced levels of service, due to their deterioration, issues with their design or construction, or exposure to various types of hazards. These risks are managed through operational activities throughout the asset's lifecycle.

Table 5-3 summarises the risks and mitigation controls Auckland Transport has identified with respect to asset integrity.

Risk	Mitigation controls
Inappropriate asset design or faulty construction	Design and construct assets in compliance with appropriate national and international standards and with asset management policies.
Asset failure (end of life)	Regular asset inspections. Adequate maintenance and renewal budgets, so identified issues can be addressed.
Asset damage (extreme weather)	Streamlined process for the public, rail operator and Auckland Transport staff to report damage. Adequate maintenance and renewal budgets, so identified issues can be addressed.
Asset damage (vandalism)	Streamlined processes for the public, rail operator and Auckland Transport staff to report damage. Adequate maintenance and renewal budgets, so identified issues can be addressed.

Risk	Mitigation controls
	Cooperation with police to identify those causing damage, and recover costs where possible.
Asset damage (fire)	Fire systems installed and maintained to a high standard in rail stations. Safety standards met for fire prevention.

Table 5-3: Asset integrity risks and mitigation controls

5.4.3 Natural hazards

Transport infrastructure and services are prone to damage and disruption from natural hazards, such as earthquakes and liquefaction, coastal inundation, floods and tsunamis. Proactive planning and mitigation controls to address these hazards will improve the resilience of the transport network and will help future-proof it and make it more sustainable.

Table 5-4 summarises the risks and mitigation controls Auckland Transport has identified with respect to natural hazards.

Natural hazard risk	Mitigation controls
Assets are damaged or services are disrupted due to natural hazard events	• Identify hazard types and assess the level of exposure and vulnerability to natural hazards. • Identify areas at high risk and implement prioritised resilience improvement activities in these areas. • Prepare emergency response plans for natural hazards. • Secure emergency funds in response to natural hazard events.

Table 5-4: Natural hazard risks and mitigation controls

5.4.3.1 Natural Hazard Risk Management Framework

Auckland Transport is developing a Natural Hazard Risk Management Framework for its transport network. The framework will assess the risks related to natural hazards, and will be used to prioritise risk mitigation measures and network resilience improvements.

Under the framework, natural hazard risks are assessed based on their:

- likelihood – the chance of a natural hazard event happening
- vulnerability – the level of potential damage that could be caused if assets are exposed to the hazard
- consequence – what effect a hazard event would have on transport objectives.

This approach is illustrated in Figure 5-3.

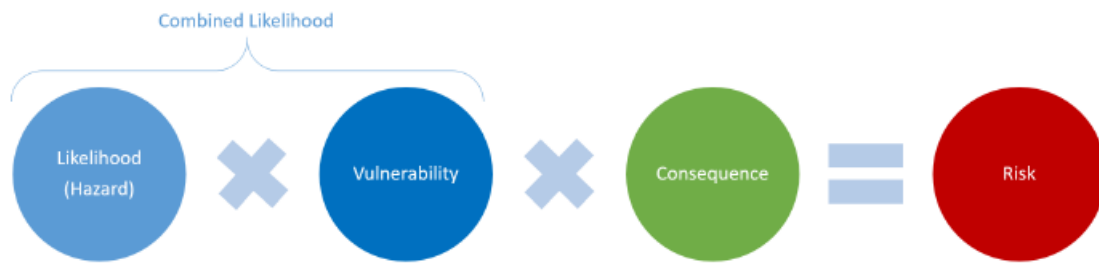


Figure 5-4: Natural hazard risk management assessment approach

This natural hazard risk assessment will allow Auckland Transport to identify key risk areas and any assets that are likely to be exposed to natural hazard events, and give them a risk profile ranking from very low to very high.

The information will help decision-makers prioritise risk-mitigation initiatives in the highest ranked risk areas.

Once we have identified the priority risks, we will develop options to improve network resilience. Options will balance the cost and effort of their implementation against the benefits to be gained.

5.4.3.2 Natural hazard exposure assessment results

Auckland Transport has assessed the exposure of the transport network to the following natural hazards:

- earthquake and liquefaction
- coastal inundation and sea-level rise
- flooding
- tsunami
- volcanic activity.

The interim result of this assessment is available for road assets, and will be completed for public transport assets before the adoption of the 2021 Asset Management Plan.

Earthquakes have been identified as a key risk for the rail network, and a seismic strength assessment has been undertaken for all rail stations. All stations, except Britomart, meet current seismic standards. Seismic strengthening of Britomart station is currently underway, as part of the development of the City Rail Link.

5.5 Rail risk register

Auckland Transport identifies key risks for its rail assets and network, and develops mitigation plans to address these risks. This information is recorded in a risk register.

5.5.1 Rail network risks

The most significant risk of the rail network is the high risk of death wherever pedestrians and trains interact at level crossings.

Auckland's rail network has 45 level crossings, of which 31 are road and pedestrian crossings, and 14 are pedestrian-only. Level crossings represent a high risk, especially as the frequency of rail services

increase. Responsibility for managing different aspects of this risk rests with Auckland Transport, KiwiRail, the NZTA and the wider community, as shown in Table 5-5.

Asset type	Risk category	Risk detail	Risk rating	Mitigation controls
Road and rail networks	Crashes with trains	22 deaths of pedestrians in Auckland in the five calendar years 2015 to 2019, following crashes with trains	High	Work with KiwiRail and the NZTA to: • improve safety infrastructure and train warning systems at rail level-crossings • provide safe walking and cycling links along and across the rail corridor to reduce the demand for trespassing • fence and otherwise restrict unauthorised access to the rail corridor • raise awareness of rail safety issues • use CCTV footage and other measures to review and improve all rail level-crossings • where possible, close rail level-crossings or grade separate them (build over-bridges or underpasses).

Table 5-5: Rail risk register – rail network

5.5.2 Rail station risks

Table 5-6 sets out the risks that Auckland Transport has identified and recorded in its risk register for its rail station assets.

