Asset Management Plan

June 2021

Greater Wellington
Te Pane Matua Taiao

metlink

Table of Contents

List of abbreviations

AMP	Asset Management Plan
BRT	Buses Replacing Trains
Capex	Capital expenses
CBD	Central Business District
CCTO	Council Controlled Trading Organisation
CCTV	Closed Circuit Television
CPTED	Crime Prevention Through Environmental Design
DMU	Diesel Multiple Unit
DEMU	Diesel/Electric Multiple Unit
ECTS	European Train Control System
EMU	Electric Multiple Unit
ERP	Enterprise Resource Planning System
EV	Electric Vehicle
FRACAS	Failure Reporting, Analysis, and Corrective Action System
GPS	Government Policy Statement on Land Transport 2021
GHG	Green House Gas
GWRC	Greater Wellington Regional Council
FRAC	GWRC's Finance, Risk and Assurance Committee
GWRL	Greater Wellington Rail Limited
HVAC	Heating Ventilating and Air Conditioning
IS	Infrastructure Strategy
KPIs	Key Performance Indicators
LGA	Local Government Act 2002
LGWM	Lets Get Wellington Moving
LOS	Level of Service
LTMA	Land Transport Management Act 2003
LTP	Long Term Plan
MaaS	Mobility as a Service
MDC	Masterton District Council
MDBI	Material Damage Business Interruption insurance policy
MDRF	Material Damage Reserve Fund insurance policy
MDBF	Mean Distance between Failures
MoT	Ministry of Transport

MVOS	Minimum Vehicle Operating Standard
MROM	Metropolitan Rail Operating Model
NBS	National Building Standard
NLTF	National Land Transport Fund
Opex	Operating Expenses
PCC	Porirua City Council
PID	Passenger Information Display
PTOM	Public Transport Operating Model
RLTP	Regional Land Transport Plan
RMA	Resource Management Act 1991
RMC	Rail Monitoring Centre
RNIP	Rail Network Investment Plan
RPTP	Wellington Regional Public Transport Plan
RRP	Wellington Regional Rail Plan
RUB	Requirements for Urban Buses in New Zealand
RSS	Rail Safety System
RTI	Real Time Information
RTRT	Wellington Regional Transport Response Team
SE	Suburban express
SPAD	Signal Passed At Danger
SW	Suburban Wairarapa
TA	Territorial Authority
Transdev	Transdev Wellington Ltd
TSR	Temporary Speed Restriction
VQS	Vehicle Quality Standards
Waka Kotahi	Waka Kotahi New Zealand's Transport Agency
WCC	Wellington City Council
WCCL	Wellington Cable Car Limited
WoF	Warrant of Fitness
WNA	Wellington Network Agreement
WNMP	Wellington Network Management Plan
WRGF	Wellington Regional Growth Framework
WRMSP	Wellington Regional Mode Shift Plan

Introduction

This Asset Management Plan (AMP) describes how we are building an efficient, accessible and low carbon public transport network for the Wellington region. Our multi-modal public transport network of trains, buses, and ferries provides our communities with effective travel options to access jobs, education, healthcare, cultural activities, shops, friends, and whanau. It improves the liveability and economic productivity of our region by:

- decreasing traffic congestion, particularly in the morning and afternoon peak periods, which in turn affects journey times, and journey-time reliability
- providing transport choices, including during off-peak periods
- contributing to the reduction of carbon emissions from transport
- enabling efficient land use and development of a compact, well-designed and sustainable environment.

We have made extensive improvements to our network to deliver affordable, faster, more frequent, and reliable services. We have a great opportunity to further enhance the liveability of our region through creating a more sustainable, accessible and reliable public transport network. A priority for us is ensuring the Wellington City bus network is operating at a level that customers can expect from a world-class public transport network. We will continue to invest to improve network resilience and to unlock capacity to facilitate mode shift and meet both current and future demand.

To this end, the key challenges that we address in this AMP are:

- providing sufficient capacity to meet mode shift targets and demand expectations;
- meeting customer levels of service expectations; and
- efficiently delivering our extensive low carbon work programme.

Purpose

Delivering a world-class public transport network that is fit for purpose for now and in the future requires ongoing investment. The purpose of this AMP is to communicate our 30-year investment plans for the prudent management of our public transport network for the period 2021 to 2051. It demonstrates the alignment from our organisational and public transport objectives through to the levels of service, our service providers, the condition of our assets, and the consequent forecast programme of works.

The investment plans contained within this AMP promote efficiency, inclusive access to public transport for all, mode shift, resilience, and security by minimising and managing the risks to our network from natural and human-made hazards, and contribute to the transition of New Zealand to a net zero carbon emissions' nation.

Scope

This AMP is also the AMP for Greater Wellington's subsidiary company Greater Wellington Rail Limited (GWRL). In 2011, GWRL took ownership of a significant number of the rail assets contained within this AMP.

Our public transport services are delivered through a combination of service contracts that we fund and manage, and assets which we own or manage.

The assets that we own are contained within four asset classes:

- rail station infrastructure: except for Wellington Railway station, we own all the station buildings, overbridges, subways, lighting, fences, bike racks, and other minor rail station infrastructure in the region.
- rail rolling stock
- bus and ferry infrastructure
- customer information assets

The service contracts that we fund and / or manage with our service providers are:

- bus operations
- ferry operations
- rail track assess agreement

The assets and activities relating to the rail network, where we have a long term access agreement with the rail network owner KiwiRail, and the operational activities associated with rail, bus, and ferry services have been included for completeness.

All expenditure presented in this document is on a nominal basis in FY 2021 dollars. Expenditure is shown by June financial year. For example, FY 2020/21 refers to the year 1 July 2020 to 30 June 2021. This AMP has been developed during the Covid-19 pandemic response. As this AMP communicates our 30-year investment plans, our assumption is that the strategic direction will remain constant over the period. The impacts of Covid-19 on patronage trends are yet to be fully understood. However, we consider that after a short period of stabilised demand for services in the medium term, strong economic recovery and population growth will increase demand for our public transport network.

The expenditure in this AMP covers asset renewal capex, asset improvement capex, asset opex, key asset leases, asset insurance, and asset maintenance. We have not included expenditure associated with the following items:

- departmental costs
- bus fleet as these assets are operated by our bus service operators
- Let's Get Wellington Moving initiatives
- national ticketing systems

- Snapper
- the On-Bus-Next-Stop announcement system
- our back office IT systems that run our customer information assets
- RTI 2.0 expenditure.

Status

This is a draft AMP. This draft AMP provides the supporting information and bottom-up detail that underpins the development of Greater Wellington's 2021-2031 Long Term Plan (LTP). This AMP will be updated and finalised to align with adopted Levels of Service and budgets following the finalisation of the LTP in 2021.

AMP document structure

This AMP is structured into nine sections as outlined in Figure 1.

Figure 1: AMP document structure

Expenditure Summary

Expenditure Summary

The expenditure described in this AMP is an investment in our vision of an efficient, accessible, and low carbon public transport network. Our 30-year plan is based on assumptions about the impact of population and demographic changes, the economy, climate change and natural hazards, technology, and legislative and governance changes on our public transport network.

Our key initiatives and investment plans support our three strategic priorities of improving customer experience, increasing mode shift to public transport, and reducing public transport emissions by decarbonising the fleet. These are discussed further below.

Improving Customer Experience

We have identified a number of initiatives where improving our customers' experience when they use our public transport network has the potential to increase the use of public transport. The forecast activities and expenditure contained within this AMP are required to improve customer experience by improving customer information, comfort and convenience of our public transport service, and improve accessibility. Our customer expectations are always evolving. The forecast activities and expenditure ensure we can provide:

- information and facilities that assist with making a connected journey using multiple modes of travel, such as cycling or walking for part of that journey
- accessible information tailored for specific needs
- clean and safe vehicles and facilities
- adequate shelter from the weather in exposed waiting areas
- services and facilities near commonly accessed places, such as work, shopping centres and medical facilities
- prompt updates about changes to services and disruptions
- easy to access vehicles and facilities
- accessibility features in all vehicles, facilities and services that provide access equal to that of people without disabilities e.g. wheelchair-accessible and super-low-floor buses and access to trains, use of accessibility and safety standards in the design and development of public transport facilities
- 'Universal Design' principals and engage people with disabilities during the design and development of new facilities and services

Increasing mode shift to public transport

The Wellington region has the highest mode share across New Zealand with 31% of the trips to work being made either on public transport, by walking, or by cycling. Of the 82,000 people commuting into central Wellington during the peak period, 18% are rail passengers

and 16% are bus passengers. This means there is an opportunity to increase mode shift from private vehicle to our public transport network across the region.

The draft Regional Land Transport Plan 2021 has set a target of a 40% increase in mode shift to active modes and public transport by 2030. Our public transport system has traditionally functioned well for single mode trips, but initiatives that enable more flexibility between modes will be key to making it easier for more people to use shared and active modes for a wider variety of trips, including the traditional journey to work or school. The forecast activities and expenditure within this AMP to support mode shift (in addition to those that relate to customer experience) include integrated ticketing, bike racks on buses, and bike parking at stations.

Reducing public transport emissions by decarbonising the fleet

Our public transport network is a key contributor to reducing greenhouse gas emissions by moving people out of private vehicles and onto another alternative. With public transport contributing approximately 3% of our regional land transport related emissions, a move to a zero carbon emission fleet and the development of a more efficient and reliable public transport network will help us achieve our sustainability goals and contribute to Regional Land Transport Plan 2021 target of a 30% reduction in carbon emissions from transport by 2030.

Decarbonisation of our public transport fleet will be a key contributor to reducing Greater Wellington's carbon footprint. Public transport currently contributes to 50% of Greater Wellington's carbon footprint (37% bus, 13% rail). Modernisation and decarbonisation of our public transport fleet and infrastructure will lead to more efficient journey times which will encourage more people to shift from private car usage. This will result in a decrease in overall carbon emissions for the region.

We have adopted a procurement policy where all future growth buses and retiring diesel buses will be replaced with electric buses. We are working with KiwiRail to plan rolling stock improvements, and electrification of infrastructure. East by West Ferries, our ferry operator, has invested in the development of an electric ferry, the first commercial electric ferry in the southern hemisphere. This is due to be commissioned 2021.

There are some key challenges that need to be overcome in order to achieve full decarbonisation of our bus, rail and ferry services by 2030 including:

1. Funding. The capital expenditure required to implement the decarbonisation agenda is significant and will require contribution from regional and central government sources.
2. New Zealand's electricity generation is largely from renewable resources. However, a portion is still generated from burning fossil fuels. Full decarbonisation of the public transport fleet cannot be achieved until New Zealand's electricity generation is completely renewable and sustainable.

Expenditure overview

Over the 30-year period covered by this AMP, our total opex forecast for rail is $1.4b. This comprises rates, leases, insurance, electricity, and maintenance.

The total capital forecast for rail for the same period is $3.64b. This includes:

- **capex renewal expenditure** of $462m on the KiwiRail Network, $132m on rail infrastructure, and $691m on rolling stock
- **capex improvement expenditure** of $1.30b on the KiwiRail Network, $169m on rail infrastructure, and $888m on rolling stock.

Our total opex for bus is $223m. This comprises both asset renewal opex and maintenance. The total capex renewal and improvement is $63m.

The expenditure presented in this AMP reflects our dedication to improving customer experience, increasing mode shift to public transport, and reducing public transport emissions by decarbonising the fleet.

The expenditure in this AMP covers asset renewal capex, asset improvement capex, transitional rail, asset opex, key asset leases, asset insurance, and asset maintenance. We have not included expenditure associated with the following items:

- departmental costs
- bus fleet as these assets are operated by our bus service operators
- Let's Get Wellington Moving initiatives
- national ticketing systems
- Snapper
- the On-Bus-Next-Stop announcement system
- our back office IT systems that run our customer information assets
- the software component of the RTI 2.0 expenditure (please note the asset infrastructure associated with the RTI 2.0 project, such as the RTI display screens is included within this AMP).

Our total public transport asset opex expenditure forecast by asset type is shown Figure 2.

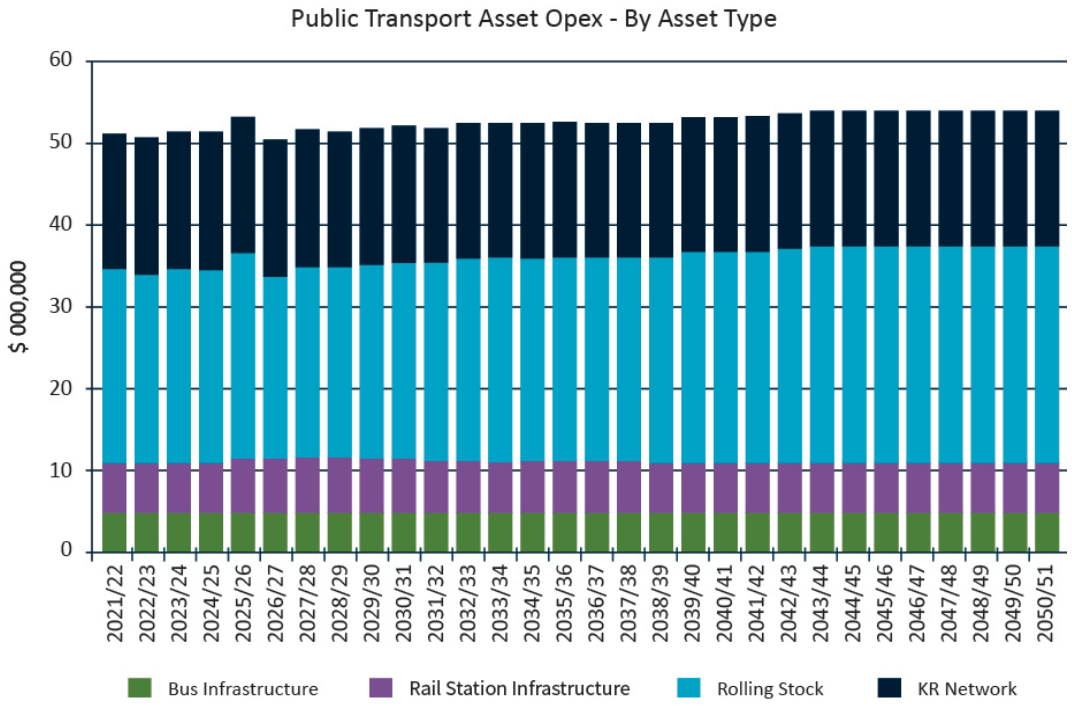


Figure 2: Public Transport asset opex forecast including maintenance

Our public transport asset opex by expenditure type is shown in Figure 3.

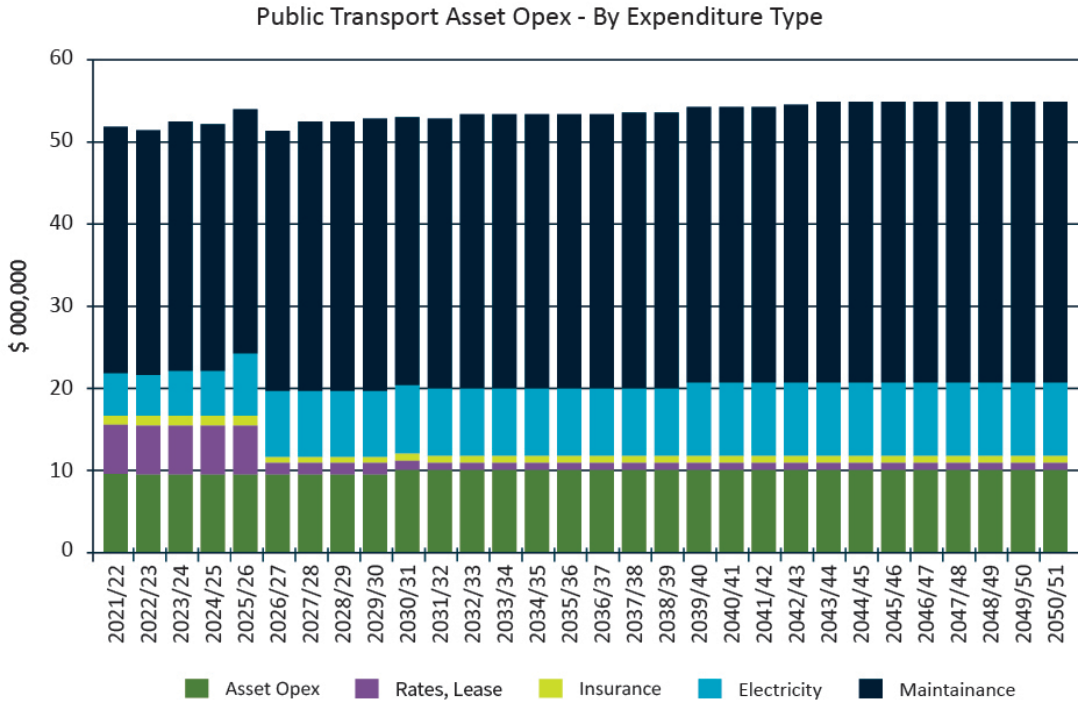


Figure 3: Public transport asset opex by expenditure type

Our total public transport asset capex by asset type is shown in Figure 4.

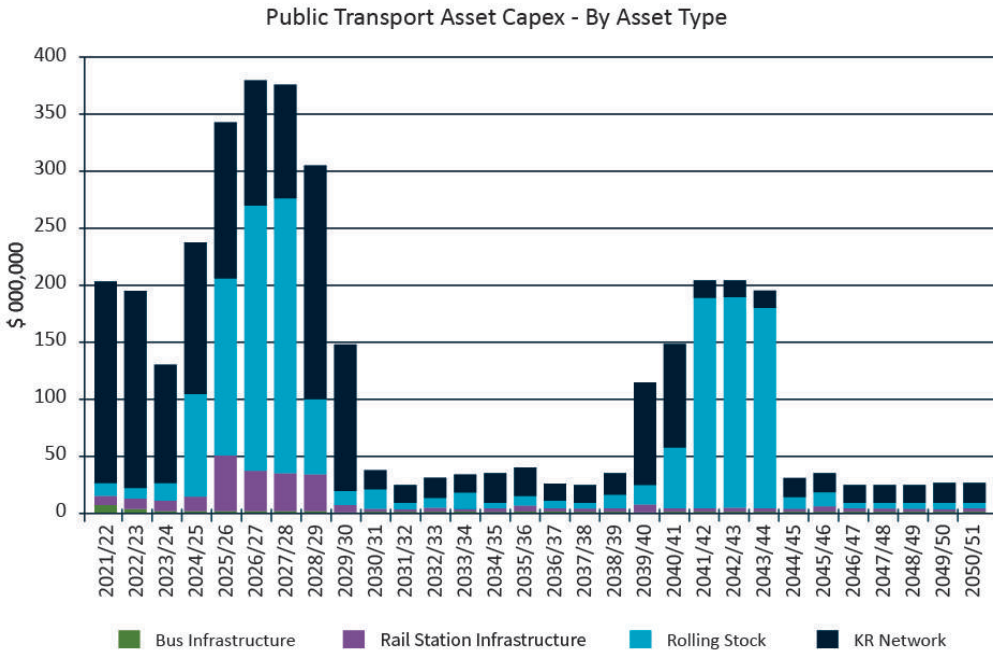


Figure 4: Public transport asset capex by asset type

Our public transport asset capex by renewal and improvements is shown in Figure 5.

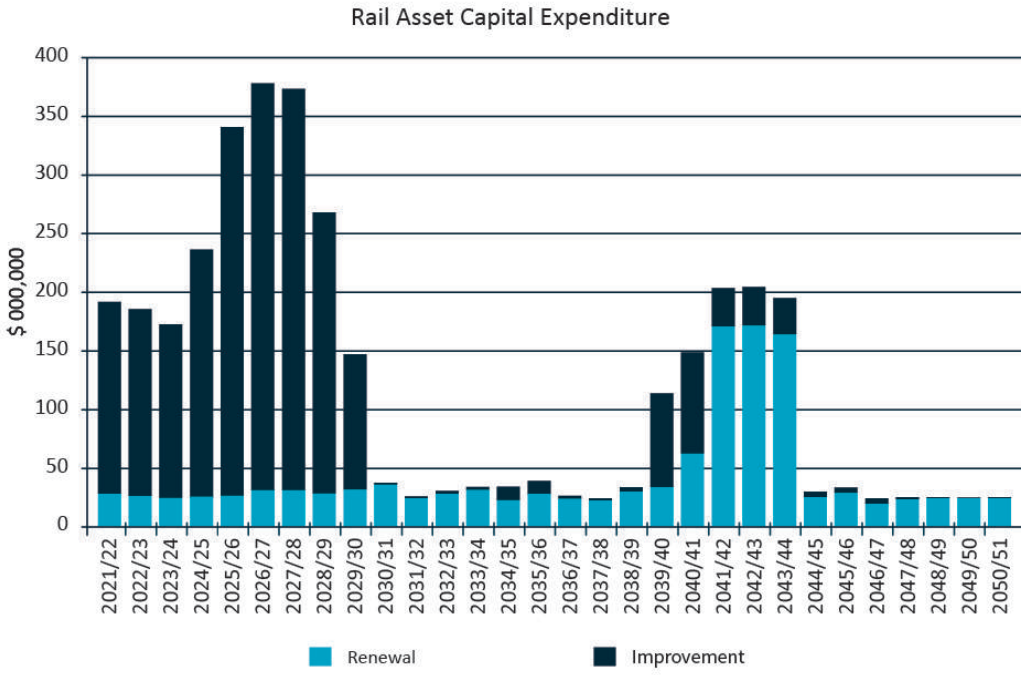


Figure 5: Public transport asset capex by renewals and improvements

Rail Portfolio

Over the 30-year period covered by this AMP, our total opex forecast for rail is $1.4b. This comprises rates, leases, insurance, electricity, and maintenance. The rail portfolio opex is forecast to steadily climb as patronage climbs over the next 30 years. The most notable change within the opex forecast, is the proposal to cancel the locomotive hook and tow lease arrangement with KiwiRail for the Wairarapa services in 2026. The hook and tow locomotives will be redundant once we have the new multiple units, low/zero emission fleet operating on this line. Some of these costs are transferred into maintenance costs of the new electric multiple units (EMU) fleet at this time.

The total capital forecast for rail for the same period is $3.64b. This includes:

- **$1,285m capex renewal expenditure.** This comprises $462m on the KiwiRail Network, $132m on rail infrastructure, and $691m on rolling stock.
- **$2,357m capex improvement expenditure.** This comprises$1.30b on the KiwiRail Network, $169m on rail infrastructure, and $888m on rolling stock.

The significant capex investment is required, particularly in the first decade, to achieve the customer experience improvements, achieve mode shift, and meet growth targets.

The key areas of investment are:

- improvements to rail station infrastructure facilities, with a particular focus on customer experience. This includes increased shelter and improvements in facilities while passengers wait for trains, improved connections between the stations and the community such as improvements to Park and Ride, bicycle storage facilities, and improvements to paths, lighting, security and general accessibility. For more detail refer to Figure 67 and the station infrastructure asset class plan.

- renewal of the carriage fleet, and provision of a low/zero emission fleet for additional capacity and service frequency on the longer distance Wairarapa Line. Additional expenditure is required to boost the capacity and service frequency of the suburban services operating on the current electrified network, in particular on the Hutt and Kapiti Lines.

- KiwiRail network improvements which are critical for achieving a fit-for-purpose metro rail network. We have assumed this will be fully funded by the National Land Transport Fund (NLTF). Therefore, they have these initiatives have not been

included in the Long Term Plan (LTP) financials, but they have been included within this AMP. The profile of this investment is shown in Figure 6.

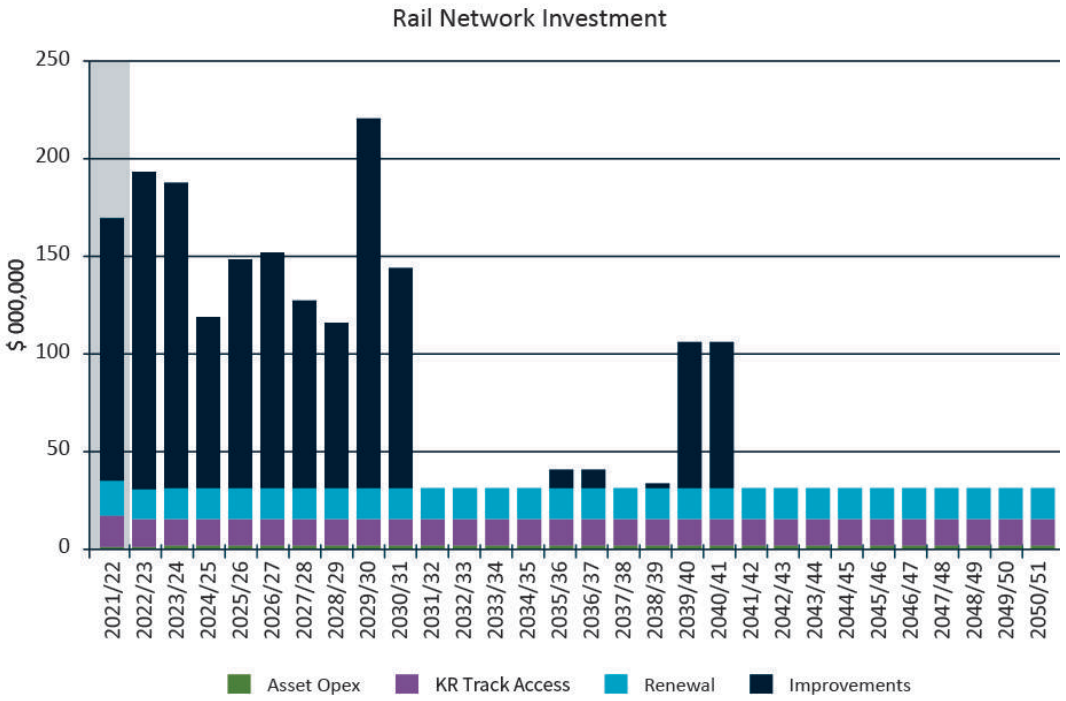


Figure 6: Rail Network investment

This investment involves:

- completing the catch up renewal of traction overhead line system and track infrastructure
- unlocking capacity and resilience improvements
- Wellington Station signalling and track improvements
- regional capacity and safety improvements to enable improved Lower North Island regional passenger rail services
- renewal of the signalling system to best practice safety standards, improve operational resilience, and enable capacity improvements of the network
- increasing capacity of the network to support a two-tiered layered 10min peak services on the Hutt and Kapiti Lines, which will enable the capacity needed to achieve targeted mode shift
- resilience of the network, including both operational resilience and life-lines resilience
- pedestrian and vehicle level crossing safety improvements across the region, which will become increasingly important as rail service frequency increases

Bus and Ferry Portfolio

The key investment drivers for our bus and ferry infrastructure relating to our bus and ferry infrastructure assets are to improve customer experience and promote mode shift from private vehicle to our public transport network.

Our total opex for bus is $223m. This comprises of both asset opex and maintenance. The bus and ferry asset opex is forecast to remain steady over the planning period. The asset opex covers asset studies and investigations, signage changes due to timetable changes, cleaning costs, and maintenance costs as well as asset management and maintenance costs associated with assets that are part of the Metlink network but are not directly owned by us.

The total capex renewal and capex improvement is $63m.The core capex investments for our bus and ferry portfolio are:

Bus Shelter New & Replacement Programme: $43.4m of investment to renew and install new bus shelter facilities. Having a place to wait for a bus service that is safe and protects the customer from environmental factors is key to customer satisfaction. This continuous programme of investment provides facilities that meet CPTED design and best practice for accessibility and encourages mode shift.

Porirua, Waikanae and Paraparumu Bus Hub improvements: $4.78m of investment to improve safety, security and accessibility**.** Public transport services in Porirua, Waikanae and Paraparaumu are key to a connected community and reducing congestion on the road network. There are thousands of customer movements through these hubs every day. Safety, security, and inclusive access upgrades are expected to significantly increase the overall customer experience and encourage modeshift. This initiative will actively address CPTED design and accessibility best practice to support our communities' safe use of public transport.

New CBD bus layover area including an area for EV charging: The capital cost of the new CBD layover including an area for EV charging is not included within the AMP. However, we have included $2m within the forecast for the investigation to develop options for consideration. Core layover and charging areas in Wellington CBD (the Lambton Interchange) are under pressure and will have insufficient layover capacity when EV charging infrastructure is installed. A proposal also exists for the owners of the land where the interchange is located to redevelop the area for other purposes; this will further reduce layover capacity on the CBD network. To continue to provide core services to the wider public transport network a new bus layover area with EV charging is required. We are investigating several locations.

RTI 2.01 asset infrastructure: $4.9m of investment to replace the asset infrastructure associated with the RTI 2.0 project, such as the RTI display screens. Please note the software component of the RTI 2.0 expenditure is not included within this AMP.

Our Operating Environment

Our Operating Environment

The environment in which we operate is changing. It is being shaped by a number emerging external influences and the wider system and legislative framework within which we operate. This includes national and regional policies, strategies, plans and societal outcomes sought by the governmental organisations with whom we work. As an activity of Greater Wellington, our role, purpose, strategic aims, and the investment priorities outlined in this AMP are directed by Greater Wellington's overall vision, purpose, and the community outcomes sought for the Wellington region. Accordingly, the factors affecting our operating environment can be characterised into three main areas:

- emerging trends, both national and regional environmental influences
- national strategic context and legislative environment
- regional Strategic context and Greater Wellington, as our parent organisation.

These are described below.

Emerging trends and environmental influences

Investing in our public transport network to ensure it is, and remains, fit for purpose into the future requires careful targeting of expenditure on assets and services that count towards delivering a world class service. To do this, we need a realistic view of the future to ensure we continue to provide reliable, cost effective, accessible, and safe services that meet our customers' changing needs.

In line with this, the plans contained within this AMP account for a range of trends and environmental influences that we see emerging within our operating environment. We account for these trends and influences in our planning so that we can ensure a fit for purpose and resilient public transport network for the region we serve. Key trends and influences are discussed below.

Economics

As New Zealand and the world deals with extreme levels of uncertainty surrounding COVID-19, our focus remains on ensuring our region remains resilient and connected. Before COVID-19, the Wellington regional economy was strong, benefiting from an increasing population and positive economic growth. In light of the sudden shock of COVID-19 to the New Zealand economy, its economic future is uncertain. Decreases in employment and household income will also challenge the ability of households to pay council rates. Over the longer term, it is expected that our region's economic strength will remain, or intensify, in the following industries: professional scientific and technical services; public administration and safety; financial and insurance services; health care and social assistance; and information media and telecommunications.

For the first seven months of the 2019/20 financial year we were on track to achieve record patronage growth on the network. However, in January 2020, COVID-19 began to emerge as a risk. By the end of March 2020, New Zealand had entered Alert Level 4 lockdown; public transport was deemed by the government to be an essential service which had to keep operating, patronage plunged dramatically, services were reduced, cleaning increased substantially, driver safety measures were implemented, and it became free to travel on public transport (free travel remained in place until 30 June 2020).

During COVID-19, Metlink worked to ensure the provision of public transport as an essential service in a way that responded to Government directives, customer needs, and the safety of passengers and Metlink staff.

As we emerged from the initial (March 2020) lockdown, we saw sustained patronage growth. Patronage in the Wellington Region increased at a rate higher than anticipated. In fact, Wellington's recovery in terms of patronage was the strongest in the country.

We consider that after a short period of stabilised demand for services, in the medium term, strong economic recovery and population growth will increase demand for public transport. The increase in SuperGold card users will also put finance pressures on public transport.

Population and demographic change

Projections show the population in our region is expected to grow almost 9% in the next 10 years. However, as per our economic outlook, our region's population is expected to experience slowed growth in the near term (2021-2023) due to the impacts of Covid-19, including reduced migration flows and economic activity in the region. Population growth is expected to then recover to levels similar to those experienced in the region in recent years. The region's population is expected to reach approximately 570,000 by 2030 (9% growth from 2020) and 632,000 by 2043 (20% growth from 2020).

The projections also show that population growth is not expected to be evenly distributed across the region, with higher growth rates expected in Porirua, Kāpiti Coast, and the Wairarapa. As a result, we must plan for both population expansion within existing concentrated areas such as Wellington City and the Hutt Valley, as well as extending our services to new communities emerging in less heavily developed parts of the region. Increases in population will place pressure on our existing infrastructure and services and it will also require new infrastructure and services.

Demographic changes in age profile is also expected. We expect to see an increasingly aged demographic, exacerbating existing disproportionately aged populations in Kapiti Coast and the Wairarapa, while broadly increasing the proportions across the wider region. An increasing age demographic will require us to adapt the way we offer our current services, ensuring they are future-proofed for changing demand and expectations. For example, we will need to be responsive to the mobility needs of an older population and be available beyond the traditional peak commuter hours. For the younger population, we expect that

they will continue to be centred in the cities, particularly in Porirua, Lower Hutt, and Wellington City.

We need to consider what these changes mean for getting around our region. Careful planning is required to ensure development of our Public Transport network meets the changing needs of our communities and is sustainable, in particular:

1. Whilst there remains a level of uncertainty with respect to the impacts of Covid-19, patronage growth could outstrip capacity in the short term. Providing for capacity growth is a key investment area for Metlink.
2. In the medium and longer term, we need to consider new communities or areas of growth in our investment planning to ensure we continue to provide the levels of service our customers need.
3. There is a need for increased focus on mobility and mobility services to be reflected in our service levels and investment planning throughout the period 2021-2024 and beyond.

Natural hazards and climate change

The Wellington region has a physically diverse natural environment subject to a wide range of natural hazards including earthquakes, tsunami, landslides, river and coastal flooding, erosion, slope failure drought and severe wind. Much of our infrastructure assets are in areas prone to natural hazards. Climate change will increase both the frequency and magnitude of natural hazard events that already occur in the region. As such, climate adaption and mitigation timeframes as well as our planning timeframes need to be well understood to ensure timely planning processes well ahead of the impacts being felt.

Accordingly, our infrastructure and asset planning decisions that assume lifespans of 30-100 years need to incorporate climate change projections and natural hazards. This is particularly true for decisions that are expensive to alter or reverse. When a decision relates to a long-lived asset, having full information on climate impacts and emission costs is highly unlikely, so our planning approaches must have an adaptability to them and a built-in programme of monitoring and review, so we can incorporate new challenges and opportunities as they arise.

Therefore, our investment planning for public transport reflects these trends and environmental influences by:

- increasing our focus on resilience planning in our maintenance and capital spend, throughout the asset lifecycle from design to delivery and maintenance
- ensuring resilience initiatives are appropriately prioritised in our expenditure profile and considering the future population growth
- increasing investment in decarbonisation initiatives through the use of alternative fuel technologies in our vehicle fleets.

- translating climate change effects and adaptation which are considered in regional initiatives such as Let's Get Wellington Moving into our public transport planning.

Technological change

Advances in technology are ongoing, rapid and unpredictable. Technology advancement assists us in delivering value to our customers. There are raised expectations among our communities for more personalised services and more data sources in an increasingly timely and accessible manner. New products and capabilities are changing the way we can communicate with the communities we serve and will enable us to improve the services we offer.

There is opportunity to shift the way we use the data we have from merely measuring performance or reporting, towards driving business operations and planning our network. Additionally, advanced analytics leads to new insights, which mature into new data services, which in turn enable new services that we can offer.

There is high uncertainty around the nature and capabilities of the new technologies with which we will be utilising and interfacing with, and the pace at which these will be adopted. This is driven by the rapid and unpredictable pace of innovation in the technology space, the unpredictable extent of uptake by firms and consumers, and our communities' changing expectations. Keeping pace with our customers' expectations of technology will play an important role in service delivery and the retention and acquisition of customers.

The emergence of new technologies presents both challenges and opportunities for public transport. New payment systems and digital 'mobility as a service' apps are changing customers' expectations. Public Transport On-Demand, connected and autonomous vehicles and car sharing schemes could result in significant changes to the role of public transport. Robust security, privacy, and transparency are both core principles and challenges for us.

Our assumption within this AMP is that technological change will continue, with greater advancements in two-way public engagement and communications. During the period covered by this AMP, we expect to:

- become more focussed on data driven decision making, commensurate with the availability of both the data and the technology to access and analyse the data
- progress the evolution of electronic ticketing solutions, which we consider will evolve quickly
- participate on digital platforms that people will increasingly plan and consume their travel choices (e.g. Mobility as a Service).

Legislative change, governance, and partnerships

The legislative environment in which we operate regularly changes. Legislative, statutory and regulatory change will be ongoing and may change our role, relationships and our ways

of operating. We may also see new governance roles and responsibilities for climate change and public transport. There is a high level of uncertainty surrounding what and when changes may be made. Covid-19 has added a further layer of uncertainty in this regard.

There are growing expectations around transparency, participation, and partnerships. Increasing democratisation of our work and the growing prevalence of partnership models will, while bringing funding and resourcing challenges, provide opportunity to improve the quality of our services and outcomes for our region.

The importance of working in partnership will continue to increase. More and more of our work is dependent on partnerships for delivery, whether that be fundamental partnerships with mana whenua, partnerships with territorial authorities in the region on shared delivery, partnerships with government agencies to achieve significant projects and programmes for the region, or partnering with the private sector and community organisations to achieve local goals.

Partnership approaches are rewarding and we need to ensure that our budgeting and resource allocation anticipates a slowed down, more consultative process and is responsive to the changes which may be brought about outside of our line of sight through working in partnership.

National Strategic Context

Legislation and national transportation priorities sets the national strategic context in which we operate. These are discussed below.

Legislative environment

There are a number of legislative acts that guide our work. The three key pieces of legislation that set out our role in public transport (as part of Greater Wellington) and describe and prescribe our funding arrangements are:

- **Land Transport Management Act 2003** (LTMA) sets out the planning and funding framework that directs central government funding annually into roading, public transport and traffic safety. It also sets out the requirements for the development of the Regional Land Transport Plan and Regional Public Transport Plan. The LTMA was significantly updated in 2008 and 2013.
- **Land Transport Management Amendment Act 2013** established the Public Transport Operating Model (PTOM). The PTOM provides a framework for building long-term public transport public-private partnership between regional councils and transport operators, allowing for better integration of services and more focus on customer needs.
- **Local Government Act 2002** (LGA) - provides for the local authority to take accountability for meeting current and future community needs including quality

infrastructure and local public services. It also sets out the requirements for the Long- Term Plan and the identification of community outcomes.

The other legislative acts that impact and influence our asset management decisions include:

- Local Government (Rating) Act 2002
- Land Transport Act 2004
- Local Government Borrowing Act 2011
- Climate Change Response (Zero Carbon) Amendment Act 2019
- Resource Management Act 1991
- Civil Defence Emergency Management Act 2002
- Health and Safety at Work Act 2015
- Railways Act 2005
- Building Act 2004

Transportation priorities

The two key documents that provide the national strategic transportation direction and priorities are the **Government Policy Statement on Land Transport 2021** (GPS) and the draft **New Zealand Rail Plan.** The release of draft New Zealand Rail Plan was timed prior to the engagement on the 2021 GPS to ensure that the government's vision for rail can be considered in the 2021 GPS and future budget decisions. In future years, the New Zealand Rail Plan and GPS will be refreshed concurrently. The government has amended the LTMA to enable the new planning and funding framework for rail.

GPS

The GPS sets out the government's strategic direction for land transport. It guides the allocation of funds by Waka Kotahi NZ Transport Agency from the National Land Transport Fund. The GPS is updated every three years and sets out the strategic priorities the Government is seeking from its land transport investment.

These are:

Safety: Developing a transport system where no-one is killed or seriously injured.

Better Travel Options: Providing people with better transport options to access social and economic opportunities.

Climate Change: Developing a low carbon transport system that supports emission reductions, while improving safety and inclusive access.

Improving Freight Connections: Improving freight connections for economic development.

The GPS has identified five key outcomes from these strategic priorities so that the transport system within New Zealand improves the wellbeing and liveability of New Zealand communities. These are illustrated in Figure 7.

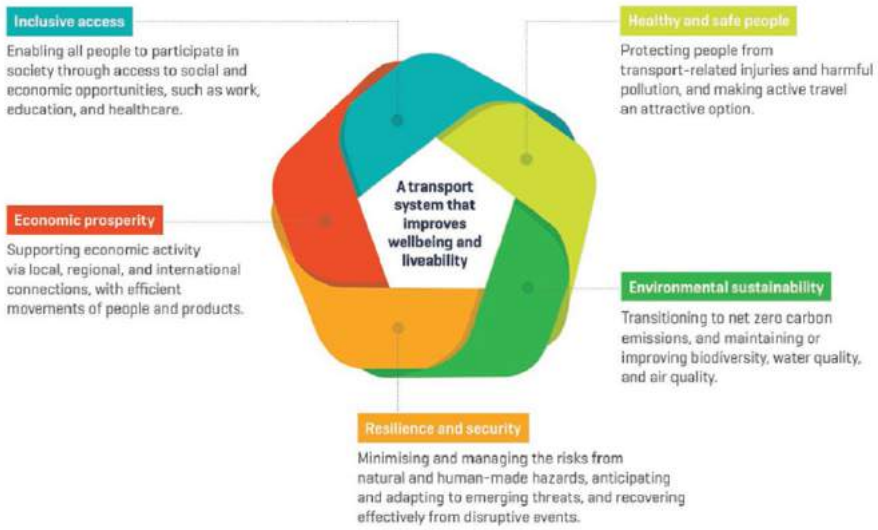


Figure 7: Desired outcomes from GPS

The GPS also confirms the Government's commitment to the Let's Get Wellington Moving (LGWM) programme and support of the implementation of the New Zealand Rail Plan.

In summary, the key elements of the GPS that are relevant to us as the provider of the Wellington region's public transport network are:

- shift transport modes to public transport and active modes
- reduce transport generated emissions
- invest in LGWM and regional rail network
- build public transport capacity
- integrate transport and land use
- provide access to good affordable transport choices
- ensure connected and reliable journeys around the region.

The investment plans contained within this AMP reflects the GPS's strategic priorities except for the strategic priority of 'improving freight connections' as our role and activity is providing public transport for people.

New Zealand Rail Plan (draft*)*

The December 2019 draft New Zealand Rail Plan (NZRP) outlines the Government's vision and priorities for the national rail network. The NZRP is an output of the recommendations of the Future of Rail review by the Ministry of Transport, Waka Kotahi, KiwiRail, and Treasury, which sought to identify the role of rail in the transport system together with a sustainable long-term funding approach.

The NZRP sets out the government's vision and priorities for rail and its intentions for the first decade of investment needed to achieve a reliable, resilient, and safe rail network. The Government's long-term vision is to provide modern transit systems in New Zealand's largest cities and to enable increasing volumes of freight to be moved off the roads onto rail. In relation to public transport the strategic investment priority is investing in metropolitan rail to support growth in New Zealand's largest cities.

The NZRP investment priorities have informed the 2021 GPS. The NZRP identifies the following future opportunities for the Wellington Metro Rail Network and services to accommodate current growth and safety expectation in the medium term:

- new trains for Wairarapa and Capital Connection and increased service frequency (including a new depot and Wairarapa Line capacity and safety upgrades)
- signalling improvements and automated train protection
- re-modelling rail approaches to Wellington Station to add capacity
- improvements to platforms and station facilities coupled with greater integration with other modes of transport.

Beyond that, the NZRP notes that, with growth and increased pressure on capacity, additional investment may need to be considered to:

- reduce length of the North and South Junction single track section on the Kapiti Line between Pukerua Bay and Paekakariki
- provide an additional platform at Waikanae
- replace and/or expand the electric multiple unit (EMU) fleet
- provide further grade separation
- upgrade the Wellington Station passenger terminal and building.

Regional Strategic Context

The Wellington region covers 8,111km^2 of the lower North Island. The northern boundary goes from the north of Otaki on the west coast across to north of Castlepoint on the east coast. There are eight territorial authorities within the Wellington region. These are the Kapiti Coast District Council, Porirua City Council, Upper Hutt City Council, Hutt City Council, Wellington City Council, Masterton District Council, Carterton District Council, and South Wairarapa District Council.

There are over 530,000 people in the Wellington region. All parts of our region are growing. The Wellington Regional Growth Framework indicates that there will be between 91,000 and 151,000 additional people in the region by 2050.

Transportation priorities

Greater Wellington is responsible for developing policies and plans that direct the activities of the region including public transport. Greater Wellington is required to take into account the Government Policy Statements when developing these policies and plans.

Let's Get Wellington Moving (LGWM) is a joint initiative between Wellington City Council, Greater Wellington and Waka Kotahi and it is also a specific Government Commitment as outlined in the 2021 GPS.

The transportation priorities of Greater Wellington and LGWM are discussed below.

Greater Wellington

Greater Wellington promotes our region's liveability, ensuring the region's environment is protected while meeting the economic, cultural and social needs of the community.

As an activity group of Greater Wellington, our strategic direction and planning accounts for Greater Wellington's vision and purpose which are:

- **Vision:** An extraordinary region – thriving environment, connected communities, resilient future.
- **Purpose:** Working together for the greater environmental good.

Greater Wellington's desired community outcomes are:

- **Thriving environment:** Healthy fresh and coastal water, air, soils, indigenous biodiversity and unique landscapes that support current and future community wellbeing, clean and safe drinking water, a prosperous low carbon economy.
- **Connected communities:** Vibrant and liveable region in which people can move around, with active and public transport choices, sustainable rural and urban centres that are connected to each other including mana whenua and Maori communities.
- **Resilient future:** Safe, healthy and prepared communities, inclusive and equitable participation, adapting to the effects of climate change and natural hazards, resilient economic base, modern and robust infrastructure.

Greater Wellington's Wellington Regional Land Transport Plan (RLTP)

The RLTP is the strategic document that guides the development of our region's transport system and investment, including public transport. It identifies our region's transport priorities which then inform the National Land Transport Programme. We use the RTLP to communicate our region's direction and priorities with stakeholders, including the public.

The RLTP recognises and articulates the significant role transport plays in shaping what the Wellington region is like as a place to live, work, play and learn, and it provides a framework for transport planning that supports our broader goals for the region. The RLTP recognises

that, as the region grows, more people and increased economic activity will place greater demand on the transport network. This demand will be especially patent on the public transport components of the overall network. The RLTP focuses on initiatives that enable us to grow in ways that make it easy to get around while reducing congestion and carbon emissions and creating more liveable places. The RLTP sets the vision for investing in a transport network that:

- offers good, affordable travel choices
- supports compact centres, liveable places and a strong economy
- is safe
- minimises impacts on the environment
- provides for connected, resilient and reliable journeys.

Recognising that we are in an environment of economic constraint, and acknowledging the importance of aligning regional resources and target investment to areas of the greatest regional benefit, to achieve its vision, the RLTP sets out the region's priority areas for investment. These are:

To achieve our vision, strategic objectives and targets, the RLTP sets out the region's priority areas for investment. These are:

- **Public transport capacity:** Build capacity and reliability into the Wellington region's rail network and into Wellington City's public transport network to accommodate future demand.
- **Travel choice:** Make walking, cycling and public transport a safe and attractive option for more trips throughout the region.
- **Strategic access:** Improve access to key regional destinations, including the port, airport and hospitals, for people and freight.
- **Safety:** Improve safety, particularly at high risk intersections and on high risk urban and rural roads
- **Resilience:** Build resilience into the region's transport network by strengthening priority transport lifelines and improving redundancy in the system.

Greater Wellington's Long-Term Plan (LTP)

The purpose of the LTP is to provide a long-term direction and sets out Greater Wellington's priorities, programmes and projects including expenditure, for the region over a 10-year period. Public transport is a significant part of Greater Wellington's long term planning focus, accounting for approximately 65% of Greater Wellington's expenditure. The LTP is reviewed every three years and any changes are addressed during the annual planning process. It sets out the strategic context and the community outcomes for the region including vision and the priority areas that need planning for. It also includes detail on how each activity is funded, information about council controlled organisations, the financial and

non-financial assumptions that guide Greater Wellington's planning, and Greater Wellington's 10 year Financial Strategy and the 30 year Infrastructure Strategy.

The Infrastructure Strategy provides details of the level and timing of investment needed to operate, replace, renew, and upgrade existing facilities and the Financial Strategy outlines the required rating and debt levels to fund these investments. Together, the two strategies outline how Greater Wellington intends to balance investment in assets and services with affordability. The council uses its asset management plans as a basis for, and to deliver, the Infrastructure Strategy

Our strategic priority is to provide an "efficient, accessible and low carbon public transport network". We will deliver on this via our three key result areas of decarbonisation of the our public transport fleet, encouraging modeshift, and ensuring accessibility. Strategic focus areas are:

- for mode shift - Contribute to the regional target of a 40% increase in regional mode share from PT and active modes by 2030, including delivery and implementation of Let's Get Wellington Moving
- for decarbonisation of the public transport vehicle fleet - Reducing public transport emissions by accelerating decarbonisation of the vehicle fleet
- for customer experience - Continue to improve customer experience across all aspects of the network

The following principles embodied in the Infrastructure Strategy ensure a consistent and considered approach for managing infrastructure:

- ***Forward looking*** *- intergenerational equity. Infrastructure is future oriented – developed and managed with consideration for long-term use including future technology and population changes.*
- ***Optimal*** *- Greater Wellington will optimise its infrastructure planning to take account of lifetime cost and demand factors*
- ***Adaptable*** *– We will build and develop assets that are resilient to social and environmental changes, including adverse events*
- ***Coordinated*** *– We develop our infrastructure in consultation with our major partners reflecting our part in the national system (central government, Territorial Authorities, Council Controlled Organisations).*

These principles mean our investment plans will aim to:

- provide an effective and efficient integrated public transport network.
- invest in and improve the public transport.
- provide a high level of continuity in service delivery, albeit with some planned disruptions, while minimising significant unplanned disruptions.

Greater Wellington Regional Public Transport Plan (RPTP)

The RPTP provides the strategic direction for our region's public transport network, consistent with the RLTP. The RPTP communicates how we propose to develop our public transport network and is used to engage with all of our stakeholders for developing and improving the public transport network in the region.

Wellington Regional Rail Plan

The purpose of a rail plan is to maintain and grow rail's position as the key transport mode for long to medium distance and high-volume transport services over the next 25 years. Its scope covers the rail corridors within the region. The plan recognises and encourages the increasing popularity of rail as a sustainable transport choice for passengers and freight. It also recognises that rail is an essential service underpinning the effective functioning and economic development of the Greater Wellington region and is a key contributor to reducing carbon emissions within our region.

The Wellington Regional Rail Plan has identified the following key investment drivers:

- current infrastructure is not capable of safely accommodating additional trains, which restricts the options available to accommodate future demand
- inconsistent customer journey experience and limited rail system capacity, which constrains the rail system's ability to meet regional mode share targets and, consequently, the associated regional growth and environmental obligations
- the condition and configuration of the rail network makes it vulnerable to service disruptions which have a flow on impact into the wider transport system.

Addressing these issues will enable us and our regional and central government partners to achieve a vision of a safe, customer focused and efficient rail passenger service to drive the region's economic development and social wellbeing in an environmentally and socially sustainable and resilient manner.

The Wellington Regional Rail Plan aims to make rail the main way for people to move between communities north of Wellington CBD by providing:

- highly connected stations in communities where people work, live, play and learn
- an accommodating environment in which to wait
- frequent services that are faster and more convenient to use than private vehicle
- a reliable service that recovers quickly from disruption
- easy payment options make for a seamless travel experience
- infrastructure and safety systems in place to enable transport
- customers using rail as preferred transport from the north.

The Wellington Regional Growth Framework (WRGF) - in development

The WRGF is a spatial plan that will describe a long-term vision for how the region will grow, change and respond to key urban development challenges and opportunities. The WRGF will identify where (among other regional infrastructure such as housing, three waters etc.) public transport is recommended in the context of climate change, resilience, and natural hazards as well as the aspirations of mana whenua. Its objectives are broader than transport but reinforce both national direction and regional direction emerging from the draft 2021 RLTP.

The assumptions and directions set out in the WRGF have provided input into our asset management plans at the tactical and strategic level.

Greater Wellington's Annual Plans

Greater Wellington's Annual Plans provide an update on progress on initiatives set out in Greater Wellington's Long Term Plan.

Wellington Regional Mode Shift Plan (WRMSP)

The WRMSP sets out how our region will make progress over the short-medium term to increase mode shift from private vehicles to travel by public transport, walking, and cycling. The WRMSP outlines focus areas under urban form, making shared and active modes of travel more attractive, and influencing travel demand and transport choice.

The WRMSP provides a strategic direction to our asset strategies and asset management plans.

LGWM

LGWM provides strategic direction to guide investment in the Wellington transport system. It is a joint initiative between Wellington City Council, Greater Wellington, and Waka Kotahi NZ Transport Agency. The focus is the area from Ngauranga Gorge to Miramar including the Wellington Urban Motorway, access to the port, and connections to the central city, Wellington Hospital, and the airport. It includes all modes of transport to get to and around Wellington.

At its heart, LGWM seeks to move more people with fewer vehicles, by providing attractive travel choices. This involves better walking facilities, connected cycleways, high-quality mass rapid transit, more reliable buses, improvements at the Basin Reserve, and an extra Mt Victoria Tunnel.

LGWM's vision is to have a great harbour city that is accessible to all with attractive places, shared streets, and efficient local and regional journeys. To realise its vision, its strategic priority is to move more people with fewer vehicles. Its programme's objectives are for a transport system that:

- enhances the **liveability** of the central city

- provides more efficient and reliable **access** for users
- reduces reliance on private car travel
- improves **safety** for all users
- is **resilient** and adaptable to disruptions and future uncertainty.

In this AMP our investment plans are consistent with the LGWM goals and objectives.

Accounting for our operating environment

Our public transport network contributes directly to the national and regional transportation strategic priorities. As an activity group of Greater Wellington, the plans within this AMP are directed by, and account for, the emerging trends and the strategic context within our operating environment. Our plan for the future is to continue to invest in all aspects of our public transport network to deliver a world class service. We will make our network the preferred mode choice for all commuters through continuous improvement in service quality, coverage, and affordability.

Our Operating Environment

Metlink: Who we are

As the Public Transport Group of Greater Wellington, we manage the Wellington region's public transport network and public transport services.

We have the highest public transport use in the country, with nine out of ten of the region's residents having caught a bus, train, or ferry last year; more people use public transport to get to work than anywhere in Australasia except Sydney. This has not happened by chance. It is the result of hard work and significant investment in public transport.

With more than 38 million journeys a year, we deliver our services across an integrated network of bus, train, and harbour ferry services to people in Wellington City, Hutt Valley, Porirua, Kapiti, and the Wairarapa. Our integrated public transport network includes approximately 100 bus routes and over 200 school bus services, four passenger rail lines, and four harbour ferry stops. Discounted taxi services provide travel support and assistance for people who have difficulty using the regular services. We are also responsible for developing and maintaining public transport infrastructure including trains, railway stations, train maintenance depot, bus and ferry shelters, signs, and Park and Ride facilities.

We focus on planning, managing and operating a public transport network that is fit for purpose now and into the future. We regularly review our services to ensure they continue to meet the needs of the community and provide value for money for users, ratepayers, and taxpayers.

What we do

We are building a world class, low emission public transport network to make Greater Wellington even greater and we're making extensive improvements to our network to deliver faster, affordable, more frequent, and reliable services.

We plan an integrated public transport network to ensure it operates efficiently and effectively. We organise our network around a layered hierarchy of services of core routes, local routes, and targeted services. Core routes form the network's backbone, linking high demand with high capacity, direct services. Local routes include all-day medium to low frequency services connecting centres within suburban areas. Local routes complement the core network by collecting and distributing passengers from and to the core routes. Targeted services provide services to areas where there is not enough demand to justify core or local routes, or where normal services cannot meet peak demand.

To do this, we plan, fund, and operate the Wellington region's public transport network of train, bus, and harbour ferry services. We own and maintain parts of the public transport network, including trains, railway stations, and bus shelters. We contract companies to operate the train, bus, and harbour ferry services on our behalf. We provide customer

information about our public transport services, as well as providing a transport subsidy scheme (Total Mobility) for people with disabilities who cannot easily use public transport.

Our activities are split into six components:

1. **Rail services** provide the core routes which form the network's backbone, linking areas of high demand with high capacity, direct services with extensive operating hours. Our rail services activity covers:
    - determining the service level and timetable for rail services
    - planning for the future development of the rail services (the Wellington Regional Rail Plan)
    - procuring and funding the operator to provide services
    - owning, and/or funding, and/or managing assets necessary for the services, including:
        - the rail network owned and maintained by KiwiRail
        - the electric trains that service the metropolitan area and the carriages that service Wairarapa
        - the electric train depot
        - railway stations
        - pedestrian overbridges and underpasses
        - Park and Ride facilities

In 2013, Greater Wellington signed an 85-year track access agreement with KiwiRail. This agreement provides us guaranteed access to the rail network and defines the responsibilities of each party.

2. **Bus services** provide the core routes which form the network's backbone, linking areas of high demand with high capacity, direct services with extensive operating hours; the local routes providing local access to town and activity centres within the suburban areas and complement the core routes; and targeted services providing services to areas or link destinations where there is low demand, or where normal services cannot meet the peak demand. Our bus services activity covers:
    - determining the service level and timetable for bus services
    - planning for the future development of the bus fleet and services
    - procuring and funding the operator to provide services
    - owning and/or funding and/or managing assets necessary for the services, including bus infrastructure such as bus stop signs, bus shelters, bus hubs, and other associated infrastructure.
3. **Ferry services** (including some infrastructure) provide the East West ferry service to and from Eastbourne and Seatoun to the city.

4. **Fares, ticketing, customer services and information** involves a number of initiatives designed to retain and grow public transport patronage by:

    - managing and setting the rules for public transport fares, and managing the public transport ticketing system
    - information about the public transport services for customers to plan and undertake journeys. This includes real time information, journey planning tools, and timetable information - delivered through Metlink analogue and digital channels and third-party digital information providers.
    - managing of the Metlink brand and the promotion of public transport
    - managing contact with customers, including the provision of a call centre
    - understanding customer experience and monitoring customer satisfaction with our services to help us to continually improve them.

5. **Public transport network planning** involves:

    - planning the network so that it operates efficiently and effectively.
    - preparing the Wellington Regional Public Transport Plan (PT Plan) which includes identification of the public transport services that are integral to the public transport network; the policies and procedures that apply to those services; and the information and infrastructure that support those services
    - reviewing services to ensure that they are meeting the needs of the community that they serve and providing value for money for users, ratepayers and taxpayers.

6. **Total Mobility** provides subsidised door-to-door transport services for 12,000 customers who are unable to independently use buses, trains, or ferries due to a permanent impairment – the service aims to ensure our customers continue to have access to an affordable travel option. Our main activities for total mobility include:

    - managing customer applications for the service including contracting assessment agencies to provide eligibility assessments
    - contracting transport operators to provide adequate and appropriate Total Mobility services
    - administering and monitoring Total Mobility to ensure effective and efficient delivery of services.

The implementation of the PTOM has meant that we take an active role in the operation of the network with respect to fare revenue, ticketing equipment, and resolving customer complaints.

The region we serve

The Wellington region is an interdependent network of cities, towns, and rural areas with a modern urban economy paired with a quality natural and social environment. It covers

8,111km2. The northern boundary goes from the north of Otaki on the west coast across to north of Castlepoint on the east coast as shown Figure 8. The Wellington region is home to approximately 530,000 people.[1]

Figure 8: Wellington region

Many people within our region are completely reliant on our public transport network. Our public transport network encourages people to get involved in social and economic activities. This includes people with disabilities, the elderly, young people, and people on low incomes.

Our public transport network is a major contributor to the region's social, economic, and environmental goals by providing access between peoples' homes and where they work, play, study, and access community services. It also aids decreasing traffic congestion, particularly in the morning and afternoon peak periods which contributes to the reduction of vehicle emissions from private vehicles within our region.

[1] Statistics NZ subnational population estimate as at 30 June 2019

Our Vision and Strategic Focus Areas

Our public transport network helps connect and grow our region and contributes to the overall wellbeing of the Wellington region. To help create an even greater Wellington region, our vision is to provide an efficient, accessible and low carbon public transport network. We will deliver on this through our three key result areas of decarbonising our public transport fleet, encouraging mode shift, and improving customer experience. Therefore, we have established three strategic priority areas as shown in Table 1.

Table 1: Our strategic focus areas, key measures and themes

Strategic Priority	Efficient, accessible and low carbon public transport network		
Strategic Focus Areas	**Mode Shift** Contribute to the regional target of a 40% increase in regional mode share for public transport and active modes by 2030, including delivery and implementation of LGWM and Wellington Regional Rail's Strategic Direction	**Decarbonise Public Transport Vehicle Fleet** Reduce public transport emissions by accelerating decarbonisation of the vehicle fleet	**Improve Customer Experience** Continue to improve customer experience across all aspects of the network Prioritise the safety and maintenance of the public transport network to encourage safe behaviours
Key measures	40% increase in mode shift to public transport by 2030	60% reduction in public transport emissions by 2030 30% reduction in carbon emissions for the Wellington region by 2007 40% reduction in Greater Wellington generated emissions by 2025, and carbon neutral by 2030	Maintain customer satisfaction rating greater than 92% for overall trip 40% reduction in serious injuries on the public transport network by 2030

Themes	Provide a high quality, high capacity, high frequency core network Improve access to public transport Promote behaviour change	Drive environmental and cost sustainability by pursuing smart commercial opportunities and lower carbon technologies Decarbonise the Metlink bus fleet by 2030 Explore ways to further decarbonise the Metlink rail and ferry fleet	Greater choice and flexibility for journey planning, fares and fare payment options Improve the accessibility of public transport for all Prioritise safety through continuous improvements to both infrastructure and operations.

We have identified a number of themes and initiatives that will assist us in achieving our strategic focus areas. Those initiatives relevant to the AMP are reflected in our Expenditure Summary and detailed in our Asset Class Plans.

How we are funded

Our public transport network is funded through fares, Greater Wellington rates, and investment from Waka Kotahi. Greater Wellington sets the level of expenditure and the rates contribution as part of the LTP and Annual Plan processes, and reviews the public transport fares every year. The share of funding provided by Waka Kotahi is set by the Financial Assistance Rate.

Our key customers, partners, and stakeholders

We cannot deliver an efficient, accessible, and low carbon public transport network on our own. A crucial part of delivering our service is our working relationship with our key customers, partners, and stakeholders. To ensure we deliver an efficient, accessible and low carbon public transport network, we continue to partner with mana whenua, central and local government organisations, customers, ratepayers, the region's residents and ratepayers, operators, and maintenance providers.

Customers

We have characterised our customers into three categories. These are regular customers, customers with disabilities and impairments, and new and potential customers.

Regular customers

This group of customers use public transport on a regular basis to access jobs, education, healthcare, cultural activities, shops, friends, and whanau. Over half of public transport trips occur during peak periods.

Most regular customers use public transport by choice, with many choosing to live close to public transport services. Other modes of transport are often used to complement their journey, such as walking, biking, driving, or being driven.

However, over 15% of our public transport customers are dependent on public transport. This may be because they have no alternative way of travelling due to, among other things, disability, impairment, lack of access to a private vehicle, or because they do not have a drivers licence.

With a continual focus on improvement in services, these regular customers could be encouraged to use public transport more often (for instance outside of their normal peak time travel or when their circumstances change). Our regular customers require and expect our public transport to:

- go where they want to go, at times they want to travel
- provide value for money
- be easy to understand and use
- be safe, comfortable and reliable
- provide flexibility, allowing them to change their plans
- provide competitive journey time

To meet these requirements and expectations of our public transport network it is essential we provide:

- quick and easy payment methods
- affordable fares
- information and facilities that help them make a connected journey using multiple modes of travel, such as cycling or walking, for part of that journey
- accurate real-time information
- clean and safe vehicles and facilities
- adequate shelter from the weather in exposed waiting areas
- services and facilities near commonly accessed places, such as work, shopping centres and medical facilities
- prompt updates about changes to services and disruptions
- easy to access vehicles and facilities.

Customers with disabilities and impairments

People with disabilities and impairments are a significant part of our customer base. The Human Rights Act requires us to provide access to public transport services and facilities, wherever practical without discrimination. The importance of this is re-enforced by the acknowledgement that in some cases, a disability or impairment will mean that public transport is the only available or affordable mode of travel.

These customers expect our public transport network to:

- have accessibility features incorporated into all vehicles, facilities, and services that provide access equal to that of people without disabilities such as wheelchair-accessible and super-low-floor buses, access to trains, accessibility and safety standards in the design and development of public transport facilities
- demonstrate commitment to 'Universal Design' principles and engage people with disabilities during the design and development of new facilities and services
- have accessible information, including in formats tailored for specific needs
- offer concessionary fares
- demonstrate awareness of disability rights and issues by staff who are in contact with customers
- provide appropriate assistance when required – especially when there is a potential safety risk.

New and potential customers

New and potential customers are people who have never used or infrequently use public transport in the Wellington region. Providing them with a reason to use public transport and a good experience throughout their journey will encourage them to adopt public transport as an occasional or preferred mode of travel.

Many people depend on a private vehicle. These people are unlikely to adopt public transport for practical reasons. However, a change in individual circumstances, such as children becoming more independent, new house, or new job, or expectations have changed, such as increasing road congestion causing increasing journey times and cost, is an opportunity for them to adopt public transport, if it can provide a viable alternative, in terms of reliability, speed, cost, and comfort.

To attract new and potential customers we need to offer:

- frequent and reliable services that allow flexibility and options
- comfortable vehicles and waiting facilities
- convenient and seamless access to services and destinations
- accurate real-time information about departures and journey times
- competitive travel times
- quick and easy payment.

Key Partners

A crucial part of running our public transport network is our relationship and partnership with mana whenua, central government agencies such as Waka Kotahi and the Ministry of Transport, territorial authorities, KiwiRail, and transport operators. We work together with our partners to deliver a quality service for our customers and to meet the common vision of delivering an efficient, accessible, and low carbon public transport service.

Territorial authorities, Waka Kotahi and KiwiRail provide crucial infrastructure to deliver the network. Where this infrastructure is not fit for purpose or there are gaps, this impacts on reliability and customer satisfaction.

We work with territorial authorities and Waka Kotahi at a number of levels. At a strategic level Greater Wellington works with the Regional Transport Committee through the Regional Land Transport planning process to identify region wide priorities, and prioritise activities. On an operational basis, Metlink works with territorial authorities and Waka Kotahi to ensure public transport services are integrated and delivered efficiently and effectively through regular liaison meetings and information sharing.

KiwiRail is the key rail infrastructure owner. In 2013, Greater Wellington signed an 85-year track access agreement with KiwiRail. This agreement provides us guaranteed access to the rail network and defines the responsibilities of each party.

Mana whenua

Our partnership with mana whenua is long standing and ongoing. We have a common goal of supporting the environmental, social, cultural, and economic wellbeing of the region. Our relationship provides a way for us to engage directly on the issues that matter.

We and our six mana whenua partners work together in a unique way. This partnership is important to us as it ensures our partners can be recognised and supported in maintaining their role as kaitiaki (guardians) of their ancestral lands. Table 2 outlines our mana whenua partnership objective.

Table 2: Mana whenua partnership objective

Policy	Actions
Objective: An effective partnership with mana whenua.	
Partner with mana whenua to improve our responsiveness to Māori customers	• Build strong enduring relationships with mana whenua through all facets of public transport delivery. • Explore Māori values and sustainability interface within a Responsiveness to Māori framework. • Work with mana whenua to develop a Māori responsiveness plan for public transport, including the consideration of Kaupapa Māori principles to enhance design of public transport activity and guide current and future public transport policy. • Work with mana whenua to reach communities and build relationships to encourage public transport use. • Ensure that Māori values are reflected in the built environment through our design principles by seeking co-design opportunities where possible. • Extend the use of Te Reo Māori in customer information channels and fare payment methods.

Ministry of Transport (MoT)

The MoT is the government's principal transport advisor. Their aim is to improve the overall performance of the transport system, improve the performance of transport Crown entities, and achieve better value for money for the government from its investment in the transport system. It gives effect to government policy by supporting the development of legislation, regulations and rules. The MoT also manages and accounts for funds invested in transport.

The MoT is responsible for drafting and consulting on the GPS on land transport.

Waka Kotahi New Zealand Transport Agency (Waka Kotahi)

Waka Kotahi's primary objective is to contribute to an effective, efficient, and safe land transport system. Its functions include managing funding of the land transport system including auditing the performance of organisations receiving land transport funding; managing regulatory requirement for transport on land; issuing guidelines for, and monitoring the development of, regional public transport plans; determining which activities should be included in the National Land Transport (NLT) Programme and managing the prioritisation of investment in the programme; approving activities as qualifying for payment from the NLT; and approving procurement procedures for land transport activities.

Waka Kotahi's requirements and expectations of us is that our public transport services and infrastructure supports their strategic priorities, is cost effective, funded and procured correctly and the rail system is managed in a safe manner.

Territorial authorities

There are eight territorial authorities within the Wellington region. Territorial authorities are responsible for public transport planning within their territory. They are the infrastructure owners of the roads on which the services operate, the footpaths, the wharves and piers the ferries operate from, and some bus shelters, covered walkways and seats. The local TAs own the wharves and piers that the ferries use.

The territorial authorities' requirements and expectations are that our public transport network supports their economic and urban development, and their sustainability goals. They also expect that our public transport services and infrastructure are cost effective and meet the needs of their residents.

KiwiRail

KiwiRail owns, maintains, and operates the rail network. It controls network operations, provides rail operators with the access to the tracks, and implements, coordinates, and maintains an approved safety system for the rail network. We have a long term Access Agreement with KiwiRail which provides us with guaranteed access to the network and defines the responsibility of each party.

We work with KiwiRail to ensure effective demand forecasting, shared infrastructure planning and shared business case development.

Transport operators

Our network is serviced by a number of transport operators as shown in Table 3.

Table 3: Our service operators

Service	Operator
Bus	NZ Bus, Tranzit Group, Mana Coach Services, Uzabus
Rail	Transdev Wellington Ltd (Transdev)
Ferry	East by West

Our transport operators are discussed further below.

Rail operator

From 3 July 2016, we commenced a 9+6 year performance based partnering contract with Transdev Wellington Ltd (Transdev) to be the rail operator for our region. Transdev holds the rail safety licence with Waka Kotahi.

Transdev has sub-contracted Hyundai Rotem to perform the maintenance function of the Matangi EMU units. Transdev and Hyundai Rotem operate under a 'one company policy' meaning that all standards, policies and values are consistent across the operations and maintenance depots.

In accordance with the PTOM, we work with Transdev to meet our common vision of delivering an efficient, accessible and low carbon rail passenger service. Transdev's requirements and expectations of us include effective demand forecasting, shared planning, robust rolling stock renewal planning, reliable and effective maintenance of stations, and provision of security systems at stations and rolling stock yards.

Ferry operator

East by West is our sole ferry operator that runs the ferry service within Wellington Harbour. East by West expectations are that the wharves are easy to manoeuvre into and out of and that they are suitable and appropriate for its ferry fleet.

Bus operators

Our region has an extensive bus network that provides public transport within all our cities and towns and operates as a feeder to the rail network for journeys through the region.

Under the PTOM, services are grouped into 'units' of routes. Our region's bus network is made up of 16 units. We have contracted four bus operators as shown in Table 3 above to operate our bus network.

Our bus operators' expectations and requirements are that we work together with them to meet the region's vision for public transport; bus stops are easy to manoeuvre into and out of; bus stops are easily identifiable; and bus stops are suitable and appropriate for the bus fleet.

Maintenance contractors

Maintenance contractors are contracted to maintain and improve our public transport assets. Our contractors expect that our public transport assets are easy to maintain and that stops, stations, and wharves are readily identifiable.

Our Levels of Service

Our Levels of Service

We apply the term 'levels of service' as the standard to which we deliver our public transport service to our customers and stakeholders. When we set our levels of service we ensure they are customer focused, address the issues that are important to the communities we serve, are technically meaningful, and align with our vision of providing an efficient, accessible and low carbon public transport network.

Our public transport service also needs to contribute to the government's strategic priorities for land transport. Therefore, we align our levels of service with them and our corresponding strategic focus areas of facilitating mode shift (from private vehicle), maintaining a customer satisfaction rating greater than 92% for the overall trip, and achieving a 30% reduction in transport-generated emissions.

We aim to increase patronage on public transport network through:

- providing reliable and punctual public transport services and assets
- providing convenient and accessible public transport services and assets
- ensuring our public transport services and assets contribute to the reduction of the region's transport carbon emissions
- providing good quality public transport services and assets, by having safe, clean, comfortable, and good condition assets
- delivering information that is easy to use, understand, and supports real time journey planning and payment options

Therefore, our levels of service are the key drivers for the plans and investment identified in this AMP. Our levels of service are:

- provide a consistent and high quality customer experience across the public transport network
- promote and encourage people to move from private vehicles to public transport and active modes (walking, scooter, active MaaS etc)
- gross emissions for our public transport fleet will be minimised, reducing the offsets required to reach net carbon neutrality
- reduction of accidental death and serious injury on our public transport network to encourage safe behaviours.

Our investment in our public transport network continues to be a success story. Prior to the Covid-19 related lockdown in March 2020, patronage was set to reach new highs across the region. In 2019, there was a significant patronage increase in rail, with a new annual patronage high of 14.3 million passengers, an increase of 800,000 passengers on the previous year. Peak patronage rates were even higher, with Hutt Valley and Kapiti lines rising by 9%. Prior to the March 2020 lockdown, growth continued into 2020 with a further

5.5% increase in peak passengers. This increase in patronage hasn't happened by chance. It's the result of hard work, significant investment in our public transport network, and working with our customers to understand their public transport needs and the expectations of the communities we serve.

Consultation process to define levels of service

We take into consideration our customer views and requirements in our service level targets and resultant improvement opportunities through:

- consulting on our plans and undertaking specific service reviews
- undertaking independent public transport passenger satisfaction surveys
- examining patronage and performance data
- seeking direct feedback.

Each of these are discussed below.

Consulting on our plans and undertaking specific service reviews

Our region's people express their expectations through input into our planning process. This includes consultations undertaken for the RLTP, the Regional Public Transport Plan, the LTP, and consultation on specific projects such as service reviews and the location and design of new infrastructure. Input is also sought on the location and design of new infrastructure, for example bus stop markings and shelters.

In developing its plans, Greater Wellington is also keen on hearing stakeholder views on what they see as priorities across the region. Engagement is always sought and feedback incorporated into the final plans.

We also undertake specific service reviews. For example, between 2019 and 2020 we undertook a Bus Network Review (BNR), to evaluate the significant changes we made to our bus network in 2018.

The changes involved creating a more efficient network design (routes, bus stops and timetables); high-frequency routes and more services; more effective transfers; and some improved off-peak services (especially at weekends). There were major changes to bus routes and timetables within Wellington City, with minor changes to timetables for the rest of the region.

The Wellington City BNR looked at what worked well and what changes needed to be made. This BNR was run from July to September 2019 and was generously supported by bus customers. We consulted with bus customers and the community through a range of activities, including focus groups, public drop-in workshops, and online surveys.

The feedback received showed that many people were negatively impacted by the July 2018 changes. We have listened and acted upon the feedback received by developing a package

of recommended network improvements and have developed an action plan to address the recommended developments and improvements. The action plan is shaped by the resources (drivers, buses and funding) available to us over the next three years. Working within these constraints, the plan establishes clear expectations for what can be delivered and considered in the short, medium and long-term.

We consulted with the rest of the Greater Wellington region (Porirua, Tawa, Hutt Valley, Kāpiti Coast and the Wairarapa) from March through until May 2020. This. The consultation found that most of the consultation participants are happy that their bus journey meets their needs and most see the network changes as an improvement to the previous network design. However, there is still room for improvement.

The feedback we have received has informed a set of recommendations which we will consider as part of the review of the Regional Public Transport Plan. We will also consider the recommendations as part of the ongoing programme of work to improve customer experience from both a network design and operational perspective, with special attention given to the issues identified by customers with accessibility issues. Where the review has resulted in additional infrastructure investment, we have reflected such investment in this AMP.

Public transport passenger satisfaction survey

We commission Gravitas Research and Strategy Ltd, a research and strategy agency, to conduct regular, independent on-board passenger surveys. The results of these surveys assists us to identify and prioritise ongoing improvements for our customers. Our latest survey was November 2019. We were due to complete another on-board survey in May 2020, but this did not proceed due to Covid-19.

The November 2019 survey had a total of 3,190 respondents. Questionnaires were handed out to every eligible bus passengers and every third eligible train passenger on pre-selected Wellington city bus and region-wide train services.

Surveys undertaken in the three years prior to major bus network changes in mid-2018 showed consistently high levels of over-all satisfaction. The last survey undertaken prior to these changes scored overall satisfaction with the trip at 91% and overall satisfaction with the region's public transport system at 86%. The first two surveys undertaken after the changes (November 2018 and May 2019) showed significant drops in satisfaction (with overall satisfaction with the trip at 87% and overall satisfaction with the region's public transport system at 69%), largely due to the perceived negative impacts of changes to Wellington City's bus network. However, due to Metlink's response to addressing many of the customer concerns, the November 2019 survey reported significant improvements toward pre-mid-2018 satisfaction levels.

The results of the survey showed that the share of passengers that are satisfied or very satisfied with our public transport network has improved significantly. Passengers' satisfaction with the trip increased back to 91% and satisfaction with the public transport system increased to 74%. Our public transport network is perceived as easier to use than six month ago, particularly for accessibility of stops and stations. Service frequency and route coverage also contributes to ease of use. However, service reliability, including too many delays, disruptions and breakdowns continue to make public transport use challenging for some. Satisfaction with the provision of information about delays and disruptions has improved over the last 12 months. There has been a significant increase in the percentage of passengers that report their public transport experience is better or the same as prior to the July 2018 service changes, with 63% passengers reporting a better or same experience compared to 51% in May 2019.

As a result of the improvements we have made to our public transport network, our passengers are more likely to recommend using public transport to others. There are now more public transport promoters than detractors, with 79% of our passengers likely to recommend our service compared to 74% in May 2019. The Net Promoter Score has increased from -10 in May 2019 to +1 in November 2019.

The results of the on-board survey did show us that there are a number of improvements we can make to our public transport network. These are shown in Figure 9 below.

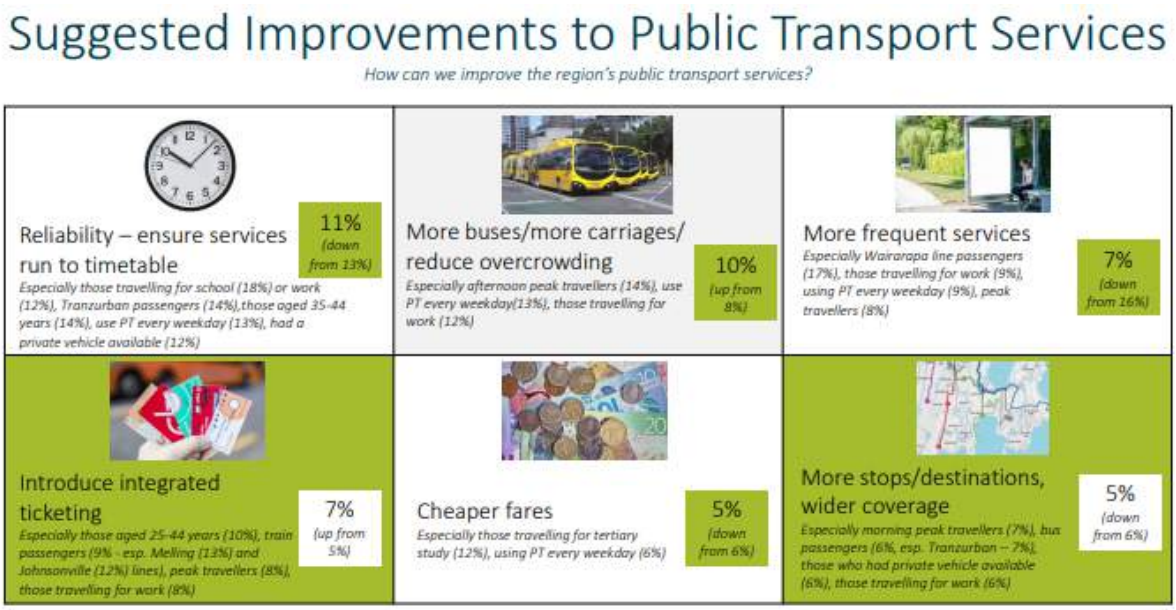


Figure 9: Customer on-board survey improvement

The full results of the November 2019 are located on our website at:

https://www.metlink.org.nz/assets/Uploads/Metlink-Public-Transport-Customer-Satisfaction-Survey-July-2019.pdf

Therefore, the investment outlined in this AMP reflects the need to:

- increase capacity by having more carriages and buses on our network, particularly at peak times, to reduce overcrowding and increase reliability
- provide more frequent services particularly on the Wairarapa line
- provide wider coverage by adding more stops and destinations at peak time for our bus customers
- introduce integrated ticketing.

Levels of Service

We have translated Greater Wellington's LTP performance measures into asset specific measures which we have set out in our asset class plans, as strategic investment drivers.

Our levels of service and performance measures are outlined in Table 4.

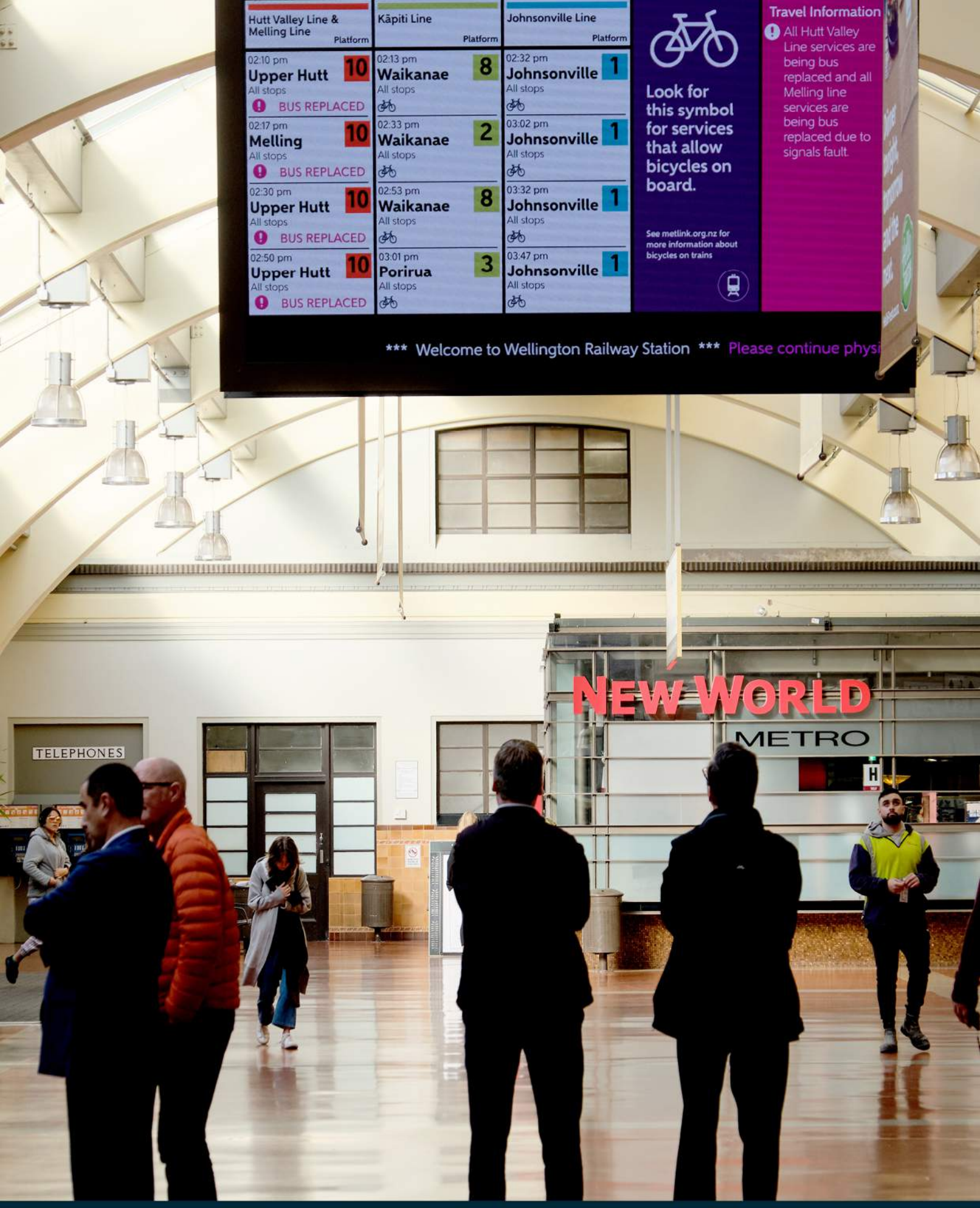
Strategic Priorities	Key Result Areas	Levels of Service	Performance Measures	Baseline (2019/20)	2021/22 Target	2022/23 Target	2023/24 Target	2024-31 Target
An efficient, accessible and low carbon public transport network	Improving the customer experience across all areas of the public transport network	Provide a consistent and high quality customer experience across the public transport network	Passengers' overall satisfaction with the Metlink public transport (by mode)	New Measure	**Bus** 92% customer satisfaction score	**Bus** 94% customer satisfaction score	**Bus** 95% customer satisfaction score	**Bus** >96% customer satisfaction score
					Rail 93% customer satisfaction score	**Rail** 94% customer satisfaction score	**Rail** >95% customer satisfaction score	**Rail** > 96% customer satisfaction score
					Ferry >98% customer satisfaction score	**Ferry** >98% customer satisfaction score	**Ferry** >98% customer satisfaction score	**Ferry** >98% customer satisfaction score
			Passenger satisfaction with convenience of paying for Metlink public transport	New Measure	>76% customer satisfaction score	>78% customer satisfaction score	>80% customer satisfaction score	>90% customer satisfaction score
			Passenger satisfaction with Metlink information currently available	New Measure	>87% customer satisfaction score	>89% customer satisfaction score	>92% customer satisfaction score	>93% customer satisfaction score
			Passenger satisfaction with Metlink public transport being on time	New Measure	>80% customer satisfaction score	>82% customer satisfaction score	>85% customer satisfaction score	>90% customer satisfaction score
An efficient, accessible and low carbon public transport network			Percentage of scheduled bus trips that depart their timetabled starting location on time	94.2%	95%	95%	95%	95%

Strategic Priorities	Key Result Areas	Levels of Service	Performance Measures	Baseline (2019/20)	2021/22 Target	2022/23 Target	2023/24 Target	2024-31 Target
			(punctuality) – to 5 minutes					
			Percentage of scheduled rail services on-time (punctuality) – to 5 minutes	89.4%	95%	95%	95%	95%
	40 percent increase in regional mode share for public transport and active modes by 2030	Promote and encourage people to move from private vehicles to public transport	Annual Public Transport boardings per capita	63 per capita	64 per capita	65 per capita	67 per capita	Increasing to 88 per capita by 2030/31
		Provide fit-for-purpose vehicles, infrastructure and services to continually deliver a high quality core network that meets ongoing demand	Percentage of passengers who are satisfied with the condition of the station/stop/wharf	New measure (88% Nov 2020)	90%	92%	94%	>96%
			Percentage of passengers who are satisfied with the condition of the vehicle fleet	New measure (94% Nov 2020)	92%	93%	94%	>96%
	Reducing public transport emissions by accelerating decarbonisation of the vehicle fleet (bus, rail, ferry)	Gross emissions for Metlink's public transport fleet will be minimised, reducing the offsets required to reach net carbon neutrality	Tonnes of CO_2 emitted per year on Metlink Public Transport Services	New Measure (22,030)	20,626 tonnes	19,223 tonnes	17,818 tonnes	5,500 tonnes in 30/31[2]
		Reduction of accidental death and serious injury on the public transport network and prioritisation of safety and maintenance on the Public Transport network to	Accidental deaths and serious injuries sustained on the Public Transport network as a result of Metlink or operator activity	New Measure	Establish a baseline	5% Reduction compared to previous year	5% Reduction compared to previous year	5% Reduction compared to previous year

[2] This figure represents the expected emissions in 2030/31. For each of the years 2027/28 to 2029/30 emissions are expected to be 7,993. During the years 2024/25 to 2026/27 emissions are anticipated to be between 16,000-18,000 tonnes per year.

Strategic Priorities	Key Result Areas	Levels of Service	Performance Measures	Baseline (2019/20)	2021/22 Target	2022/23 Target	2023/24 Target	2024-31 Target
		encourage safe behaviours						

Table 4: Our Levels of Service



Demand and Growth

Demand and Growth

Our investment into our public transport network continues to be a success story. Prior to lockdown in March 2020, patronage was set to reach new highs across the region. In 2019, there was a significant patronage increase in rail with a new annual patronage high of 14.3 million passengers - an increase of 800,000 passengers on the previous year. Peak patronage rates were even higher, with our two busiest lines Hutt Valley and Kapiti rising by 9 per cent. This increase in patronage hasn't happened by chance. It is the result of hard work, significant investment in our public transport network, and understanding the public transport needs and expectations of our region's people. Prior to lockdown, growth continued into 2020 with a further 5.5% increase in peak passengers.

Over 40% of the region's jobs are located in central Wellington[3] which reflects, in part, the concentration of government administration and knowledge-based roles in the City. This creates significant commuter peaks, as people travel to access employment opportunities from residential centres across the region.

Higher than expected demand for rail travel meant that, prior to the Covid-19 pandemic, many services are operating at or near capacity during the busiest time of the commuter peak. For example, seated capacity and Park and Ride capacity are generally reached on the main lines at approximately 7am and some potential passengers are being deterred from using rail because the trains are full.