Asset type	Risk category	Risk detail	Risk rating	Mitigation controls
Rail stations	Safety of passengers	Potential for slips, trips and falls at rail stations	Medium	Ensure the safe design of stations and boarding facilities to minimise the risk of trips, slips and falls.
Rail stations	Personal safety	Potential for customers to feel unsafe, especially when travelling at night	Medium	Increase patronage, because there is safety in numbers. Provide security at stations. Provide electronic help points at all stations, and monitor these at all times. Use CCTV to identify and proactively address personal safety risks.
Rail stations	Electrical safety	Safety risks with access to certain areas, due to electric overhead lines	Medium	Put in place a risk register and mitigation strategies. Train staff to the required standards to work in these areas.
Rail stations	Service delivery	Communication systems become non-operational, due to damage to fibre-optic cables by third parties	Medium	Routinely test fibre-optic cables. Ensure third-parties accessing the rail corridor are using checklists to ensure assets are left in required condition.

Asset type	Risk category	Risk detail	Risk rating	Mitigation controls
Rail stations	Service delivery	Damage to assets due to vandalism	Medium	Install electric fencing around the Wiri depot and all stabling yards. Increase CCTV coverage of stations and depots that have a significant number of incidents. Liaise with the NZ Police to minimise incidents.
Rail stations	Service delivery	Premature failure of assets, prior to their expected useful life	Medium	Ensure robust testing procedures in place for trialing new components. Ensure assets have met the required technical specifications.
Rail stations	Service delivery	Increased maintenance costs, due to poor design of components	Medium	Consider whole-of-life costing at the design stage.

Low

Medium

High

Very high

Table 5-6: Rail risk register – rail stations

5.5.3 Rolling stock risks

Table 5-7 sets out the risks that Auckland Transport has identified and recorded in its risk register for its rolling stock assets.

Asset type	Risk category	Risk detail	Risk rating	Mitigation controls
Rolling stock	Renewals	Timing and logistics of intermediate overhaul of EMUs.	High	As set out in the renewals plan for rolling stock, section 6.1.3
Rolling stock	Safety of passengers	Potential for slips, trips and falls on trains.	High	Maintain and operate trains to minimise safety risks. Encourage vulnerable passengers to use the middle (level boarding) carriage.
Rolling stock	Finance	High maintenance costs, due to poor design of components.	Medium	Structure rolling stock supply contracts to leave significant maintenance risk with the supplier.
Rolling stock	Service delivery Asset management	Asset condition rating is the responsibility of the supplier, not an independent assessor.	High	Undertake at least one independent assessment of a sample of asset condition information supplied by CAF.

Asset type	Risk category	Risk detail	Risk rating	Mitigation controls
Rolling stock	Service delivery Asset management	Facilities for washing underside of EMU units do not meet needs. Difficulty removing debris, including hazardous materials.	High	Improve facilities at Wiri or provide facilities at another depot to provide for more effective train washing.
Rolling stock	Service delivery Asset management	Damage to rolling stock assets, due to accidents and vandalism.	High	Improved CCTV coverage of stations and stabling facilities. Provide better fencing and security. Liaise with NZ Police to minimise vandalism and theft.
Rolling stock	Service delivery Asset management	Failure of power supply or of signalling system causing non-operational rolling stock.	Medium	Obtain ongoing support from KiwiRail.
Rolling stock	Service delivery Asset management	Major overhaul budgets will increase costs significantly in 2024.	Medium	Include these costs in 2021 AMP, to ensure decision makers are aware.



Table 5-7: Rail risk register – rolling stock (trains)

5.6 How risk underpins decision-making

The various risk mitigation measures, identified and required under the risk management framework, also need to align with Auckland Transport's capital improvements, maintenance and operational programmes, and will be used to prioritise and justify these programmes and projects.

The information is also useful for developing an evidence-base for funding applications and for assessing the benefits of projects for users.

This process is highlighted in Figure 5-4.



Figure 5-5: Risk-based decision-making process

6 How we manage assets throughout their lifecycle

Auckland Transport actively manages its assets throughout their lifecycles, using lifecycle management plans. Lifecycle management plans contain several important components, including:

- an operational plan – detailing how we will ensure assets remain fit for purpose, and how we respond to customer service requests and emergency events
- a maintenance plan – setting out how we will identify and repair asset faults
- a renewals plan – explaining our approach for replacing assets as they deteriorate
- a capital improvements programme – detailing our plans to create new assets or improve existing assets
- a disposal plan – explaining when and how we will dispose of assets, once they have reached the end of their lives.

In this section we explain our approach to lifecycle management, and outline the operational, maintenance, renewal and disposal plans and the capital improvement programme that we have developed for the rail assets in the Auckland transport network.

Lifecycle management also includes:

- surveys and data checks to ensure that information is accurate, relevant and up to date
- database management, because good asset information is an asset in its own right.

6.1 Lifecycle management plan – rolling stock

The lifecycle management plan for rolling stock relates to the operations, maintenance and renewals of Auckland Transport's fleet of EMUs. Figure 6-1 shows a typical Auckland Transport EMU. Each EMU is a three-car set, made up of one trailer car in the middle and a powered driving car at each end, shown in . The three-car set operates in service as a single unit, or as two three-car sets coupled together. Each train carries up to 375 passengers.



Figure 6-1: Auckland Transport EMU

6.1.1 Rolling stock overview

Auckland Transport currently has a supply and maintenance agreement with CAF for its fleet of EMUs. Auckland Transport also owns a fleet of 10 diesel trains, used for the Papakura to Pukekohe service.

The first EMU was introduced into service in 2014, with the full fleet of 57 in service by mid-2015. The maintenance agreement with CAF will last for 12 years, in the first instance, and is subject to extension. Auckland Transport built a maintenance depot for the EMUs at Wiri in Manukau. The depot has stabling capacity for up to 28 electric trains, a cleaner's platform and train wash equipment.

The expected useful life of an EMU unit is 35 years, calculated on the expected kilometres run in its lifetime and the manufacturer's support lifecycle. Intermediate overhaul will be required at 640,000 million kilometres, with the first of these falling due in December 2020. A major overhaul will be required after 1.28 million kilometres, and is forecast to fall due for the first units in June 2026.

The number of trains in service in each year from 2018/2019 to 2030/2031, is shown in Table 6-1.

	2018/ 2019	2019/ 2020	2020/ 2021	2021/ 2022	2022/ 2023	2023/ 2024	2024/ 2025	2025/ 2026	2026/ 2027	2027/ 2028	2028/ 2029	2029/ 2030	2030/ 2031
EMUs	57	57	72	72	72	82	94	94	104	118	118	118	118
DMUs	10	10	10	10	10	10	10	0	0	0	0	0	0

Table 6-1: EMUs and DMUs – forecast numbers

Source: Estimate prepared for draft 2021 Regional Land Transport Plan

The components of each EMU, for the purpose of lifecycle management, are shown in Table 6-2.

Component group	Component
Exterior	External fabric
	Paint finish
	Decals and signage
Interior	Seats and upholstery
	Carpets and flooring
	Other interior fittings
Train systems	Wheel sets, gear boxes and axle boxes
	Bogies (each EMU has six H-frame bogies, incorporating the suspension system)
	Traction system (transformer and traction converter, and four traction motors)
	Coupling systems
	Auxiliary power system (for other train systems)
	Heating, ventilation and air conditioning systems
	Train management system (the COSMOS computer control system)
	Doors
	Communication, including onboard CCTV
	Braking and emergency stopping systems
	Exterior lighting
	Interior lighting
	Fire detection and control systems

Table 6-2: Components of EMUs

6.1.2 Operational and maintenance plan for rolling stock

6.1.2.1 Operational and maintenance activities

Currently, Transdev operates Auckland's rail service using Auckland Transport's fleet of electric trains, and has a role in the asset management, operations and maintenance of these trains, as delivered by CAF. Transdev also have a role in operating the diesel fleet, which will be phased out when the electrification of the network to Pukekohe is complete.

A procurement process is underway to re-tender the rail franchise. The role of Auckland's rail franchise holder in the management of trains may change when the re-tendering of the rail franchise is complete.

An asset management document was prepared for Auckland Transport by CAF in 2013 and revised in 2019. The document includes condition information. However, it does not conform to the same methodology used by Auckland Transport for other assets, and much of the information is qualitative.

A following is a brief summary of the 2018 asset condition information in the CAF asset management document.

- **Body exterior:** the exterior appearance of the EMUs is a concern, as painted surfaces have suffered from vandalism through graffiti, scratching and (less commonly) acid etching. Graffiti is removed, generally on the same day, but the process can cause gradual damage to underlying paint work and decals. When graffiti removal is delayed, permanent damage to paintwork can result.
- **Underframe:** the Wiri Depot does not currently have good equipment for cleaning the build-up of grime and dirt on the underframe of trains, which can contain hazardous substances.
- **Body interior:** generally, the appearance of the body interior is very good, although some of the glow strips now look dirty. Wear and tear of seat bases and backs is becoming an issue, and vandalism of seat backs is common.
- **Traction and other key systems** are being maintained to meet safety standards and operational requirements. The reliability of key systems is tracked and reported

The current maintenance and inspection programme for the EMUs is set out in Table 6-3.

Activity	Description	Frequency (km)	Tolerance
Routine maintenance	Basic inspection (IB)	10,000	+/-1,000 km
	Mean inspection 1 (M1)	20,000	
	Basic inspection (IB)	30,000	
	Mean inspection 2 (M2)	40,000	
	Basic inspection (IB)	50,000	
	Mean inspection 3 (M3)	60,000	
	Basic inspection (IB)	50,000	
	As above every 10,000km, up to M16:		
	– IB and M1 to M16 sequence up to 640,000km, then:		
	Major periodic maintenance – intermediate overhaul	640,000	10%
Repairs	– IB and M1 to M16 sequence up to 1,280,000km, then:	Every 10,000km	+/-1000km
	Major periodic maintenance – intermediate overhaul	1,280,000	10%
	Vandalism – repairs to broken windows, track debris etc	As required by contract	

Table 6-3: Maintenance and inspection programme for EMUs

6.1.2.2 Historical maintenance and operations costs

Payments to CAF for electric trains are all classified in Auckland Transport's budget as asset-based operations, but include maintenance costs and some minor renewals. Payments to CAF are specified as:

- maintenance cost per kilometre
- management fee
- other costs
- performance margin
- variations.

These payments include the cost of the intermediate overhauls, but exclude the cost of the major overhaul. The operational cost of the Wiri maintenance depot is included in the payments to CAF.

For DMUs, operations and maintenance costs are paid to KiwiRail and are made up of

- management and maintenance fee
- other costs
- fuel costs.

Auckland Transport's fleet of 10 DMUs are used to provide a shuttle service from Papakura to Pukekohe. The operations and maintenance costs of diesel trains are high in comparison to electric trains, as shown in Figure 6-2 and Table 6-4.

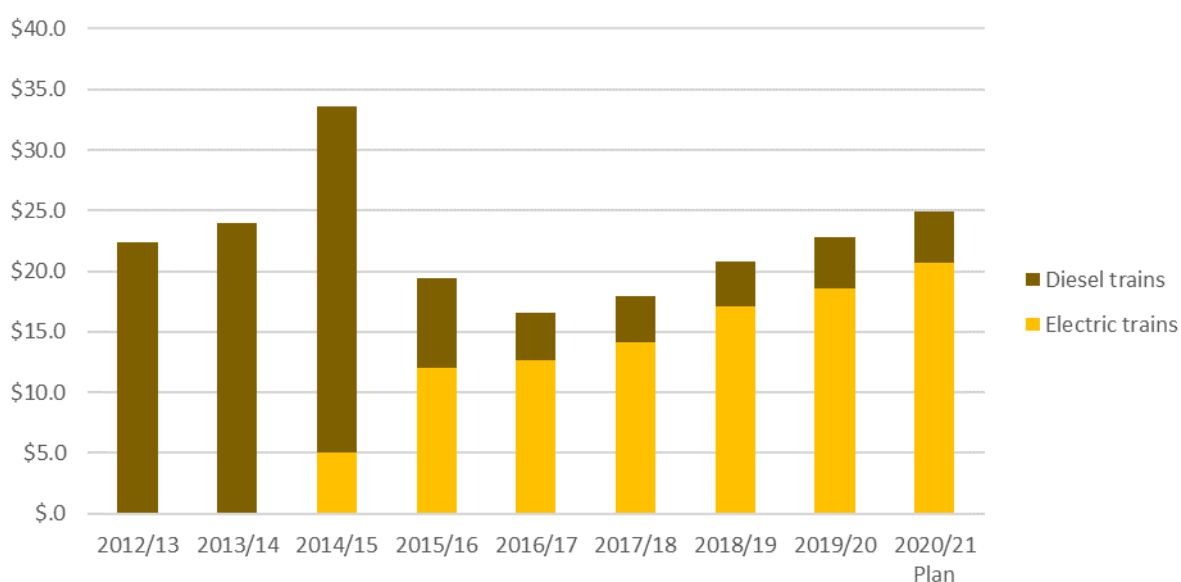


Figure 6-2: Past operations and maintenance costs for diesel and electric trains

Asset type	2012/ 2013	2013/ 2014	2014/ 2015	2015/ 2016	2016/ 2017	2017/ 2018	2018/ 2019	2019/ 2020	2020/ 2021 plan
Electric trains	\$0.0	\$0.0	\$5.0	\$12.0	\$12.7	\$14.1	\$17.1	\$18.6	\$20.7
Diesel trains	\$22.4	\$24.0	\$28.5	\$7.4	\$3.8	\$3.8	\$3.7	\$4.2	\$4.3

Table 6-4 : Past operations and maintenance costs for diesel and electric trains

6.1.2.3 Future operations and maintenance requirements

Future costs to operate and maintain electric trains increase with the number of trains, as shown in Figure 6-3 and Table 6-5. Diesel trains will not be in service after the Papakura to Pukekohe electrification is complete, estimated to be in 2025.