Figure 10 shows the growth in regional bus and rail patronage from 2006 to 2018.

[3] Let's Get Wellington Moving, Draft Programme Business Case Report June 2019

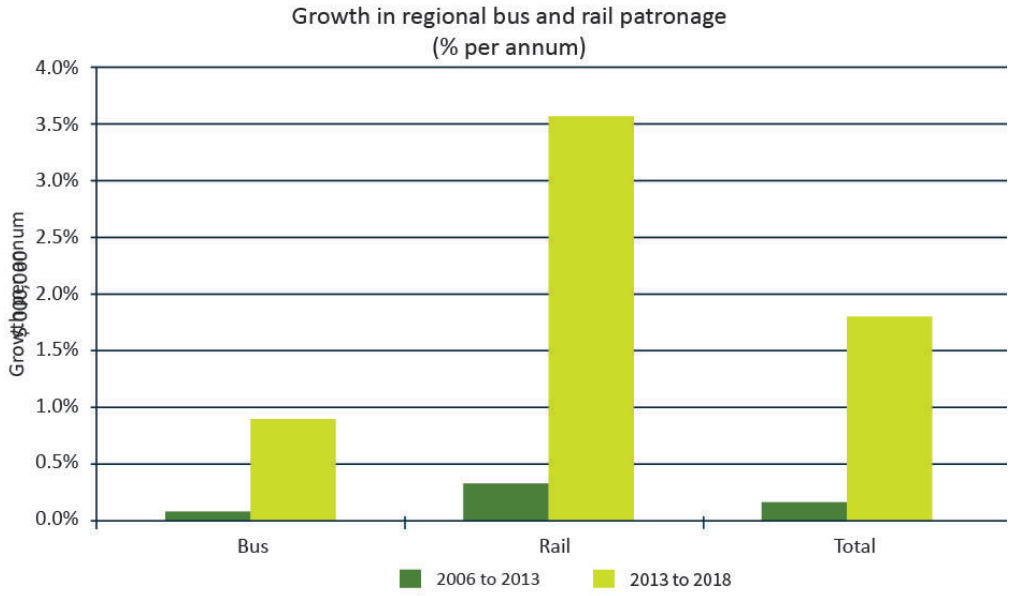


Figure 10: Growth in regional bus and rail patronage

Bus patronage has grown. Capacity constraints on the Wellington City bus network, particularly nearer the centre of the city, are impacting service reliability and journey times. Space constraints on the Golden Mile mean that only a limited number of buses can reliably run on this corridor (in the order of 60-100 buses per hour per direction). This makes it difficult to add more buses without creating congestion decreasing reliability and creating safety issues for vulnerable users. Outside the Golden Mile, immediate capacity constraints relate more to the availability of high-capacity buses and route clearance to permit high-capacity buses.

Prior to the Covid-19 pandemic, it was estimated that demand for travel on the regional rail and Wellington City bus systems during peak commuter periods would exceed capacity within the next five to ten years based on population growth forecasts both within, and outside, Wellington City.

Patronage and performance data

For our patronage performance reporting we measure passenger boardings on all modes. We measure through fares and boarding data. We lack reliable data on transfers between modes and on rail and ferry services.

June 2020 resulted in continued lower passenger boardings. Prior to the Covid-19 level four lockdown in late March 2020, we had record patronage growth for both bus and rail.

Passenger boarding trends

We track passenger boarding trends to provide insights such as whether passengers are choosing to use specific services. We had been experiencing continued passenger boarding

growth up to February 2020, but from mid-March 2020 onwards we have experienced a decrease in boarding growth for all modes.

Figure 11 shows the number of passenger boardings for all modes using a 12-month rolling total from July 2015.

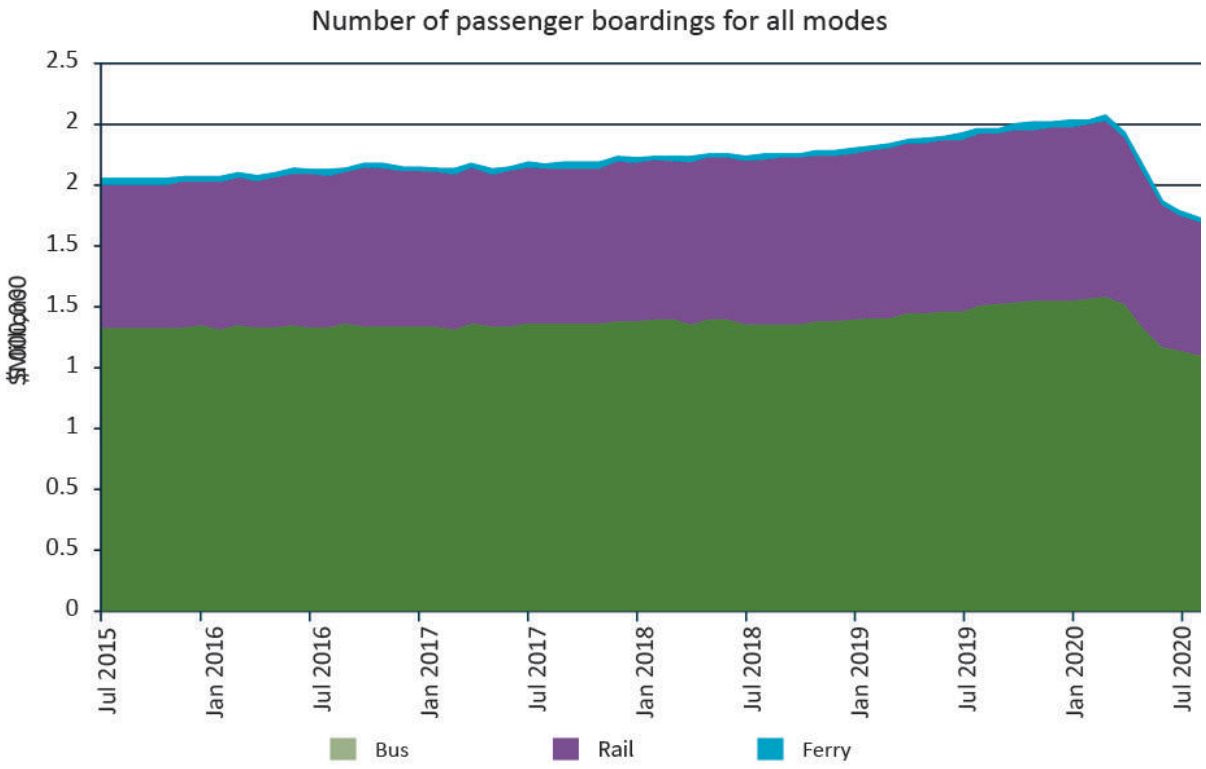


Figure 11: Number of passenger boardings for all modes from July 2015

Bus passenger boardings

Under Alert Level 1, July 2020 bus passenger boardings were 12.2% lower than July 2019. Pre Covid-19, we were experiencing increased growth of 7.3%.[4] Table 5 shows the reduction in bus passenger boardings for July 2019 compared with July 2020.

[4] July 2019 to February 2020

Table 5: Bus passenger boarding July 2019 vs July 2020

By area for Jul			
	Jul-20	Jul-19	% Change
Wellington	1,463,213	1,683,659	-13.1%
Hutt Valley	376,631	415,236	-9.3%
Porirua	78,196	85,634	-8.7%
Kapiti	46,655	53,800	-13.3%
Wairarapa	12,228	13,861	-11.8%
Total	**1,976,923**	**2,252,190**	**-12.2%**

Figure 12 shows the monthly bus passenger boardings from July 2019 to June 2020.

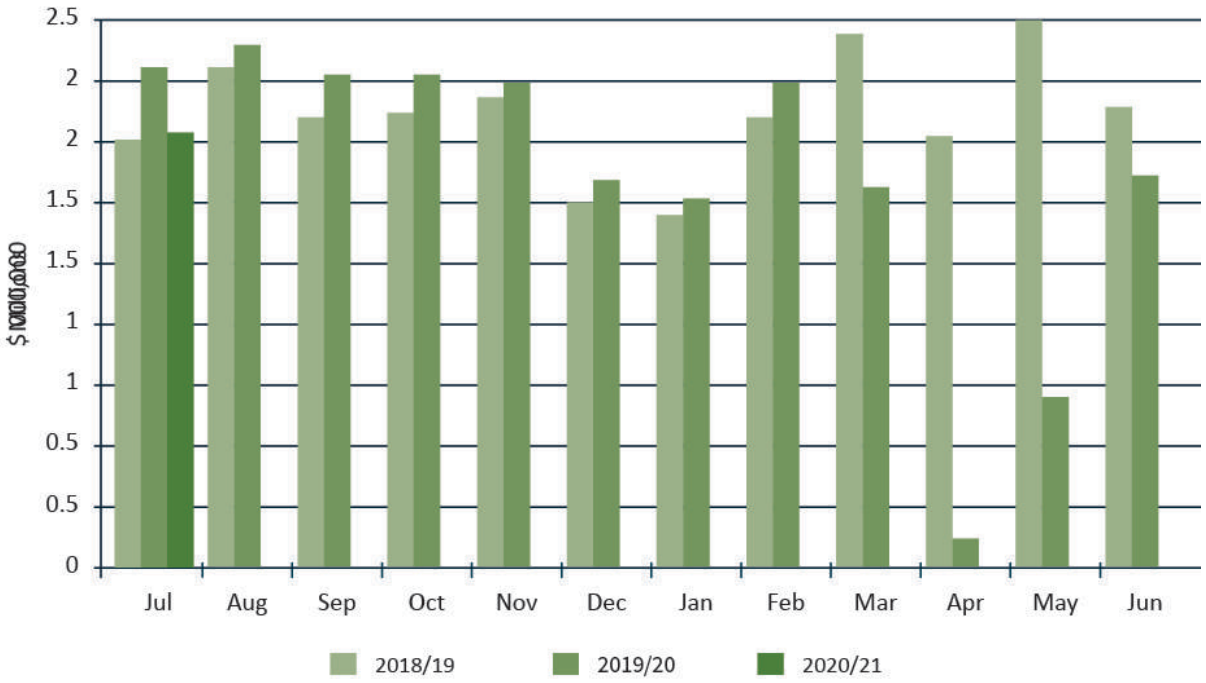


Figure 12: Monthly bus passenger boardings from July 2019 to June 2020

Rail passenger boardings

Under alert level 1, July 2020 rail passenger boardings were 18.4% lower than July 2019. Pre Covid-19, we were experiencing increased growth of 3.5%.[5] Table 6 shows the reduction in rail passenger boardings for July 2019 compared with July 2020.

Table 6: Rail passenger boardings July 2019 vs July 2020

By line for Jul

	Jul-20	Jul-19	% Change
Hutt Valley	449,835	559,332	-19.6%
Kapiti	445,720	544,272	-18.1%
Johnsonville	106,923	125,160	-14.6%
Wairarapa	58,860	71,123	-17.2%
Total	**1,061,338**	**1,299,887**	**-18.4%**

Figure 13 shows the monthly rail passenger boardings by line from July 2019 to June 2020.

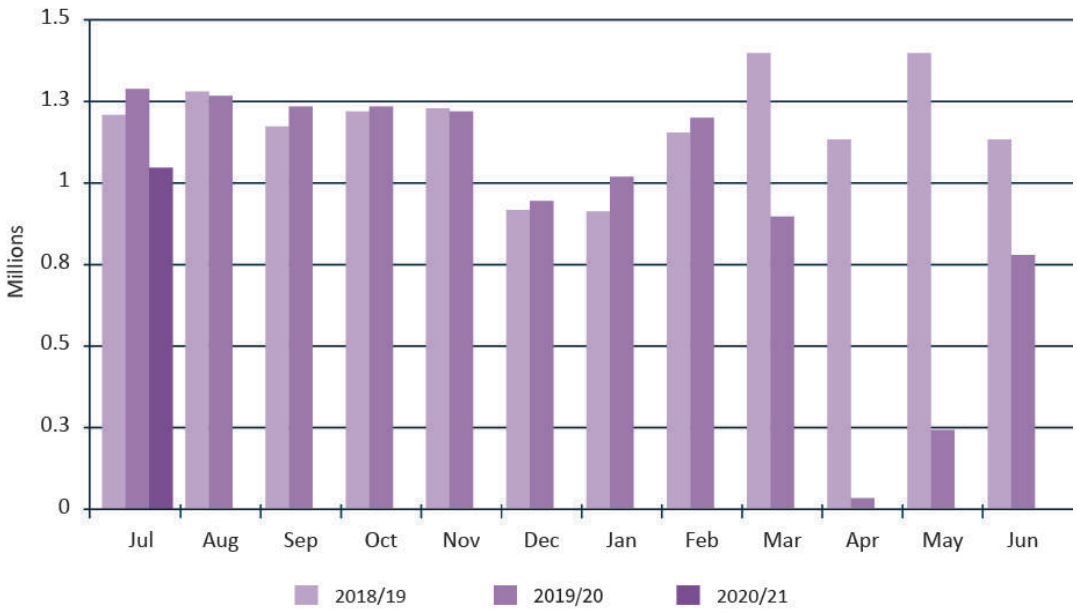


Figure 13: Monthly rail passenger boardings from July 2019 to June 2020

[5] July 2019 to February 2020

There was also a decrease in total peak growth by line of 20.1% as shown in Table 7.

Table 7: Rail peak by line July 2019 vs July 2020

Peak by line for Jul

	Jul-20	Jul-19	% Change
Hutt Valley	310,535	390,429	-20.5%
Kapiti	285,102	360,479	-20.9%
Johnsonville	67,660	79,987	-15.4%
Wairarapa	48,033	59,173	-18.8%
Total	**711,330**	**890,068**	**-20.1%**

Ferry passenger boardings

Under Alert Level 1, July 2020 ferry passenger boardings decreased by 12.9% compared with the same month last year; this is compared to a decrease of 1.4% pre Covid-19 (July 2019 – February 2020). Figure 14 shows the monthly ferry passenger boardings from July 2019 to June 2020.

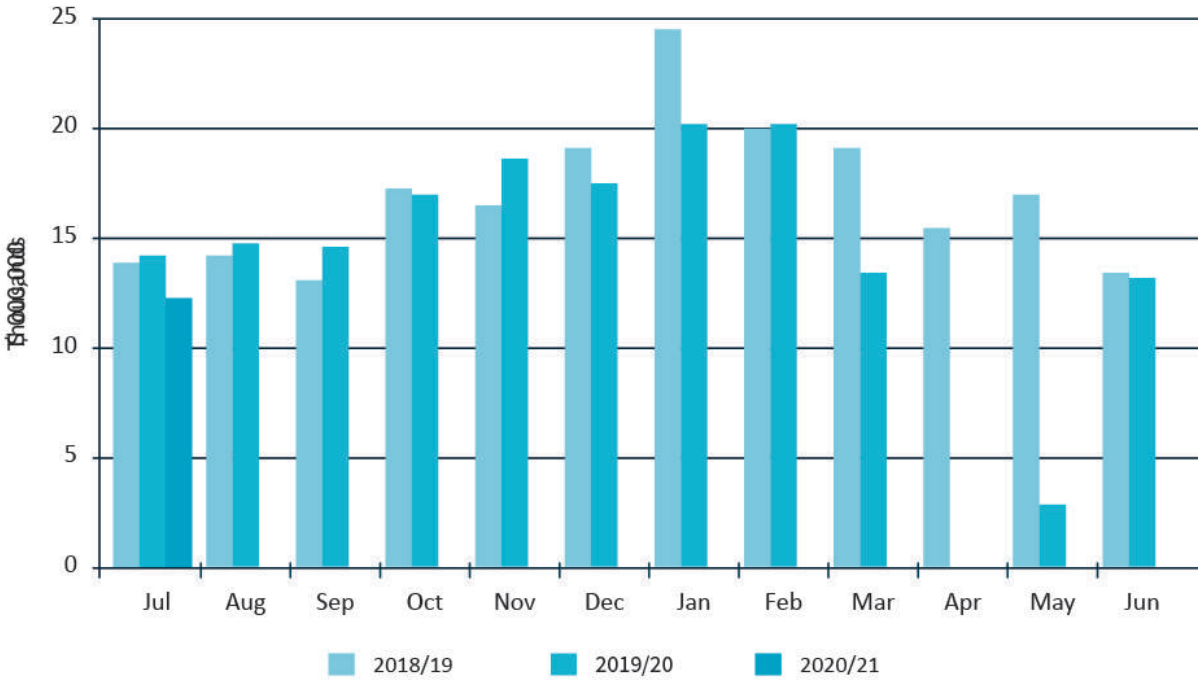


Figure 14: Monthly ferry passenger boardings from July 2019 to June 2020

Expected growth

The Wellington region is the third largest region in New Zealand with a population of approximately 530,000. Our region has experienced stronger than predicted population growth over the past two decades with further growth of up to 200,000 forecast for the next 30 years. An expanded population will bring economic development and changes to where we live, learn, work, and play.

Higher urban density in Wellington and Porirua Cities and the Hutt Valley, and increasing residential growth in the Wairarapa and Kapiti, will place increasing demands on our public transport. For this growth to be sustainable, and to ensure we achieve our goals of improving safety, access, and reducing emissions, we and our regional and central government partners will need to continue to invest in our public transport infrastructure and services.

To plan and budget for the period cover by this AMP, we make assumptions around population and demographic changes, and how these will potentially impact our public transport network. Greater Wellington's Long Term Plan 2021-31 identifies that population in the region is expected to grow by almost 9%, with growth rates higher in some places than others. Our region's population is expected to reach approximately 570,000 by 2030

and 632,000 by 2043 (20% growth since 2020). Population growth will not be evenly distributed across the region, with higher growth rates expected in Porirua, Kāpiti Coast, and the Wairarapa. While there are high levels of uncertainty around the details of this growth, impacts on public transport can be expected. These impacts include patronage growth outstripping capacity in the long term, and the creation of new communities requiring additional infrastructure, stops, and routes. With an aging population, the increases in Gold Card users will present financial challenges for the provision for public transport.

This AMP has been developed during the Covid-19 pandemic and our response. The record patronage growth we were on track to achieve during the 19/20 financial year was materially impacted by Covid-19. With considerable financial support from central government, through Waka Kotahi NZ Transport Agency, we made public transport free of charge from the March 2020 Level 4 lockdown until 30 June 2020. Since coming out of the March 2020 lockdown, we've seen higher and quicker than anticipated patronage recovery; this is a testament to the value our residents place in our public transport network.

Patronage trends are yet to be fully understood given the uncertainty surrounding the effects of, and recovery from, the Covid-19 pandemic; however, indicative trends in our public transport network predict a return to 'pre-Covid-19' levels within the next 12 months.

Patronage Growth

We assume that public transport patronage and annual growth rates are as shown in Table 8.[6]

Table 8: Patronage growth rates

Year	Annual patronage (million boardings)				Annual growth rate			
	Bus	Rail	Ferry	Network	Bus	Rail	Ferry	Network
2017-18	23.79	13.55	0.20	37.54				
2018-19	**24.75**	**14.32**	**0.20**	**39.27**	4.0%	5.7%	-1.0%	4.6%
2019-20	19.80	11.46	0.16	31.42	-20%	-20%	-20%	-20%
2020-21	12.37	7.16	0.10	19.64	-38%	-38%	-38%	-38%
2021-22	**24.75**	**14.32**	**0.20**	**39.27**	100%[7]	100%[2]	100%[2]	100%[2]
2022-23	25.24	14.61	0.21	40.06	2%	2%	2%	2%
2023-24	25.75	14.90	0.21	40.86	2%	2%	2%	2%
2024-25	26.52	15.35	0.22	42.09	3%	3%	3%	3%
2025-26	27.31	15.81	0.22	43.35	3%	3%	3%	3%
2026-27	28.13	16.28	0.23	44.65	3%	3%	3%	3%
2027-28	28.98	16.77	0.24	45.99	3%	3%	3%	3%
2028-29	29.85	17.28	0.24	47.37	3%	3%	3%	3%
2029-30	30.74	17.79	0.25	48.79	3%	3%	3%	3%
2030-31	31.67	18.33	0.26	50.25	3%	3%	3%	3%
2031-32	32.62	18.88	0.27	51.76	3%	3%	3%	3%

The following factors have been considered when planning and budgeting for this AMP:

1. Patronage has grown at 5% per annum across the network over recent years, faster than population growth of about 1.4% per annum. Covid-19 and possible consequential structural changes to our economy, commuting patterns, and lifestyles are expected to reduce patronage growth rates for the earlier part of the planning period, but these effects will diminish over time. Specifically:

    a. Growth in population after July 2021 is likely to be slower than previously experienced and forecast, because of lower levels of migration, although Kiwis returning to New Zealand from overseas and lower migration levels to Australia could mitigate this effect.

    b. It is likely that an increasing proportion of Wellington's workforce will work from home on some (or all) days of each week or walk or cycle to

[6] Known data used for 2017-18, 2018-19 and most of 2019-20

[7] The 100% growth rates shown for 2021-22 represent a doubling of patronage from estimated levels of the previous year, and a return to 2018-19 patronage levels.

work more than previously. This may result in changes to the five-day commuting dynamic and there a potential reduction in peak public transport demand.

c. Higher levels of unemployment may still exist at the start of the planning period, which will reduce travel demand.

2. Patronage will likely fluctuate as New Zealand communities recover from the disruption caused by Covid-19 and alert levels go up and down as part of the New Zealand Government's response. Further, external factors such as fluctuation in the global oil price or limitations in supply may cause fuel price fluctuations, hence may influence private vehicle usage.

3. The Bus Network Improvements initially implemented in July 2018 (with ongoing refinements) will drive patronage increases because of the service improvements.

4. We are accelerating the move to an all-electric bus fleet, which is expected to entice some travellers out of their cars.

5. Ongoing work on improving the rail network means that rail service improvements will continue to attract more customers.

6. Integrated fares and ticketing (IFT) across our public transport network in about 2023 will generate new customers and facilitate travel on more than one public transport mode, with this effect being most noticeable in the first full year after implementation. The effect of IFT has already been evident when we partially integrated bus ticketing in July 2018, consolidating all bus electronic ticketing onto one system (Snapper) from the previous four systems while simplifying fares and tickets. IFT will increase rail revenue through better revenue collection and protection.

7. Significant investment in public transport is expected under the Let's Get Wellington Moving (LGWM) programme, with a greater emphasis on growth in public transport over private motor vehicles, which will support increased patronage growth across our public transport network.

8. LGWM proposes rapid transit in downtown Wellington. While decisions are still pending as to the exact form and timing of this new facility, patronage growth across the rail network is expected, while bus patronage would drop in the CBD parts of the bus network but increase on outer services feeding into the rapid transit system.

We have therefore assumed that public transport patronage will increase at 2% per annum for the first two years, then at 3% per annum for the rest of the planning period.

While the timing and quantum of future growth is now subject to significant uncertainty, it is clear that current networks will not have sufficient capacity if forecast growth eventuates. Once capacity thresholds are met, rail and bus services are likely to become overcrowded, less reliable and less attractive, increasing the potential for mode shift to private vehicles.

The large volume of trips made to/from/and within Wellington City each day means that failure to improve capacity and reliability on the region's rail network and Wellington City's bus network will directly impact regional aspirations to increase public transport mode share and reduce transport emissions. It will also make travel around the region more time consuming and costly, with potential to constrain growth. Analysis undertaken as part of the 'Let's Get Wellington Moving' Programme Business Case suggests up to 3,000 jobs could be deferred or located elsewhere due to forecast public transport constraints[8].

Having a resilient, effective and reliable public transport system that can meet the diverse needs of our growing and changing population therefore continues to be essential, if the region is to continue to remain a desirable place for people to live, work and play. Careful planning and investment will be required to ensure the region's transport system supports and enables sustainable population growth, and meets the needs of the region's communities both now and in the future.

Our investment plans presented within this AMP (see further sections below) are based on these patronage forecasts.

[8] Let's Get Wellington Moving Programme Business Case – Draft June 2019 (refer page 24 https://getwellymoving.co.nz/assets/Documents/Programme-Business-Case/LGWM-PBC-Report-21-June-2019-Draft.pdf)

Risk Management

Risk Management

This section sets out the role that risk management has in guiding our asset management and investment decisions. To achieve the service our customers deserve, we take a multi-faceted approach to managing risk. For the purposes of this asset management plan, such approach primarily focuses on identifying significant risks to the reliability and continuity of our service due to the failure of our assets and infrastructure. Our asset management framework incorporates practices designed to identify and mitigate these risks.

Risk management is an integral part of our overall business philosophy and is embedded within all of our activities and in the decisions we make. As a part of Greater Wellington, we use Greater Wellington's risk management approach. This approach is outlined below.

Risk Management Framework

Our Risk Management Policy states the following objectives:

- increase the likelihood of Greater Wellington Regional Council achieving its strategic and business objectives
- safeguard Greater Wellington Regional Council's assets and those people using them, people resources, finances and reputation
- ensure risk management practices are integrated into all Greater Wellington Regional Council operations and processes
- provide a timely response to risks escalation and issues as they occur
- promote awareness of risk management process and a culture of risk management awareness such that everyone in the organisation is responsible for managing risk
- aid decision making
- maintain a flexible and evolving risk management framework which is aligned with ISO 31000:2018 and best practice generally.

Our Greater Wellington risk management framework closely mirrors the requirements of the international risk management standard ISO 31000. Our risk management approach is focused on understanding, monitoring and proactively uncertainty and risk.

Our approach to risk management includes a formal risk governance structure and clear accountabilities and responsibilities at all levels to ensure our approach to risk is ratified and continuously reviewed.

We have broadly defined the organisational risk categories as set out below in Figure 15.

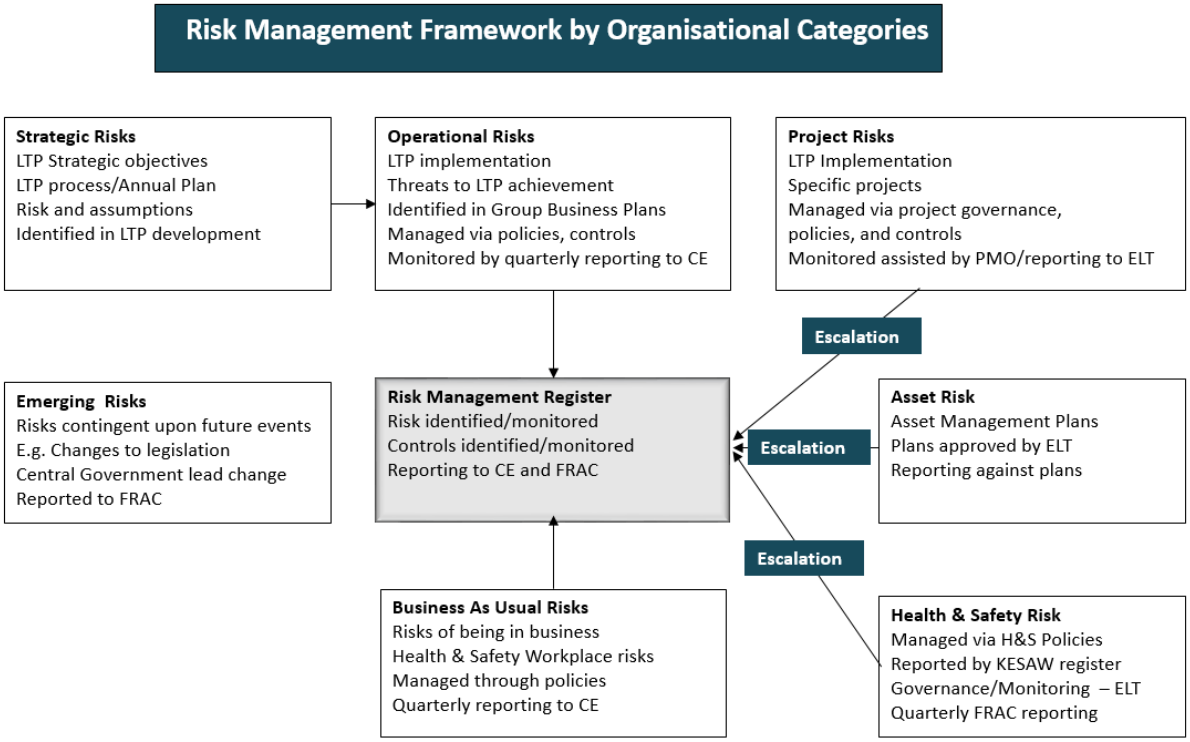


Figure 15: Risk Management Framework by organisational categories

Greater Wellington has stated it will prioritise, for mitigation, any risks with the following potential consequences:

- health and safety of the public, staff, and contractors
- legislative or regulatory breaches
- environmental damage

Our approach to asset risk management aligns with this philosophy.

Asset risk management

Whilst the above diagram categorises asset risk separately, we are careful to consider other categories within our asset risk framework that can manifest with our assets and infrastructure as we build, operate, and maintain our assets. These include project risks, and health and safety risks.

We recognise there are areas of risk that relate specifically to particular assets, sites, or parts of our public transport network. Our asset management approach incorporates processes designed to identify and mitigate such risks which then influence our individual asset class planning.

The following sets out our practices with respect to asset risk management.

Incident Management

We investigate incidents and events during our operations to a level of detail appropriate for the seriousness of the potential or actual consequence. We use a combination of internal and external investigation practices to identify root cause and preventative and mitigation actions. Any actions arising from individual incidents or trend analysis that require us to change our asset design or rectify particular assets or groups of assets are incorporated into our investment plans for each asset class.

Operational Feedback

Customer feedback regarding bus and ferry assets and infrastructure is received via phone, email, or social media. The details are logged into our CRM Resolve system.

The majority of customer feedback for our bus and ferry assets relate to bus stop or bus shelter repairs, cleaning, or graffiti removal. These are forwarded directly to our cleaning and maintenance contractor who has an obligation to clean or repair the asset within the timeframe specified in the contract, to ensure that the asset is not a health or safety risk to the bus operator or the public. We also use this information to assess the asset condition or performance, and life expectancy of the asset. Examples of other bus assets and infrastructure feedback include:

- request for a bus shelter
- request for a new bus stop
- request to move a bus stop
- request for improving lighting at bus stops
- Real Time Information (RTI) boards not showing accurate information or not working

Feedback is also received from bus operators and mainly relates to accessibility of bus stops and bus stop layout (including road markings), hazards en-route e.g. trees, utility poles, and road layouts.

Issues which require investigation, traffic resolutions, or discussion with a Greater Wellington team, TA or other external stakeholder, are logged and assigned to one of our team members for investigation. The log provides information on the current state and condition of assets and provides a basis for forward planning for replacements, upgrades, and new infrastructure in the asset class plan, and in conjunction with urban planning and development. Our asset class plans reflects this information.

Natural disaster

The region's infrastructure is vulnerable to natural hazards including earthquakes, tsunamis, major storms, floods and landslips; ranging from *high impact/high probability* events (e.g. a

major earthquake) to *low impact/high probability events* (e.g. storms). Climate change is expected to increase the frequency and intensity of some of these hazard events.

In preparing for natural hazard events and climate, we need to understand the extent of the risks the assets and services are exposed to, and also understand what may be required to respond or adapt to them.

Accordingly, our infrastructure and asset planning decisions that assume lifespans of 30-100 years need to incorporate climate change projections and natural hazards events. This is particularly true for decisions that are expensive to alter or reverse.

Surface flooding, from more intense and frequent rain events, and coastal flooding, associated with sea level rise, are the biggest risks identified to our assets and services.[9] Consequently, our assets and activities on floodplains and/or in relative proximity to the coast are the most at risk, i.e. the lower Hutt Valley or Porirua. The area of vulnerability is not just the coastal edge but on the neighbouring hinterland.

Also highlighted is the increasing risks to our services due to failure of other infrastructure or services owned, controlled or managed by third parties. For example, flooding of the roading network affects our public transport capability.

We continue to incorporate resilience in our investment decision-making through options assessment, asset specification, and designs.

Maintaining service continuity

The National Infrastructure Plan 2015 recognises the need for infrastructure organisations to shift beyond a narrow focus on shock events or infrastructure failure to thinking more about interdependencies, maintaining service continuity, and community preparedness. To ensure our service continuity now and in the future, our approach to asset and risk management continues to evolve to incorporate the wider perspective of resilience and sustainability into our investment planning.

Our awareness of the importance of resilience and sustainability in maintaining service continuity has been highlighted by events such as the Christchurch and Kaikoura earthquakes, the 2019 South Island floods and the global Covid-19 pandemic, as well as emerging environmental influences such as population and demographic change, economic shocks, technological change, and climate change.

The resilience of our infrastructure determines how it will cope in the immediate term after an event or disaster. Resilience is wider than just natural disasters. It incorporates the capacity to withstand disruption, absorb disturbance, act effectively in a crisis, adapt to changing conditions, and adapt to slower changes over time.

[9] Predictions and associated impacts from NIWA (2017) Climate Change Report for the Wellington Region. www.gw.govt.nz/climate-change

Planning for infrastructure sustainability is focused on the longer term of how our infrastructure development meets the needs of the present without compromising the public transport needs of future generations. Global issues like climate change, population growth, resource depletion, economic shocks and natural hazards means that our infrastructure has to be sustainable. When designing, constructing and operating our public transport network we incorporate the concept of sustainability in a manner which optimises our region's environmental, social and economic outcomes for now and in the future. Infrastructure sustainability is a framework we employ to ensure our public transport network contributes to Greater Wellington's vision of a region that has a thriving environment, connected communities and a resilient future. This is an evolving area.

Insurance

We use insurance to manage risk to deliver, with certainty, our Long Term Plan community outcomes.

Greater Wellington maintains a 'Material Damage Business Interruption' (MDBI) insurance policy for all above-ground assets (excluding motor vehicles and rolling stock, which are separately insured). Above-ground assets are insured on a maximum probable loss basis i.e. the maximum loss that an insurer would be expected to incur on a policy, representing the worst-case scenario for an insurer.

Greater Wellington doesn't insure 100% of its assets due to the unlikelihood that all assets would at the same time be affected by a hazard event. We have MDBI insurance with an excess of 5% site value, minimum $100,000, maximum $20 million. In order to meet this insurance excess, Greater Wellington has set up a cash fund called the Material Damage Reserve Fund (MDRF), initially from the savings of a higher insurance excess and latterly from the proceeds of forestry cutting rights. This MDRF now stands at $9 million and grows as interest is capitalised to it. Public transport assets (excluding motor vehicles and rolling stock) are included. Substantially smaller excesses apply to other hazards e.g. fire.

In 2016, Greater Wellington passed the process to fully insure rail assets over to Transdev, as part of the tri-party partnering contract ('the rail contract') between Greater Wellington, GWRL, and Transdev.

Covered are:

- vehicles
- EMU depot
- EMU depot plant and equipment

The balance of rail infrastructure assets owned by Greater Wellington is insured under the MDBI policy.

Global insurance costs are increasing, making insurance more difficult to obtain and increasingly unaffordable. As such, we are continually focussing our efforts on value for money aspects of risk to ensure we are insuring for the risks we are least able to control and/or accept.

Our Asset Management Approach

Our Asset Management Approach

As our region grows and new transport technologies and services open up, a world class public transport system has become increasingly important to our region's liveability. The asset planning and investment decisions we make today contribute to making our region a better place to live, while making mobility cheaper, safer, more accessible, and better for our environment. It's all about providing a better public transport experience to make Wellington even greater.

Greater Wellington's aim of reducing the region's carbon footprint incorporates a mode shift from people traveling in private vehicles to more people traveling by bus, train and ferry, especially at peak times. Our vision of providing an efficient, accessible, and low carbon public transport network aligns with this and sets the foundation of our approach to asset management.

Effective asset management is fundamental to achieving our vision and the Government's strategic priorities. Asset management involves the balancing of costs, opportunities, and risks against achieving our vision, strategic priorities, and desired levels of service. We plan and continuously refine our asset management activities against the Governments' and Greater Wellington's strategic priorities. Our approach to asset management ensures we manage our assets to deliver the desired levels of service and strategic priorities, in the most cost-effective manner throughout an asset's lifecycle, for present and future customers.

Asset management is part of our core business and is integrated with our other business processes.

Asset Management principles and objectives

Greater Wellington's vision and strategic priorities provide an over-arching framework to ensure we are working on the things that matter. The following principles shape how we manage our assets in a consistent and considered way:

1. ***Forward looking.*** Our public transport network is future oriented. It is developed and managed with consideration for long-term use including factors such as environment, future technology and population changes.
2. ***Optimal.*** We manage our assets in a planned and methodical manner to deliver agreed levels of service that provides the required levels of service at the lowest lifecycle cost for present and future customers.
3. ***Adaptable.*** We will develop and build assets that are resilient to social and environmental changes, including adverse events.

4. ***Compliance.*** Our asset management activities follow our commitment of providing a safe and environmentally sustainable public transport network in a way that complies with statutes, regulations and industry standards.
5. ***Partner, stakeholder and customer oriented.*** Reflecting our part in the national transport system, we consult with our partners, stakeholders and customers and take into consideration their views and requirements in our plans and levels of service.
6. ***Manage demand and growth.*** We assess and make provision for the future financial and service level impacts of changing population, legislation, demographics, and economic environment.

Our asset management system

Our asset management system provides the direction for our asset planning and recognises the need for clear connectivity between central and regional government's strategic priorities and our day-to-day asset management activities. Our asset management system takes into account both our internal organisational structure and our external operating environment such as key partner and stakeholder expectations, our legislative requirements and economic constraints.

Asset Management Strategic Plan/ Asset Management Policy

Greater Wellington's Infrastructure Strategy provides direction for the level and timing of investment needed to operate, replace, renew and upgrade assets. The Financial Strategy outlines the required rating and debt levels to fund these investments. Together the two strategies outline how Greater Wellington intends to balance investment in assets and services with affordability.

Greater Wellington's Asset Management Policy sets our framework for consistent and methodical asset management planning.

Governance and organisational structure

Our governance structure ensures appropriate oversight and a methodical approach is employed to our asset management activities and decision making. A key facet of our asset management approach is maintaining a clear alignment with our strategic priorities. A robust framework of responsibilities and controls are in place to ensure our asset management decisions align with our strategic priorities.

An overview of the public transport responsibilities and governance roles within this structure are set out in Figure 16.

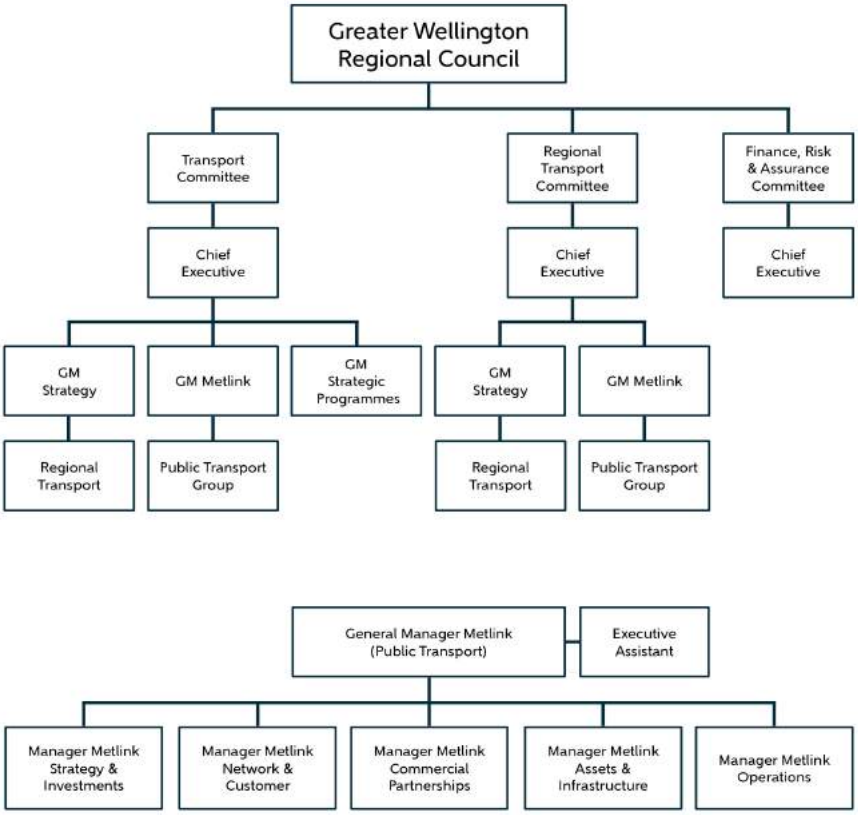


Figure 16: Public transport responsibilities and governance structure

Greater Wellington's Regional Councillors, Regional Council, and Metlink governance

Regional Councillors

Our regional councillors expect Greater Wellington to employ good asset management processes so that its assets deliver the desired outcomes for the communities the regional councillors serve, at least lifecycle cost.

Greater Wellington's asset management governance structure and processes provides assurance to its regional councillors by communicating underlying planning assumptions, the demand drivers, and the consequences of investment decisions, the linkage between Greater Wellington's strategy, strategic priorities and the levels of service required, the costs of projects required to maintain levels of services, and the risks associated with our assets and how those risks are mitigated.

As Greater Wellington is responsible for a wide range of strategies, plans, and functions, our regional councillors need to have a clear understanding of current issues, while being

efficient and effective. To achieve this, Greater Wellington has established nine committees and one subcommittee that have specific purpose and responsibilities for particular issues. The committees responsible for public transport are the Transport Committee, Regional Transport Committee, and the Finance, Risk and Assurance Committee.

Transport Committee

The Transport Committee is a committee of Greater Wellington Regional Council, comprising of thirteen councillors. It oversees the development, implementation and review of Greater Wellington's strategic direction and policies for transport and mode-shift and provides input into joint transport-related projects and initiatives. It also ensures that transport programmes promote a thriving environment, connected communities, and a resilient future for the region.

The Transport Committee is responsible for the preparation of the Wellington Regional Public Transport Plan.

Regional Transport Committee

The Regional Transport Committee is comprised of two persons who represent Greater Wellington, one person who represents each of the eight territorial authorities of the region, one person who represents Waka Kotahi, and one person who represents KiwiRail. It promotes the objectives of the Land Transport Management Act 2003 within the region, linking it to other regions of New Zealand and other transport systems.

The Regional Transport Committee is responsible for the RLTP and as such sets the vision for the Regional Public Transport Plan.

Finance, Risk and Assurance Committee

The Finance, Risk and Assurance Committee monitors, evaluates and reports to Greater Wellington on its finance, risk and assurance management policies, systems and processes.

Greater Wellington

Greater Wellington promotes the region's liveability by ensuring the region's environment is protected while meeting the economic, cultural and social needs of the region. Its specific responsibilities include environment management, flood protection and land management, provision of regional parks, public transport planning and funding, and metropolitan water supply.

As part of providing public transport, Greater Wellington is responsible for ensuring the delivery of a safe, accessible, reliable and environmentally friendly transport system, including public transport in the region at least cost to the regional ratepayer. Greater Wellington's Chief Executive is responsible to the thirteen Wellington regional councillors to ensure the region's asset management activities and investments contribute to Greater

Wellington's vision of an extraordinary region that has a thriving environment, connected communities and a resilient future.

Metlink

The General Manager Metlink is accountable to Greater Wellington's Chief Executive for our public transport asset planning and investment decisions. Within Metlink, we maintain organisational roles, and responsibilities that are consistent with implementing our vision and strategic priorities.

Our team responsibilities for asset management decision making within Metlink is shown in Table 9.

Table 9: Team responsibilities for asset management decision making within Metlink

Team	Responsibilities
Strategy and Investments	The strategy and Investments function provides strategic management and guidance by working with others to set priorities, focus energy and resources, strengthen operations, ensure that staff and other stakeholders are working toward common goals, clarify intended outcomes/results, and assesses and adjusts the Group's direction in response to a changing environment and in line with the Regional Public Transport Plan. This team oversees the development of robust business cases for funding, benefit realisation monitoring and managing the co-funding relationship with Waka Kotahi. The data collection and analysis function that sits within the Strategy and Investments team provides critical information to drive Group strategy development; business planning and evaluation, and course correction if required. There is a critical connection from this data team to all other parts of the business, as the business must become data driven in order to best respond to our customers' needs and expectations.
Assets and infrastructure	The Assets and Infrastructure function is accountable for building, managing and maintaining assets and infrastructure to support an integrated network of public transport. The objective of the function is to provide the best value level of service for the budget available. It includes the management of the entire life cycle—including design, construction, commissioning, operating, maintaining, repairing, modifying, replacing and decommissioning/disposal—of physical infrastructure and assets. They also ensure that assets and infrastructure are built and maintained to Group strategy, design, regulatory and contractual requirements to ensure an integrated PT network that is accessible and meets customer and stakeholder needs and strategic goals.

Network and Customer	The Network and Customer function is accountable for the design of the network and services to be delivered, in consultation with the Operators, ensuring a robust business case is made for change, and design is aligned to strategy and data analysis, including customer experience data. This function ensures that the services, provided through our business partners, are suited to the needs of the customers, and are in line with our commercial agreements. They examine all activities, infrastructure, communication, people, and material components involved in services to improve both quality of service and interactions between the provider of the service, the Group and its customers. It ensures that design changes can be executed effectively and efficiently within commercial constraints, in a fully multi-modal manner
Commercial Partnerships	The Commercial Partnerships function is accountable for managing contracts with Operators to deliver PT services for our customers. It is also accountable for business development, exploring new avenues of activity and seeking opportunities to increase revenue. They develop strong relationships with different teams within the Group and GW and with business partners to ensure everyone is working toward the same commercial targets and goals. They provide strategic commercial advice and assurance to support strategic decision-making and for policy formulation and delivery.
Operations	The Operations functions are accountable for delivering service to customers. They do this by maintaining close and effective working relationships with the Operators to ensure that the operation of public transport conforms to contracted services and performance levels. The function is accountable for operational planning and improvement, including business continuity and disaster recovery planning. They focus on customers and working with Operators on improving services and their delivery. They work across service delivery for all our current modes – Bus, Rail, Ferry and Total Mobility

Asset Lifecycle approach

To realise value from our assets, we employ a lifecycle approach to the management of our assets. This involves all stages in the management of the asset, from the conception of the need for the asset, to acquiring the asset, and then operating, maintaining, refurbishing, replacing and then either divesting or disposing of the asset, including managing any post disposal liabilities.

Greater Wellington's strategic priorities drive our asset lifecycle management, which in turn influence timing and quality of maintenance, refurbishment and renewals. We maintain our assets until they reach the end of their useful lives, when they are refurbished or replaced.

When determining an asset's useful life we consider age, condition, performance, customer service, growth and changing demands, criticality and risk, and ongoing maintenance requirements.

The ownership of the assets that make up the public transport network is a complex model. As such, Greater Wellington's asset management role and practices are scaled as appropriate to the situation. Where we do not own the assets that are fundamental to our service delivery, we ensure there are appropriate contracts and arrangements in place to manage our service risk from asset degradation and configuration. This requires a contract management and relationship management model that aligns as much as possible to our own practices and delivers the outcomes we are seeking for our customers.

Our methodical lifecycle approach means we consider lowest whole of life cost, rather than short term savings, when making decisions. Taking a lifecycle approach to our planning also assists us in making our assets and programmes of work more sustainable and environmental friendly. For example, integrating whole of life carbon thinking when planning and delivering our infrastructure assets is a practical approach we are taking to achieve our vision of a low carbon public transport network.

Our asset management approach reflects our lifecycle activities, encapsulating the main activities and information flows within our asset management value chain.

Figure 17 shows our asset lifecycle activities.

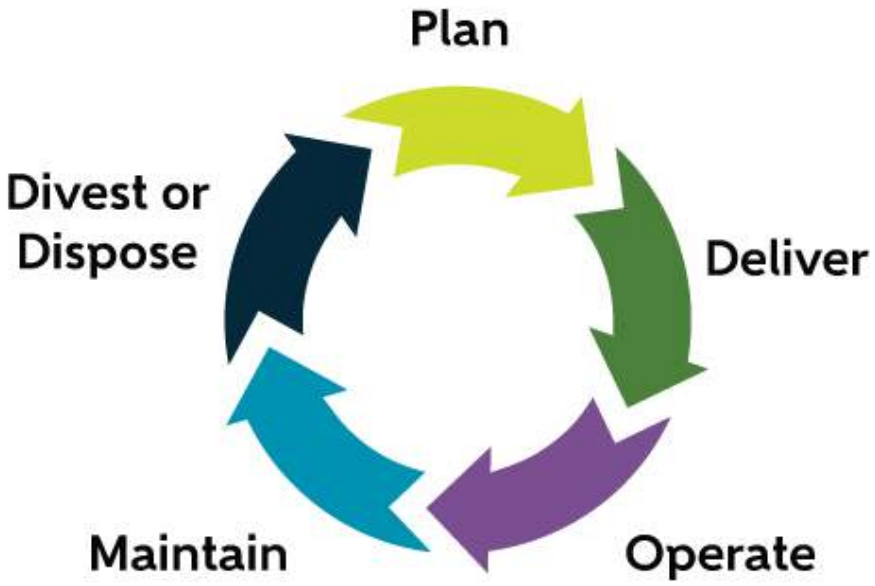


Figure 17: Our asset lifecycle activities

Further detail of our asset lifecycle activities is provided below.

Planning. Our planning lifecycle stage consists of several interrelated activities, to ensure investments deliver the right service, at the right cost, and within acceptable risk tolerances. This requires understanding asset management drivers, identifying, prioritising and integrating options, and estimating costs. Decisions are made within the context of our overall strategic priorities.

Deliver. Throughout the deliver lifecycle stage our objective is to safely and cost-effectively deliver our programmes of works. This requires us to continually challenge and improve our project planning, project management, and delivery skills to deliver the required levels of service.

Operate. During this stage, we operate our network to ensure we meet our levels of service.

Maintain. Throughout the maintain stage, we proactively maintain our public transport assets to ensure they remain safe, secure, and reliable.

Divest or dispose. Our assets that are surplus to requirements will be disposed of. Our criteria for determining asset disposal include underutilisation, obsolescence, provision exceeds required levels of service, replacement before predicted economic life, life expired rolling stock retired if remanufacture is not economically viable, uneconomic to upgrade, policy changes, service provided by other means such as private sector involvement, and potential risk of ownership such as financial, environmental, legal and social risk.

Asset information

Robust asset knowledge and information is crucial to good asset management as it enables evidence based- decision making. Our knowledge of our assets and forecasting capability has continued to grow. Our emphasis on asset data for use in investment decision making has resulted in our focus to improve our asset data quality so that our systems, processes and data are sustainable, robust and fit for purpose. As part of this we are in the process of implementing a new asset management information system, Ngātahi.

Our asset information system is used to support the development of our asset management plans. Ngātahi will allows our field staff to enter asset data at source. While out in the field, our field staff will be able to update asset condition ratings, update asset records and attributes, record asset defects, and creating new work orders.

Industry standards

We are committed to providing a safe and environmentally sustainable public transport network in a way that complies with industry standards. Our asset management decisions account for:

1. **Requirements for Urban Buses in New Zealand (RUB).** The purpose of the RUB is to standardise urban bus requirements across regional councils and Auckland

Transport to create efficiencies and improve the usability and accessibility of buses for all customers. It documents the standards for design and performance of the bus fleet, access and seating configuration including priority seating and luggage storage, facilities for passengers with impairments, safety and security, and internal, external and operational communication. The RUB is currently being reviewed.

2. **New Zealand Public Transport Design Guidelines (Guidelines).** The Guidelines are being developed collaboratively by Waka Kotahi with an industry Reference Group. The industry Reference Group members are from all over New Zealand, reflecting a range of contexts and perspectives. The principles of the Guidelines were created to encourage the public transport system is consistent in design, accessible, safe, affordable, operationally efficient, support mode shift and positive urban design.
3. **National Rail Safety Standards (NRSS).** The objective of the National Rail System Standards is to provide a generic framework for the management of safety and change within the Rail Safety System (RSS). It is applicable for all activities involving the operation of Rail Service Vehicles on the National Rail System and is designed to meet the requirements set out in the Railways Act and the Land Transport Safety Authority document "Rail Safety Licensing and Audit Guidelines." The NRSS covers safety management, health assessment of rail safety workers, risk assessment, occurrence management, mechanical engineering interoperability, rail operations interoperability, audit, document control, crisis management, and heritage vehicle and train management.

Continuous Improvement

We have a focus on continuous improvement. Since our 2017 AMP we have undertaken a significant amount of development of our AMP and associated processes. This year's AMP is a step change from our previous AMPs and is a reflection of our commitment to continuous improvement.

Going forward we are continuing to evolve and strengthen our asset management approach. As part of this, we are looking to:

- develop a universal investment decision framework
- strengthen our cost estimation processes
- further implement data driven decision making including improving and cleansing existing data and capturing new data
- leverage the functionality of our new asset management system, Ngātahi, including implementation of asset health modelling for specific assets
- use of risk and criticality in our decision making where necessary and practicable.

Our Asset Class Plans

Our Asset Class Plans

This section describes our asset management approach, strategic objectives, risks, plans and financial expenditure forecasts for the assets covered by this AMP. We have categorised these assets between two categories of portfolios. These are Rail Services, and Bus and Ferry Services. These two asset portfolios are documented within five asset plans. These are Rail Rolling Stock, Rail Station Infrastructure, Bus Fleet Management, Bus and Ferry Infrastructure, and Customer Information Assets. Each of these are described below.

Rail Services Overview

Introduction

Our rail portfolio covers the assets we use for delivering metro rail services within the Wellington region. These assets are detailed in the Rolling Stock and Station Infrastructure asset class plans. We own, fund, and/or manage the assets necessary for the Wellington region's metro rail services. We determine the service level and timetable for rail services, plan for future development of the rail services, procure, and fund the operator to provide services.

Our rail network consists of the Johnsonville, Kapiti, Hutt Valley (including Melling), and Wairarapa passenger lines. It provides a transit system that delivers vital support for the significant commercial, government, and professional service industries in our region.

Approximately 75 percent of our region's population lives north of the Wellington CBD. Our rail network provides high-capacity, long-distance, time-competitive commuter services connecting key urban areas across the region to Wellington's CBD. 425,000 residents are served by our 2,250 commuter trains in a typical week. They make about 42,000 trips per weekday (at peak). Rail currently accounts for 41 percent of peak trips from the north (18 percent of all peak trips) to the Wellington CBD where 40 percent of jobs are located.

Greater Wellington's subsidiary, (GWRL), took ownership of a significant number of the rail assets in 2011. Transdev is our contracted rail operator for the region. Since 2011, we have invested significantly into our rail network to improve the infrastructure and services. These improvements have led to a growth in our rail patronage from 12.8 million passenger journeys to 14.3 million journeys between 2015 and 2019. Our rail patronage continued to grow in the first half of the 2019/20 financial year until the 2020 Covid-19 disruptions.

With ever-increasing demand on our rail services, it is imperative we continue to operate a safe, reliable, and resilient network. Keeping our rail network fit for purpose and fit for the future requires ongoing investment. This involves continuing to maintain and improve the level of service provided by our existing infrastructure through:

- targeted and catch up renewals in the rail network assets (owned by KiwiRail);
- targeted routine maintenance and renewals in assets owned by GWRL;
- upgrades, and investment in new infrastructure across all assets to improve the level of service to meet our customer's expectations.

We are committed to investing to accommodate growth expectations and the resultant increased pressure on capacity. The rail asset class plans outlined in this AMP support the continual improvement targets in levels of service for our passengers, will unlock capacity for ongoing and expected high levels of growth, and improve resilience of the network. The

investment aligns with, and contributes to the achievement of our strategic priorities of mode shift, customer experience, carbon footprint reduction, and safety.

KiwiRail Agreements

We have in place a number of KiwiRail leases. These are discussed below.

Wellington Network Agreement (WNA)

In June 2013, we signed an 85-year WNA which grants Greater Wellington access to the Wellington railway network to operate metro rail services within the Wellington region.

KiwiRail remains the owner of the rail network which includes: track; signals; telecommunications; network control; overhead traction power system; station platforms; some structures (bridges and tunnels); slopes and drainage; and level crossings.

Under the WNA, we pay a share (based on tonnage or train km's depending on asset wear mechanism) of maintenance and renewal costs undertaken each year.

The WNA requires that KiwiRail prepare a Wellington Network Management Plan (WNMP) structured around three-year windows for budgeting and delivering within an overall planning horizon. KiwiRail is required to plan and undertake all maintenance and renewal work on the rail network. The WNMP is the mechanism for Greater Wellington and KiwiRail to agree the desired level of network performance and the investment required to achieve such service.

The age of the rail network infrastructure varies and the expected asset life also varies significantly depending on the asset type. Some assets, such as bridges and tunnels, have a life in excess of 100 years. KiwiRail's primary objective is to keep the network safe and open. However, KiwiRail currently carries a significant level of deferred maintenance. As such, network performance lags our desired levels of service. In the case of the Wairarapa Line (north of Upper Hutt), the condition and performance is declining, with current level of speed restrictions resulting in 2-3 times the "acceptable" level of delays. There is a specific programme of work currently being undertaken to target 'catch up renewals'; this is a programme of tactical upgrades designed to lift the network standard to that which one would expect of an effective and efficient metro rail network.

Shunt locomotive lease

To operate the carriage fleet on the Wairapapa Line, we lease from KiwiRail two diesel electric shunt locomotives for shunting carriage trains between the carriage depot and Wellington Station. The other shunt is used for moving vehicles in and out of the unpowered heavy lift road in the EMU depot; this shunt will be not required once the operation of the crabs has been fully accepted by the Rail Maritime Transport Union (RMTU) and staff appropriately trained. This is expected to be completed in 2021.

The maintenance and long-term asset management of the electric shunt locomotives are the responsibility of KiwiRail as the asset owners.

Key rail asset leases – Wellington Railway Station

We also have lease arrangements with KiwiRail in regards to some other key assets. These include: Wellington Railway Station staff areas; Wellington Station public toilets; Wellington Station concourse (public area); Wellington Station platforms; and carriage depot. A majority of these assets require us to manage or fund maintenance and cleaning of these assets. The condition of these assets are generally poor, and in the need of further investment, through refurbishment or renewal.

Key investments

Over the 30-year period covered by this AMP, our total opex forecast for rail is $1.4b. This comprises rates, leases, insurance, electricity, and maintenance. The rail portfolio opex is forecast to steadily climb as patronage climbs over the next 30 years. The most notable change within the opex forecast , is the proposal to cancel the locomotive hook and tow lease arrangement with KiwiRail for the Wairarapa services in 2026. The hook and tow locomotives will be redundant once we have the new multiple units, low/zero emission fleet operating on this line. Some of these costs are transferred into maintenance costs of the new electric multiple units (EMU) fleet at this time.

The total capital forecast for rail for the same period is $3.64b. This includes:

- **capex renewal expenditure** of $462m on the KiwiRail Network, $132m on rail infrastructure, and $691m on rolling stock
- **capex improvement expenditure** of $1.30b on the KiwiRail Network, $169m on rail infrastructure, and $888m on rolling stock. The significant capex investment is required, particularly in the first decade, to achieve the customer experience improvements, achieve mode shift, and meet growth targets.

The key areas of investment are:

1. Improvements to rail station infrastructure facilities, with a particular focus on customer experience. This includes increased shelter and improvements in facilities while passengers wait for trains, improved connections between the stations and the community such as improvements to Park and Ride, bicycle storage facilities, and improvements to paths, lighting, security and general accessibility. For more detail refer to Figure 67 and the station infrastructure asset class plan.
2. Renewal of the carriage fleet, and provision of a low/zero emission fleet for additional capacity and service frequency on both the longer distance Wairarapa and Kapiti Lines. Additional expenditure is required to boost the capacity and

service frequency of the suburban services operating on the current electrified network, in particular on the Hutt and Kapiti Lines.

3. KiwiRail Network improvements which are critical for achieving a fit-for-purpose metro rail network. We have assumed this will be fully funded by the National Land Transport Fund (NLTF). Therefore, these initiatives have not been included in the Long Term Plan (LTP) financials but they have been included within this AMP. The profile of this investment is shown in Figure 18.

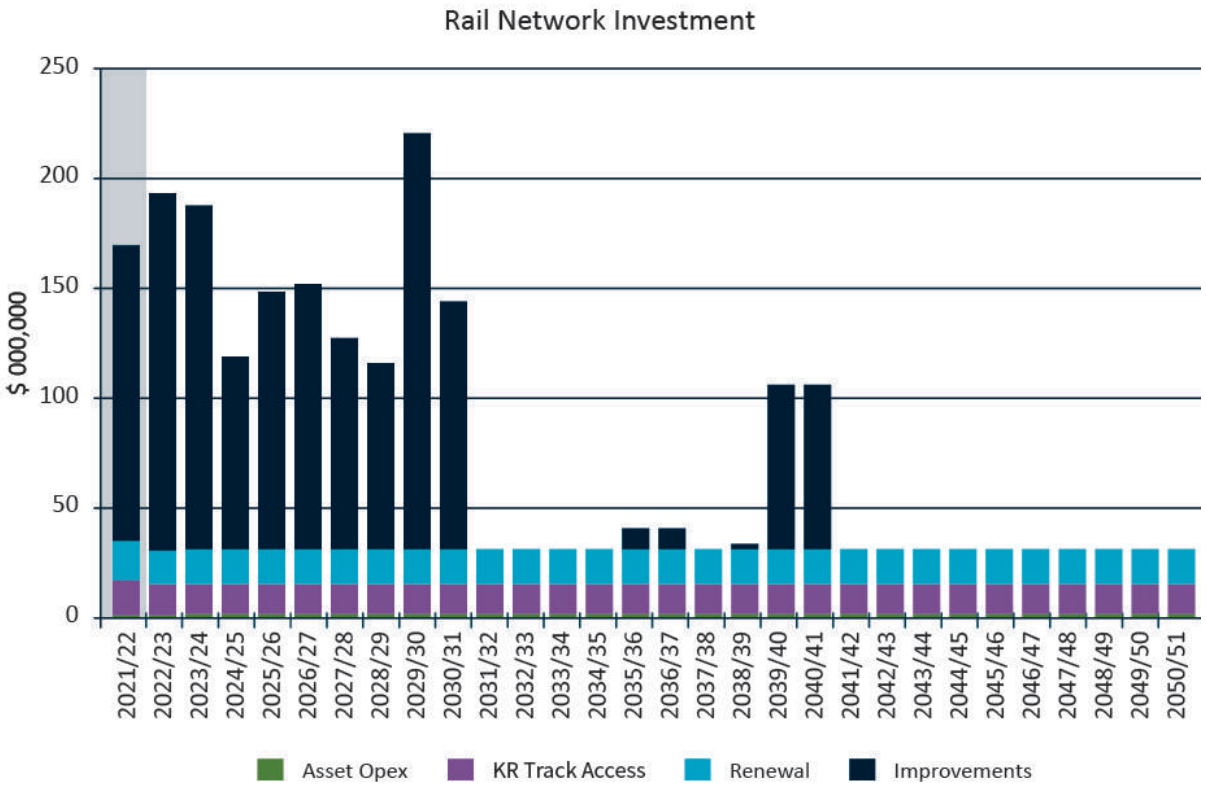


Figure 18: Rail Network investment

This KiwiRail network improvements involves:

- completing the catch up renewal of traction overhead line system and track infrastructure
- unlocking capacity and resilience improvements
- Wellington Station signalling and track improvements
- regional capacity and safety improvements to enable improved Lower North Island regional passenger rail services.
- renewal of the signalling system to best practice safety standards, improve operational resilience, and enable capacity improvements of the network

- increasing capacity of the network to support a two-tiered layered 10min peak services on the Hutt and Kapiti Lines, which will enable the capacity needed to achieve targeted mode shift.
- resilience of the network, including both operational resilience and life-lines resilience.
- pedestrian and vehicle level crossing safety improvements across the region, which will become increasingly important as rail service frequency increases.

Figure 19 shows our rail opex forecast and Figure 20 our rail capex forecast.

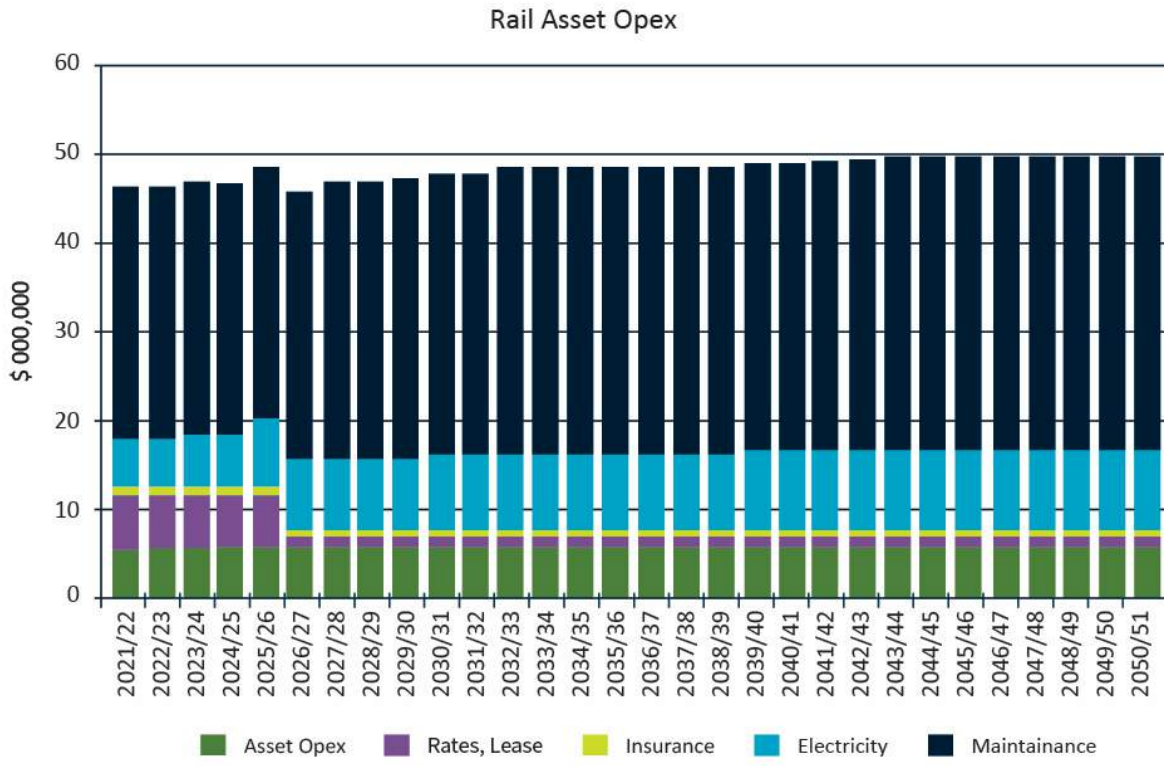


Figure 19: Rail opex forecast in 2021 dollars

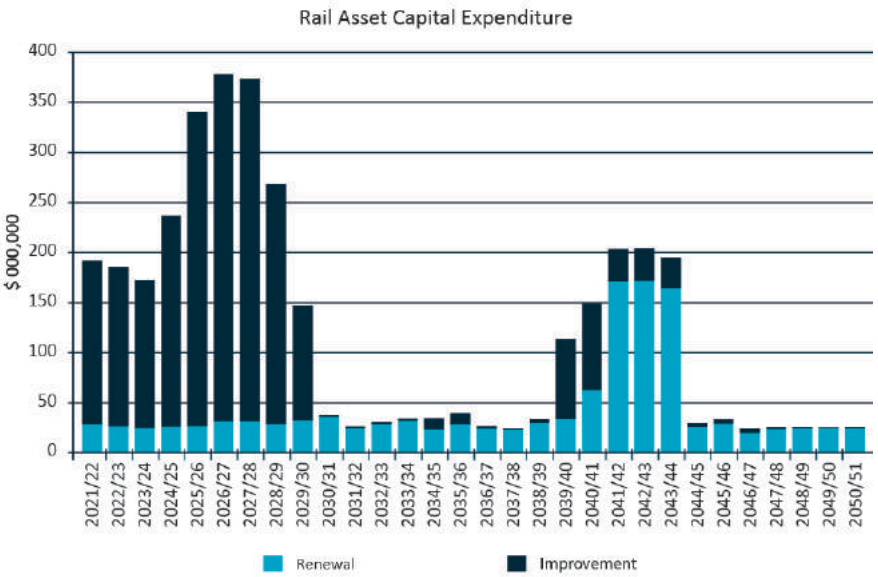


Figure 20: Rail capex forecast in 2021 dollars

Figure 21 shows our KiwiRail Network opex and capex forecast.

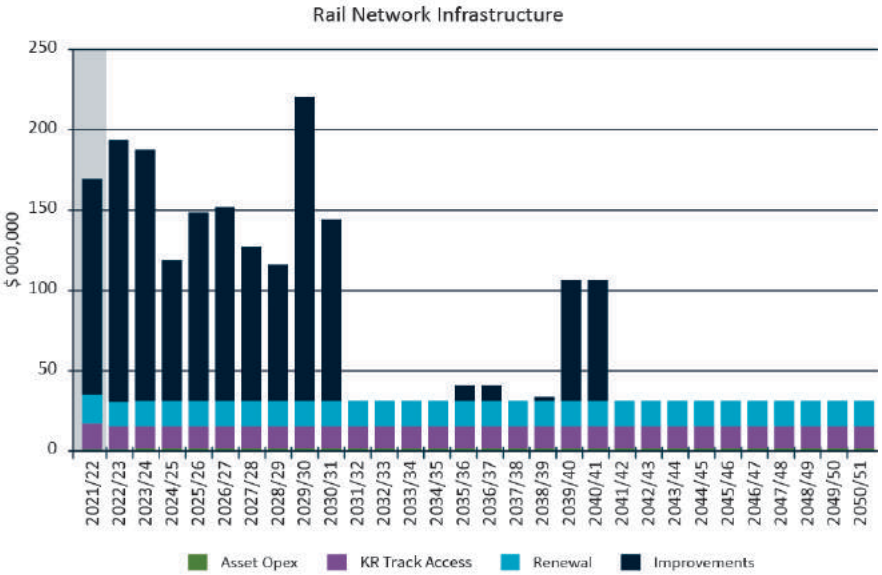


Figure 21: KiwiRail Network opex and capex forecast in 2021 dollars

Risks and uncertainties

The primary expenditure risk within this portfolio relates to:

- funding certainty
- patronage forecast / capacity requirements
- KiwiRail network resilience, safety and overall performance
- cost uncertainty

Rail Services asset class plans

The following sections describe in more detail our asset management approach for our rail assets. These are separated into two asset class plans:

1. Rail Rolling Stock; and
2. Station Infrastructure.

These asset class plans describe the strategy, asset characteristics, management approach, and expenditure profile.

Rail Rolling Stock Asset Class Plan

This asset class plan describes our lifecycle management approach for our rolling stock assets. Rail rolling stock represents our largest asset portfolio.

Our rolling stock assets consist of:

- Two-car Matangi Electric Multiple Units (EMU) carriages
- Matangi driving simulator
- Wairarapa locomotive hauled carriages (Wairarapa carriages)
- Auxiliary Generator222 (AG222) generator and luggage carriage
- Zephyr electric shunt crabs

Plan summary

Our rolling stock is critical for delivering an efficient, accessible and low carbon rail service. Therefore, our overarching objective is to provide high quality, safe, and fit for purpose rolling stock at the service frequency, level of comfort, and reliability expected by our customers.

Our key strategies for achieving this key objective is:

- ensure our planned and heavy maintenance regime maintains the vehicles to the required level of condition and performance throughout their asset life.
- specify the design requirements for our rolling stock to meet the requisite levels of service through the life of the assets.

- provide a driver training simulator, to enable training to be undertaken in a safe environment and reduce requirement for actual rolling stock.
- continue to model future demand to ensure our investment planning incorporates the need for additional rolling stock to maintain our capacity in line with the demand.

Our rolling stock is operated and maintained under contract with Transdev. Transdev has sub-contracted Hyundai Rotem to undertake the maintenance function of the Matangi EMU units.

We operate the EMUs on the Johnsonville, Kapiti, Hutt and Melling lines. They are modern, in good condition and will require replacement from the mid-2040s. Our Wairarapa carriages, including the AG222 are operated on the Wairarapa line. They are approaching the end of their serviceable lives and will require replacement in the next decade.

The maintenance opex is currently approximately $12.5m per year and is forecast to gradually increase over the next 30 years to $15.1m per year as the fleet grows in response to predicted demand. The majority of this expenditure includes cleaning, planned and corrective maintenance, security services such as CCTV monitoring, software, depot plant and equipment maintenance, inventory management, warehouse facility and inventory financing, software Escrow[10], and insurance.

Over the next 30 years the renewal capex is forecast to be $691m. This expenditure will fluctuate over time due to the various lifecycles of rolling stock major components and systems. Over the next 10 years, the average renewal capital investment is expected to be approximately $9.3m per year (with a range between $5.4m and $16.5m).

The capex is required to renew the Wairarapa carriage fleet to provide a low/zero emission fleet for additional capacity and service frequency on both the longer distance Wairarapa and Kapiti Lines; boost the capacity and service frequency of the suburban services operating on the current electrified network; in particular, on the Hutt and Kapiti Lines; and replacement of the EMUs between 2040 and 2045 which will also provide additional capacity to meet demand projections.

[10] Escrow is a third party Intellectual Property ‘bank’

Figure 22 shows our forecast rolling stock operational and capital expenditure.

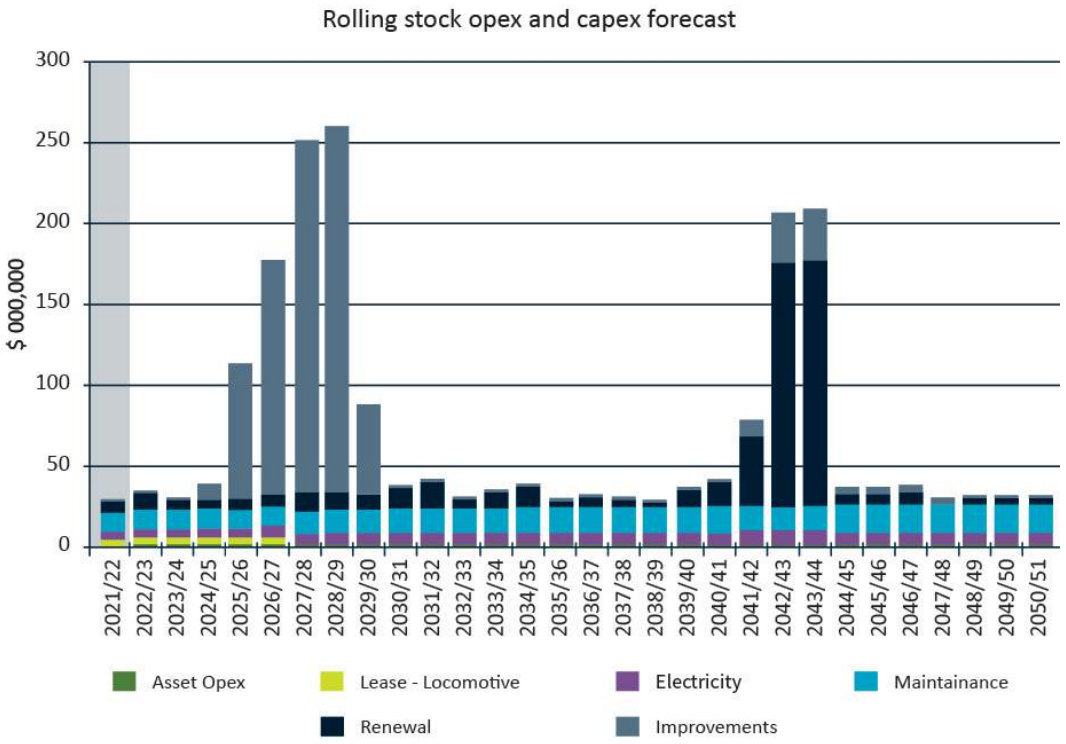


Figure 22: Rolling stock opex and capex forecast in 2021 dollars

Strategic objectives

Our overarching objective is to provide high quality, safe, and fit for purpose rolling stock at the service frequency, level of comfort, and reliability expected by our customers.

To achieve this, our key objectives are:

Customer Experience:

- provide carriages designed to appropriate standards, to achieve the following outcomes:
  - all vehicles maintain comfortable interior temperature (HVAC system)
  - all vehicles have features for a wide range of users (wheelchairs, prams, cycle storage, visibly impaired, hearing impaired, etc)
  - Passengers experience consistent and comfortable ride quality
- provide a full suite of information for all customers, including next stop passenger information, Public Address system, hearing loops, help points, route maps, and safety information.

Mode Shift:

- ensure our planned and heavy maintenance regime maintains the vehicles to the required level of condition and performance throughout their asset life so we achieve the availability and reliability standards in our performance measures

- ensure we plan for future capacity and account for vehicle procurement lead time

Decarbonisation

- ensure our replacement rolling stock is procured to achieve our decarbonisation strategies and service levels.

Safety

- provide carriages designed to appropriate safety standards, to achieve the following outcomes:
  - rolling stock interfaces safely with the network infrastructure
  - carriages meet structural strength, fatigue and crashworthiness requirements
  - door operation is safe
  - interior layout provides a safe and secure environment (i.e. lighting, CCTV Systems, help points, clear and open visibility, etc)
  - maintain high train visibility

Our progress towards achieving these objectives is monitored as performance measures, which are described further below.

Our key strategies for achieving these key objectives are:

- specify, in our maintenance contract, the prescribed planned and heavy maintenance regime to ensure the vehicles remain the required level of condition and performance throughout it asset life.
- monitor compliance with the contract through an assurance regime monitoring, in particular:
  - compliance with the MVOS
  - monthly performance lead and lag indicators, including corrective and preventive maintenance
  - adherence to regular maintenance management systems and processes
  - inventory and stock management and levels ensuring they are sufficient for foreseeable faults, planned and unplanned maintenance
- manage a Failure Reporting Analysis and Corrective Action system to ensure maintenance processes & procedures and vehicle design are continuously improving
- implement a robust engineering change process, to ensure that all changes are justified and well considered in regard to the overall performance (customer, safety, whole of life cost, etc) of the vehicle
- have a driver training simulator, to enable training to be undertaken in a safe environment and reduce requirement for actual rolling stock
- undertake future demand modelling to forecast the need for additional procurement of rolling stock

Asset characteristics - current state

Our Matangi EMUs are two-car units and are designed to run on all lines in Wellington's 1500V DC overhead electrified system. Each unit is made up of a semi-permanently coupled power car and trailer car. They are of stainless-steel construction and have a low-floor/level boarding section, air conditioning, passenger-operated doors, and an AC traction system with blended regenerative braking. The first Matangi 1 entered service in February 2011 and the last Matangi 2 in October 2016.

A Matangi EMU is shown in Figure 23 below.

Figure 23: Matangi Units

We use our Wairarapa carriages to provide the longer-run train services on the non-electrified Wairarapa line. They are hauled by diesel-electric locomotives provided by KiwiRail, via a wet hook and tow agreement. The maximum train length used in service is nine carriages.

Our Wairarapa trains include a generator to provide onboard power to the train, and an accessible carriage. All the carriage types are interoperable, which means they can be coupled as required. All passenger carriages are equipped with passenger operated power doors, air conditioning, and a passenger information system.

We have two types of Wairarapa carriages; the suburban Wairarapa (SW) carriages and the suburban express (SE) Wairarapa carriages. Both types were originally early 1970's British

Rail Mk II carriages. Between 2007-2010 KiwiRail rebuilt and converted them to be compatible with the New Zealand rail network. During the conversion, bogies were fitted to the carriages.

The level of rebuild for the SE carriages was much less than that of the SW carriages as they were quickly introduced into service in 2010 to increase capacity on the Hutt Valley and Kapiti lines until the introduction of the Matangi EMUs. In 2013 further work such as installation of standard toilets into 2 of the SE's, and an accessible toilet unit in the SEs was carried out to make them suitable for use on the Wairarapa line to supplement the SW fleet. They re-entered service 1st of July 2013. The SE carriages retain many of the original MkII design features including original windows, lighting, and high-density airline-style seating.

Figure 24 is an example of our SW carriage.

Figure 24: SW carriage

Figure 25 is an example of our SE carriage.

Figure 25: SE carriage

The AG222 is a generator and luggage carriage, it does not have seating for passengers. It is used to increase bicycle and luggage capacity on scheduled services. It also is equipped with an electrical generator which can be used to supply electrical power to trains if either an SE or SW generator is not available.

Figure 26 is an example of a AG222 carriage.

Figure 26: AG222 carriage

The Matangi driving simulator is a replica of the Matangi driver cab. It enables drivers to be safely trained and assessed in a full range of operational environments and situations.

The Zephir 1800E electric crab is a road rail vehicle designed for moving rolling stock within a depot. They have the capability of providing tractive power and braking to a 200ton load. The Zephir 1800E electric crabs is used for safe controlled movements of rolling stock within the EMU depot and wheel lathe facilities.

Asset importance

The Wellington passenger rail network forms the backbone of our Public Transport network. Our rolling stock is a critical component of our rail network and provides a vital passenger transport link across the Greater Wellington region. The provision of modern, safe and reliable rolling stock connects our customers to their places of work, schools, events and communities. Without modern, safe and reliable rolling stock, our organisational strategic focus areas of mode shift, decarbonisation of our public transport fleet, and improving our customer experience would not be realised.

Our region's prosperity relies on our rolling stock to transport high volumes of commuters into and out of the CBD each day from surrounding communities. Our region's road network does not have capacity for these commuters. When there is an outage in our rail network, the region's road network becomes heavily congested and traffic grinds to a standstill. Additionally, an outage on our rail network negatively impacts our customers who solely rely on our network to access jobs, education, healthcare, cultural activities, shops, friends, and whanau.

Without sufficient rolling stock capacity, the service we provide would be significantly degraded and, in the extreme, we would have to leave our passengers at the platform to catch a later service or some alternative mode of transport.

Unreliable rolling stock impacts us delivering the required capacity, which ultimately affects service demand and it also affects our customer's experience of our service. Our customers have high expectations for on-time performance and the ability to have a seat. These factors influence their decision to travel by train, or not.

Our Matangi driver simulator is an integral part of driver training for new drivers, refresher training of experienced drivers, and qualification of drivers returning to service. The simulator allows new drivers to learn to drive in a safe and controlled environment and makes it possible to practice techniques and scenarios which are not practical or safe in a 'live' railway environment. The simulator simulates varying weather conditions, degraded modes, and potential hazards e.g. earthquake, flood, track obstruction etc, which would otherwise potentially take many driving hours to experience.

Population

Our rolling stock consists of seven asset types. The asset types by population are shown in Table 10.

Table 10: Rolling stock asset population

Asset types	Population	Seated Capacity
Matangi 1, 2 Car Units	48	147
Matangi 2, 2 Car Units	35	147
Matangi driving simulator	1	n/a
SW carriage cars	18	37-64
SE carriage cars	6	40-69
AG222 Cars	1	n/a
Zephyr 1800E crab	2	n/a

Age profile and life expectancy

The age of our rolling stock ranges from 4 years to 50 years. Each rolling stock type has a different life expectancy. The expected life, along with the expected timeframe for half-life refurbishments and the end-of life and for each asset type is outlined below.

The age, life expectancy, including expected end of life of our rolling stock assets are summarised and in Table 11.

Table 11: Age expectancy of rolling stock

Asset type	Current age	Standard base life	Mid-life refurb due	End-of life
Matangi 1, two-Car Units	8-10 years	30 years	2025-2027	2040-42
Matangi 2, 2-Car Units	4-6 years	30 years	2030-2031	2045-46
Simulator	2 years	28 years	2030	2050
SW carriage cars	45-50 Years Rebuilt 2007-08	20 years	Minor refurbishment 2020-2023	2027-2028
SE carriage cars	45-50 Years	20 years	Minor refurbishment	2027-28

	Refurbished 2010		2020-2021	
AG222 Cars	40 years Refurbished 2008	20 years	Minor refurbishment 2020	2027-28
Zephyr 1800E crab	3 Years	30 years	20	2047

Figure 27 shows our rolling stock age profile.

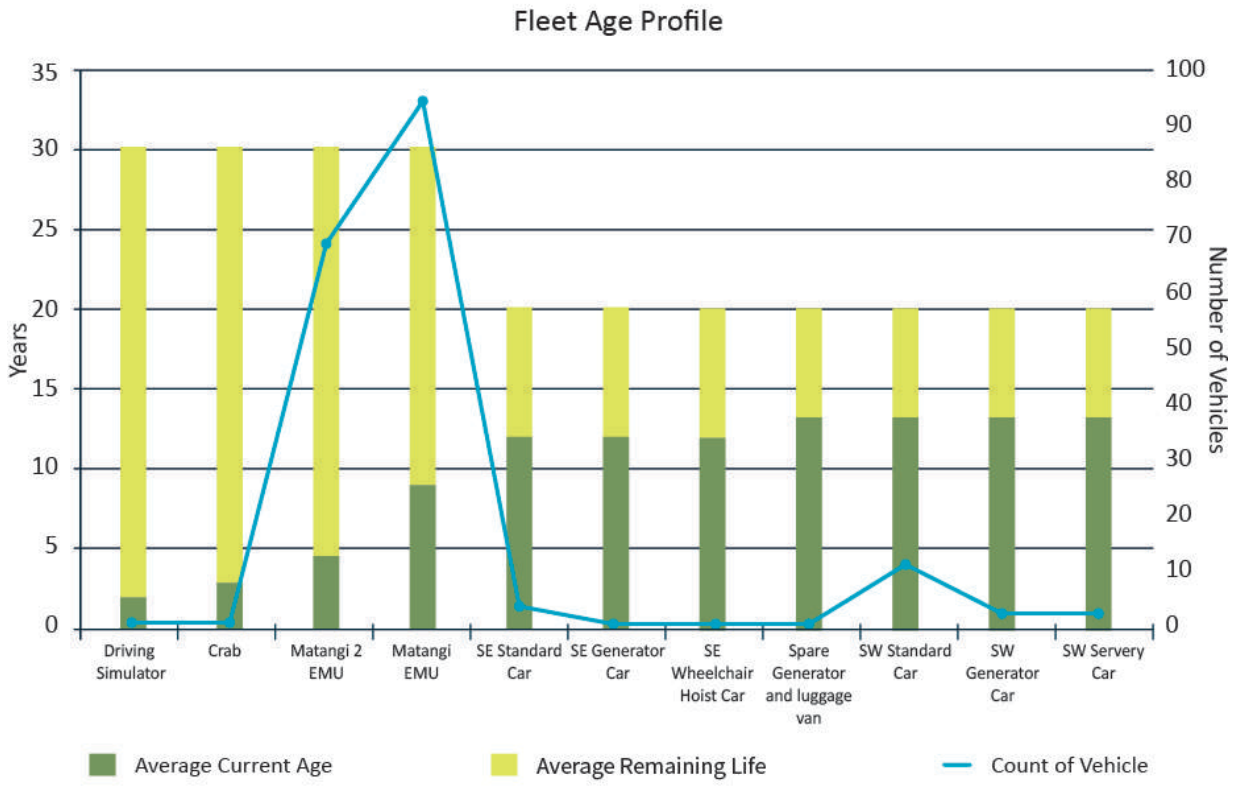


Figure 27: Rolling stock age profile

Asset condition

We determine the condition of our rolling stock assets by using the condition grade rating system within the International Infrastructure Management Manual (IIMM). Table 12 shows our condition rating description.

Table 12: Description of condition rating

Condition Rating	
Rating	**Description of Condition**
1	Very good condition only preventative maintenance required
2	Good condition: Minor maintenance required plus Preventative maintenance
3	Moderate condition: Significant maintenance required
4	Poor condition : Significant maintenance required
5	Poor condition : Unserviceable

Overall, the health of our rolling stock is good. Table 13 below summarises the asset condition across our rolling stock assets.

Table 13: Rolling stock asset condition

Assets	Condition Rating
Matangi 1	2.0 (2018)
Matangi 2	1.7 (2018)
Driving Simulator	1.0
SW	2.9 (2018)
SE	2.9 (2018)
AG222	2.5 (post Minor refurbishment)
Zephyr 1800E crab	1.0

The condition is described in more detail below.

Matangi EMUs

The Matangi 1 fleet has an overall condition rating of 2.0 (good) and the Matangi 2 fleet has an overall condition rating of 1.7 (good/very good). The overall operational performance and reliability of the fleet is meeting expectations of a modern fleet.

The EMUs contain multiple sub-systems and components that form the train as a whole. Each of these sub-systems have a different expected life, and hence require replacement or refurbishment at different frequencies.

These assets (at the sub-system and aggregated up to provide overall condition rating) are monitored through largely an internal asset fleet condition review process, which is occasionally peer reviewed by an external party.

An overhaul/renewal maintenance programme is in place. This is intended to maintain the condition of the vehicle and its sub systems/components throughout the design life of the vehicles. To maximise the efficiency of the heavy maintenance / renewal activities, these are grouped together at three yearly intervals for each unit, with the objective to lift the condition grade back to the baseline.

The rail partnering contract includes a detailed MVOS that the operator must adhere to. It details the extent of defects allowed and the duration these defects can remain unrepaired. If the vehicle does not meet this, it should be removed from service for repair. The maintenance programme and the MVOS ensure the EMUs operating in service meet our expectations in reliability, and appearance, as well as customer safety and comfort throughout the life of the asset.

The Matangi EMUs contain safety customer focused features expected in a rail vehicle manufactured in 2010, such as low floor accessibility, fully fire compliant with BS6855 Class 1B Fire Rating, GM/RT2100 structural compliance including crashworthiness features such as anti-climb fins, and crumble zones.