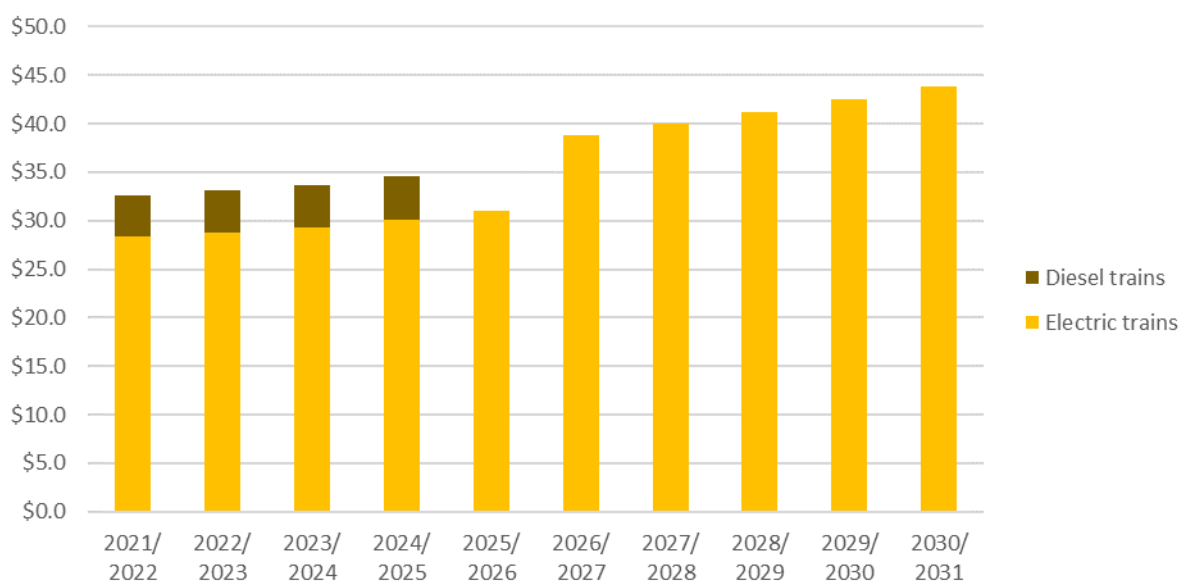


Figure 6-3: Recommended future operations and maintenance costs for diesel and electric trains

	2021/ 2022	2022/ 2023	2023/ 2024	2024/ 2025	2025/ 2026	2026/ 2027	2027/ 2028	2028/ 2029	2029/ 2030	2030/ 2031
Electric trains	\$28.4	\$28.8	\$29.3	\$30.1	\$31.0	\$38.9	\$40.0	\$41.2	\$42.5	\$43.8
Diesel trains	\$4.2	\$4.3	\$4.3	\$4.4	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Total	\$32.6	\$33.1	\$33.6	\$34.5	\$31.0	\$38.9	\$40.0	\$41.2	\$42.5	\$43.8

Table 6-5: Recommended future operations and maintenance costs for diesel and electric trains

6.1.3 Renewals plan for rolling stock

Asset renewal is:

- works performed to restore an existing asset to the current expected standard or level of service

- replacement or major repair of an asset that has reached the end of its effective life, where the work is required to extend the asset's life or restore its service potential.

By this definition, both the intermediate and major overhauls of EMUs are renewals. During the 10 years of this asset class management plan, all EMUs are expected to require:

- an intermediate overhaul after 640,000 kilometres of service
- a major overhaul after 1.28 million kilometres of service.

Intermediate overhauls of the initial fleet of 57 EMUs fall due from 2020/2021, and major overhauls between 2026 and 2029.

For electric trains, Auckland Transport does not have a separate renewals budget, because the costs of the intermediate overhaul work is covered under AT's contract with CAF; that is, the intermediate overhaul is paid for as part of the operational costs described in Section 6.1.2. However there are still logistical and operational challenges for AT, even though the cost is provided for.

- Intermediate overhaul requires each unit to be out of service for 14 to 28 days per unit
- Space constraints at the Wiri depot mean that only one unit can be overhauled at a time
- Day-to-day timetabling practice has been to allocate EMUs so as to keep their kilometres consistent. This means that the current fleet of EMUs will all fall due for intervention over a short period. The arrival of new EMUs to increase the fleet size from 57 to 59 currently, and 72 by the end of 2021, will enable CAF to amend its timetabling practice, in order to ensure that the units fall due for intermediate overhaul over a longer time period.

From 2026, Auckland Transport will need to provide funding for major overhauls; this is the Celectric Trains renewal cost shown in Table 6-6. Like the intermediate overhauls, major overhauls will require AT to plan ahead for logistical challenges that this will create. This includes the need for a capital investment to expand facilities at Wiri to provide for major overhauls.

Renewals forecasts for diesel trains are also shown in Table 6-6. AT budgets for diesel train renewals separately from operations and maintenance. This provision ends in 2023/2024, in anticipation of the electrification of the rail line to Pukekohe and the introduction of electric trains on this service.

	2021/ 2022	2022/ 2023	2023/ 2024	2024/ 2025	2025/ 2026	2026/ 2027	2027/ 2028	2028/ 2029	2029/ 2030	2030/ 2031
Diesel trains	\$0.6	\$0.6	\$0.6	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Electric trains	\$0.0	\$0.0	\$0.0	\$12.7	\$19.4	\$17.6	\$4.5	\$4.6	\$4.7	\$9.5

Table 6-6: Recommended future renewals costs for trains

6.1.4 Disposals

Disposal refers to the activities necessary to dispose of decommissioned assets. Disposal options include selling assets, breaking assets up into component parts, and selling off or scrapping assets at the end of their useful life.