Matangi driving simulator

The driver training simulator is in very good condition. It is located within a customised training facility with restricted access and is maintained by a dedicated technician.

Wairarapa carriages (carriages)

The SW & SE carriage fleet have a moderate condition rating. They are monitored through an internal asset condition review. A maintenance programme is in place to maintain the condition throughout the design life of the carriages. This maintenance plan is both time and distance based with heavy maintenance work carried out every 300,000-400,000 kilometers.

The MVOS details the standard the operator must adhere to. It details the extent of defects allowed and the duration these defects can remain unrepaired. If the vehicle does not meet this, it should be removed from service for repair. The maintenance programme and these MVOS standards ensure vehicles operating in service meet our expectations in reliability, and appearance, as well as customer safety and comfort throughout the life of the asset.

These carriages have a condition rating of moderate condition. Operational reliability and availability is good.

SW Carriages

The SW's are showing their age, although still in an acceptable condition for service, further intervention is required to allow them to reach their design life. The exterior body finish has degraded over time and signs of bodyside corrosion are becoming more obvious, this is especially prevalent around the window areas. The Window double glazing units require replacement to eliminate fogging and water ingress issues. The interior panelling and amenities are still in good condition but soft furnishings are in need of replacement. Minor refurbishment is due to commence in, the scope will address the above issues. All carriage seats are in the process of being replaced by the maintainer as part of a maintenance bid promise.

An overhaul and renewal maintenance programme is in place which is intended to maintain the condition of the carriages and its sub systems/components throughout the design life. To maximise the efficiency of the heavy maintenance and renewal activities, they are grouped together into two key overhaul cycles (half wheel life, and full wheel life), with the objective to lift the condition grade back to the baseline.

The MVOS details the standard the operator must adhere to. It details the extent of defects allowed and the duration these defects can remain unrepaired. If the vehicle does not meet this, it should be removed from service for repair. The maintenance programme and these MVOS standards ensure vehicles operating in service meet our expectations in reliability, and appearance, as well as customer safety and comfort throughout the life of the asset.

While the life of the SW carriages can continue to be extended through refurbishment and renewal (with the exception of fatigue life, but no indication of structural cracks have been observed), the vehicle will remain a 1970's designed vehicle. Hence it is uneconomical to retrofit some modern features, which are becoming expected in a rail carriage such as crashworthiness and accessibility standards. Due to this, the life of these carriages is not recommended to be extended beyond 2027/28.

SE Carriages

The SE's require significant exterior body work to remove and repair corrosion, failing body filler and deteriorated paint and identify, as well as prohibit areas of water ingress. The carpets are worn and the original seats are in very poor condition. The windows are the original glazing units installed in the early 1970's.

Three of the six SE carriages have undergone refurbishment in 2020 addressing the known issues, the other three will be completed by mid-2021. All carriage seats have been replaced by the maintainer as part of a maintenance bid promise. Upon completion of the

refurbishment they will have a condition rating of good, while the carriages still to be refurbished, have a moderate condition rating.

The condition of the body shell is not fully known with certainty as the linings were not removed during their reconstruction in 2007. A thorough structural inspection was carried out on a couple cars in 2012-2013 and nothing of concern was identified. SW cars in contrast received extensive body shell repairs mainly to repair rust damage.

An overhaul and renewal maintenance programme is in place which is intended to maintain the condition of the carriages and its sub systems/components throughout the design life. To maximise the efficiency of the heavy maintenance and renewal activities, they are grouped together into two key overhaul cycles (half wheel life, and full wheel life), with the objective to lift the condition grade back to the baseline.

The MVOS details the standard the operator must adhere to. It details the extent of defects allowed and the duration these defects can remain unrepaired. If the vehicle does not meet this, it should be removed from service for repair. The maintenance programme and these MVOS standards ensure vehicles operating in service meet our expectations in reliability, and appearance, as well as customer safety and comfort throughout the life of the asset.

While the life of the vehicle can continue to be extended through refurbishment and renewal (with the exception of fatigue life, but no indication of structural cracks have been observed), the vehicle will remain a 1970's designed vehicle. Hence it is uneconomical to retrofit some modern features, which are becoming expected in a rail vehicle such as crashworthiness and accessibility standards. As a result, the life of these carriages is not recommended to be extended beyond 2027/28.

AG222

The AG222 has a condition rating of good. It received minor refurbishment in 2020, as substantial corrosion was identified and removed in the body and doors, and rotten timber flooring was replaced. The AG222 is now an old vehicle but provided bogies, brake equipment and draw-gear are maintained, and the body kept rust-free and painted as required, it should not need replacement for 10 years or more.

The generator set is expected to have a reliable working life of 30,000 operating hours, therefore the generator is due for replacement in mid-2021.

An overhaul and renewal maintenance programme is in place which is intended to maintain the condition of the carriages and its sub systems/components throughout the design life. To maximise the efficiency of the heavy maintenance and renewal activities, they are grouped together into two key overhaul cycles (half wheel life, and full wheel life), with the objective to lift the condition grade back to the baseline.

The MVOS details the standard the operator must adhere to. It details the extent of defects allowed and the duration these defects can remain unrepaired. If the vehicle does not meet this, it is removed from service for repair. The maintenance programme and these MVOS standards ensure vehicles operating in service meet our expectations in reliability, and appearance, as well as customer safety and comfort throughout the life of the asset.

Zephyr 1800E crab

The Zephyr 1800E crabs were built between March and May 2017 and are considered to be in very good condition.

An overhaul and renewal maintenance programme is in place which maintains the condition of the vehicle and its sub systems/components throughout the design life of the vehicles.

Asset risk

Rolling stock are critical assets from a rail service perspective. The likelihood however of losing all of our rolling stock is slim. There are though several risks that have the potential to affect the function or service of our rolling stock assets. These risks manifest across the asset base to varying degrees.

Insurance plays a key role in mitigating the financial risks. However, the ability to quickly provide the lost or damaged rolling stock to meet the demand is problematic as our trains are largely bespoke purpose-built trains, due to the narrow gauge railway 15000vdc we have in Wellington.

Our rolling stock is insured for material damage. To ensure premiums remain cost-effective, we take a Maximum Probably Loss approach.[11]

The following describes the risks and mitigations to our rolling stock assets.

Environmental Risks

The largest risk to our rolling stock assets is a tsunami which inundates the Wellington railway yards where a significant proportion of the fleet is stored between peaks during the day. Additionally, the rail network our rolling stock operates on is not currently resilient to adverse weather and natural disasters, which has the potential to affect the function or service of our rolling stock assets. KiwiRail, as the network asset owner manage these risks with input from us. Network risk includes track obstructions and track failures.

Risks that have the potential to affect the function or service of our rolling stock and the region's rail network include:

[11] The realistic maximum loss in a single event

- overtopping of the tracks and trains caused by increased wave action and storm surge
- flooding
- landslides from the land being too dry or too wet, human interaction,
- earthquakes.

There are a range of Wellington Metro Upgrade Projects that are improving the resilience of Wellington's network to adverse weather and natural disaster.

Operational Risks

Operational risks which could lead to vehicle collision or derailment relate mainly to driver training. Our trains are equipped with a range of features such as a driver vigilance device and over-speed protection to ensure the driver remains active and alert. For example our EMUs are fitted with tripcock devices which apply the brakes in case of signal overrun.

Unpredictable low adhesion track conditions which impede braking is another serious risk which can lead to Signal Passed At Danger and in extreme cases vehicle collision. Special grip improving "sandite" machines have been installed in high risk locations around the network.

Driver training and awareness is a key part of managing operational risks. Our Matangi driving simulator enables drivers to practice driving in a range of unusual conditions and degraded modes which better equips them for hazardous conditions.

Our Wairarapa carriages were designed and built in the 1970's. Although upgraded to meet operational requirements, they are still based on a 50 year old design. The age profile of these carriages creates a number of specific risks. These include:

1. Crash worthiness design standards have improved significantly since the carriages were designed. Whilst condition is maintained, the fleet will not perform as well as new rolling stock in an accident. As such, this risk continues to increase with age.
2. Unknown Structural defects due to initial manufacture or rebuild/refurbishment error or degradation in structural materials.
3. Passenger accessibility on the majority of the carriage fleet is poor by today's standards; we have four accessible carriages in our fleet, with three being used every peak.

Identification, assessment, and mitigation of these operational risks is ongoing and requires a multi-party approach involving Metlink, KiwiRail, and Transdev.

Equipment failure and maintenance induced defects

Our rolling stock assets are at risk of equipment failure and maintenance induced defects.

The risk of equipment failure is managed through our maintenance plan. The maintenance plan has been informed by the probability and criticality of risks determined by Failure Mode Effects and Criticality (FMECA). This includes regular inspection of critical equipment and replacement or refurbishment based on equipment condition or anticipated service life. Unexpected failures and defects are investigated using the Failure Reporting, Analysis, and Corrective Action System (FRACAS) to determine root causes and check and update the FMECA.

Maintenance induced faults are reduced by identifying high-risk maintenance activities and defining the required experience and qualification to undertake the task. In-service maintenance induced defects are also handled by the FRACAS to understand root-causes and prevent recurrence.

Supply chain continuity and obsolescence

A consistent single fleet increases the risks associated with supply chain continuity. Our rolling stock assets rely on maintenance spare parts and consumables which are manufactured overseas. In many cases, the parts are bespoke for our EMUs and made by relatively small suppliers. As such, supply continuity over the 30 year design life is not certain. To help mitigate this risk, software source code is held in Escrow, and most suppliers have signed Continuity of Supply agreements. The Covid-19 pandemic has increased this risk.

Obsolescence

Obsolescence risk for our rolling stock assets also include digital obsolescence and future safety, accessibility, and network compatibility obsolescence. Many of the EMU systems rely on microprocessor controlled electronic equipment and, over time, this equipment will become obsolete and require replacement and upgrade. In addition to planned maintenance interventions, which include computer chip and memory replacements, the EMU fleet is planned for a mid-life upgrade when they reach the 15 year mark. The mid-life upgrade includes the upgrade or replacement of any aging computer systems.

Safety, accessibility or network compatibility requirements is always a risk to assets with a long service life operating in the context of changing legislative and regulatory requirements. It is certain that the Wellington Metro Network will be re-signalled within the EMU's expected lifetime. This will likely require major retrofit of modern signalling equipment to maintain compatibility with the network. It is also possible that unforeseen changes are required to meet future safety or network standards. Similarly, there could be future accessibility or human factor requirements which our rolling stock cannot meet and will require retrofit or potentially early replacement.

Obsolesce risk is high for our Wairarapa carriages with much of the onboard electronic equipment bespoke. To date, failures have been confined to individual components of a

system rather than systemic across the fleet. We have no warranties or other contractual safeguards that reduce this risk.

Asset Performance

Our rolling stock assets are generally performing well. Table 14 outlines our rolling stock asset and service performance objectives.

Table 14: Rolling stock asset and service performance objectives

Asset type	Functional quality	Customer Experience	Safety
Matangi 2 Car Units	**Reliability)**: Vehicle reliability MDBF > 40,000km **Availability (PI1)**: non - availability shall be equal to or less than 1 vehicle per month during the AM and PM Peaks **MVOS**: On each day the total number of vehicles used in service which exceed the acceptable limits of the Operationally Restricted - Minimum Vehicle Operating Standards requirements shall be less than or equal to 2 **Rail vehicle Utilisation** (PI3): Aim to get even wear and tear across the fleet	**MVOS**: Presentation Defects - Minimum Vehicle Operating Standards requirements shall be less than or equal to 2. **Customer Satisfaction Survey:** Comfort of the inside temperature How often the service runs Having enough seats available Service being on time	Maintenance compliance against plan
Simulator	Availability	N/A	N/A
SW carriages **SE carriages** **AG222 Cars**	**Reliability:** Vehicle reliability MDBF > 80,000km **Availability:** non - availability shall be equal to or less than 1 vehicle per month during the AM and PM Peaks **MVOS:** On each day the total number of vehicles used in service which exceed the acceptable limits of the Operationally Restricted - Minimum Vehicle Operating Standards requirements shall be less than or equal to 2 **Rail vehicle Utilisation:** Aim to get even wear and tear across the fleet	**MVOS:** Presentation Defects - Minimum Vehicle Operating Standards requirements shall be less than or equal to 2 **Customer Satisfaction Survey:** Comfort of the inside temperature How often the service runs Having enough seats available Service being on time	Maintenance compliance against plan

Zephyr 1800E crab	Availability	N/A	Maintenance compliance against plan

EMUs

The reliability of our EMUs is consistently above our asset performance target of mean distance between service failures (MDBF) of 40,000km. They are meeting design objectives and performing well against similar vehicles internationally.

Prior to 2019/2020, our EMUs had rarely met the MDBF 40,000km target. This was a consequence of a reactive rather than pro-active maintenance plan. In 2019 we redeveloped our approach to a pro-active maintenance plan and also made administrative changes. The improvement in reliability can be seen in Figure 28.

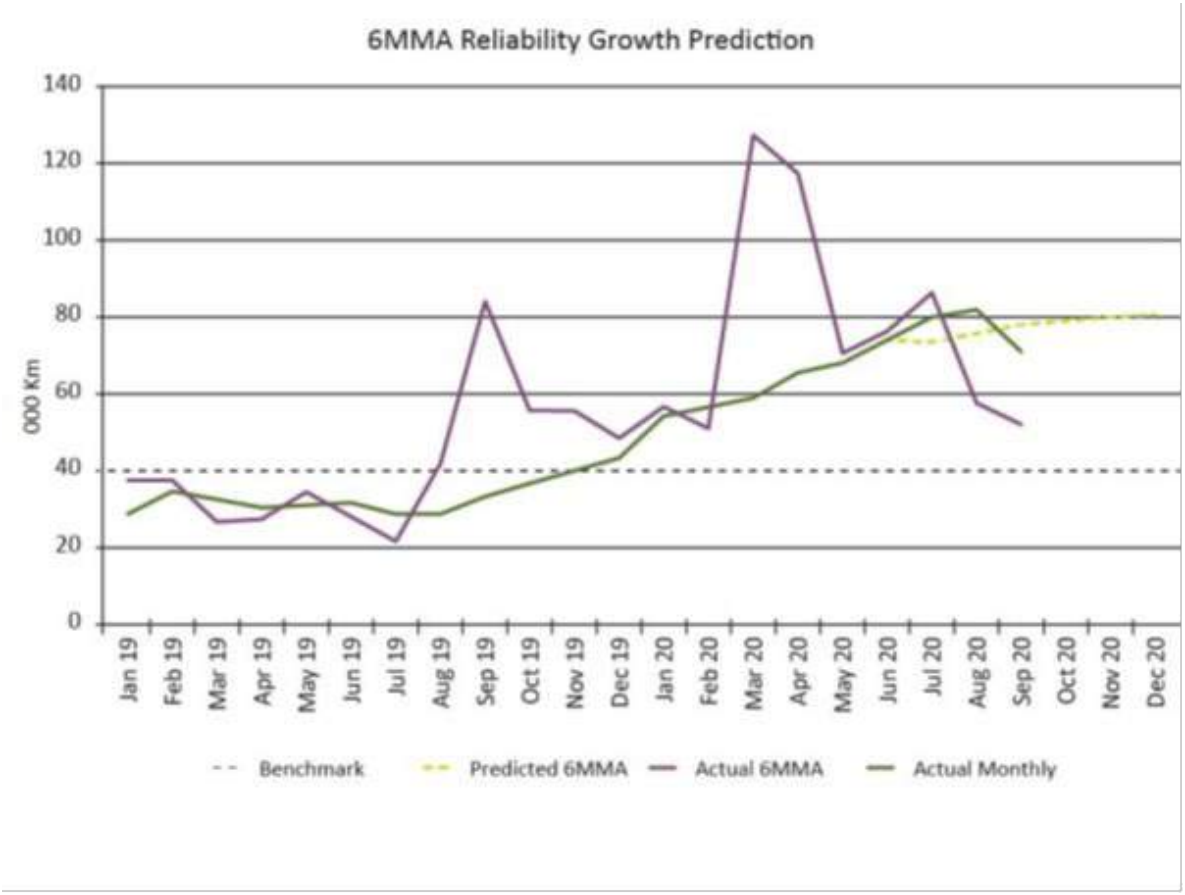


Figure 28: EMU reliability

We use FRACAS to identify defects that affect reliability. We investigate the root causes of these defects and design corrective actions to resolve them. In addition to FRACAS, we have

a reliability growth plan in place to target the highest 'reliability affecting' issues and forecast the impact of the corrective actions.

Current reliability improvement initiatives include:

- door track improvement modifications
- carbody sealant replacement to resolve water ingress issues; cab door latch upgrade
- smoke sensor cleaning
- pressure sensor cleaning
- pneumatic hose redesign.

Prior to Covid-19, patronage growth was exceeding expectations. Therefore, the ability to provide sufficient capacity during peak times became challenging.

Our EMUs provide a good quality customer experience through:

- sealed windows with air conditioning, for quietness and comfort
- smooth acceleration, deceleration and ride quality (within the limitations of the track quality prevailing in the Wellington Metro area)
- passenger-operated doors to minimize unnecessary opening/closing cycles and associated drafts and heat loss or gain
- passenger information displays and auto-generated announcements
- level boarding (from compliant platforms) and a flat-floor section, particularly convenient for bicycles, wheelchair, mobility scooters, and the mobility-impaired
- open access between the cars of each pair allowing easy movement to reduce local crowding.

Our EMUs meet modern safety standards. They are fitted with the following specific safety features:

- a fire safety design appropriate to vehicles with a significant proportion of tunnel operation
- crashworthiness design including a crumple zone and anti-climb fittings appropriate to a mixed-traffic (freight and passenger) rail-line
- an easily-deployed evacuation ramp with handrails at each end door
- CCTV and personal call points, to increase passenger security.

Wairarapa carriages

Reliability of our Wairarapa carriages is measured as a collective rather than at the carriage level. The MDBF target for our Wairarapa carriages is 80,000km. Reliability is consistently above the MDBF target . Our Wairarapa carriages are meeting design objectives and performing well against similar vehicles internationally. Figure 29 shows our Wairarapa carriages reliability.

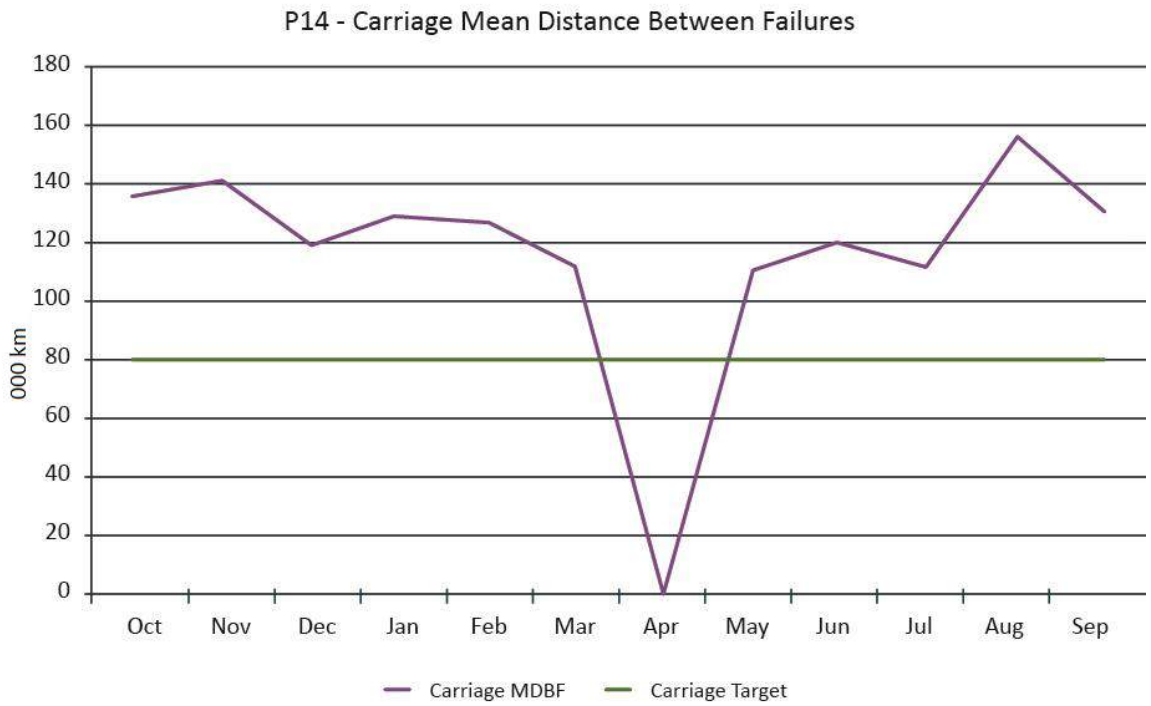


Figure 29: Wairarapa carriage fleet reliability

FRACAS is also used for our Wairarapa carriages in the same way and for the same purposes as for our EMUs.

Current reliability improvement initiatives include:

- improvements to automatic carriage steps
- PA switch replacement
- HVAC refurbishment.

Prior to Covid-19, patronage growth was exceeding expectations. Therefore, the ability to provide sufficient capacity during peak times became challenging. The SW and SE carriage quality and functionality largely meet the requirements for our Wairarapa services with modern amenities (air conditioning, passenger information system, etc). The locomotive hauled carriage operating model is dated and, as a result, journey times are sub-optimal.

The carriage fleet provide a good quality passenger environment, including:

- onboard toilets
- mobility-impaired access via hydraulic lifts installed in each SWS carriage which also has a disabled-access toilet
- passenger-operated end doors, with automatic extendable steps

- open gangways, to enable passengers to traverse the entire train's length
- low interior noise levels achieved through end vestibules
- automatic internal vestibule doors as per long-distance train practice
- climate control with air conditioning, heating and ventilation systems
- Passenger Information Displays and automated announcement system
- high backed long distance seating including head rest
- tables
- carpet, modern lighting, and interior décor.

The SW fleet provides slightly higher level of passenger amenity with:

- seats fitted with drop down tables and power outlets for laptops, overhead reading lights, etc
- onboard snack and drink vending machines
- onboard potable water coolers
- large full length windows for improved viewing and curtains.

The ride quality between the SE and SW fleets also varies. Both are acceptable within the limitations of the track quality prevailing on the Wairarapa line. The SW fleet has slightly lower performance with its coil spring suspension system, while the SE has a modern constant ride height air-sprung bogie.

The overall journey time and service frequency of the service is constrained by the type of rolling stock used and the condition of the network. A locomotive-hauled carriage passenger train has much lower acceleration and de-acceleration profiles in comparison to the EMUs. fleet. The locomotive also needs to be cut off, turned, and re-coupled to the train after each trip. This incurs high operating staff costs and slows the equipment cycle time leading to lower utilisation and less platform and service capacity. This ultimately reduces customer experience and satisfaction in the service as a whole.

The investment plan provides for replacement rolling stock and reflects the renewal work on the track undertaken by KiwiRail to improve the Waiarapa service performance.

EMU driving simulator and Zephyr shunt crabs

The Matangi driving simulator and the Zephar electric shunt crabs are meeting performance expectations as outlined in Table 14.

Asset information

Rolling stock critical assets. We have a high level of confidence in our asset data for our rolling stock fleets. We have reliable data in respect of the asset type, condition, construction date, location, quantity, and performance.

All vehicle and vehicle documentation changes since Greater Wellington have obtained ownership have been managed through an Engineering Change process. Part of change implementation includes updating fleet documentation.

For the Matangi fleet, the level of knowledge and documentation is extensive, covering from the vehicle design and manufacture, as well as the maintenance records. Our primary data sources include design documentation, manufacturing records, Fleet Maintenance Plan, as-built drawings, and FMECA records.

For all of our vehicle fleet, the vehicle asset data is available through the IBM Maximo Maintenance Management Information System (MMIS) which is managed by vehicle services subcontractor.

Fleet condition assessments are undertaken every two-years to determine vehicle condition grades and highlight areas where asset condition is of concern. The Matangi fleet condition assessments are undertaken internally.

Lifecycle Management and Activities

Our asset management lifecycle approach for our rolling stock is to ensure that the vehicles can meet our service requirements (performance, reliability, safety, comfort, availability) for the duration of their expected life.

Planning

Prudent management of the rolling stock fleet ensures the necessary capacity, reliability, safety and customer expectations can be delivered each and every day into the future.

Due to the long lead times to undertake renewals, upgrades, and replacement activities, forward planning is critical for rolling stock fleet management to ensure that the demanded capacity and frequency can be met and that journeys are on-time to meet customers' expectations.

Capacity management - current and future requirements

Rolling stock is custom built for the Wellington rail environment. Procuring a few additional rolling stock to meet demand growth is not cost-effective due to the cost to design and set up production for a small vehicle order. The lead time to procure a new fleet of trains for the Wellington rail environment typically takes 5-6 years; forward planning is critical to manage the level of investment and capacity demands.

Capacity planning is undertaken with the objective of procuring sufficiently large quantities to attract international market attention at affordable prices. Ideally, procurement for capacity should be managed at the same time as procurement for renewal. However, where growth is accelerated additional out of cycle capacity uplifts are likely to be required.

Figure 30 shows rail's peak hour demand and capacity initiatives.

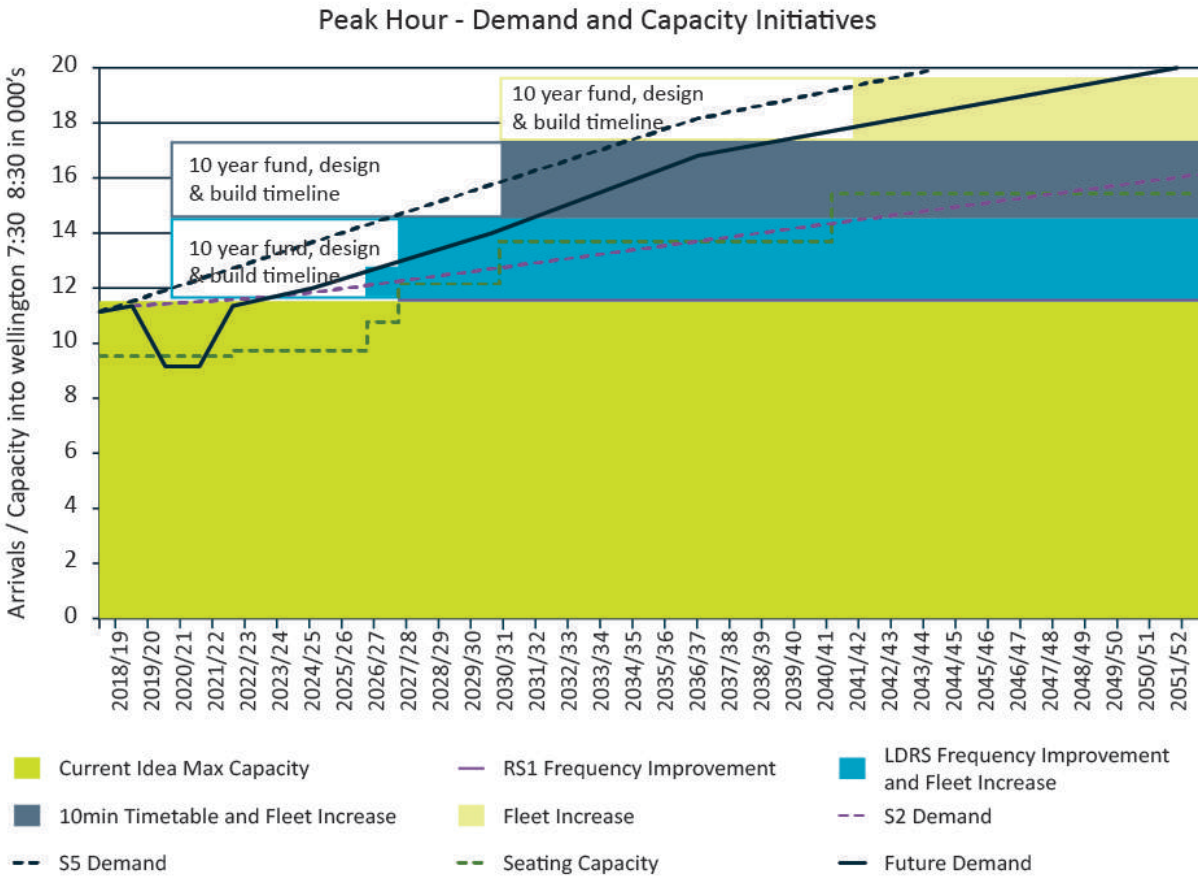


Figure 30: Rail peak hour demand and capacity initiatives

Our current forecast and plans are based on the Wairarapa fleet capacity increase being timed to co-inside with the fleet renewal in 2027.

Cost Estimation

Cost estimation for planning purposes is established through knowledge of the market, and previous activities of similar nature.

The maintenance and renewal costs are based on fixed price agreements in place as part of the operator maintenance contract. We have confidence in the costs during the term of the contract (through to 2029). The refurbishment and renewal activities in the contract are currently priced below market actuals. A significant cost uplift is therefore expected at the end of the contract term.

The cost for new rolling stock is difficult to accurately estimate, as the cost is impacted on the order size, specification, and the market. Indicative costings are obtained through enquires with manufacturers.

Table 15 below outlines the risks to our forecasting assumptions. If these risks manifest, investment will be prioritised based on risk and criticality.

Table 15: Risks to significant forecasting assumptions

Risk	Risk Level	Likely Financial Effect	Consequence/Mitigation Strategy
Inflation is lower or higher than anticipated	Med	Med	Changes the level of rates and debts
Interest rates are higher or lower	Med	Med	Changes the level of rates and debts/offset by hedging strategies
Funding from Waka Kotahi is higher or lower	Med	High	Changes the levels of rates and debts. Review level of service and work programmes, adjust as required
Exchange rate is higher or lower affecting the purchase price of passenger rolling stock	Med	High	Changes levels of rates and debts/hedging of known liabilities and seek more funding from the Crown
Natural disaster/flood event damages Greater Wellington's property, plant and equipment	Med	Low-high	Call on insurance and self-insurance funds, adjust operating programmes and change the level of rates and debt if necessary

Procurement

The procurement of new rolling stock is typically undertaken by through an international two stage (EOI and RFT) procurement process. The procurement generally includes design and build but there is an opportunity to include maintenance, operation, maintenance facilities, financing.

Procurement for the maintenance and refurbishment of rolling stock was undertaken via a two stage (EOI / RFT) international procurement process and included the operation of the rail service. The current contract is a 9 plus 6 year contract and is currently 4 years into its term. A 6 year extension is based on performance.

Contingency planning

The following specific contingency planning is undertaken:

1. During the procurement of rolling stock we need to procure sufficient rolling stock to allow for maintenance, renewals and mid-life activities throughout the lifecycle of the asset, as well as patronage growth.

2. We procure sufficient critical inventory spares during the procurement of new trains to enable renewal activities to occur (i.e. sufficiently large rotable pool). Purchasing insurance spares is also critical for contingency planning. In addition, we procure spare items that are at risk of being damaged or broken during the life of the fleet, and are likely to be difficult, expensive, and/or have long lead times.
3. The contractual arrangement with our rolling stock maintenance provider allows for a range of contingency options for Greater Wellington to transfer staff and maintenance operation to Greater Wellington or alternative provider if the provider were to withdraw from the contract.

Deliver

Within the Deliver lifecycle stage we construct, and commission the programmes of work that have been identified within the Planning Stage.

When new rolling stock contract is awarded, we maintain a high level of management oversight through the design, manufacture, testing, and commissioning process to ensure that the ideal design, quality, reliability, customer, and safety expectations are achieved.

Operate

Operation and maintenance is contracted through the Partnering Contract. The Partnering contract is a nine plus six year service contract which commenced in 2016.

The Partnering Contract includes a number of provisions to ensure that the assets are operated in a manner which helps to achieve our desired levels of service these include:

- a requirement for the fleet to be operated in such a manner to balance the fleet utilisation and within a specific set of Minimum Vehicle Operating Standards
- regular interior and exterior cleaning regime
- regular reporting of asset utilisation, performance and maintenance activities
- continuous improvement processes such as FRACAS, Warranty Management, Configuration and Change Control Processes
- security management services, and rectification of vandalism

Maintain

We undertake regular exterior and interior cleaning including graffiti removal of our rolling stock assets.

Figure 31 shows our EMUs in the maintenance depot.

Figure 31: EMUs in the maintenance depot

The maintenance requirements for our rolling stock assets is outlined below.

EMUs

The maintenance programme for our EMUs is shown in Table 16. The maintenance programme has been developed to meet GWRL expectations of service reliability and quality throughout the life of the fleet.

Table 16: EMUs maintenance schedule

Maintenance Check	Interval	
	Time	Mileage
Planned Maintenance		
'A' Check	30 days	7,500 km
'B' Check	60 days	15,000 km
Annual Electrical Fitness Test	1 year	N/A
Renewals / Heavy Maintenance		
'C1' Check	3 years	270,000 km
'C2' Check	6 years	540,000 km
'C3' Check	9 years	810,000 km
'C4' Check	12 years	1,080,000 km
'C5' Check	15 years	1,350,000 km

Technology on our EMUs such as the AC traction equipment (VVVF inverters and traction motors) is new to the NZ rail industry. As a result, experienced overhaulers are only available overseas or alternatively, specialist tooling, processes, and expertise needs to be developed in New Zealand. During the planning of these renewal and overhaul activities, the options, lead times, benefits, risks, and costs are evaluated for each component. Changes to fleet maintenance must be approved by the asset owner and potentially any cost savings shared.

Maintenance is based on component exchange to reduce out-of-service time and to standardise component repair processes. We seek to maintain fleet availability within 90-95% during peak service periods.

Major component renewals, replacements, refurbishment are carried out during C Checks – heavy maintenance, which are budgeted as Renewals or Capex. The life of major components and systems on a train have different periods. Our renewal programme bundles heavy maintenance into a C Check, which is undertaken every three years. Each check focuses on different components and systems based on its life cycle.

As part of the overhaul process, we work with our contractors to seek opportunities to further optimise the renewal programme and extend the overhaul intervals; this reduces

the whole of life cost and/or risk profile of the asset. Where possible, savings are shared with the maintenance provider.

All heavy maintenance occurs at the first-line maintenance depot. We have planned a half-life refurbishment (rehabilitation) programme in 2025-28 in conjunction with the C5 check to implement technology upgrades and refit the interior of the trains. We will also consider increased safety features (such as European Train Control System (ETCS)) at this time subject to a business case and funding support. Figure 32 shows our Matangi heavy maintenance expenditure.

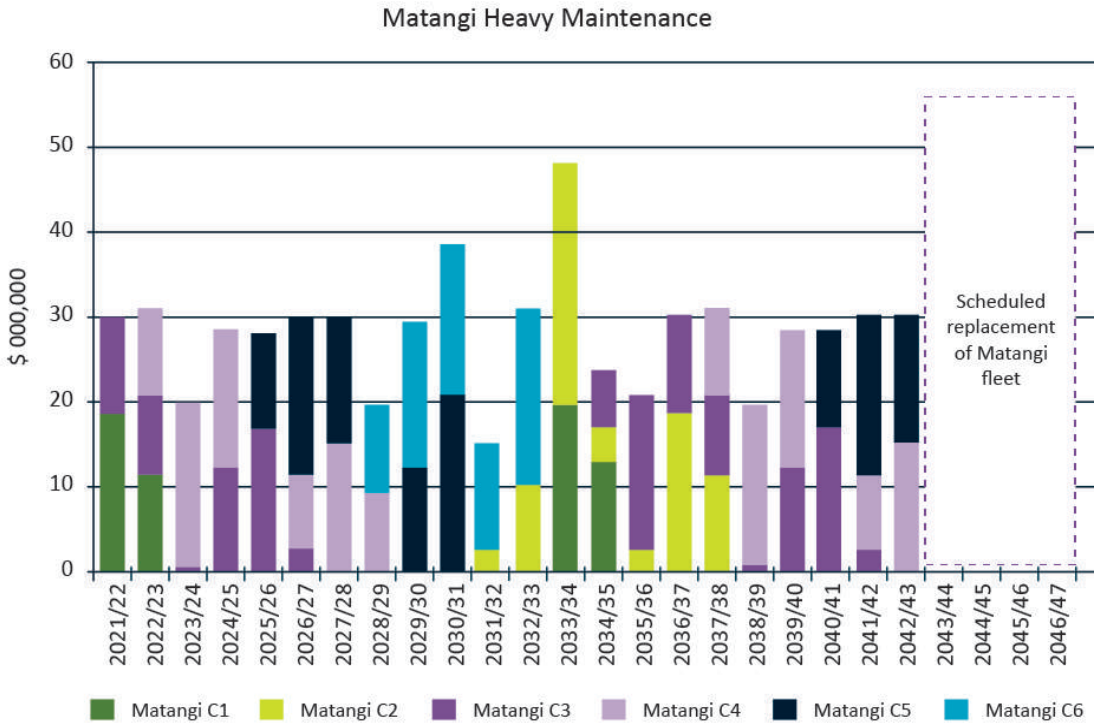


Figure 32: Matangi heavy maintenance expenditure

Figure 33 shows our carriage heavy maintenance and refurbishment expenditure.

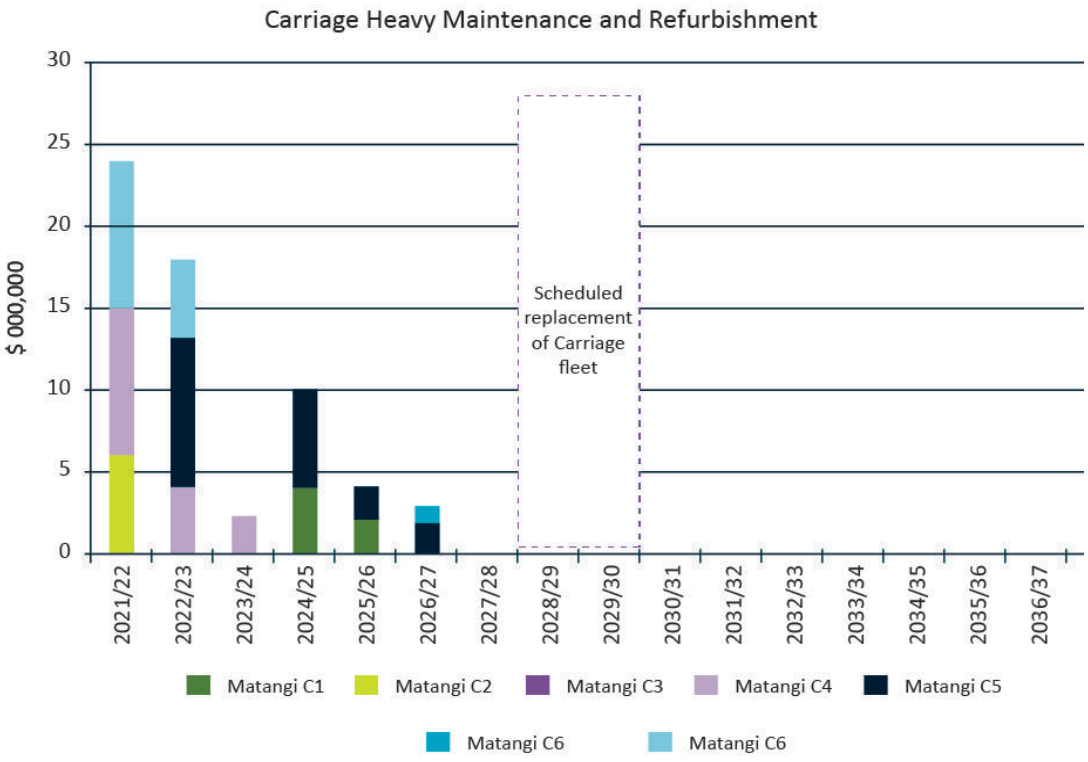


Figure 33: Carriage heavy maintenance and refurbishment expenditure

The planned fleet life is 30 years, meaning fleet replacement can be expected to occur around 2040-47 subject to life-extending initiatives.

Matangi driving simulator

The Matangi driver training simulator has the following preventative maintenance requirements:

1 month:	Cleaning
6 months:	Calibration and database checks
12 months:	Deep cleaning and data archiving
4 years:	UPS battery replacement

SW class, SE class and AG222 carriages

SW, SE and AG carriages are maintained by our maintenance contractor in the KiwiRail owned Carriage Depot, which also supports KiwiRail's other passenger carriage services. It

includes an automated exterior wash plant and a stabling and marshalling yard. Cleaning is the same as for the Matangi EMUs.

The maintenance programme for the carriages, has been developed to meet our expectations of service reliability and quality throughout the life of the assets. Table 17 shows the carriage maintenance schedule.

Table 17: Carriage maintenance schedule

Maintenance Check	Interval	
	Time	Mileage
Planned Maintenance		
Servicing	Daily	
'A' Check		12,000km
'B' Check		24,000km
'C' Check (including electrical warrant of fitness)	12 months	
Generator Servicing	450 & 1800 hours	
Renewals / Heavy Maintenance		
'D1' Check		half wheel life
'D2' Check – Bogie Overhaul		full wheel life
'D3' Check – Generator Replacement	25,000 hours	

Maintenance practices and cost sharing arrangements are the same as for the Matangi EMUs.

The components and systems on a carriage are far less extensive than on the Matangi EMU's. Renewal programmes are bundled into three different renewal programmes called D Checks; these checks are undertaken at half wheel life and full wheel life (due to the wheel replacement being the most significant component on a carriage), and 25,000 hrs of generator operation. All renewal activities are planned to occur at the first-line maintenance depot.

Half-life refurbishments for this fleet, like the Matangi EMUs, are planned around 2025-28 in conjunction with the C5 check. Similarly, any increased safety features such as European Train Control System (ETCS) will be installed at this time subject to funding.

Major component renewals and replacements are carried out during the D Checks, which are budgeted as Renewals.

Zephyr 1800E crab

Table 18 shows the Zephyr 1800E crab preventative maintenance plan which is built around hours of operation.

Table 18: Zephyer 1800E crab preventative maintenance requirements

Hours of operation	Overview of requirements
Every 500	General inspection of components, insulation checks, battery checks, lubrication levels, and Functional tests
Every 1000	Lubrication, oil and filter replacement, security of fasteners
Every 3000	Replace hydraulic oil
~6000	Rubber rail wheels
~12000	Battery pack replacement

The preventative maintenance programme is included within the vehicle services contract.

Divest or Dispose

There are currently no plans to divest or dispose of rolling stock other than when it is at end of life and has been replaced with a new fleet.

The market for resale of New Zealand end of life passenger rolling stock is limited as there are limited third world countries or developing nations which have a narrow gauge railway. While there is potentially some resale for the Wairarapa carriage fleet (locomotive hauled) for heritage operators or similar within New Zealand, it is unlikely there is a need for the entire fleet. The practical resale opportunities for the Matangi electric multiple units are almost none due to Wellington's unique narrow gauge and 15000vdc railway network.

While resale opportunities will be explored, it is likely the most practical options for disposal are likely to be scrapping.

Forecast expenditure

Figure 34 shows our rolling stock operational and capital expenditure forecast.

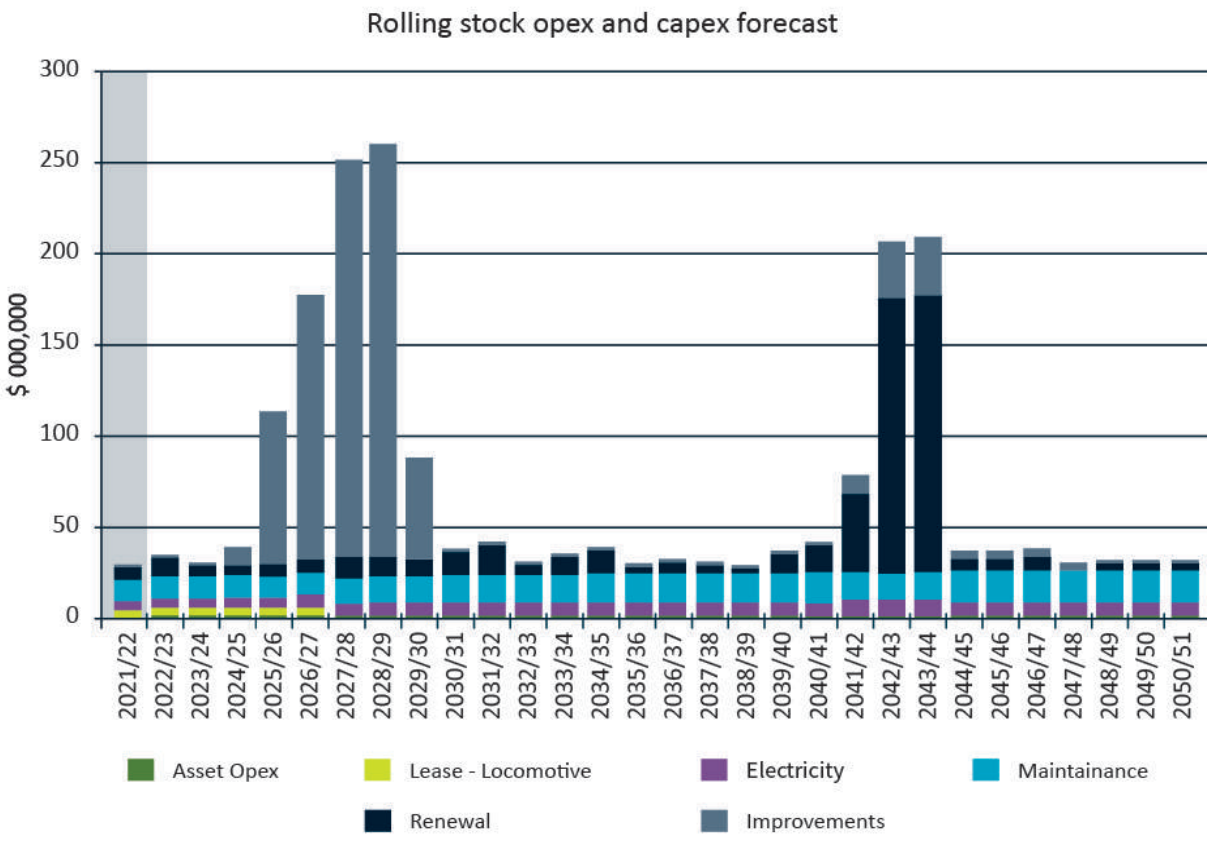


Figure 34: Rolling stock operational and capital expenditure forecast in 2021 dollars

Operating expenditure

The operational maintenance expenditure for the rolling stock fleet is currently approximately $12.5m per year and is forecast to gradually increase over the next 30 years to $15.1m per year as the fleet grows in response to the predicted demand.

The majority of the operational maintenance cost for the rolling stock assets is within a fixed price contract with our contracted operator and maintainer Transdev / Hyundai-Rotem; these costs are reflected in our 30-year asset investment plan. These operational costs include cleaning, planned maintenance and corrective maintenance, security services (i.e. CCTV monitoring), software, depot plant and equipment maintenance, inventory management, warehouse facility and inventory financing, software Escrow, and insurance.

Capital Expenditure

As shown in Figure 34 above, the renewal capital expenditure for the rolling stock fleet is forecast to fluctuate over time due to the various life cycles of rolling stock major components and systems. Over the next 10 years, the average renewal capital investment is expected to be approximately $9.3m per year (with a range between $5.4m and $16.5m).

However, over the next 30 years, we have forecasted substantial investment in replacement and additional rolling stock. This is for the renewal of the carriage fleet, and provision a low/zero emission fleet for additional capacity and service frequency on both the longer distance Wairarapa and Kapiti Lines. We have also forecasted investment which is required to boost the capacity and service frequency of the suburban services operating on the current electrified network; in particular, on the Hutt and Kapiti Lines.

We have also forecasted investment in replacement and additional rolling stock between 2040 and 2045 to enable replacement of the Matangi fleet, and provide additional capacity for the ongoing increases in demand.

Rail Station Infrastructure Asset Class Plan

This asset class plan describes our asset lifecycle management of our station infrastructure assets. Our station infrastructure assets are located on rail platforms which are owned and operated by KiwiRail.

Our station infrastructure assets consist of:

- station buildings
- station shelters
- station pedestrian overbridges and subways
- station Park and Ride facilities
- station Bike and Ride assets
- security assets
- lighting
- signage
- station seats and litter bins
- access assets

Plan summary

To increase the number of people who use our public transport network, we need to make it easier for them to access our public transport network. Our station infrastructure assets are a vital component of this. We need to ensure our station infrastructure assets provide an accommodating and safe environment, vehicle and cycle parking facilities, drop-off facilities, easy to use passenger overbridges and subways, and good informational signage.

Therefore, our overarching objective is to provide safe, high quality, fit-for-purpose rail station infrastructure which contributes to attracting new public transport users. Our key strategies for achieving this are:

- ensure our station infrastructure assets are regularly cleaned, and free of graffiti and vandalism, so as to provide a clean, comfortable, and accommodating environment
- provide a safe environment through Crime Prevention Through Environment (CPTED) design for our station infrastructure assets
- maintain, build new, and uprate existing assets to ensure that all station infrastructure assets meet our requisite levels of service, at least lifecycle costs.

Our station infrastructure assets cover a wide range of assets with a wide range of customer utilisation, life expectancies, and intervention points. A significant proportion of our station infrastructure buildings, shelters, overbridges, and subways are very old. Some are heritage protected, which means more costs to upgrade and longer planning and design phases.

The operational maintenance expenditure for our station infrastructure assets is forecast to remain relatively steady at approximately $6.2m per year over the next 30 years. This operating expenditure covers costs such as cleaning, rates, lease, insurance, electricity and planned and corrective maintenance activities.

The renewal capital expenditure for our rail station infrastructure assets is forecast to remain relatively steady at $4.2m per year.

An estimated $166m in improvement capital expenditure is expected over the next 10 years for our station infrastructure assets. This investment includes increased shelter for passengers while they wait for our rail service, and improved connections to our stations such as improved Park and Ride facilities, bicycle storage facilities, and improvements to paths, lighting, security and general accessibility improvements.

Figure 35 shows our station infrastructure assets operational and capital expenditure forecast.

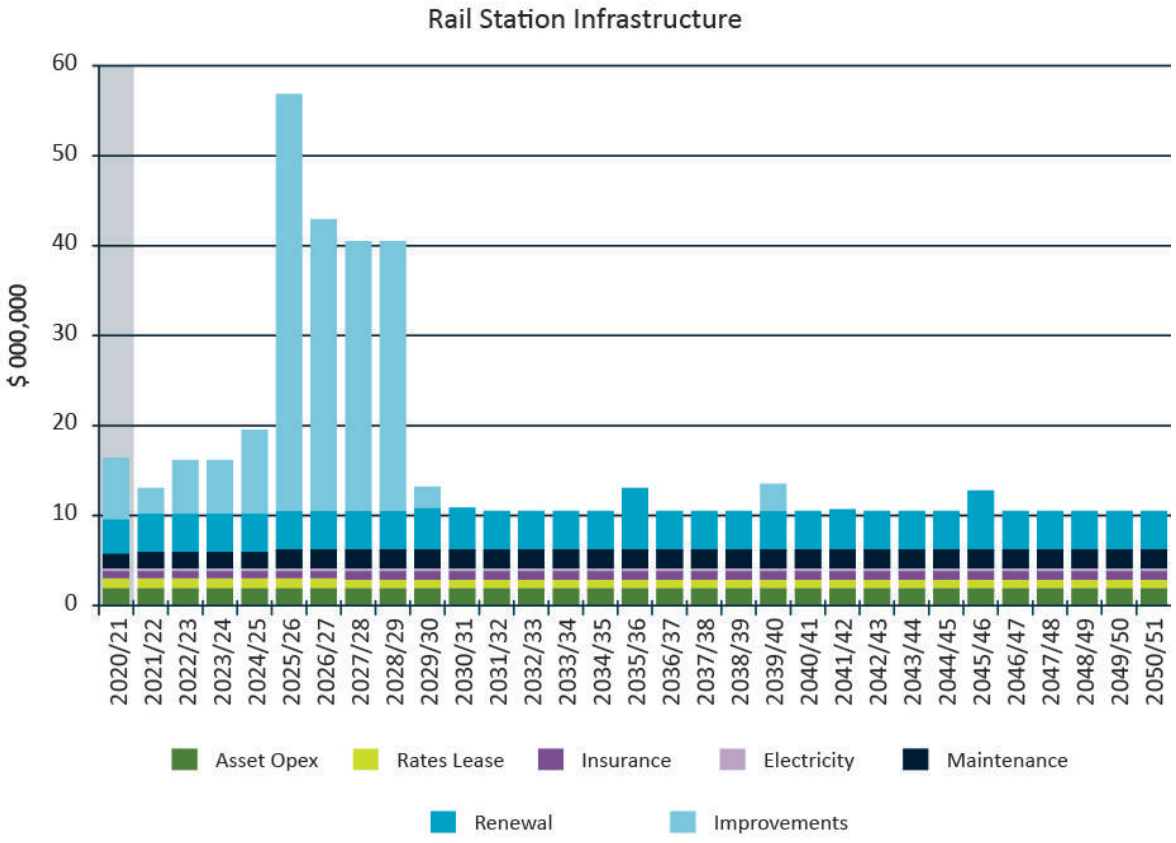


Figure 35: Station infrastructure operational and capital expenditure forecast.

Strategic objectives

Our overarching objective is to provide safe, high quality, fit-for-purpose rail station infrastructure which increases customer experience and contributes to our strategic goals of mode shift and decarbonisation to meet our service levels.

To achieve this, our key objectives are:

Customer Experience:

- provide an accommodating and safe environment for passengers to wait and store their bicycles
- provide sufficient information for our customers so they can plan and execute their journey
- provide adequate shelter for all passengers including enough capacity at peak times so that:
    - ≥91% of passengers are satisfied with the overall station
    - ≥85% of passengers who are satisfied with the cleanliness of our stations
    - ≥89% of our passengers feel safe while using our station facility
    - ≥89% of our passengers are satisfied with the information at our stations
    - our station buildings, shelters, pedestrian overbridges and subways, and Park and Ride assets to be good condition or above with a condition grade of ≤2.5
    - 94% of our stations buildings and shelters to be in moderate condition or above with a condition grade of ≤3
    - 92% of our pedestrian overbridges and subways to be in moderate condition or above with a condition grade of ≤3
    - 80% of our station Park and Ride facilities to be in moderate condition grade or above with a condition grade of ≤3

Mode shift

- provide well designed access to the train service for all our public transport users
- ensure our station infrastructure assets are placed at destinations to encourage multimodal access and connectivity between our public transport network and the communities we serve so that:
    - ≥91% of passengers are satisfied with the overall station
    - ≥89% of our passengers feel safe while using our station facility
    - ≥89% of our passengers are satisfied with the information at our stations

Decarbonisation

- ensure that environmental, sustainability and health outcomes are considered in the planning and provision of our station infrastructure assets.

Safety

- ensure that accessibility and safety is incorporated in the planning and provision of all our rail station infrastructure, so that:
    - 96% of our stations have CCTV coverage
    - 100% of our station pedestrian overbridges to be at least 67% of NBS
    - 38% of our station pedestrian subways to be at least 67% of NBS

Our key strategies for achieving these key objectives are:

- ensure our station infrastructure assets are regularly cleaned, and free of graffiti and vandalism, so as to provide a clean, comfortable, and accommodating environment
- provide a safe environment through Crime Prevention Through Environment (CPTED) design for our station infrastructure assets
- maintain, build new, and uprate existing assets to ensure that all station infrastructure assets meet our requisite levels of service, at least lifecycle cost. We will address localised deterioration with repairs and minor replacements to enable deferment of major investment until maintenance is no longer an economic solution. In the case where specific hazards are identified, we will put mitigation programmes in place.
- ensure station infrastructure signage is located in easy-to-find locations and is easy for passengers to understand.

The investments outlined in this AMP are focussed on meeting these objective, strategies and targets.

Asset characteristics - current state

Our station infrastructure assets are located on rail platforms which are owned and operated by KiwiRail. There are 48 stations across our rail network. With the exception of Wellington Station, which is owned by KiwiRail, Greater Wellington owns, and manages the customer facing facilities at all of these stations.

Our station infrastructure cover a wide range of assets with a wide range of customer utilisation, life expectancies, and intervention points. A significant proportion of our station infrastructure buildings, shelters, overbridges, and subways are very old. Some are heritage protected, which means more costs to upgrade and longer planning and design phases.

When ownership of the station infrastructure assets was transferred to us in 2011, they were in poor condition. Since then significant investment has been undertaken to maintain, renew and replace the infrastructure to bring these assets up to the requisite levels of service.

We categorise our stations based on use as shown in Table 19.

Table 19: Station categorisation based on use

Very high use (>10,000 Passengers/Week)	**High use** (<10,000 and >5,000 Passengers/Week)	**Medium use** (<5,000 and >2,000 Passengers/Week)		**Low use** (<2,000 Passengers/Week)
Wellington	Woburn	Melling	Takapu Road	Ngauranga
Petone	Taita	Ava	Mana	Western Hutt
Waterloo	Silverstream	Epuni	Pukerua Bay	Wingate
Upper Hutt	Trentham	Naenae	Paekakariki	Pomare
Porirua	Raroa	Manor Park	Featherston	Box Hill
Paraparaumu	Johnsonville	Heretaunga	Carterton	Kenepuru
Waikanae	Redwood	Wallaceville	Masterton	Maymorn
	Tawa	Crofton Downs		Woodside
	Linden	Ngaio		Matarawa
	Paremata	Awarua Street		Solway
	Plimmerton	Simla Crescent		Renall St
		Khandallah		

The following is a brief description of our station infrastructure assets.

Station buildings

We own twenty-three station buildings along our rail network. In addition to this we lease the Wellington Railway Station. Our station buildings vary significantly in size and functionality. We have large, staffed station buildings at very high use stations, to small, unstaffed station buildings at low use stations.

Figure 36 shows the very high use Upper Hutt Station which is staffed.

Figure 36: Upper Hutt Station Building – rebuilt in 2015.

Historically, most station buildings provided customer service amenities, such as toilets and waiting areas, but over time the number of staffed stations across the network has reduced and these staffed-station facilities are currently only located at 10 stations across our network. These are Wellington, Petone, Waterloo, Upper Hutt, Porirua, Paraparaumu, Waikanae, Featherston, Carterton and Masterton. These stations all still provide toilets, waiting areas and ticket offices.

The reduction in the number of staffed stations has resulted in some buildings being closed off to the public, though several station buildings have been renovated with the improved areas made available for local community or commercial activities. For example Paekakariki and Carterton Stations have a museum, Plimmerton Station has a model railway store and Paraparaumu and Porirua Stations have a small coffee shop.

A number of our station buildings are heritage protected, which means more costs to upgrade, and longer planning and design phases. Figure 37 shows the heritage protected Carterton station building.

Figure 37: Carterton Station Building

As previously noted, Wellington Station building is owned by KiwiRail with key public and operational areas leased to us. We make the operational areas available to Transdev.

Station shelters

We provide station shelters on all rail platforms, ranging from extensive shelters such as Paraparaumu Station which run the majority of the platform length as shown in Figure 38 to smaller aluminium or timber shelters such as Matarawa Station as shown in Figure 39.

Figure 38: Shelter at Paraparaumu

Figure 39: Shelter at Matarawa

The type of shelters on our rail network is based on the use of the rail station with high use stations having larger or multiple shelters and low use stations having smaller single shelters. Previously, several of our station shelters were very old and in poor condition but through a programme of shelter renewals and upgrades this has improved with many new shelters built throughout our network to provide a comfortable waiting area for customers.

Station pedestrian overbridges and subways

Our passenger overbridges and subways, enable passengers to access platforms at a number of stations on the network. Across 17 stations there are 13 pedestrian overbridges

and 12 pedestrian subways, the majority of which are in a basic functional state. They were in very poor condition when the assets were transferred to our ownership.

Station Park and Ride

Park and Ride facilities are carparks provided at or near railways stations where customers can park their car for free and continue their journey on our public transport services.

We provide Park and Ride facilities at 33 stations across our network. This consists of 67 Park and Ride facilities ranging from tiny carparks with fewer than 50 spaces to huge carparks with more than 400 spaces. At some stations, like Upper Hutt and Petone, numerous car parking areas are provided, while at other stations, like Khandallah and Raroa, a singular car parking area is provided.

At key stations where Park and Ride is in high demand, we provide carpool parking spaces in preferred parking areas reserved for anyone with two or more people arriving in a single vehicle to continue their journey using public transport.

Our Park and Ride facilities are mostly off-street facilities. In most instances, our Park and Ride assets consist of the pavement structures and kerbing with the land itself being leased, however we own significant land at Tawa, Heretaunga, Paraparaumu, Petone, Porirua and Waikanae. We also work with local TAs to provide on street parking in the vicinity of some stations such as Taita, Naenae, Tawa and Silverstream Stations.

Our Park and Ride facilities are a vital part of our integrated public transport network, as they allow our customers that might otherwise continue their journey to work by car, to leave vehicles in a convenient and secure environment while utilising our public transport network. This results in less road congestion, reduced emissions, and enhances our region's liveability through broader health and wellbeing benefits.

The demand for Park and Ride capacity is always rising. To date increasing Park and Ride facilities has been a key mechanism in growing rail patronage, as it provides easy first and last mile connections for our customers. Generally, the new facilities have filled up as quickly as they are built, though there are fewer opportunities to expand Park and Ride facilities now.

Recent Park and Ride facilities constructed at Porirua, Paremata and Waterloo stations have also included stormwater treatment devices in their design, in the form of rain gardens, for the carpark run off contributing towards better environmental outcomes for these Park and Ride facilities. Figure 40 shows the recently constructed Waterloo Station Pohutukawa Street Park and Ride facility.

Figure 40: Waterloo Station Pohutukawa Street Park and Ride

Figure 41 shows our Porirua Park and Ride northern rain garden.

Figure 41: Porirua Park and Ride northern rain garden

Station Bike and Ride assets

Our Bike and Ride assets comprise of cycle cones, bike racks, cycle lockers, double tiered cycle shelters, and a small number of cycle storage sheds. We provide these assets for the safe, secure storage of bicycles at our stations to increase first and last mile travel options for our rail customers. Due to increased demand, carrying bicycles within the saloon area of trains during peak time is no longer suitable. As a result we are improving and increasing the provision of cycle storage facilities to enable passengers to safely and securely leave their bicycles at the outer stations.

At several key stations there are cycle locker units for the storage of bicycles. These are either a single unit which can store one bike, or double units with separate lockers at each end separated by a diagonal divider which can store two bikes. Cycle lockers are no longer being added to our stations due to the costs involved in maintaining and operating these assets. Instead, we are rolling out a series of double tiered cycle shelters at key stations. We have invested in additional security enhancements like improved lighting, CCTV and locating Bike and Rides in places with passive surveillance to improve customers' ability to cycle to stations and safely store their bikes. To date, these double tiered cycle shelters have been installed at several stations including Paraparaumu, Paekakariki, Tawa, Redwood, Carterton, Waterloo and Woburn. Figure 42 shows the double tiered cycle shelter at Paraparaumu Station.

Figure 42: Paraparaumu Bike and Ride

Station security assets

Personal safety is highly correlated with customer satisfaction and national research identifies that personal security concerns become common barriers to the use of public transport.

Our security assets consist of closed circuit television (CCTV), duress help points and personal announcement (PA) systems. These assets assist in crime prevention and anti-social behaviour at our stations and shelters. We use them for both the security of our assets and the safety of our customers. This equipment is installed at all stations, except Matarawa and Western Hutt, all rolling stock stabling yards and 82% of Park and Rides.

850 cameras are monitored 24/7, by two security guards based in the Rail Monitoring Centre (RMC) at Wellington Station. Footage is also recorded for a fixed period on a mixture of local storage at stations and a centralised data server at Wellington. As station systems are upgraded, we plan to migrate these sites to the central storage. Duress points are also monitored by RMC and remote PA announcements can be made as necessary.

We undertake rolling CCTV renewals and network expansion is planned for remaining Park and Ride sites. Due to the ever-increasing visual capability of cameras when renewed, forecasting has shown that investment in the underlying network hardware will be required to meet future bandwidth requirements.

Figure 43 shows an example of our station CCTV cameras and duress point.

Figure 43: Station CCTV cameras and duress help point

Station Lighting

A high standard of lighting is essential to enable customers to safely access our network at night. We have a minimum level of service of 50 lux across all station platforms.

The lighting across our network is installed to deliver a specific function, which is typically to provide either flood lighting, such as most of the pole top lights on platforms or at Park and Ride facilities, or provide localised lighting within shelters, and subways. In addition, emergency lighting is also provided in some locations. A range of lighting types are deployed across our network, including LED, Metal Halide and Florescent.

Figure 44 shows the percentage of LED vs non-LED at our stations.

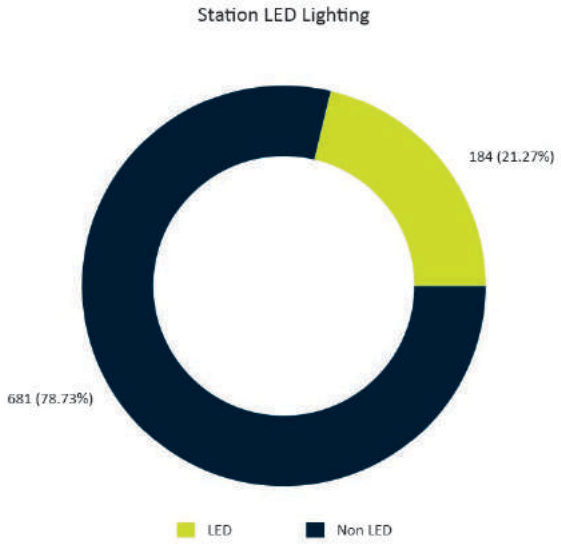


Figure 44: Percentage of LED vs non-LED lighting at our stations

We are progressively upgrading our lighting to new LED fittings. These have a lower energy consumption, longer asset longevity and lower all of life cost. 78% of our lights are still non LED so significant investment is planned to upgrade these. Figure X shows the percentage of lights on the network which have been upgraded already. Figure 45 shows our shelter lights at Redwood Station.

Figure 45: Shelter lights at Redwood Station

Station signage

Our signage provides directional information, rail and bus information, and timetable information. At present there are many signs installed on and around our rail station platforms. We have rolled out standardised Metlink signs across the region, and we are now progressively rolling out improved Metlink wayfinding and information signs across the region supplementing the existing signage. This includes the Wellington Customer Information System, buses replacing trains (BRT) LED Signage, and BRT wayfinding signage.

Our new signage also has information that direct customers to the local area including information on local icons, schools, community centres, local parks and local cycle trails, etc. This improved signage is aimed at improving customer experience on our public transport network.

Station seats and litter bins

We provide seats for customer comfort at all our stations and litter bins to assist in keeping our stations free of litter.

Our seats typically consist of bench style seats made of either timber or steel to provide a comfortable place for customers to wait for their rail service. Figure 46 is an example of our steel bench style seats.

Figure 46: Steel style seats at Woodside

Previously litter bins were only installed at staffed stations, but since 2016 litter bins are now being installed at all stations across our network including signage to encourage tidiness at our stations.

Station access assets

Our access assets consist of access paths and fences. Our access paths provide the link to and from our rail platforms. They enable easy, identifiable routes for our customers to move safely and efficiently to and from our platforms.

Many of our access paths are sealed with asphalt and have a barrier or fence running alongside them for safety.

Population, life expectancy and current remaining useful life

Our station infrastructure assets cover a wide range of assets with a wide range of customer utilisation, life expectancies, and intervention points.

Table 20 below shows the asset population by type, along with their expected life and current average remaining useful life of our station infrastructure assets.

Table 20: Population, life expectancy and average remaining useful life of our station infrastructure assets

Asset type	Total	Standard Base Life (years)	Current Remaining Useful Life (years)
Station buildings	24	80-150 (Average 87 years)	11-72 (Average 35 years)
Station shelters	54	30 – 150 (Average 44 years)	7-58 (Average 23 years)
Station overbridges	12	50-100	7-58 (Average 38 years)
Station subways	13	50-100	16-50 (Average 31 years)
Station Park and Ride	51 separate Park and Ride areas across 33 stations	25	1-24 (Average 17 years)
Station CCTV	825 cameras	7-10	1-7 (Average 3 years)
Station lighting	385 lights	10 – 20 (Average 15 years)	2-20 (Average 8 years)
Station signage	1823 signs	10-15 (Average 14 years)	2-15 (Average 9 years)
Station fences (in meters)	Unknown. In future data collection we plan to capture this information.	25-35 (Average 29 years)	7-27 (Average 14 years)
Station platform furniture	245 seats 86 litter bins	15 – seats 25 – litter bins	4-10 (Average 7 years) - seats 24 – litter bins
Station Bike and Ride – Cycle Shelter	7	25	24
Station Bike and Ride - cycle facilities (cone, rack and box)	21 cycle cones 21 cycle racks 81 cycle lockers	15-20 (Average 19 years)	2-19 (Average 7 years)

The ages of our station buildings varies significantly from historic buildings built pre-1900s through to recently renewed buildings. Our historic station buildings, such as Paekakariki (built in 1910) and Carterton (built in 1879) have heritage protection which means more

costs to upgrade and longer planning and design phases. Figure 47 shows the era our station buildings were built.

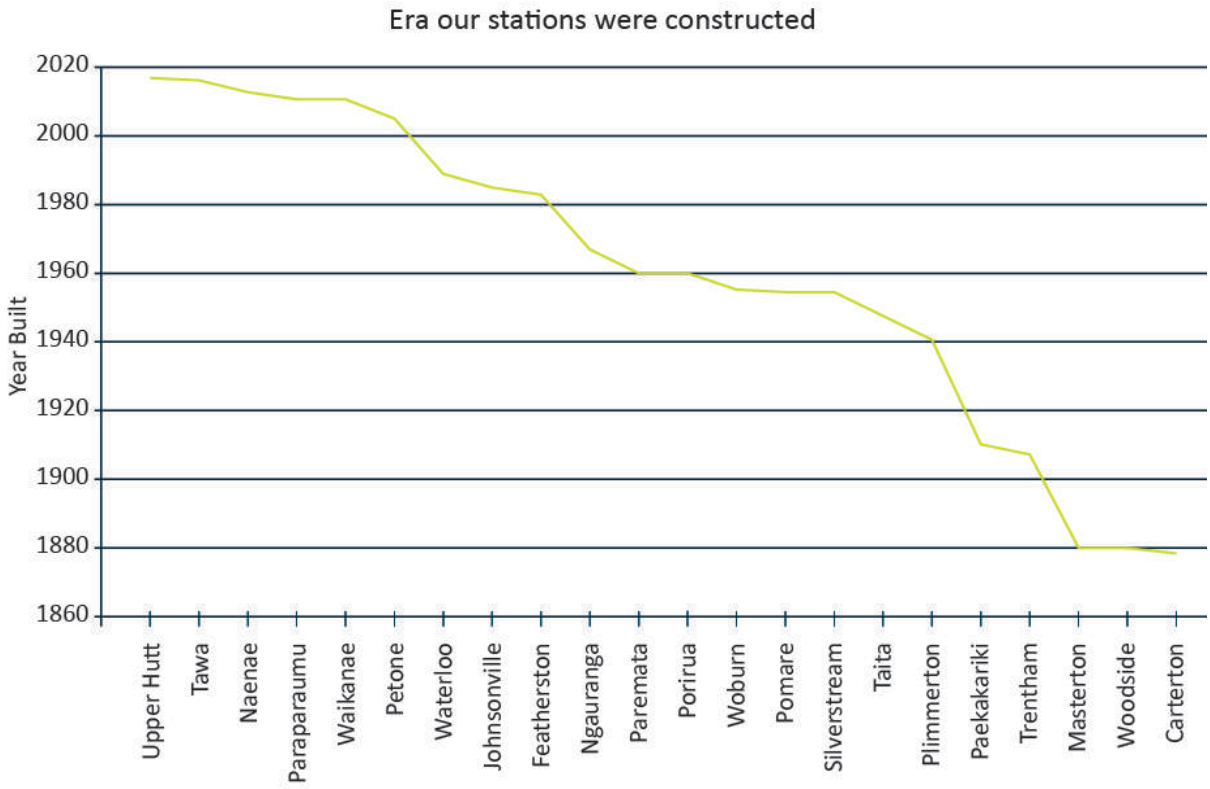


Figure 47: The era our station buildings were built

Asset importance

We determine the importance of our station infrastructure assets by the average number of people that pass through each location each week, referenced as typical weekday boardings. All assets at each site are considered to have the same importance. For example, a bike stand at a busy station will have a higher importance than one at a small station.

We recognise that our very high use stations (as categorised in Table 19) Petone, Waterloo, Taita, Upper Hutt, Porirua, Paraparaumu and Waikanae are stations of particular importance, due to the number of people that utilise these locations daily. These are our very high use stations as categorised in Table 19). While closure of these stations is unlikely to result in a complete loss of the entire rail service, we recognise that closure of these stations would result in major disruption to the local area and our customers who use these stations.

Table 21 shows our key stations and their typical weekday boardings in 2019.

Table 21: Key stations and their typical weekday boardings

Station	Typical Weekday Boardings (2019)
Wellington (not owned by Greater Wellington)	21,240
Porirua	3,120
Waterloo	2,900
Paraparaumu	2,300
Petone	1,740
Taita	760
Waikanae	1,650
Upper Hutt	1,210

In addition to station or site-based importance, there are some assets that have a particular impact on public safety and therefore are always considered important assets irrespective of where they are located. For example, we have 10 stations where the station platform is located between the rail tracks. This means that if either the pedestrian overbridge or subway which provides access to the station platform is closed there is no other way for our customers to access the station. This would result in having to close the station. While this would not prevent the rail service from running, it would cause significant disruption for customers who use that station.

Figure 48 shows our Waikanae Station, which we recognise as a key station on our network due to the typical weekday boardings.

Figure 48: Waikanae Station

Asset condition

We determine the condition of our station infrastructure by using the condition grade rating system within the International Infrastructure Management Manual (IIMM). Table 22 describes the condition rating system.

Table 22: Description of condition rating system

Condition Rating	
Rating	**Description of Condition**
1	Very good condition only preventative maintenance required
2	Good condition: Minor maintenance required plus Preventative maintenance
3	Moderate condition: Significant maintenance required
4	Poor condition: Significant maintenance required
5	Poor condition: Unserviceable

Table 23 shows the average condition rating and the percentage of each asset type with a condition grade greater than four.

Table 23: Station infrastructure asset condition

Assets	Average Condition Rating	% of Assets with Condition Grade >4
Station Buildings	1.55	3.1%
Station Shelters	1.63	4.2%
Structures (overbridges & subways)	1.55	10.6%
Park and Ride	2.19	10.4%
CCTV	2.36	28.5%
Lighting	1.96	1.4%
Signage	2.12	10.9%
Station seats and litter bins	1.42	0.6%

Bike and Ride	1.69	0%
Station Access	2.33	4.3%

Station buildings

Our station buildings are condition assessed annually by our team, and three yearly by an external consultant. The condition rating of the buildings is an averaged score, and so where the internal rooms of a station building are in a poor condition this affects the score of the entire building. The results from the condition assessments are a key input into our forward maintenance planning informing our expenditure forecast.

The condition of our station buildings varies from slightly poor condition to recently upgraded or renewed assets such as Upper Hutt, Masterton, Tawa, Naenae and Taita. Most of our station buildings are in good condition with significant maintenance work undertaken since we took over ownership of these assets.

Currently, the Waterloo Station building has one of the worst overall average condition of our station buildings due to the poor condition of the roof canopy. The canopy's outer skin is corroded. Also, the current canopy design is known to create a wind tunnel effect, particularly in southerly winds, which is unpleasant for waiting passengers. The Waterloo Station building is also expensive to maintain due to the confined working space at height. An investigation is currently in progress to determine the best long-term solution for this station building. Complete replacement of the Waterloo canopy is desired due to its poor condition, high ongoing maintenance costs and performance issues, but we are undertaking a long-term view of options for this facility to ensure the right solution is found prior to upcoming planned maintenance work on the spaceframe structure.

The condition profile of our station buildings is shown in Figure 49.

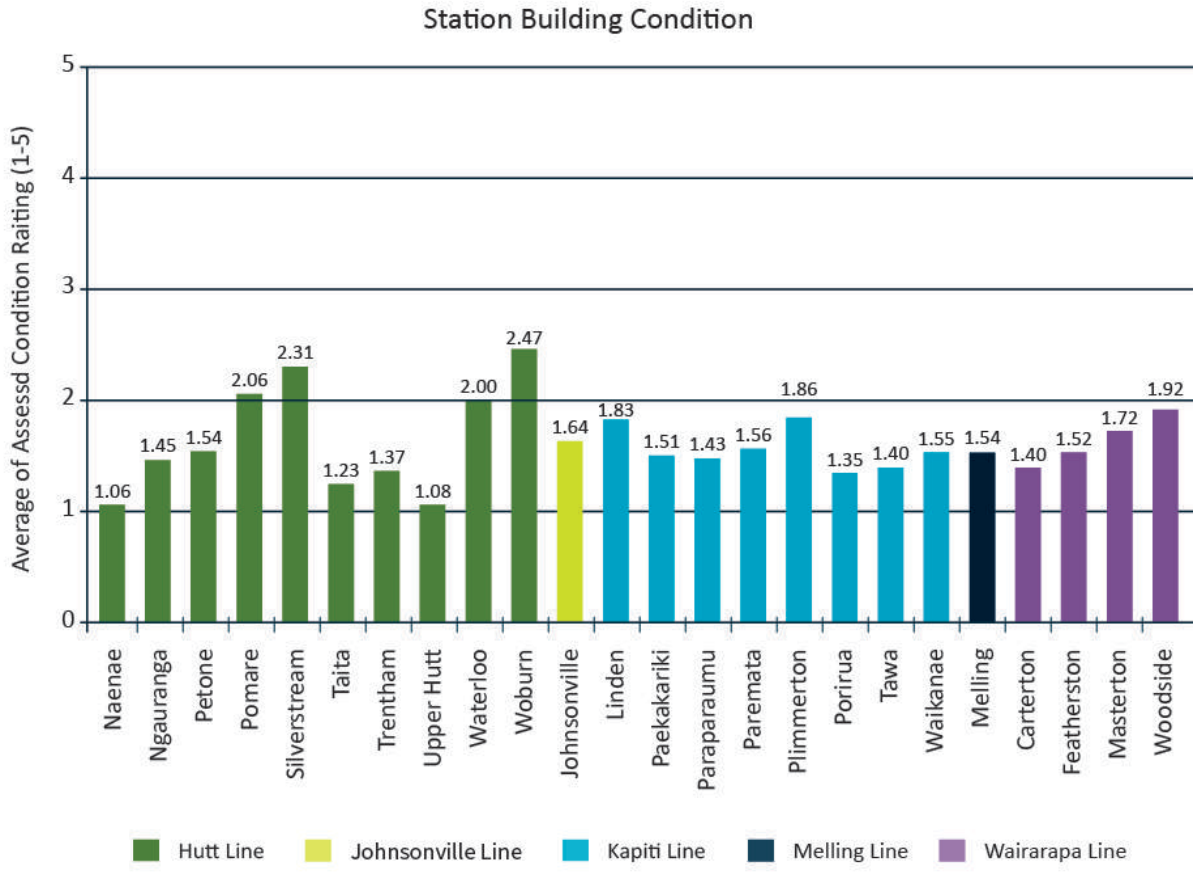


Figure 49: Station building condition at mid-2020

Station shelters

The condition of our shelters is assessed annually by our team and three yearly by an external consultant. Figure 50 shows the condition profile of our station shelters.

Currently, Wallaceville, Kenepuru, Solway and Awarua Street are the station shelters that have the worst overall condition. Wallaceville shelter is due to be demolished and replaced as part of the Upper Hutt double tracking project expected to be completed by May 2021. The other station shelters will be planned for refurbishment or renewal as appropriate as part on the ongoing shelter programme.

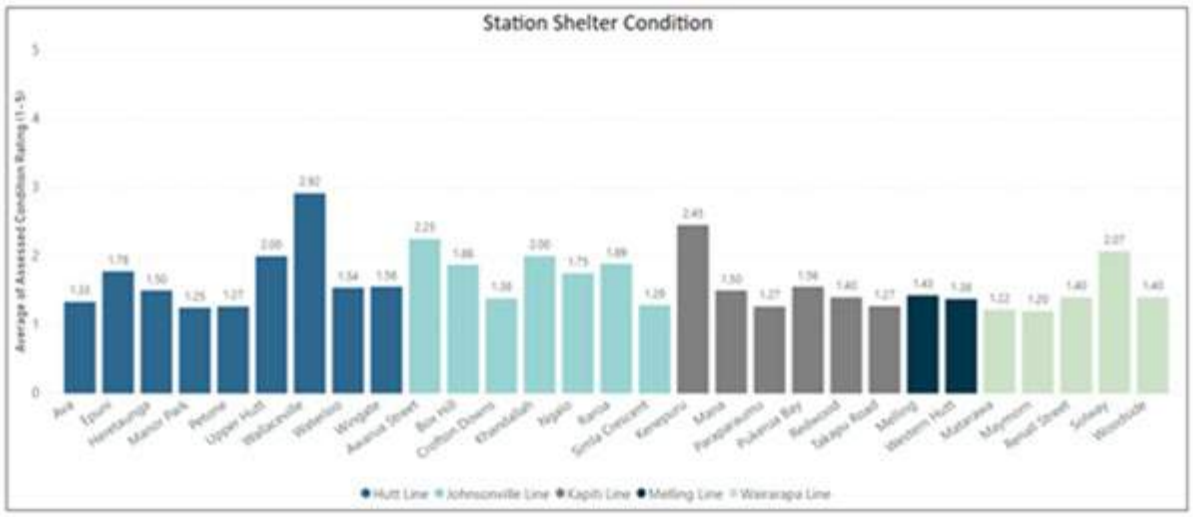


Figure 50: Shelter condition at mid-2020

Station pedestrian overbridges

The overbridges are old, long-life assets, which have had minimal to no preventative maintenance through much of their life. However, since we have taken ownership of these assets, we have been investing in progressively improving the condition of the overbridges.

Figure 51 shows the overall condition profile of the station overbridges from the Harrison Grierson Inspection Report dated February 2021 condition assessment. Tawa was not formally assessed in this report, Tawa's condition is from 2020.

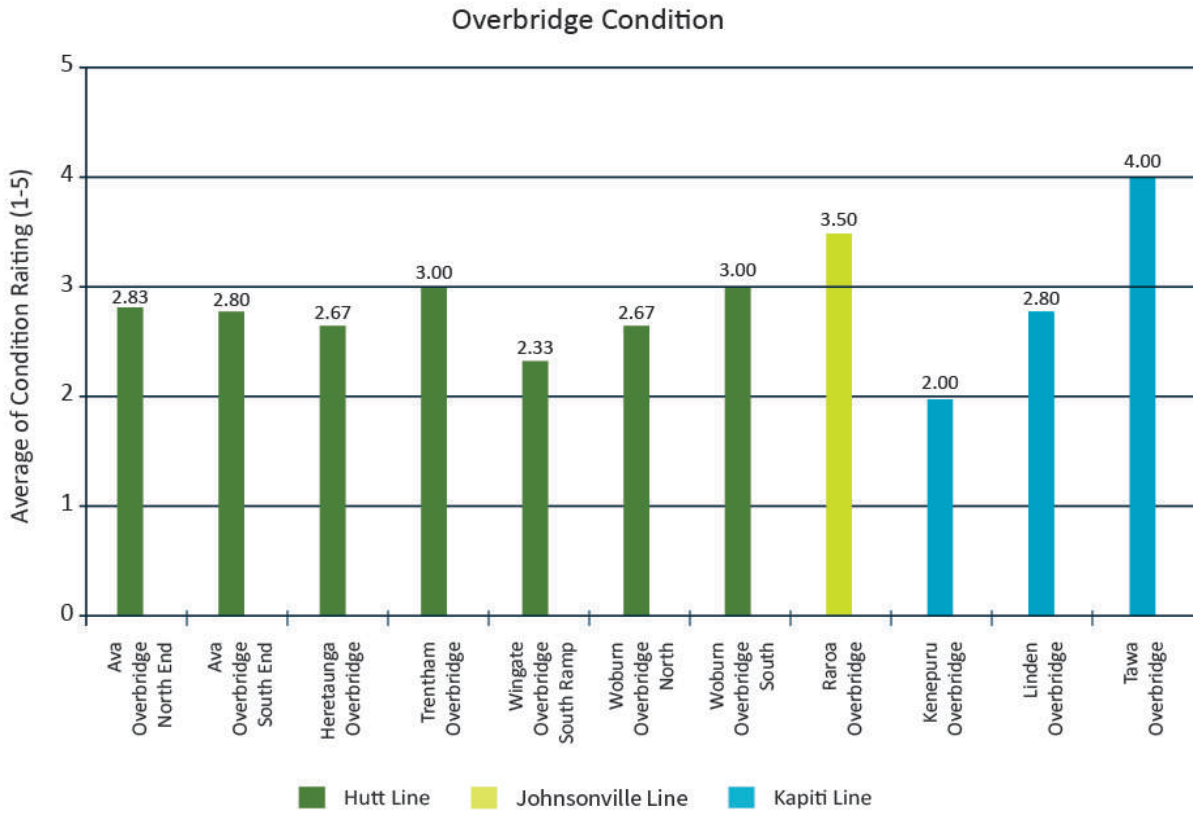


Figure 51: Pedestrian overbridge condition at mid-2020

Station subways

Our station subways have historically had very little maintenance over a number of years. However, since we have taken ownership of these assets we have invested in resolving deferred maintenance issues, and are in the process of implementing regular planned maintenance cycles on all of these assets.

While all of our subways are currently deemed safe for use by the public there are a number of issues that are being managed in relation to seismic strength, and lighting.

The lighting in a number of the subways is poor, which creates an unpleasant environment, and attracts unsocial behaviour.

As indicated by Figure 52 the seismic condition of the subways is above the minimum requirement of 33% of the New Building Standard (NBS), but well below our desired strength of above 67% NBS. We are commencing a programme of seismic strengthening of the subways, and will include a refresh of the customer environment, by improving lighting, and finishing of the subways with an aim of improving the perception of the subways, reduce vandalism, and reduce whole of life costs.

Currently Petone, Taita and Naenae subways are in the poorest condition. Naenae subway seismic strengthening and overall cosmetic refurbishment is scheduled to be undertaken in 2021/22.

Figure 52 shows the overall condition profile of the station subways as assessed by Harrison Grierson 2021.

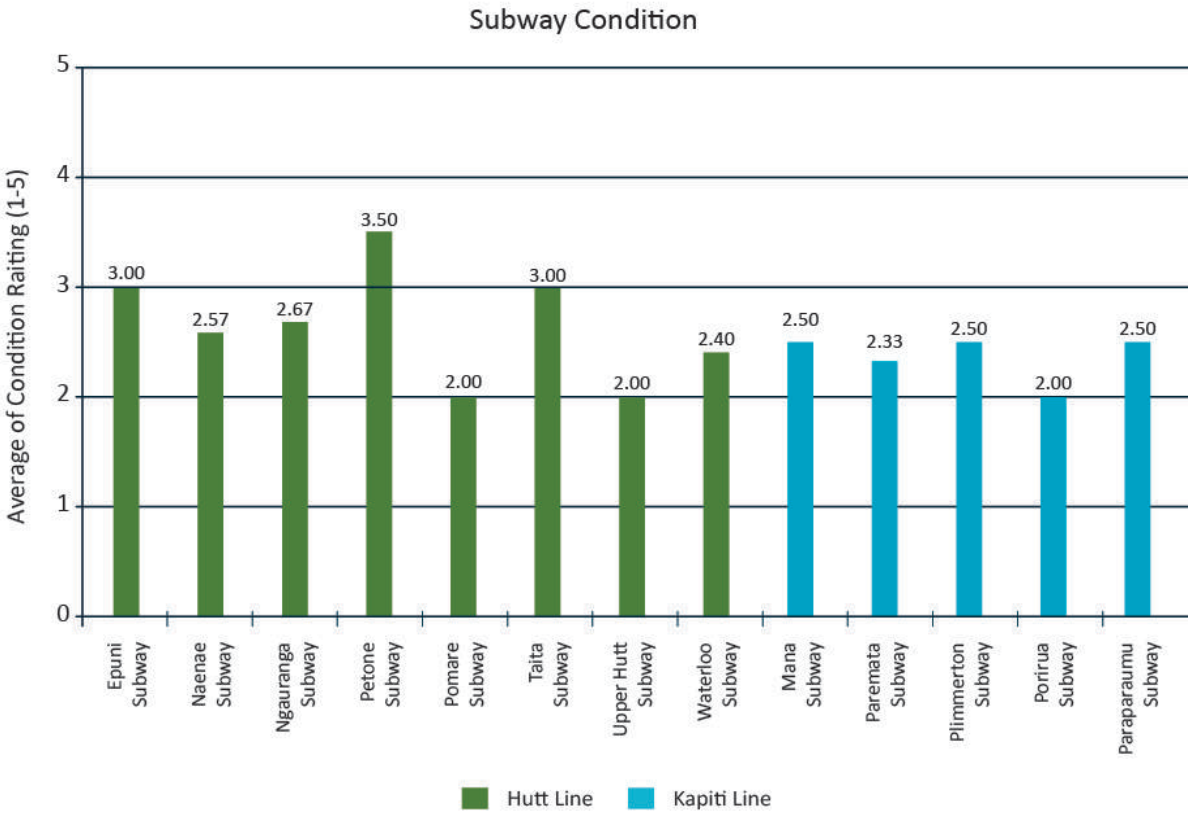


Figure 52: Subway condition

Station Park and Ride

Our station Park and Rides are condition assessed annually together with our carpark contractor. We have a programme of work in place that resurfaces our Park and Ride assets that are conditionally assessed as being in poor condition.