Auckland Transport has been fortunate to sell some of its former fleet of diesel trains and carriages. The remaining units are in a stabling yard in Taumaranui, and if not sold, would have value as scrap.

6.2 Lifecycle management plan – stations and stabling

Rail stations are among the most significant of Auckland Transport's public transport assets. From the opening of Britomart in 2003, Aucklanders have invested in rail stations as a visible statement of the importance of public transport in building our future city. The rail story has been one of 'build it and they will come', with rail patronage rising from only 2 million trips in 2003 to over 21 million in 2019.

6.2.1 Operational and maintenance plan for rail stations

6.2.1.1 Operational activities for rail stations

Rail stations need to be kept clean, secure and well lit to provide a safe and welcoming environment for the travelling public. The most significant operational activities for rail stations are:

- staffing for hub stations
- scheduled cleaning and graffiti removal
- security patrols, security response and monitoring of help points and CCTV
- security for stabling yards.

6.2.1.2 Past operations expenditure

Expenditure on rail asset operations over the past 8 years, and the planned expenditure for 2019/2020 and 2020/2021, are shown in Figure 6-4 and Table 6-7. Operating costs of rail stations have risen over past years, as new rail stations open and as rail patronage and hours of operation expand.

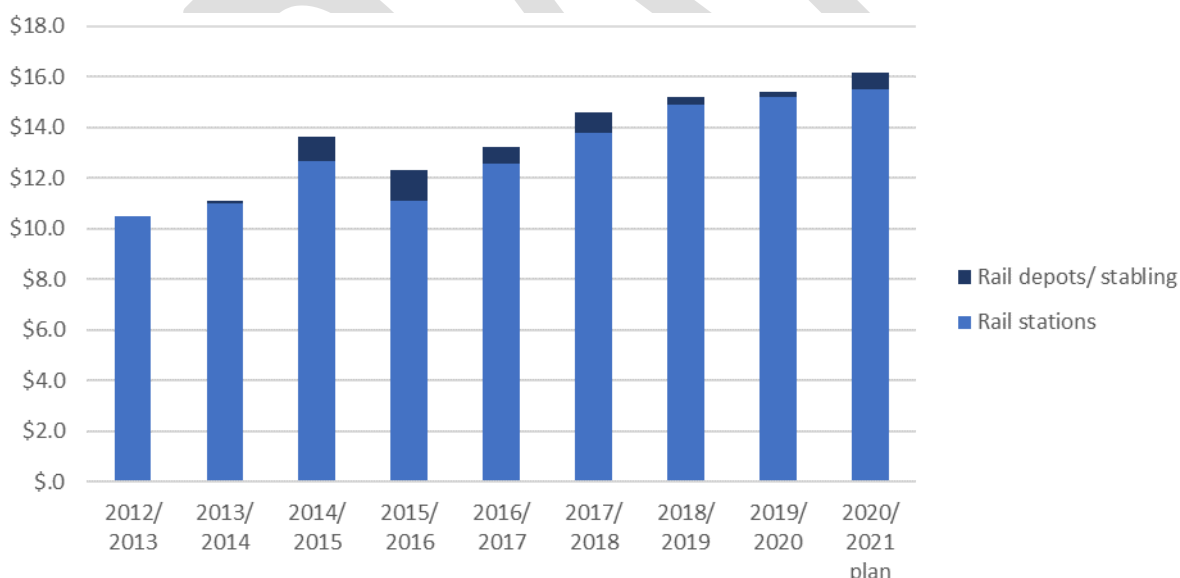


Figure 6-4: Rail station operations – actual expenditure and current plans

Asset type	2012/ 2013	2013/ 2014	2014/ 2015	2015/ 2016	2016/ 2017	2017/ 2018	2018/ 2019	2019/ 2020	2020/ 2021 plan
Rail stations	\$10.5	\$11.0	\$12.7	\$11.1	\$12.6	\$13.8	\$14.9	\$15.2	\$15.5
Rail depots and stabling	\$0.0	\$0.1	\$0.9	\$1.2	\$0.7	\$0.8	\$0.3	\$0.2	\$0.7

Table 6-7: Rail station operations – actual expenditure and current plans

6.2.1.3 Maintenance activities for rail stations

Maintenance activities for rail stations can be divided into reactive and proactive maintenance. Reactive maintenance includes:

- replacing worn components, where this does not meet the criteria for a renewal
- repairing components that have been damaged by accidents or vandalism
- responding to public requests for minor repairs.

Proactive maintenance is scheduled in advance and includes:

- scheduled repainting and graffiti prevention
- keeping up with the maintenance programme for mechanical and electrical components, especially lifts and escalators
- other proactive activities where these are more cost effective than reactive maintenance.

6.2.1.4 Past maintenance expenditure

Expenditure for rail station maintenance has only been budgeted separately since 2015/2016; prior to this it was included in the operational budgets shown in Figure 6-4.

Maintenance costs for rail stations are shown in Figure 6-5 and Table 6-8. These costs will increase over time, partly because more station assets are being added to the network, but also because station assets become older and more likely to need maintenance.