There are several Park and Ride facilities currently that are in a poor condition, such as Woburn, Plimmerton and Featherston which have had their resurfacing deferred while others projects take place to avoid renewing these areas only for further work to be required.

Woburn is due to be renewed this year, and a Park and Ride project at Featherston will renew the surface here as well. There is a further five-year renewal programme for Park and Ride surfacing to improve the condition of our Park and Ride facilities.

Figure 53 shows the overall condition profile of our station Park and Ride carparks.

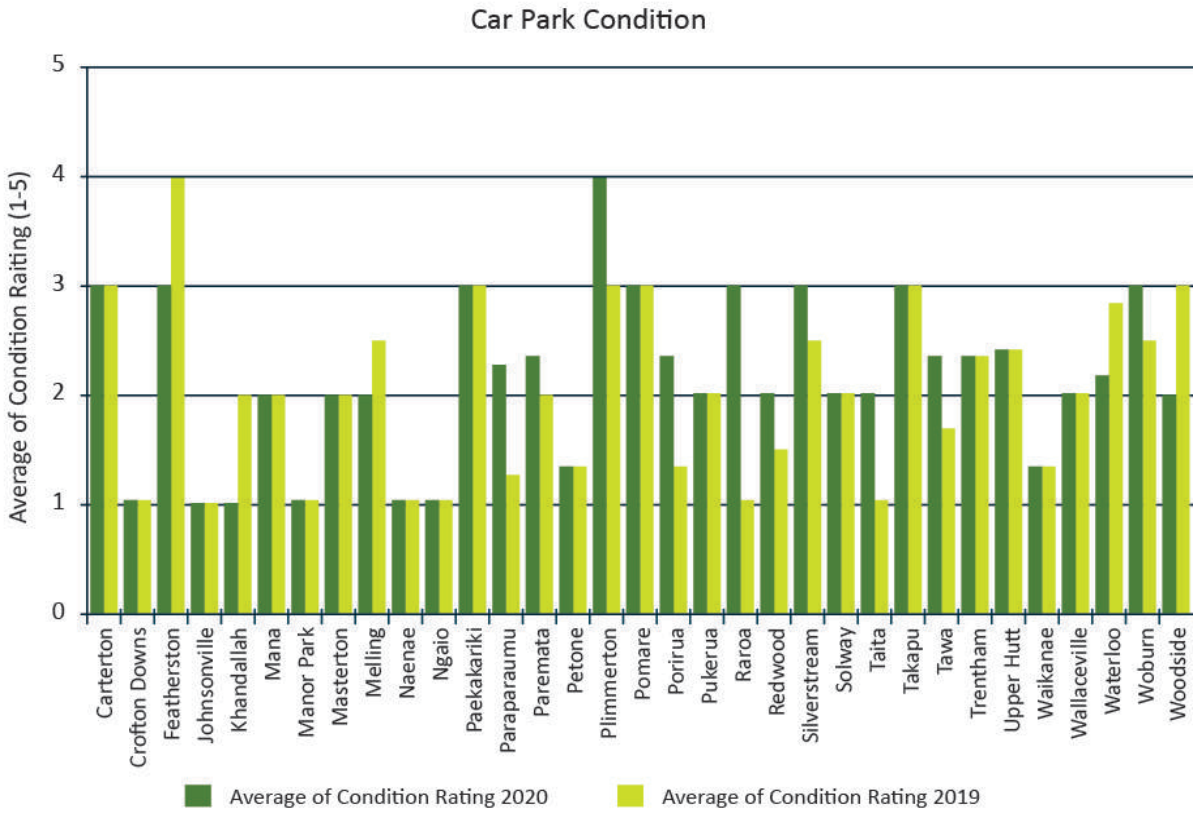


Figure 53: Carpark condition

Station security assets

Figure 54 shows the condition of our station security assets at each location, based on average condition of equipment at each location. This includes CCTV cameras, PA system, Duress Help Points and Network hardware.

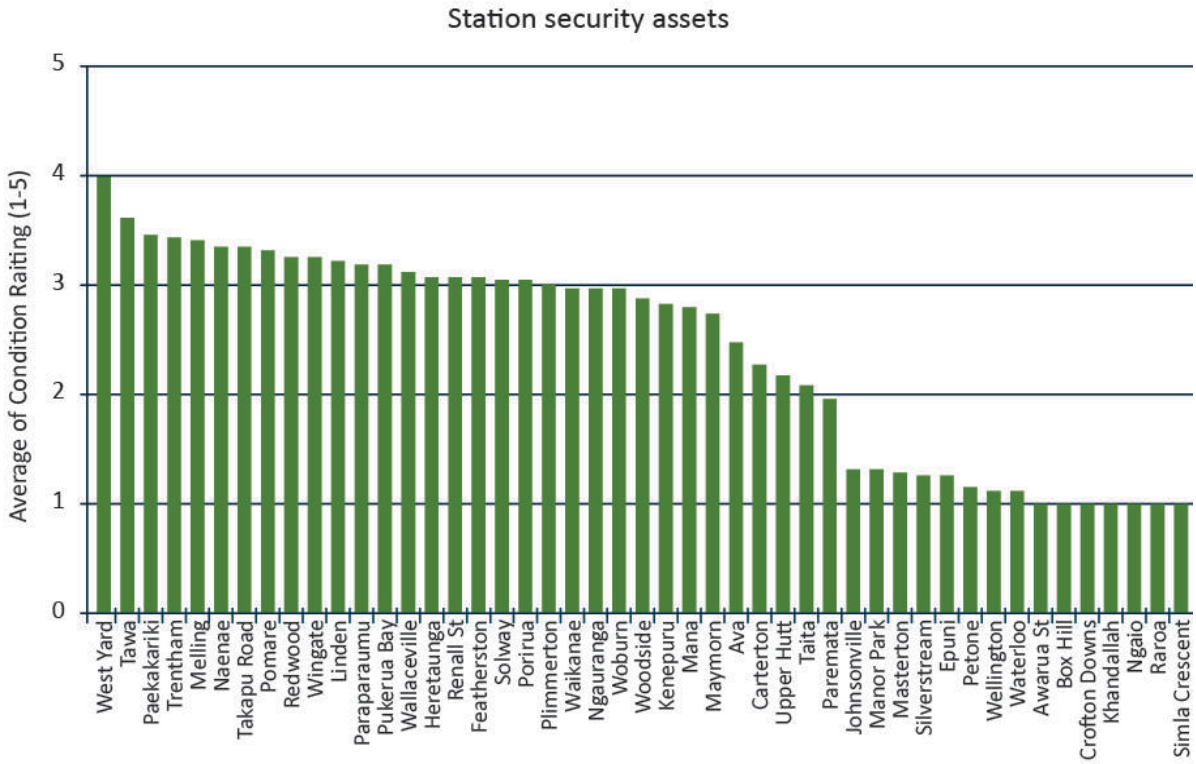


Figure 54: Station security assets condition

Station Lighting

Figure 55 shows the condition of our station platform, access and Park and Ride lighting. Overall our station lighting is in reasonable condition but significant investment is required to upgrade lighting to LED.

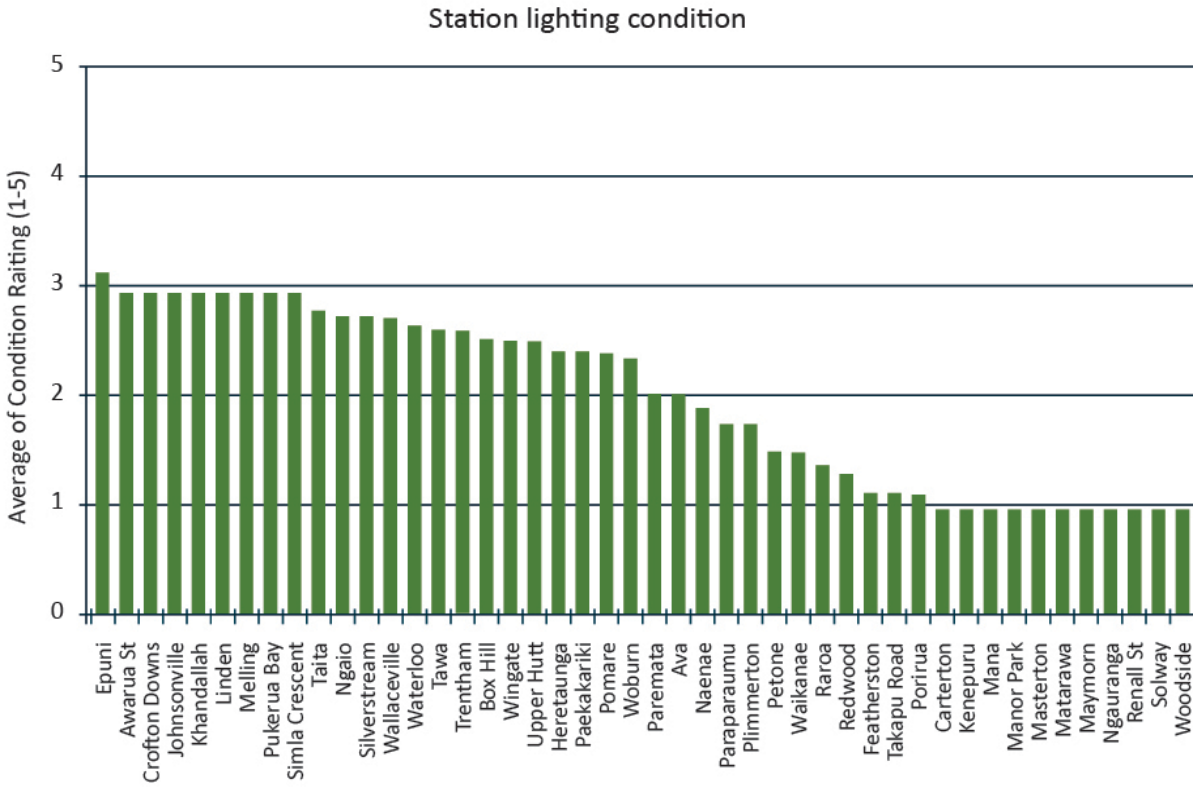


Figure 55: Station lighting condition

Note: This was not assessed in the field, the assessment was a desktop exercise. A physical assessment is planned before the end of the year by Commercial Signals. We don't currently take into account pole condition, therefore this condition is based on our light fittings but we plan to capture this information over the next three years.

Station Signage

Figure 56 shows the overall average condition of our signage at each location. The majority of our signage is relatively new and in good condition. Wellington station has the worst signage condition overall as the majority of these assets are older and due for replacement. Due to the nature of Wellington Station including its heritage status and KiwiRail's ownership of this asset, we are currently working through a number of requirements with various organisations to implement renewed signage at this station.

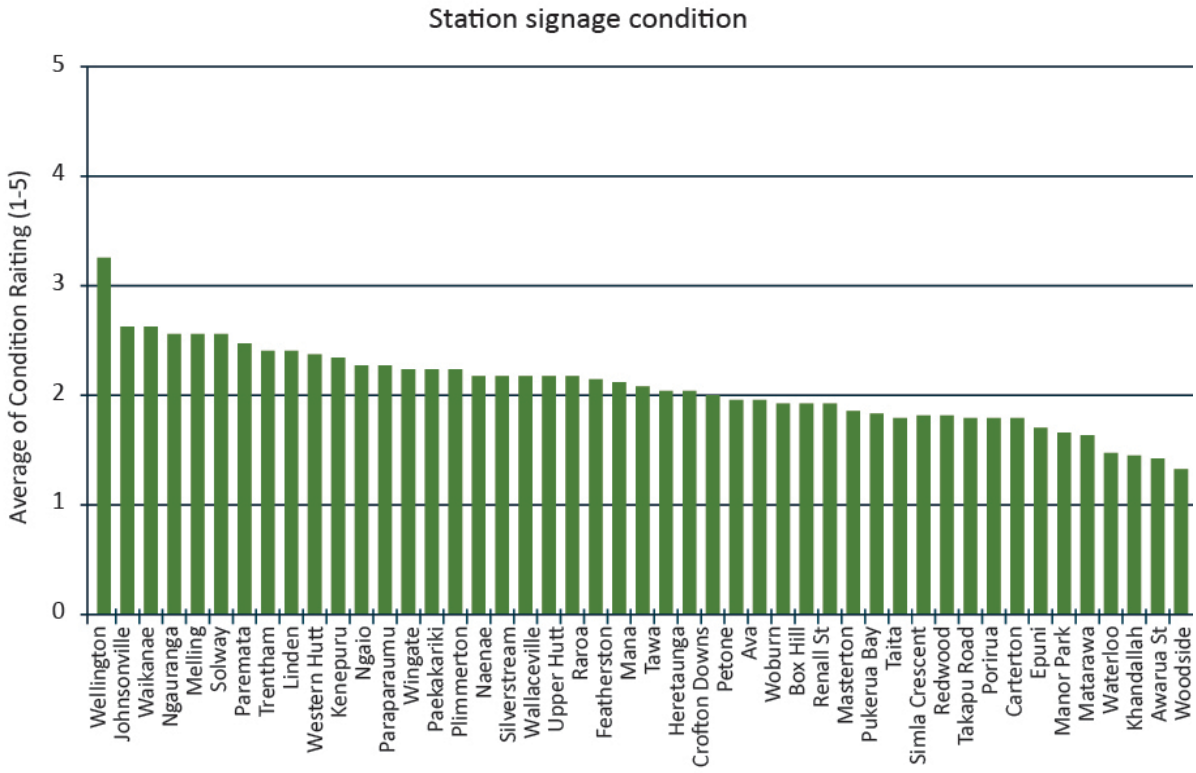


Figure 56: Station signage condition

Station Bike and Ride

A number of our Bike and Ride facilities are older assets and as a result many of these assets are not in a good condition. Many of these assets are coming to the end of their useful life with the majority of them having an average of 7 years left.

There are currently a number of station where the condition of the existing cycle facilities is very poor, such as Taita, Epuni and Naenae. As part of our improvements in the provision of cycle storage facilities at stations there is a prioritisation programme for upgrading and installing new cycle facilities and we will look to upgrade these facilities as appropriate as funding is available to do so.

Figure 57 shows the condition profile of the Bike and Ride facilities at our stations.

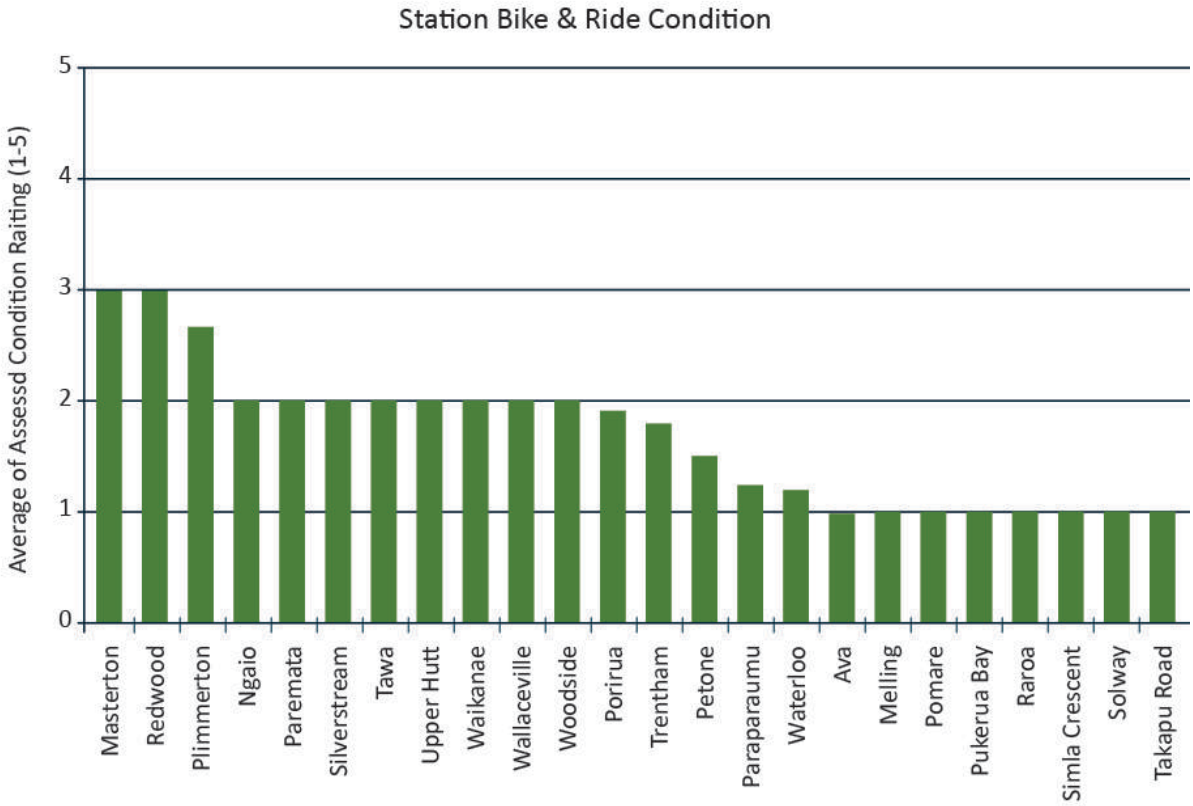


Figure 57: Bike and Ride condition

Station seats and litter bins

Our station seats and litter bins generally in good or very good condition, as shown in Figure 58. There are a number of stations where the seats are older which affects the overall condition rating for these stations but for the most part these assets are in good condition.

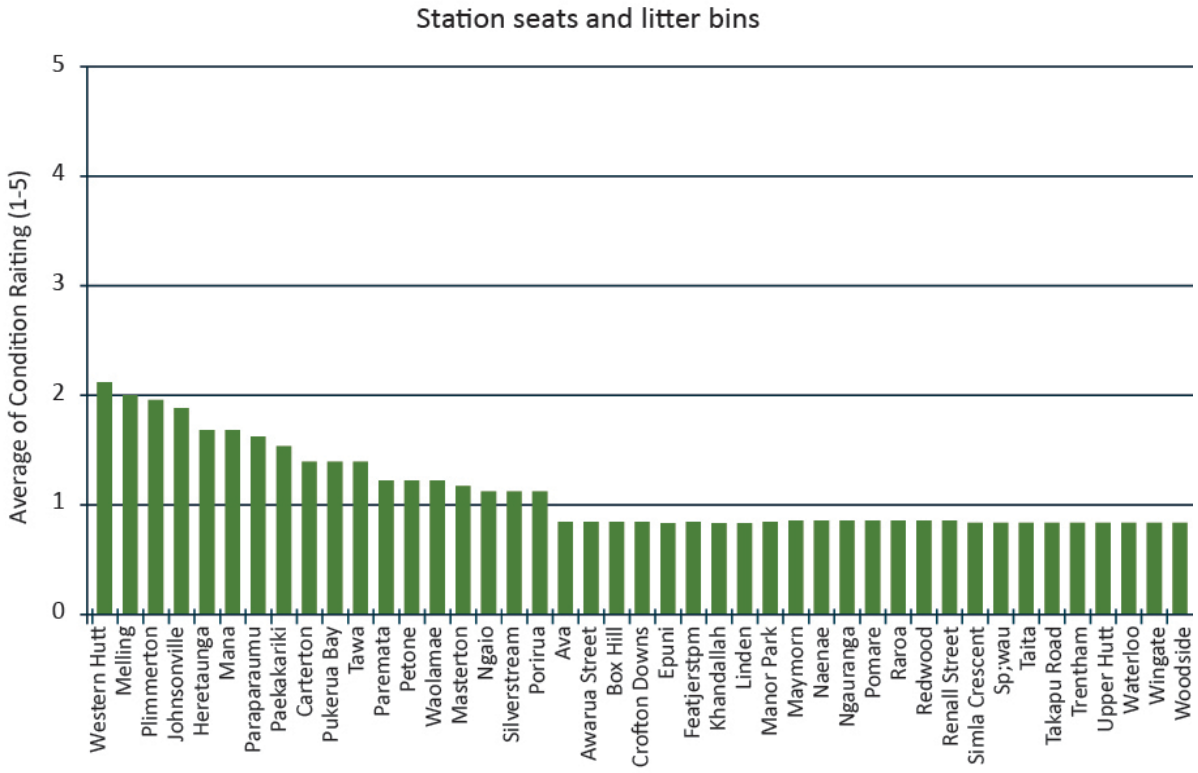


Figure 58: Station seats and litter bins condition

Station access assets

Figure 59 shows the condition of our access paths at each site location, based on the average condition of equipment installed at that site location. The site with the poorest condition is Wallaceville with the overall asset assessed as being in poor condition, though this site is currently being upgraded as part of the Upper Hutt double tracking project which will renew all the access paths to Wallaceville station.

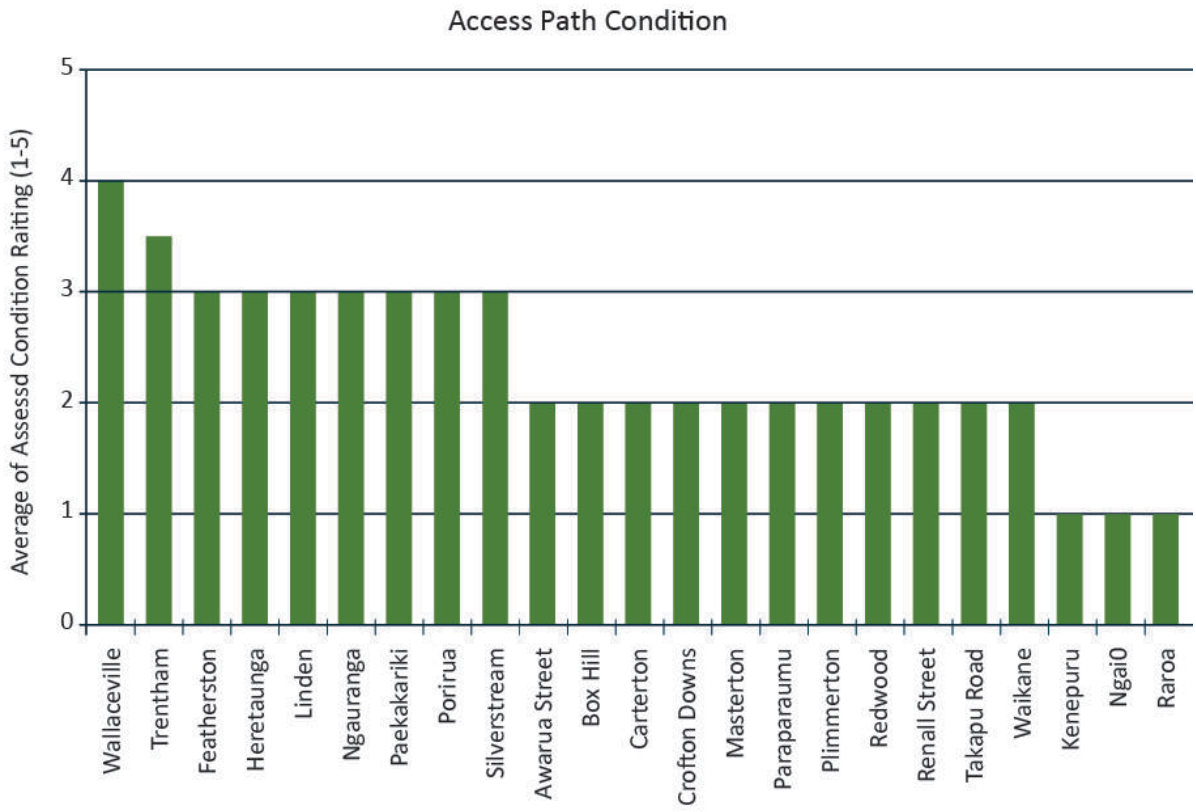


Figure 59: Station access path condition

Figure 60 shows the condition of our fences and barriers.

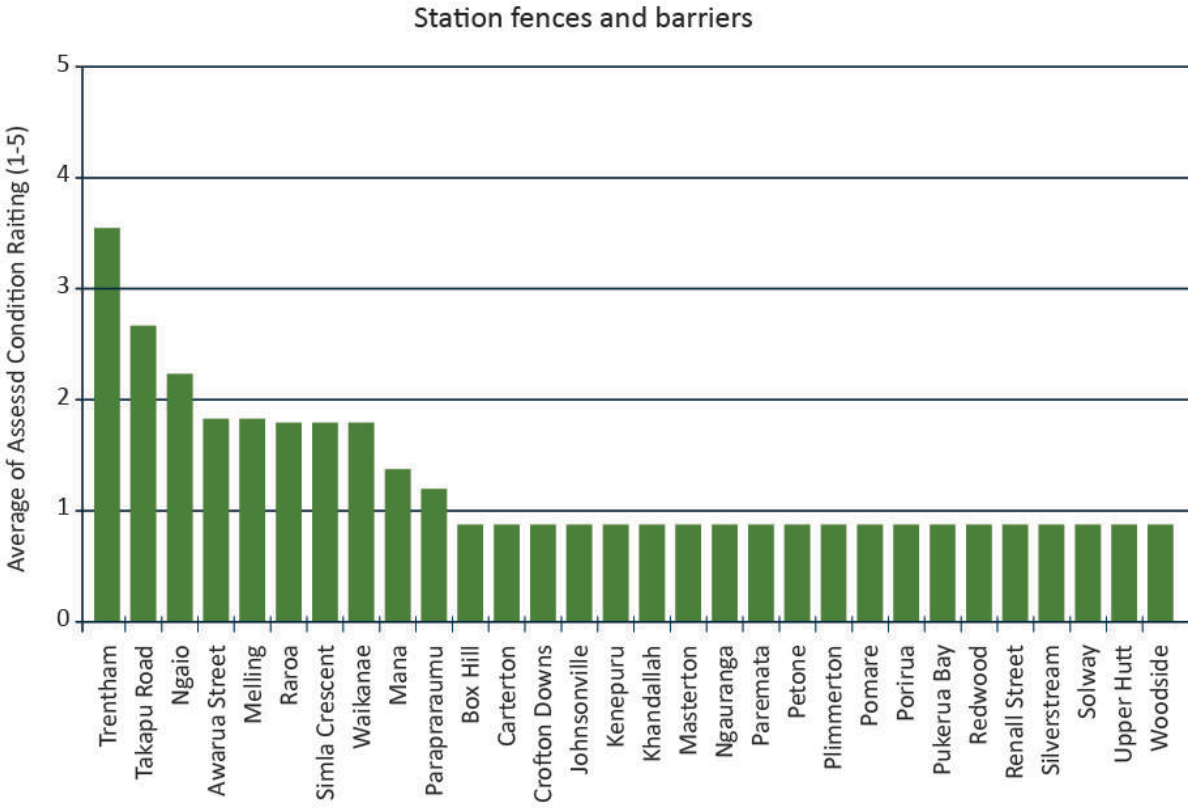


Figure 60: Station fences and barriers condition

Asset risk

While station infrastructure assets are important assets from a rail service perspective, the likelihood and overall risk of having significant impact to the overall rail service is small. However, it is more likely that service to localised communities could be impacted by infrastructure failure, if risks are not appropriately managed. There are several risks that have the potential to affect the function of these assets. These are seismic performance, asbestos management, corrosion management and storm event management. The following describes these asset risks and their mitigations for our station infrastructure assets. These risks manifest across the asset base to varying degrees.

Seismic performance

Seismic performance is a key consideration for all infrastructure asset managers in New Zealand to ensure the safety of people within and near the infrastructure during a seismic event. While insurance plays a key role in mitigating the financial risks, the ability to quickly and easily rebuild after a major seismic event, to enable us to deliver a safe service to the communities we serve, is likely to be challenging. While all of our structures meet the

minimum seismic capacity of 33% of the New Building Standard seismic rating (NBS), there is a significant proportion that are considered earthquake prone, as they fail to meet 67% NBS. As a result, we have a seismic strengthening programming in place to raise all structures above 67% NBS.

Station buildings and shelters

All our station buildings have been inspected and assessed for seismic performance, with all of them being assessed at least 50%12 of the New Building Standard (NBS), except for Pomare which is 46% of the NBS. Eight of our station buildings and four of our station shelters remain below our desired seismic strength of above 66% of the NBS. We have a programme in place to strengthen these buildings to above 66% of the NBS over the next 10 years.

When significant maintenance work is undertaken at a station building or shelter, we upgrade the seismic rating of the building or shelter to meet or exceed at least 67% of the NBS. Most of these assets are now at or above 50% NBS, with 12 of the 47 stations having a seismic strength between 50 and 66% NBS.

Pedestrian overbridges and subways

All of our station overbridges and subways have had an initial seismic assessment completed and all have achieved above the minimum requirement of 33% of the NBS. However there still remains a significant risk as currently eight of the 24 structures, two overbridges and subways, have been assessed as having a seismic strength of only 34%. Of these eight structures, four have undergone a detailed seismic assessment with the other four detailed seismic assessment due to be carried out in the next year.

A pedestrian overbridge and subway renewal programme is underway to strengthen all bridges and subways to above 66% of the NBS seismic rating over the next 10 years.

[12] Please note, two of our station buildings and shelters have not been assessed.

Figure 61 show the post seismic strengthening improvements that have been made on the Wingate North pedestrian overbridge.

Figure 61: Wingate North pedestrian overbridge – post seismic strengthening improvements

A number of seismic improvements have already mean made. Figure 62 and Figure 63 shows the current and historic seismic rating (which shows the number of improvements already made.

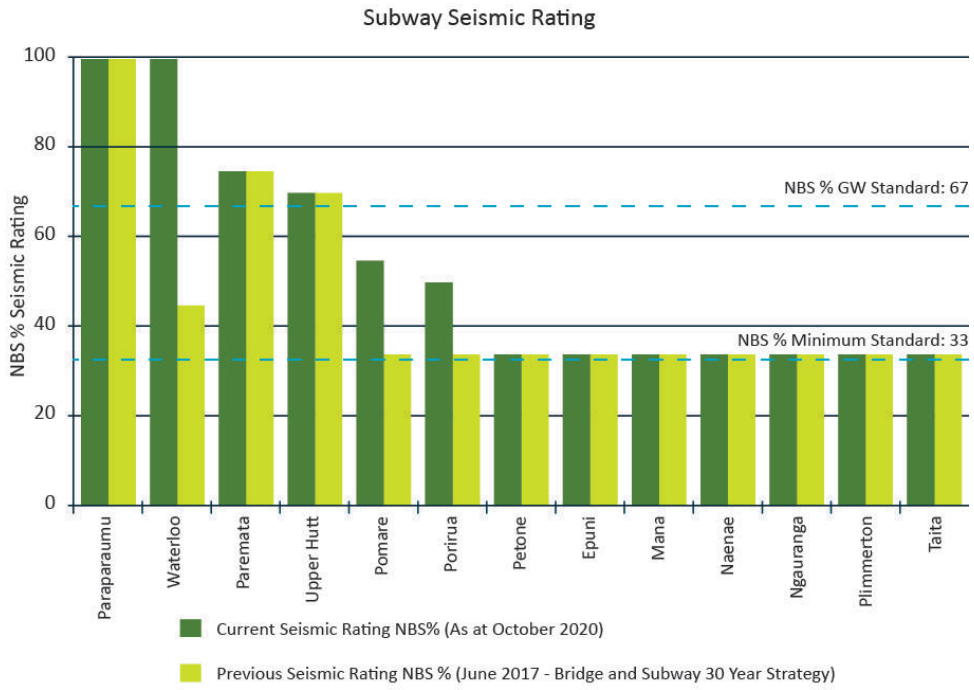


Figure 62: Current and historic pedestrian overbridge seismic rating

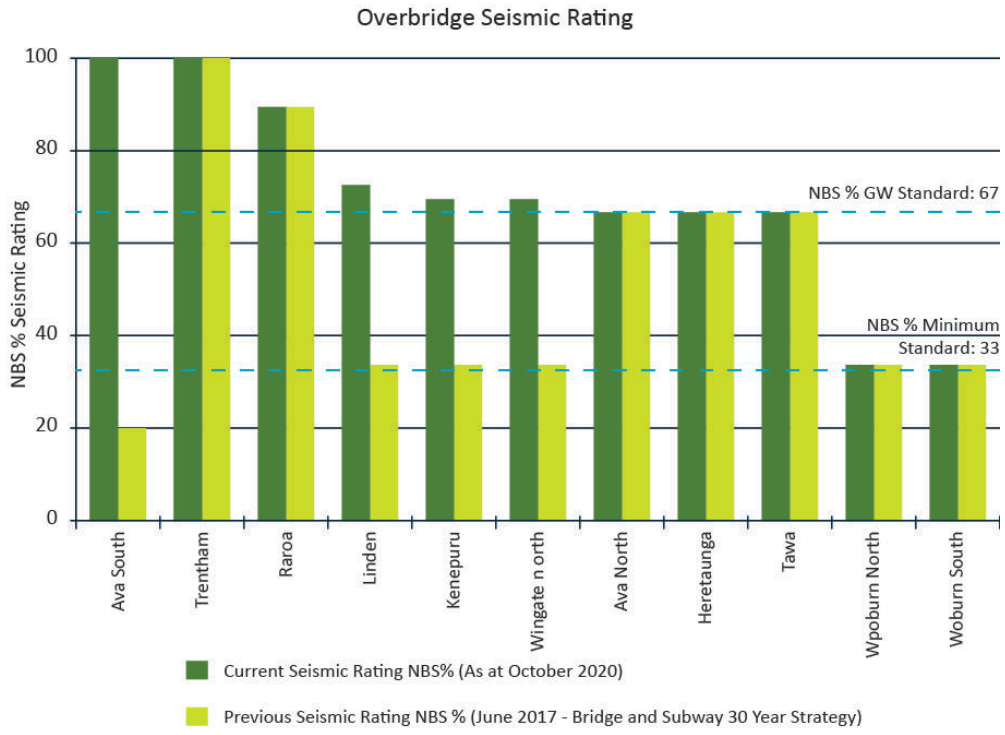


Figure 63: Current and historic subway seismic rating

Asbestos management

Due to the age of our station buildings and shelters, a number of our station buildings and shelters contain asbestos. We manage the asbestos risk at our stations in accordance with the Health and Safety at Work (Asbestos) Regulations 2016 to ensure the health and safety of our customers, service providers and the public. We have set up a register of our assets which contain asbestos, detailing the location and state of the asbestos across our sites. This is regularly monitored and reviewed through condition inspections.

We have an Asbestos Management Plan in place, to ensure the most appropriate treatment has been identified. Treatment measures involve either elimination or appropriate isolation measures are in place (encapsulation). The vast majority of our assets have now had the asbestos encapsulated to ensure the risk is minimised. In addition, we have an active programme of work to remove asbestos where practical, to eliminate the risk at that location. In recent years, both Taita and Paremata stations have undergone asbestos removal and further encapsulation to reduce the asbestos risk at these locations.

For all our work involving asbestos, we utilise Greater Wellington's standard operating procedure under the hazard management policy. We work to ensure all practicable steps are taken to ensure that exposure to asbestos is kept and maintained as low as possible and under no circumstances exceed the workplace exposure standards.

Storm events

Storm events can cause permanent damage to our station infrastructure assets. Flooding is a risk for our subway assets is flooding, either due to insufficient capacity of the drainage and pumping systems, or failure of the drainage and pumping systems within the subways. As a result, a regular maintenance plan is in place. A number of our subways have had new pipes installed to prevent water flowing into the subways and flooding them during large storm events. It is noted that the frequency and severity of these storm events are increasing as a result of climate change and while rail station infrastructure is insured, the deductible is set at a level that is unlikely to aid the financial loss as a result of flooding.

Coastal Environment - Corrosion

The coastal environment at a number of stations, such as Paremata and Ngauranga, is also a key factor that can considerably shorten the life of station assets if appropriate maintenance activities do not occur. Marine deposits such as salt spray, sand, and seaweed, are regularly removed through a building wash down programme but these stations still require the regular application of corrosion protection products to help reduce the whole of life costs.

Asset performance

Our year to date performance against our customer satisfaction and asset related targets show that we are generally trending positively to achieve them. In line with this, our assets

in this asset class have generally performed well. However, there have been instances that have affected the function of these assets. For example, the Ava South pedestrian overbridge, was required to be closed after severe cracking occurred during the November 2016 Kaikoura Earthquake. This closure removed the only ramped access to the station, and hence created significant inconvenience to the mobility impaired community near Ava Station. The redevelopment of the Ava South pedestrian overbridge has been completed.

There are instances of slips, trips, and falls across our network. We continually review the occurrence of these and address any key hotspots. For example we salt pedestrian overbridges and access paths to mitigate the risk of slips.

Station buildings and shelters

Our station building assets are generally functional. However, with the significant growth in patronage, the provision of shelter provided by our buildings and shelters, is insufficient to provide adequate protection from the wind and rain while waiting for our rail service. As a result, increased shelter is required in a number of locations.

The design and layout of a number of a number of our buildings and shelters are sub-optimal to promote the feeling of personal safety and security. Hence, CPTED enhancements are needed.

A number of our station buildings are disused and boarded up, however we are progressively upgrading them to so they can be leased by other organisations such as small businesses or community groups. This approach has been effective in creating community ownership, reducing vandalism and crime, and ultimately improving customer safety due to passive surveillance.

Station pedestrian overbridges

Generally, our overbridges are in a basic functional state, with reliable availability. However, as already mentioned, there have been instances that have affected the function and availability of our pedestrian overbridges, such as the November 2016 Kaikoura Earthquake which closed the Ava South pedestrian overbridge. The availability of some of our pedestrian overbridges may however be disrupted if new, or required, remedial works due to condition, are not undertaken in the near future.

Many of our pedestrian overbridges would not meet today's building or disability construction standards, particularly with respect to ramp gradients and step dimensions. Due to the geometric constraints, it generally is cost prohibitive to rectify these issues in the short term, however opportunities to improve accessibility will be assessed, and taken into account during any future renewal and/or strengthening activities.

A number of structures do not meet accessibility guidelines, in terms of colour contrast and hand rail dimensions and placement. A programme of works is being developed to rectify these issues.

Our seismic strengthening programme for pedestrian overbridges is drawing to a close, with the last one overbridge currently being worked on at Woburn.

Station pedestrian subways

Generally, our subways are in a basic functional state, with reliable availability.

Many of our pedestrian subways would not meet today's building or disability construction standards, particularly with respect to ramp gradients and step dimensions. Due to the geometric constraints, it generally is cost prohibitive to rectify these issues in the short term, however opportunities to improve accessibility will be assessed, and taken into account during any future renewal and/or strengthening activities.

The tiles fitted to the walls and ceiling of Waterloo pedestrian subway, are progressively losing their adhesion, and dropping off the ceilings and walls. We are planning to renew all of the tiling in the subway to reduce the risk of injury.

A number of our pedestrian subways have poor lighting which decreases the perception of personal safety while in the subways. Due to the restricted height within the subways and on-going vandalism, we continue to experiment with different solutions that both improve the lighting levels, and mitigate the potential of vandalism.

Station Park and Ride

The functionality of our Park and Ride facilities is very good, reflected in their high use, and the quality of them is reflected in their age and condition. We consider that the majority of our Park and Ride assets are safe. However we recognise that there may be some safety issues due to over demand for Park and Rides services resulting in the public parking in unallocated parking areas which in some areas can affect visibility on local roads and block footpaths. Where this occurs, we liaise with the relevant TA to identify options to address the issue.

We are continually exploring better placement for accessible parking spaces, and are developing a programme for dedicated car pool spaces and improved access through Park and Ride to encourage mode shift.

Station security assets, lighting, and signage

Our CCTV system is considered reliable. We have a with a regular, three-monthly preventative maintenance programme in place. The 24 hour 7 day a week monitoring of the cameras across the network is proving effective in discouraging vandalism, and improving the perception of safety across the network. However, at this stage the CCTV system does

not provide full coverage of the network, in particular the fibre optic link has not yet been installed on the Johnsonville Line.

We consider our lighting assets are a key component for maintaining safety and security. As such significant effort has been put in the last few years to improve lighting performance and asset condition.

Lighting is one of the most important factors in the principal of CPTED. CPTED lighting principals adopted in our lighting upgrades are:

- lighting design avoids poorly placed lights that create blind-spots for potential observers and miss critical areas
- potential problem areas are well lit: such as pathways, stairs, entrances/exits and parking areas
- too-bright security lighting that creates blinding glare and/or deep shadows is avoided, so as not to hinder the view for potential observers
- shielded or cut-off luminaires are used to control glare
- lighting is placed along pathways and other pedestrian-use areas at proper heights for lighting the faces of the people in the space (and to identify the faces of potential attackers).

The quality of lighting varies with age and condition. Many of the older lights emit less light and have poorer lighting efficiency than the newer ones. Lamp reliability is typically described by the average rated life in hours. This can vary considerably depending on the technology used. We are progressively implementing LED technology to reduce energy consumption, as well as maintenance costs as a result of the longer life bulbs. This planned replacement can enable equipment and energy savings as lighting designs can be reassessed to reduce compensatory lighting, typically applied to overcome poor lighting.

Unfortunately, our lighting is heavily vandalised, which affects the reliability of lighting. Lighting is regularly checked as part of routine maintenance by contractors at each site and complaints are responded to as received.

The reliability of our signage mainly relates to the readability of the sign and response time for replacement if vandalised or damaged. This is undertaken by the regular maintenance and inspection programme.

At present our rail platform signs are generally not directly lit at night, making readability difficult. The significance of this is now reducing due to passenger information systems now provided on all trains, informing customers of their location.

There is no information on quality of our signage at this time, although the graphics tend to be affected by UV light. This can significantly reduce the useful life of the assets at sites with high UV light exposure.

Station Bike and Ride

The availability of our station Bike and Ride is reliable and the availability of these assets is not expected to be disrupted. Any new assets installed are completed before the old assets are removed. The removed assets are relocated to stations which currently don't have bike parking.

At stations where there are good cycling routes for access, our Bike and Ride facilities are well utilised, in particular at stations such as Paraparaumu and Porirua where the majority of cycle facilities are often at peak occupancy.

A number of our Bike and Ride assets are aging assets in the form of cycle cones or toaster racks which are not favoured by our customers as they can cause damage to bicycles through poor frame support. These aging assets are progressively being replaced with new Bike and Ride double tiered facilities.

As we install these new assets, we are also installing dedicated CCTV and lighting. We also ensure they are placed in areas with good passive surveillance and easy access for nearby cycle or shared pathways.

Station access assets

The fences along our access paths generally consist of two types, known either as a 'Type A' fence or a 'Type B' fence as shown in Figure 64 and Figure 65. Figure 64 shows a 'Type A' which is a vertical paling fence and Figure 65 is a 'Type B' fence which is a simple timber post and rail fence. There are many 'Type B' fences on our access paths. We are considering upgrading them to a 'Type A' to prevent small children from either going under them or climbing over them.

Many of our fences are made from steel wire mesh and need to be able to withstand the salt water environment in the Wellington region.

Figure 64: 'Type A' fence

Figure 65: 'Type B" fence

We consider the operation of our access paths to be reliable. A number of our access paths cross the rail lines making them a high safety hazard. KiwiRail are improving these accesses by installing automated level crossing gates.

Many of our fences are made from steel wire mesh and need to be able to withstand the salt water environment in the Wellington region.

Asset information

We are investing time and effort in improving our accuracy and knowledge of our data. However further improvements in the data quality and the analysis of this data is an ongoing process. With the introduction of the new Enterprise Resource Planning system, Ngātahi, we are expecting to significantly improve our ability and capability to improve our data systems and processes.

Lifecycle management and activities

Our asset management approach for our station infrastructure assets is to maintain, build new, and uprate existing assets so that we can provide a safe, high quality, fit-for-purpose

station infrastructure at least lifecycle cost. To enable deferment of major investment until maintenance is no longer an economic solution, we address localised deterioration with repairs and minor replacements.

We apply national and regional strategic priorities and our station infrastructure strategic objectives to our planning, to ensure our investment is targeted and prioritised so we can meet our key objectives, and desired Levels of Service. We also involve local communities in aspects of our renewal projects. For example Plimmerton Station displays local schools' artwork and the Taita pedestrian subway has artwork from a local artist. This helps in the mitigation of vandalism, as it is less likely that someone would tag something that a local community member has made.

Our asset management approach reflects our lifecycle activities of Planning, Deliver, Operate, Maintain, and Divest or Dispose. Each of these are discussed below.

Planning

Our planning activities include:

- making provision for increasing service frequency which may result in planning for new assets, refurbishing existing assets, or relocating assets to where they are better utilised
- regularly review patronage demand, and ensure that sufficient provision of shelter from the wind and the rain is available for peak demand
- strengthening all buildings and structures to at least 67% of the NBS
- risk mitigation programmes for specific hazards eg our Asbestos Management Plan
- ensuring our stations and facilities are regularly cleaned, and free of graffiti and vandalism, to ensure station infrastructure provides a safe, and accommodating environment
- renewal and update the suite of information provided at stations, including timetable, real time service information, ticketing, service disruption information, wayfinding information for both the station and the community the station is located in
- during renewal and improvements activities, we upgrade the facilities to ensure they are accessible for all, and
- endeavouring to obtain a sense of community engagement in the station facilities, to increase ownership, and ultimately reduce vandalism.