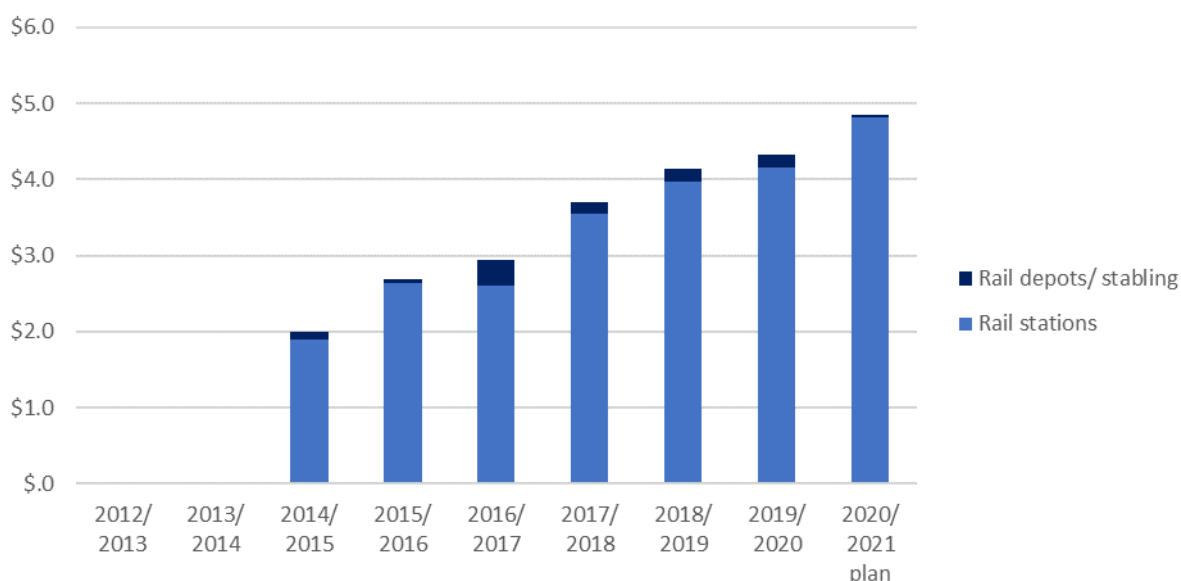


Figure 6-5: Rail station maintenance – actual expenditure and current plans

Asset type	2012/ 2013	2013/ 2014	2014/ 2015	2015/ 2016	2016/ 2017	2017/ 2018	2018/ 2019	2019/ 2020	2020/ 2021 plan
Rail stations	\$0	\$0	\$1.9	\$2.6	\$2.6	\$3.6	\$4.0	\$4.2	\$4.8
Rail stabling	\$0	\$0	\$1.1	\$1.1	\$3	\$1.1	\$2	\$2	\$0
Total	\$0	\$0	\$2.0	\$2.7	\$2.9	\$3.7	\$4.1	\$4.3	\$4.9

Table 6-8: Rail station maintenance – actual expenditure and current plans

6.2.1.5 Rail station operations – future asset needs

Forecast operations needs for rail stations over the 10 years beginning 2021/2022 are shown in Figure 6-6 and Table 6-9. This expenditure forecast is based on current costs for current stations including Britomart, with consequential increases in 2022/2023 due to the opening of Puhinui hub station and interchange, and in 2027/2028 due to the proposed Drury station, south of Papakura.

This forecast does not include the costs of operating new stations opening as part of the City Rail Link. Based on the current cost of operating Britomart Station, which is over \$6 million per year, the costs of operating the new stations at Aotea, Karangahape Rd and Mt Eden are expected to be significant.

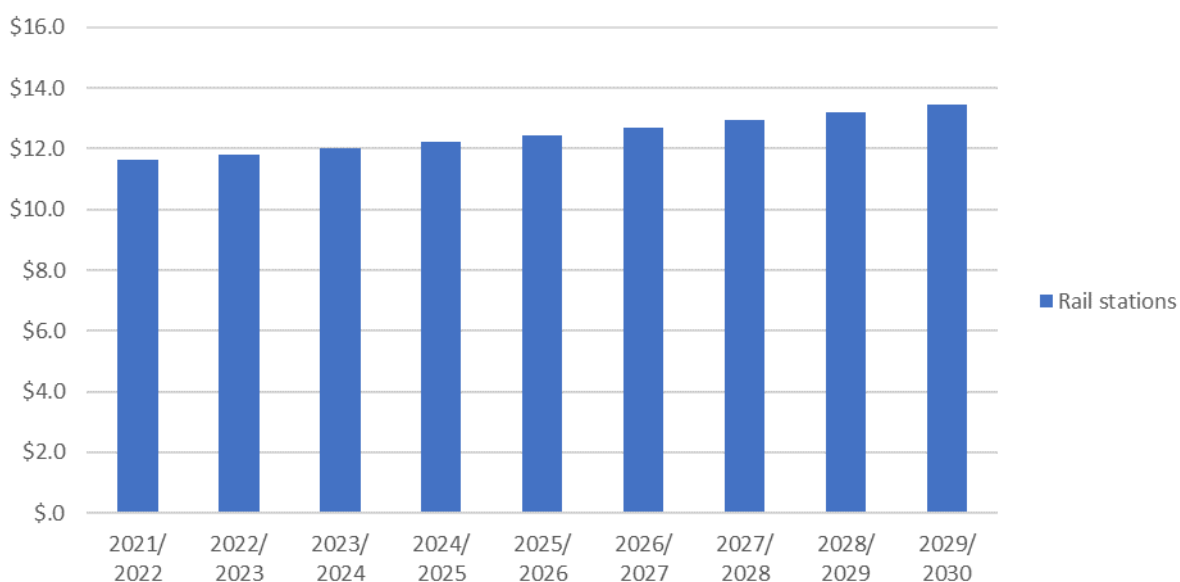


Figure 6-6: Rail station operations – future needs

Asset type	2021/ 2022	2022/ 2023	2023/ 2024	2024/ 2025	2025/ 2026	2026/ 2027	2027/ 2028	2028/ 2029	2029/ 2030	2030/ 2031
Rail stations	\$11.7	\$11.8	\$12.0	\$12.2	\$12.5	\$12.7	\$13.0	\$13.2	\$13.5	\$13.7

Table 6-9: Rail asset operations – future asset needs

6.2.1.6 Rail station maintenance – future needs

Forecast maintenance needs for rail stations over the 10 years beginning 2021/2022 are shown in Figure 6-7 and Table 6-10. This forecast is based on current costs, with increases due to new stations at Puhinui and Drury, along with provision for increased maintenance requirements as rail station assets become older and require more maintenance.

This forecast does not include the costs of maintaining new stations opening as part of the City Rail Link.

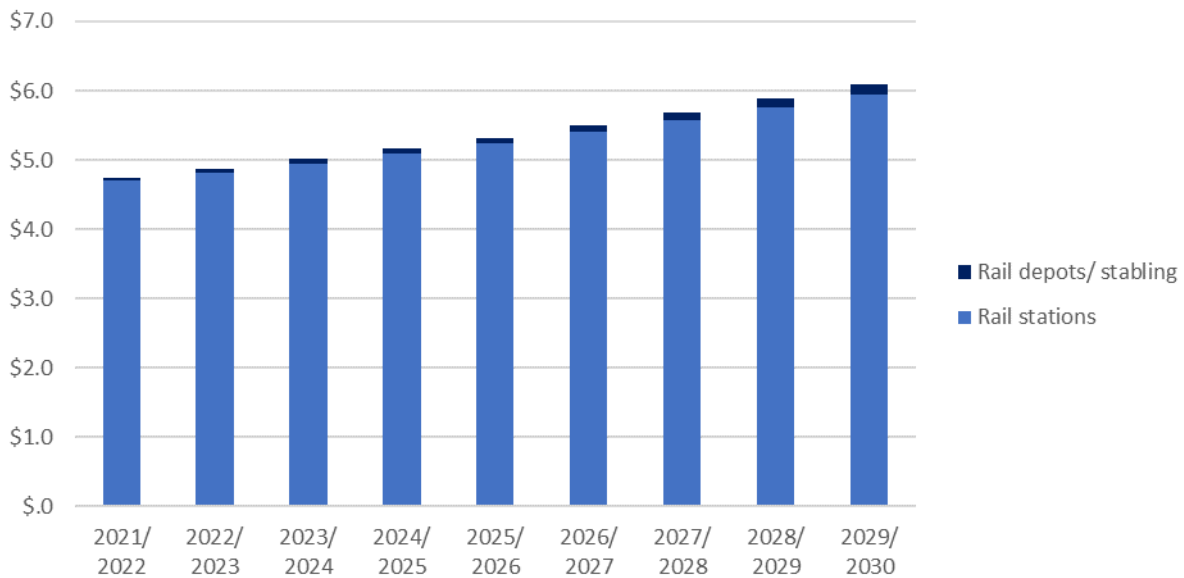


Figure 6-7: Rail station maintenance – future needs

Asset type	2021/ 2022	2022/ 2023	2023/ 2024	2024/ 2025	2025/ 2026	2026/ 2027	2027/ 2028	2028/ 2029	2029/ 2030	2030/ 2031
Rail stations	\$4.7	\$4.8	\$4.9	\$5.1	\$5.2	\$5.4	\$5.6	\$5.8	\$5.9	\$6.1
Rail depots/ stabling	\$0.0	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.2
Total	\$4.7	\$4.9	\$5.0	\$5.2	\$5.3	\$5.5	\$5.7	\$5.9	\$6.1	\$6.3

Table 6-10: Rail station maintenance – future needs

6.2.2 Renewals plan for rail stations

Most rail station assets were constructed in the decade between the opening of Britomart in 2003, and the upgrade of Panmure Station in 2014, as set out in Table 2-9.

In proportion to their expected useful life of 60 years, rail station assets are relatively new and have not yet needed major renewals. However, some station components, including signs, CCTV equipment and interior fitout are reaching the end of their useful life and require renewal.

A particular concern is lifts and escalators, which require component renewals in order to continue to meet safety requirements and to achieve their full asset life.

Auckland Transport bases its renewals plan for rail stations on:

- asset inspections to identify assets in poor or very poor condition
- prioritised asset replacements in 'vital' or 'critical' stations, as identified in Section 5.3.1.
- an optimised programme to manage health and safety, political, reputational, operational and economic risk.

The public transport renewal programme is developed from the forward works programme, which identifies priority renewals in the short term. Longer term renewals needs are based on asset condition and expected useful lives.

6.2.2.1 Past renewals expenditure

Past renewals expenditure for rail stations has been minimal, as the majority of rail station assets are still new in proportion to their expected useful life.

The provision for renewals in the 2020/2021 budget is almost entirely Britomart renewals, which need to be timed to fit with construction works for the City Rail Link. This work will not be complete and will also impact future renewals needs.

This past and planned renewals expenditure is shown in Figure 6-8 and Table 6-12.

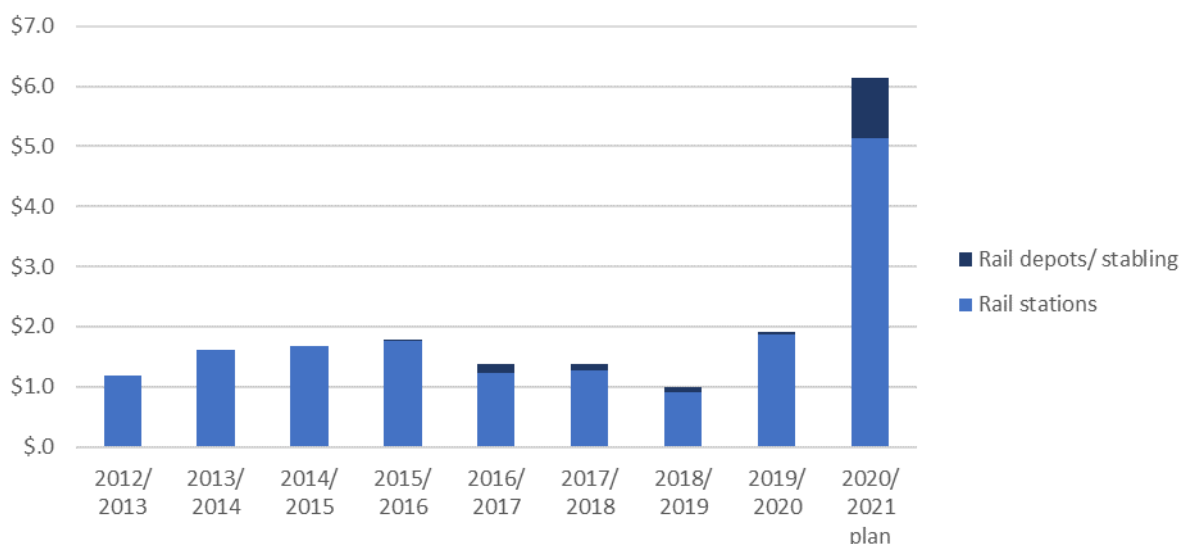


Figure 6-8: Rail station renewals – actual expenditure and current plans

Asset type	2012/ 2013	2013/ 2014	2014/ 2015	2015/ 2016	2016/ 2017	2017/ 2018	2018/ 2019	2019/ 2020	2020/ 2021 plan
Rail stations	\$1.2	\$1.6	\$1.7	\$1.8	\$1.2	\$1.3	\$0.9	\$1.9	\$5.1
Rail depots/ stabling	\$0.0	\$0.0	\$0.0	\$0.0	\$0.2	\$0.1	\$0.1	\$0.0	\$1.0

Table 6-11: Rail station renewals – actual expenditure and current plans

6.2.2.2 Rail station renewals – future needs

Auckland Transport's recommended renewals needs for rail stations are shown in Figure 6-9 and Table 6-13.

The increase in renewals needs over time shows the impact of rail station assets built in the early 2000s reaching the end of their useful life.

Significant components of the rail station renewals programme are:

- renewal of the Britomart lifts, followed by a staged programme of lift renewals at all stations
- renewal of other mechanical and electrical components, including automatic doors
- renewal of assets that are deteriorating rapidly due to design faults, such as:
 - water leaks, including in station lift shafts and the Britomart 'Volcano' water feature

- crack remediation and waterproofing, including at Britomart, Sylvia Park station and the Wiri Depot
- renewal of CCTV at all stations and at stabling sites – modern equivalent CCTV systems offer additional features, which will improve customer safety and protect assets from vandalism
- renewal of fencing and security features at rail stabling sites, also to protect assets from vandalism and graffiti.

These renewals are scheduled in the early years of this plan, prior to the opening of the City Rail Link. This timing takes advantage of rail line closures that are already scheduled for CRL works, and ensures that assets meeting current standards are in place to support the CRL benefits. As soon as the CRL opens, services will be more frequent and any renewals that require closing the rail line will be much more difficult and disruptive.

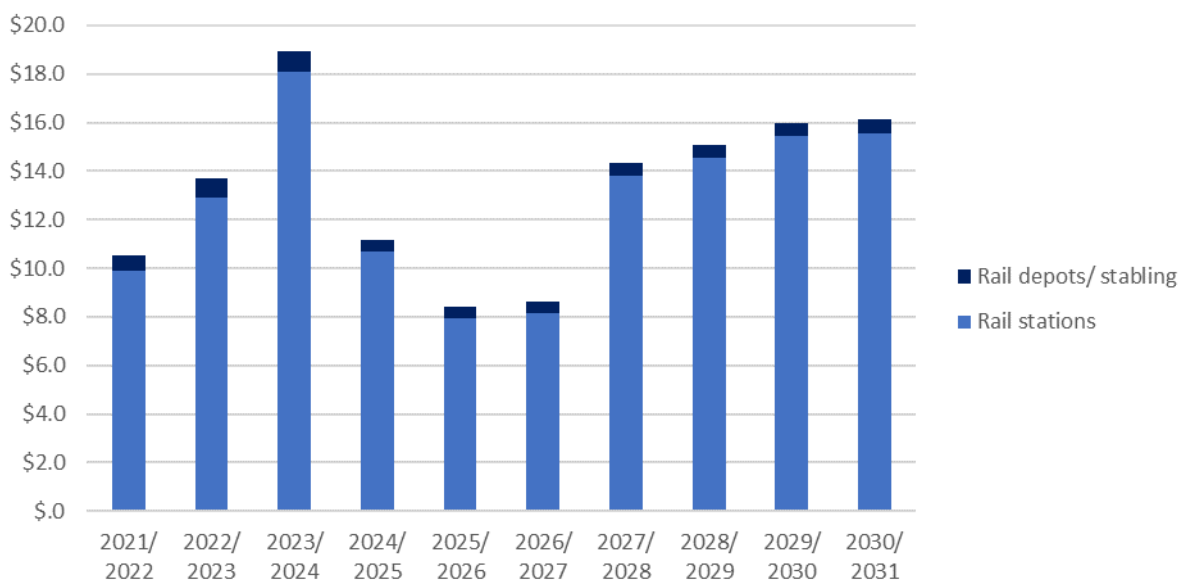


Figure 6-9: Rail station renewals – future needs

Asset type	2021/ 2022	2022/ 2023	2023/ 2024	2024/ 2025	2025/ 2026	2026/ 2027	2027/ 2028	2028/ 2029	2029/ 2030	2030/ 2031
Rail stations	\$9.9	\$12.9	\$18.1	\$10.7	\$7.9	\$8.1	\$13.8	\$14.6	\$15.5	\$15.6
Rail stabling	\$0.6	\$0.8	\$0.9	\$0.5	\$0.5	\$0.5	\$0.5	\$0.5	\$0.5	\$0.6
Total	\$10.5	\$13.7	\$18.9	\$11.2	\$8.4	\$8.7	\$14.3	\$15.1	\$16.0	\$16.1

Table 6-12: Rail station renewals – future needs

7 Plan improvements and monitoring

In developing this asset class management plan, we have identified a number of opportunities for improving both our asset management practices and how future plans are developed. These recommended improvements are shown in Table 7-1.

A scope of works for these improvement activities, including a prioritised programme for their implementation, will be developed as part of the final 2021 Asset Management Plan.

7.1 Rolling stock

Responsibility for asset management for Auckland Transport's fleet of 72 electric trains currently sits with CAF. However, Auckland Transport needs to become more actively involved in preparing for the end of the current maintenance contracts.

Recommended improvement	Description and strategy for implementation
Asset monitoring	Audit a sample of trains to verify CAF's reported condition ratings of 'good' and 'very good' for all asset components of EMUs.
	Agree asset monitoring protocols and reporting with CAF, to support the transition to Auckland Transport management of rolling stock assets at the expiry of the current maintenance contracts.
In-house capabilities	Enhance the capability of Auckland Transport staff to assess rolling stock issues and risks, and to prepare asset management strategies.
Major overhaul	Develop detailed plans for the major overhaul of Auckland Transport's original fleet of 57 EMUs, well in advance, so that each unit is overhauled after 1.28 million kilometres, without impacting on fleet performance or levels of service.
Renewals budget	Assess renewals budget needs in more detail, including whether current opex payments have a renewals component.

Table 7-1: Asset improvements – rolling stock

7.2 Rail stations

Auckland Transport rail stations have not yet needed significant renewals, but this is changing as station components reach the end of their useful life. Mechanical and electrical systems are a particular concern. Recommended improvements for rail station assets are shown in Table 7-2

Recommended improvement	Description and strategy for implementation
General data	Continue to improve the quality of the asset data in asset management systems. Develop and improve statistical techniques for drawing valid conclusions, even from imperfect or incomplete data. Improve data management techniques, including a data dictionary, data entry systems and training, and enforcement of data requirements in contracts. Ensure the full capture of new and renewed assets in asset management systems.
Electrical and mechanical systems	Ensure that lifts, escalators and other mechanical and electrical systems are proactively maintained and renewed, by preparing detailed lifecycle plans for these assets.

Asset management policy, strategy and ISO 55000	Continue to improve asset management policy and practice, in line with ISO 55000 requirements.
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Table 7-2: Asset improvements – rail stations

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