Table 24 provides an overview of the planning standard of facilities we work towards for each station category.

Table 24: Planned facilities available at each station category

	Very High Use (>10,000 Passengers/ wk)	High Use (<10,000 and >5,000 Passengers/ wk)	Medium Use (<5,000 and >2,000 Passengers/wk)	Low Use (<2,000 Passengers/ wk)
Sufficient shelter from weather for peak use	Yes	Yes	Yes	Yes
Ticket office	Yes	No	No (except on Wairarapa Line)	No
Internal Waiting Room	Yes	No	No (except on Wairarapa Line)	No
Toilets	Yes	No	No (except on Wairarapa Line)	No
Bus Inter Change	Yes	No	No (except on Wairarapa Line)	No
Bus Connection	Yes	Desired	No (except on Wairarapa Line)	No
Snapper Top Up	Yes	No	No (except on Wairarapa Line)	No
Duress Help Points	Yes	Yes	Yes	Desired
Park and Ride	Yes	Yes	Desired	Desired
CCTV - at Station	Yes	Yes	Yes	Desired
CCTV - at Park and Ride	Yes	Yes	Yes	Desired
Accessibility Compliant	Yes	Yes	Desired	Desired
Cycle Storage Locker	Yes	Yes	Yes	Desired
Cycle Cones	Yes	Yes	Yes	Yes
Rubbish Bins	Yes	Yes	Yes	Desired
RTI	Yes	Yes	Yes	Desired
Overall Condition Grade of Station	<3.0	<3.0	<3.0	<3.0

Decision Prioritisation

The work programme for station infrastructure assets is determined by applying our prioritisation processes.

A maintenance, renewal and upgrade prioritisation process has been developed and applied to our planning to ensure that the funding is allocated appropriately to address areas with greatest need.

The assets are extensively inspected by a third party every three years to develop a detailed five year maintenance, renewal and upgrade program. Furthermore the asset conditions are re-assessed each year by staff and the programme fine-tuned accordingly.

Our work programme is prioritised based on safety and then assets that have a condition rating of Condition 5 and Condition 4. These are then ranked within each group by:

- passenger numbers
- risk of safety issues if not addressed
- risk of cost increase if not addressed (damage to associated items)
- risk of further degradation of asset if not addressed
- risk of service issues if not addressed.

Our station infrastructure investment priority framework is shown in Figure 66.

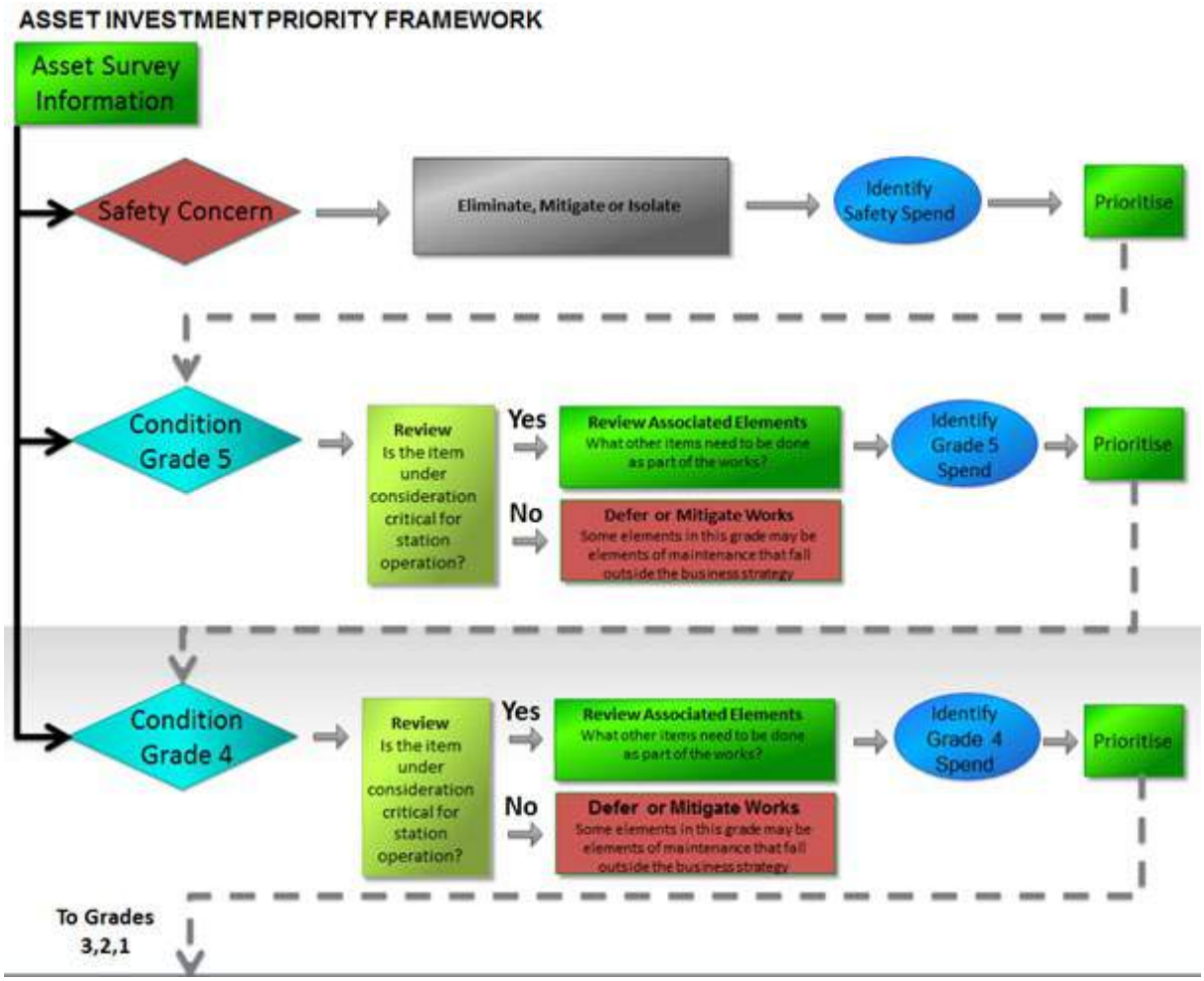


Figure 66: Station infrastructure investment priority framework

Please note Wellington, Porirua & Waterloo stations are designated as “Major Bus-Rail Interchanges”, and Waikanae, Paraparaumu, Upper Hutt, Taita, Petone and Johnsonville stations are designated as “Bus-Rail Interchanges”. Any enhancements or renewals at these sites require increased consideration in relation to cohesiveness with the bus facilities within the interchange.

Capacity Management - current and future requirements

With the growth in patronage, the provision of shelter provided by our buildings and shelters is insufficient to provide adequate protection from the wind and rain while waiting for a train. As a result, increased shelter is required in a number of locations.

Modelling is currently underway to illustrate the current and forecast shortage of shelter capacity at our station buildings, and hence enable this to prioritise investment, and ensure that during shelter and building renewal programmes that sufficient shelter is provided to cater for the forecast future demand.

Cost Estimation

The majority of the maintenance and renewal activities that is required to be undertaken is bespoke, undertaken within brown field sites and within the rail corridor (which has access limitations, and high health and safety management expectations). All of these factors make accurate cost estimation challenging.

However, cost estimation for planning purposes is established through knowledge of the market, and previous activities of similar nature. We typically procure contract maintenance, renewal and improvement activities contracts, with a number of standard rates which provide a level of certainty, at least in the short to medium term of contract rates.

Deliver

Within the Deliver lifecycle stage we procure, construct and commission the programmes of work that have been identified within the Planning Stage. Where applicable, works are integrated into a wider programme schedule that accounts for other works at the same locations using common resources.

The activities are typically project managed using internal staff resource, however an external engineer to contract is often contracted for the larger scale infrastructure renewal or new projects.

Procurement

Procurement is undertaken in accordance with Greater Wellington Procurement Policy, Waka Kotahi's Procurement Rules, and Government Procurement Rules. As a result contracts in excess of $200,000 are generally undertake on an open tender basis, with a quality price assessment process to ensure that overall value for money is obtained.

Generally we undertake procurements for multi-year contracts, with the ability to extend them if contractor performance is meeting expectations.

Operate

From 3 July 2016, we commenced a 9+6 year performance based Partnering Contract with Transdev Wellington Ltd (Transdev) to be the rail operator for our region.

The Partnering Contract includes a number of provisions to provide resources at a number of key station. These are Wellington Porirua, Paraparaumu, Waikanae, Petone, Waterloo, Upper Hutt and Masterton stations. The remainder of our stations are unmanned, however the Partnering Contract also resources a 24 hr / 7 day per week rail monitoring centre, which utilises the >800 cameras across the rail network to actively monitor and manage asset and personal safety across the network. In addition we have a roving security presence, which helps to identify and / or prevent issues.

We have a station cleaning and minor maintenance contract is also required to visit each station daily to undertake cleaning activities, and also identify and promptly remedy any vandalism.

Maintain

Maintenance activities for our station infrastructure assets are undertaken through various maintenance contracts. Annual maintenance inspections are undertaken for all assets, and corrective planned maintenance works is undertaken / prioritised in accordance with these inspections.

An overview of our key maintenance contracts for our station infrastructure assets is outlined in Table 25.

Table 25: Station infrastructure key maintenance contracts

Cleaning and minor maintenance	Provision of station cleaning services, and maintenance repairs, for example glass repair, painting, and graffiti removal etc.
Maintenance	Carry out planned minor maintenance works.
WoF and fire monitoring	Carry out Code of Compliance checks.
Cleaning and maintenance	Car park surface repairs/maintenance and undertake an annual car park clean for each car park.
Maintenance	Undertake a rolling 5 year bulb replacement program
Security	Undertakes new installations and maintenance of security (e.g. CCTV) and audio systems (e.g., Public Address & Help Points).

Station buildings and shelters

We have a station cleaning and minor maintenance contract in place to undertake cleaning and minor repairs of the stations including the buildings, shelters and subways. Although most aspects of maintenance are planned such as daily cleaning, there is an element of reactive maintenance that includes:

- responding to public inquires
- maintenance to assets that are damaged externally such as vandalism.
- any substantial reactive maintenance is agreed prior to any works being carried out.

The assets are inspected each year by staff, and extensively inspected by a third party every 3 years. This enables are detailed 5 year maintenance, renewal and upgrade program, to be re-developed every 3 years, and the programme fine-tuned each year.

Station pedestrian overbridges and subways

All maintenance is undertaken through a maintenance contract with Service Resources. Annual maintenance inspections are undertaken for all assets, and corrective planned maintenance works is prioritised and undertaken in accordance with these inspections.

Lighting

An annual cleaning, maintenance and inspection programme has been introduced for our lighting poles and fittings, to ensure that issues are identified and rectified early, particularly in relation to environmental and corrosion issues.

Historically, we have undertaken a rolling five yearly bulb replacement programme on all station and car park lighting, to minimise the cost and disruption to repair ad hoc bulb failures. As we are progressively moving to LED technology across the network, this renewal cycle will be extended out to a 10 year replacement.

Station Park and Ride

Maintenance of Park and Ride assets is undertaken through a maintenance contract to undertake:

- An annual clean of each car park
- 6 monthly sump cleans
- 3 monthly car park sump cleans
- Maintenance of storm water treatment devices such as upflow filters, and rain gardens
- Monthly vegetation maintenance
- Undertake car park service repairs and maintenance activities
- Undertake car park resurfacing, based on a programme of projected renewals.

Station security assets

Our CCTV service contract contains a preventative maintenance schedule, which includes the servicing of the CCTV assets on a six monthly basis. Any reactive maintenance is agreed prior to any works being carried out.

Divest or Dispose

There is currently no plans to divest or dispose of any rail station infrastructure assets, however prior to investing in a major asset renewal, we review the condition and performance of the existing asset, and assess if the asset should be refurbished, or alternatively completely replaced.

Due to the nature of the assets there is very little opportunity or practicality to sell the assets, however some components can be recycled during the demolition process.

Forecast expenditure

Figure 67 shows our station infrastructure operational and capital expenditure forecast.

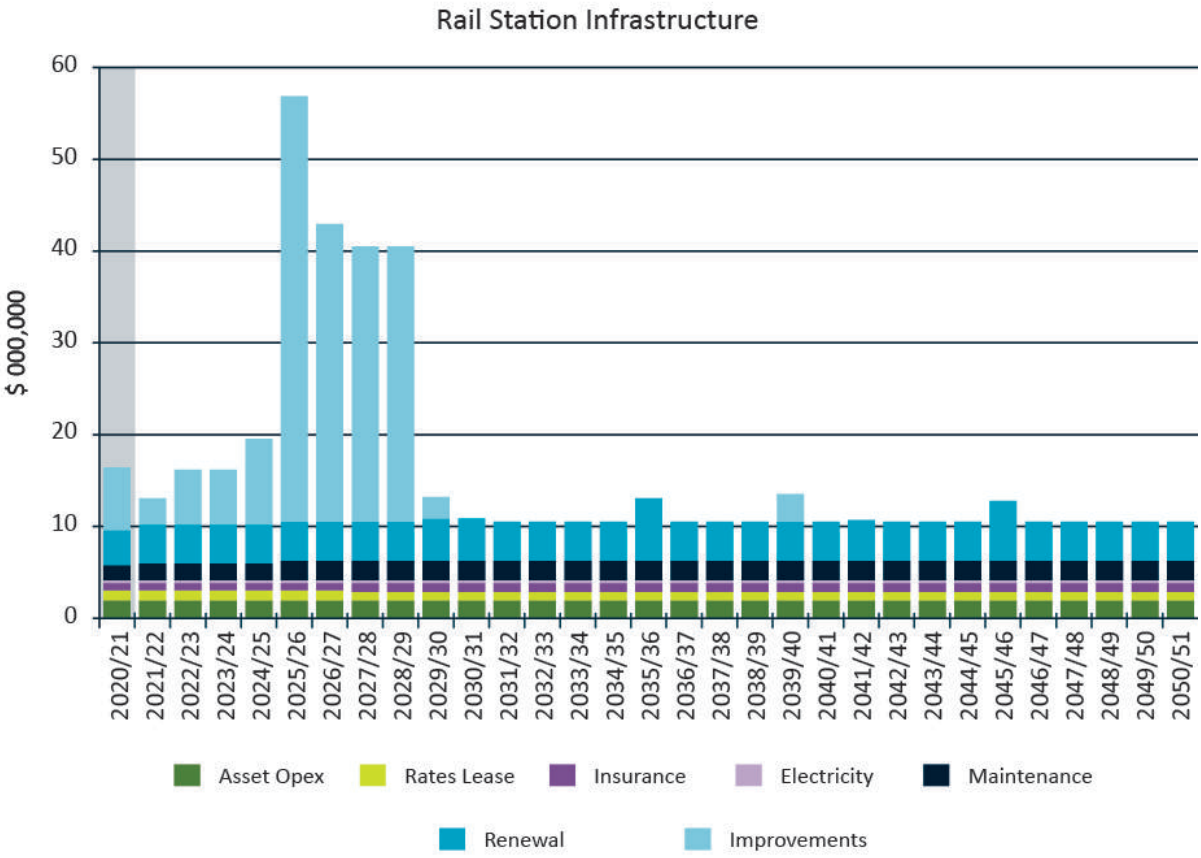


Figure 67: Station infrastructure operational and capital expenditure forecast.

Operating expenditure

As shown in Figure 67 above, the operational maintenance expenditure for rail station infrastructure is forecast to remain relatively steady at approximately $6.2m per year over the next 30 years. This operating expenditure covers, costs such as cleaning, rates, lease, insurance, electricity and planned and corrective maintenance activities.

Capital Expenditure

As shown in Figure 67 above, the renewal costs for rail station infrastructure is forecast to remain relatively steady at $4.2m/year.

In order for the customer experience improvements, and the achievement of the mode shift and growth targets the forecast includes improvements to rail station infrastructure facilities. This includes increased shelter and improvements in facilities while passengers wait for trains, improved connections between the stations and the community such as improvements to Park and Ride, bicycle storage facilities, and improvements to paths, lighting, security and general accessibility improvements.

Rail EMU Maintenance Depot Asset Class Plan

We own one rail maintenance depot for the maintenance of our EMU rolling stock13. The maintenance depot is 5,000m2 and includes a five-road maintenance floor and facilities for up to 50 staff. Other buildings included at the maintenance depot site, is a wheel lathe building located approximately 300m north of the maintenance depot, and two EMU train wash buildings, which are semi attached to the main maintenance depot. Ownership of maintenance depot was transferred to GWRL in 2011 as a result of the Crown establishing the Metropolitan Rail Operating Model.

Description

The maintenance depot is located in the Thorndon rail yard. The main maintenance depot building has been added to over the years and has two sections to the one building. There is the 1970's portion which is 1 unit in length and 4 roads wide, with full roof access on 3 of these roads. The depot was extended in 2011, which is 2 units long, and 5 roads wide, and includes a full swimming pool pit access, and roof access platforms on 2 roads. It also includes office and staff amenities.

Specialist depot plant and equipment are needed for the maintenance of our rolling stock assets. These assets are accommodated within the main depot building and the wheel lathe building. This plant and equipment include wheel lathes, washing equipment, a wheelset drop table, and scissor hoist.

Figure 68 shows an external and internal view of our EMU maintenance depot facility.

Figure 68: EMU maintenance depot facility

Condition

Our maintenance depot and wheel lathe building are in reasonable condition. Their size and the nature of the heavy maintenance activities that occur inside them mean they require constant ongoing maintenance to ensure they remain in a good condition.

[13] The SE & SW carriage maintenance facility are owned and maintained by KiwiRail, of which we have a licence to occupy.

Figure 69 shows the maintenance depot and buildings condition.

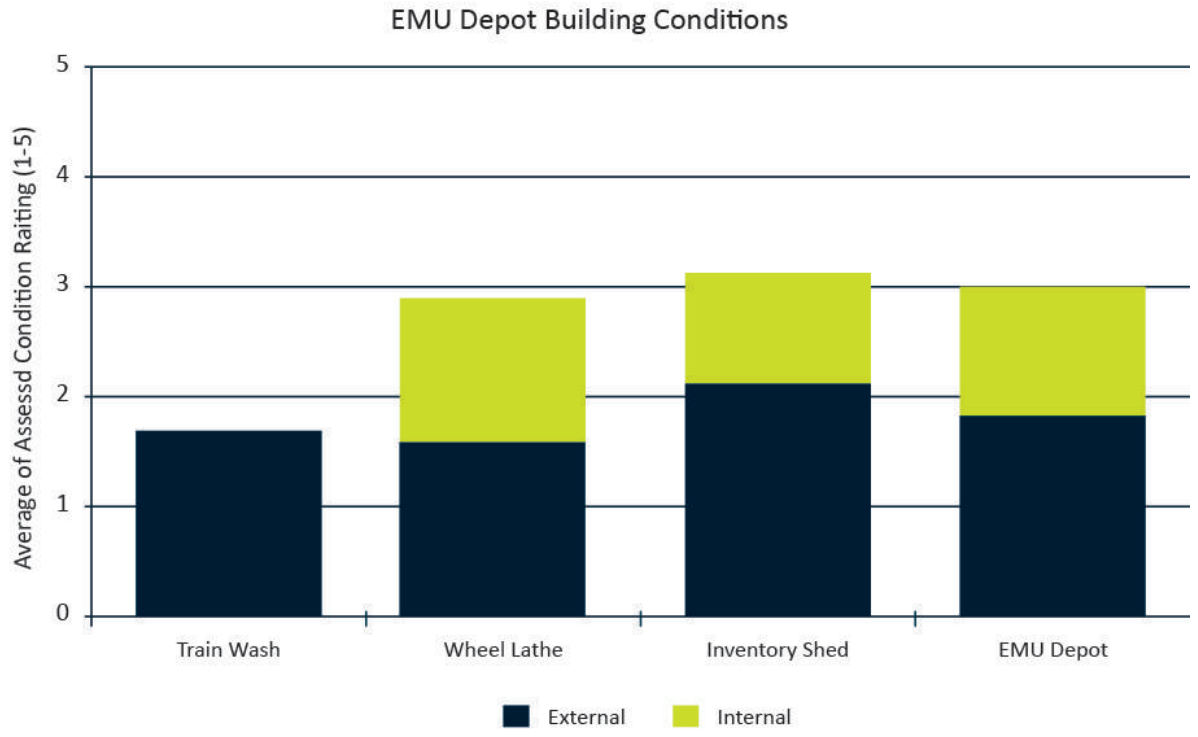


Figure 69:Maintenance depot and buildings condition

Maintain

We contract out the maintenance of the maintenance depot and wheel lathe buildings to our maintenance service provider. All maintenance conforms to agreed service standards outlined in the contract. Although most aspects of maintenance are planned, such as washing facility servicing, testing of gas heaters etc. there is an component of reactive maintenance.

The plant and equipment within the maintenance depots facilities are maintained by Transdev – Hyundai-Rotem to ensure that maintenance is timed to best suit their vehicle maintenance requirements.

Financial Expenditure

The financial expenditure for our Maintenance Depot assets is detailed in the Rail Station Infrastructure Asset Class Plan.

Bus and Ferry Overview

Our bus and ferry portfolio covers the assets we use for delivering our bus and ferry services within the Wellington region. These assets are detailed in the Bus and Ferry Infrastructure, Customer Information Assets, and Bus Fleet Management Asset Class Plans.

We have an extensive network of bus routes which we set and review on an ongoing basis. Our bus services enable people to move between many origins, including through connector services to train stations. Bus trips make up two-thirds of the Wellington region's public transport trips but only 40% of passenger kilometres.

The majority of the buses operating on our network are currently diesel powered; however, these will be progressively replaced with electric buses over the coming decade as we implement our strategic priorities of decarbonisation and climate change mitigation. An important focus for our operational and asset planning that will contribute to decarbonisation is how we work with operators and territorial authorities to ensure we have sufficiently resourced bus depots and bus layovers to service and accommodate an increasingly electrified fleet.

Since 2019, the majority of the buses on our network have been fitted with bike racks as we implement another strategic focus area of encouraging modeshift from private vehicle to public transport and active modes of transport. The use of bike racks is increasing.

Our ferry provides services between Days Bay, Seatoun, Queens Wharf, and to the Department of Conservation reserve on Matiu Somes Island. While our ferries have a small share of the total public transport trips in the region, they provide a valuable niche service for commuters and visitors. Deployment of the innovative new electric ferry, the first in the Southern Hemisphere, has enhanced the sustainability and customer experience of this service.

Our overarching objective is to provide high-quality, fit-for purpose bus and ferry stop infrastructure that retains existing customers and attracts new public transport users. We achieve this by:

- providing an accommodating environment to wait
- ensuring the stops and shelters are well designed for the vehicles using the stop
- the vehicle needs to stop where passengers expect it to stop relative to the flag, shelter, and road markings
- ensuring the stops and associated infrastructure are accessible, safe, and affordable
- placing the stops at destinations to encourage multimodal access and connectivity between our public transport network and the communities we serve

- ensuring that accessibility and safety is incorporated in the planning and provision of all our bus and ferry stop infrastructure.

Real time information (RTI) for our bus and ferry services is displayed on electronic displays across approximately 6% of our bus and ferry stops on our network. The majority of these RTI displays are within Wellington City. RTI can also be viewed online through our website, App, and third-party apps such as GoogleMaps. With our customers' increasing dependence on digital interactions to undertake day-to-day tasks and an increasing expectation that those interactions will be intuitive and helpful, our real-time customer information systems, website, and commuter App are an essential part of our strategy for retaining and growing public transport patronage. Our customers have come to expect accurate and responsive information to help them plan their public transport journey. Therefore, over recent years, we have implemented a step change in how we provide information on the network to our customers. We continue to improve our digital channels, wayfinding information, better, clearer signage at bus stops and stations, and a refreshed website and app.

Expenditure

The expenditure detailed in this AMP covers the operational, maintenance, and capital expenditure as detailed in our Bus and Ferry Infrastructure Asset Class Plan. The expenditure includes the asset infrastructure associated with the RTI 2.0 project, such as the RTI display screens but excludes the software related to RTI 2.0.

The Customer Information Assets and Bus Fleet Management Asset Class Plans are included in this AMP for completeness. The expenditure related to these assets are included in Greater Wellington's 2021-2031 LTP.

Key investments

The key investment drivers for our bus and ferry infrastructure are to improve customer experience and promote mode shift from private vehicle to our public transport network.

Our total opex for bus is $223m. The bus and ferry asset opex is forecast to remain steady over the planning period. The asset opex covers asset studies and investigations, signage changes due to timetable changes, cleaning costs, and maintenance costs. Our opex costs also include the costs to maintain and manage assets that form part of our network but are not owned by us.

Our total capex renewal and capex improvement is $63m.The core capex investments for our bus and ferry portfolio are:

Bus Shelter New & Replacement Programme: $43.4m of investment to renew and install new bus shelter facilities. Having a place to wait for a bus service that is safe and protects the customer from environmental factors is key to customer satisfaction. This continuous

programme of investment provides facilities that meet CPTED design and best practice for accessibility and encourages mode shift.

Porirua, Waikanae and Paraparumu Bus Hub improvements: $4.78m of investment to improve safety, security and accessibility. Public transport services in Porirua, Waikanae and Paraparaumu are key to a connected community and reducing congestion on the road network. There are thousands of customer movements through these hubs every day. Safety, security, and inclusive access upgrades are expected to significantly increase the overall customer experience and encourage modeshift. This initiative will actively address CPTED design and accessibility best practice to support our communities' safe use of public transport.

New CBD bus layover area including an area for EV charging: The capital cost of the new CBD layover including an area for EV charging is not included within the AMP. However, a $2m investigation has been incorporated into the LTP to develop options for consideration. Core layover and charging areas at Lambton Interchange in Wellington's CBD, are under pressure and will have insufficient layover capacity when EV charging infrastructure is installed. A proposal also exists to redevelop the current interchange area for other purposes; this will further reduce layover capacity on the CBD network. To continue to provide core services to the wider public transport network a new bus layover area with EV charging is required. We are investigating several options for suitable locations.

RTI 2.01 asset infrastructure: $4.9m of investment to replace the asset infrastructure associated with the RTI 2.0 project, such as the RTI display screens. Please note the software component of the RTI 2.0 expenditure is not included within this AMP.

Figure 70 shows our bus and ferry infrastructure asset opex, asset maintenance, capex renewal, and capex improvement expenditure over the planning period of this AMP.

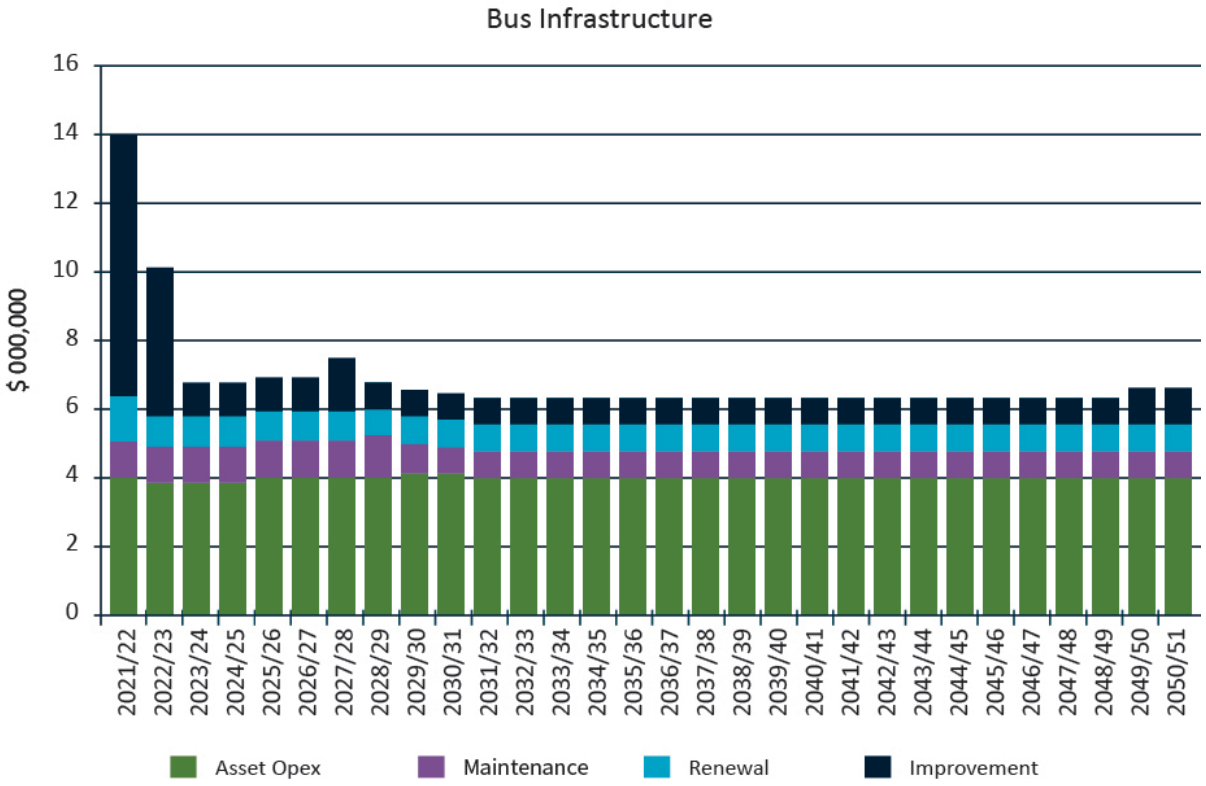


Figure 70: Bus and ferry infrastructure expenditure

Asset Class Plans

The following sections describe in more detail our asset management approach for our bus and ferry infrastructure assets. These are separated into three asset class plans:

1. Bus and Ferry Infrastructure
2. Bus Fleet Contract Management
3. Customer Information Assets

These asset class plans describe the strategy, asset characteristics, and management approach for these assets.

Bus and Ferry Infrastructure Asset Class Plan

This asset class plan describes our lifecycle management approach for our bus and ferry infrastructure assets. The assets and categorisations outlined in this asset class plan apply to the all the assets on our public transport network, irrespective whether we own them or whether they are owned by the local TA.

Our bus and ferry infrastructure assets consist of the asset types as shown in Table 26.

Table 26: Bus and ferry infrastructure assets

Item	Description
Bus shelters	Provides seating, shelter and hard standing area for passengers to wait for bus services.
Metlink and Metlink/RP5 Signs	Signs with unique stop number displayed. Current design incorporates stop number and RP5 into one sign.
RP5 Signs	Bus stop sign when traffic resolution parking restrictions are in place (combined Metlink/RP5 signage is included in the number above).
Poles	Allowing Metlink, RP5 signs, and timetable cases to be displayed.
Timetable display cases	Provides dry space for paper timetable to be displayed. Various sizes used.
Totems	Provides directional, route information and timetable information. Has more space for timetables than timetable display cases.
Wayfinding signs	Provide passengers with simple directions to public transport and other places of significance Typically located at major stops.
RTI displays	Electronic displays providing customers with real-time bus departure time information.
Seats	Separate seating that is not incorporated into a shelter or owned by the local authority (installed by exception).
Hub assets	Large shelter, incorporating network information, route information displayed, lighting, CCTV and high level of accessibility to buses

Below is a description of the assets that form this asset class.

Bus shelters

There are a variety of bus shelter designs on our public transport network. Our older bus shelters are constructed with different materials and layouts as historically each TA installed shelters to their own requirements and with local colours.

The variety of bus shelter designs and the manufacturers on our network are DesignBrand, CAM, Kiwi, HM, Metro, Concrete Bunker, and Wooden. Each of these are shown below from Figure 71 to Figure 78.

Figure 71: CAM bus shelter

Figure 72: HM bus shelter

Figure 73: Kiwi bus shelter

Figure 74: Metro bus shelter

Figure 75: Concrete and wood bus shelter

Figure 76: Concrete bus shelter

Figure 77: Wooden bus shelter

We now plan our new bus shelters to a standard modular design, which takes into account durability and quality elements, but also accessibility requirements such as wheelchair access and clearance around structures. This design provides a 'clean' overall appearance while minimising the scope for injury and vandalism. The design of these shelters incorporates Crime Prevention through Environmental Design (CPTED) standards. Standard installations are 3.6m x 1.2m, with larger and smaller shelters an option depending on site specific requirements and constraints.

New shelter installations typically have an artwork laminate on them to reduce vandalism.

Figure 78: Design Brand bus shelter with laminate

Lighting is provided at some shelters via solar lighting on a limited case by case basis. In some cases, we work with the TA to improve or adjust street lighting. New installations consider existing lighting when locating the shelter.

Signage

Our existing bus stop signs vary, as designs have developed over time. The current design of our signs combines both the Metlink sign information and the RP5 sign (see below) to maintain cost efficiency and avoid excess signage. Our new signs include the legal RP5 sign, which means traffic resolutions are required at all bus stops with this sign. Traffic resolutions are the responsibility of the TA and should be in place at all bus stops. However, there are a number of bus stops, particularly low category stops in the regions, which do not have a traffic resolution. Much of our signage is installed on utility company polls.

Table 27 shows and describes the various bus stop signs on our public transport network.

Table 27: Various bus stop signage design

	Combined Metlink/RP5 (Type D)	Metlink and RP5	Metlink Bus Stop Letter	Rail replacement	Metlink Logo	Route #
Example						
Description	Current standard for new sign installations	Alternative for new sign installations Typically used where the bus stop has time restrictions, such as school stops	Current standard at major stops and hubs where there is more than one stop grouped in one location Requires an RP5 to be installed separately	Current standard for new sign installations at stops where buses replace trains. A number of stops have older style signage.	Older signage no longer installed but meets requirements No new installations Will be phased out over time	Older signage that may have out of date route number information. No new installations Will be phased out over time
No. assets installed with an RP5	1661	43	18	5	750	43
No. assets installed without an RP5	N/A	28	5	43	17	85

In addition to the stops listed in Table 27 above, there are 196 stops with an RP5 but no Metlink signage, and 138 stops without any signage at all (most of these are hail & ride and/or school stops).

Totems and wayfinding signage

Timetable information on totems is expensive to replace when bus timetables are amended. This expense is considered when we plan or review totems.

Bus hubs

Our bus hubs are a collection of bus stops located close together that connect buses from outer suburbs with main routes. We own the bus hub assets. They are sheltered, well-lit spaces, making transferring between buses easy. Figure 79 is a picture of our Brooklyn bus hub.

Figure 79: Brooklyn bus hub

RTI displays

Our RTI displays are the electronic displays providing customers with real-time bus departure time information. RTI displays in the region vary from having three lines of information (the most common) to six, eight, or 18 lines. Additionally, a few key locations have LCD televisions displaying real time information. RTI displays have been in place since 2011 with coverage growing since then. They form a part of bus stop infrastructure at major stops. Customers can also access RTI via their smartphones through either the Metlink website or apps.

Bus stop assets owned by others

In addition to our bus stop assets, a number of assets that are required to operate a successful public transport bus service are not owned by us. These are:

1. **Road corridor.** The road corridor is where bus stop infrastructure is located, including the footpath, berms and road pavement. Allocating space within the road corridor for bus infrastructure is the responsibility of the road controlling authority. Depending on the road, this could be the TA or Waka Kotahi. They are also responsible for the painted bus stop markings. We recommend a 15m bus box and 9m entry and exit tapers.
2. **Privately owned verandas.** These provide shelter from the weather at 112 of our bus stops, meaning the bus stop does not require a Metlink bus shelter.
3. **Seating.** The TAs within our region own 991 seats for our passengers to await our bus services.
4. **Utility Poles.** Our signage is installed on 932 utility provider owned poles to reduce clutter.
5. **Adshel bus shelters.** There are 181 bus shelters on our bus network that are owned and maintained by Adshel NZ Ltd, under contract with the TA, to display advertising.
6. **Lambton Interchange.** Wellington City Council owns the Lambton Interchange. It is responsible for the maintenance and cleaning of the interchange, which is funded by Metlink.
7. **TA shelters.** WCC and Wairarapa TA's have retained ownership of the shelters they have installed, with WCC still adding to the network. Metlink undertakes to clean and maintain all shelters on the network
8. **Litter bins.** These are owned, managed, and maintained by the relevant TA.
9. **Driver facilities and toilets.** There is currently one dedicated permanent driver facility, which is located at the Lambton Quay interchange. An additional eight toilets across our public transport network are planned between 2020/21 and 2022/23. Currently two port-a-loos are provided for driver use.

Strategic objectives

Our overarching objective is to provide a high quality, fit-for-purpose bus and ferry stop infrastructure that attracts new public transport users. To achieve this, our key objectives are:

Customer Experience:

- provide a safe and comfortable environment to wait

- provide provision of shelter from weather at all Category 3[14] and above stops.

Mode shift

- ensure our bus stops are well designed and provide easy access to the bus and ferry for all our public transport users
- ensure our bus stops are placed at destinations to encourage multimodal access and connectivity between our public transport network and the communities we serve.

Decarbonisation

- ensure that environmental, sustainability and health outcomes are considered in the planning and provision of our bus and ferry stops.

Safety

- ensure that accessibility, safety, and security are incorporated in the planning and provision of all our bus and ferry stop infrastructure.

Asset characteristics - current state

Our bus stops are a place where our passengers embark and disembark. The simplicity of this process belies the complexity of the bus stop design details required to achieve an accessible, safe, and affordable bus stop. The key component to bus stop design is that the bus can reliably and consistently get close and parallel to the kerb, and stops where passengers expect it to stop relative to the flag, shelter, and road markings.

Asset Importance

We have over 3,000 bus stops on our network. To manage them easily, we define each bus stop as being in one of five categories. The five bus stop categories are based on importance to our public transport network and take into account the function and location of the bus stop. The function of the bus stop accounts for the importance of the bus stop within our network, including the number of trips servicing a bus stop and what connections that can be made. The location of the bus stop accounts for the proximity of the bus stop to places of employment, major destinations, local community facilities, and shops.

We have defined our bus stops categories as follows:

Category 1 – Premium stops

Category 1 bus stops are served by high frequency services and multiple routes. They must be used by more than 250 services per day and be within close proximity to a large number

[14] Our bus stop categories are defined in the Asset Importance section

of employment sources, businesses, shops and community facilities. Category 1 bus stops must have a large sheltered area with seating, large RTI sign, network map, lighting, totem sign for timetable display, painted bus box and tapers, bus stop traffic resolution, and a hard standing surface. We plan that Category 1 bus stops have CCTV. We currently have 29 Category 1 bus stops. The indicative cost to install a Category 1 bus stop is $106,000.

Figure 80 below is bus stop 5000 Courtenay Place, which is a Category 1 bus stop.

Figure 80: Category 1 bus stop

Category 2- Major stops

Category 2 bus stops are served by high frequency services and multiple routes. They must be used by more than 150 services per day and be within close proximity to a large number of employment sources, businesses, shops, and community facilities. Category 2 bus stops must have a sheltered area with seating, RTI sign, timetable and case, painted bus box and tapers, bus stop traffic resolution, hard standing surface, and Metlink bus stop sign. We plan that Category 2 bus stops have lighting, totem sign for timetable display, large RTI sign, and a network map. We currently have 68 Category 2 bus stops. The indicative cost to install a Category 2 bus stop is $69,000.

Figure 81 is an example of a Category 2 bus stop.

Figure 81: Category 2 bus stop

Category 3 – Standard Stops

These bus stops are served by high frequency bus routes and are often located in suburban areas, near local centres. It is planned that Category 3 bus stops have sheltered area with seating, timetable and case, painted bus box and tapers, bus stop traffic resolution, hard standing surface, and a Metlink bus stop sign. If appropriate for the location, lighting, and a RTI sign may be provided. The indicative cost to install a Category 3 bus stop is $25,000.00. We currently have 558 Category 3 bus stops.

Figure 82 is bus stop 8004 Jackson Street at Sydney Street.

Figure 82: Category 3 bus stop

Category 4 – Local Stops

Category 4 bus stops are served by standard bus routes and are often located in suburban areas. They tend to be low patronage suburban inbound stops. It is planned Category 4 bus stops have a timetable and case, painted bus box and tapers, bus stop traffic resolution, hard standing surface, and a Metlink bus stop sign. If appropriate for the location, Category 4 bus stops will have lighting and seating. We currently have 1,087 Category 4 bus stops. The indicative cost to install a Category 4 bus stop is $2,000.00.

Figure 83 is bus stop 3504 Helston Road at McMahon Way.

Figure 83: Category 4 bus stop

Category 5 – Minor Stops

Category 5 bus stops are used predominantly as set down only bus stops and can be located anywhere in the region. They tend to be outbound stops where people get off the bus and where they do not tend to get on the bus. It is planned that Category 5 bus stops must have a bus stop traffic resolution, hard standing surface, and a Metlink bus stop sign. If appropriate for the location, Category 5 bus stops will have painted bus box and tapers, lighting, and site specific timetable and case. We currently have 1243 Category 5 bus stops. The indicative cost to install a Category 5 bus stop is $2,000.00.

Figure 84 is bus stop 5351 Montgomery Avenue at Skyline Reserve, which is the second to last stop on the route.

Figure 84: Category 5 bus stop

A further bus stop type is for train replacement services, known as buses replacing trains (BRT). As these have a specific and limited purpose, they are not included within the current categorisation.

Summary

Table 28 summarises the assets required at each bus stop by category

Table 28: assets at each bus stop by category

Category	Assets Required
1	Category 2 assets plus: • Large shelter/covered area with seating • Large RTI sign • Network map • Lighting • Timetable incorporated into a totem
2	Category 3 assets plus: • RTI sign
3	Category 4 assets plus: • Shelter/covered area with seating
4	Category 5 assets plus: • Timetable and case • Painted bus box and tapers
5	• Bus stop traffic resolution • Hard standing surface • Metlink bus stop sign

The number of bus stops by category and TA is shown in Table 29 below.

Table 29: the number of bus stops by category by region

	Number of Bus Stops by Category						
TLA	**1**	**2**	**3**	**4**	**5**	**BRT**	**Total**
Wellington	26	45	262	563	421	**14**	**1331**
Lower Hutt	2	15	171	220	245	**11**	**664**
Upper Hutt	0	1	34	60	133	**4**	**232**
Porirua	0	6	47	120	152	**4**	**329**
Kapiti	0	1	14	143	131	**1**	**291**
Wairarapa	0	0	4	4	160	**5**	**173**
Total	**28**	**68**	**532**	**1110**	**1243**	**39**	**3020**

Driver facilities and toilets

We currently maintain a drivers' facility at the Lambton Quay interchange. Drivers' facilities incorporate a drivers' toilet and an area to take their prescribed breaks.

To carry out safety improvements and install charging equipment, bus layover space will be reduced at the Lambton Quay interchange in 2021. To replace the lost bus layover space, we have now leased bus layover space in Thorndon Quay. For the site to be fit for purpose for being a bus layover, we need to carry out improvement work at this new site, including the construction of a driver facility.

In addition to the planned driver facility, we plan to lease six driver-only toilets from Wellington City Council across the network and refurbish them to bring them to current code of compliance at an estimated cost of $1,000,000.00 over two years.

We plan to upgrade the bus hub at Porirua Station in 2021/22. As part of this, a dedicated driver toilet will be provided.

Quantity and life expectancy

The quantity and life expectancy of our bus stops assets are shown in Table 30.

Table 30: Shelter pop. and life expectancy

Asset	Quantity	Life expectancy (years)
Seating	87	20
Shelter – Design Brand	282	25
Shelter – CAM	84	20
Shelter – Kiwi	53	20
Shelter – Metro	47	20
Shelter – Concrete Bunker	99	45
Shelter – Wooden	95	45
Shelter – Concrete and Wood	24	45
Shelter – Heritage	6	45
Shelter – HM	50	20
Shelter – Concrete Block	11	45
Shelter - Metlink	37	20
Shelter – Metco	12	25
Shelter – Bespoke	2	20
Shelter – Other	13	
Combined Metlink/RP5	1661	7
Wayfinding Signs	39	3
Timetable and case	2719	10
Totem	54	7
RTI Display	199	10
Drivers Toilet Facilities	….	….
Drivers Toilet - Portaloo	….	….

Asset condition

Our bus and ferry stop assets have their condition assessed by our maintenance contractor during their regular cleaning and maintenance activities, which is outlined in our contract.

As the age and construction type of shelters varies greatly, shelters are assessed for replacement considering the shelter's characteristics, if it is fit-for- purpose according to CPTED, accessibility and category categorisation. For example, an older concrete shelter

may be in a good condition visually but could have poor accessibility or visibility to buses from inside the shelter. These features may qualify the shelter for renewal.

Figure 85 shows our bus shelters' fit for purpose by region as at April 2020.

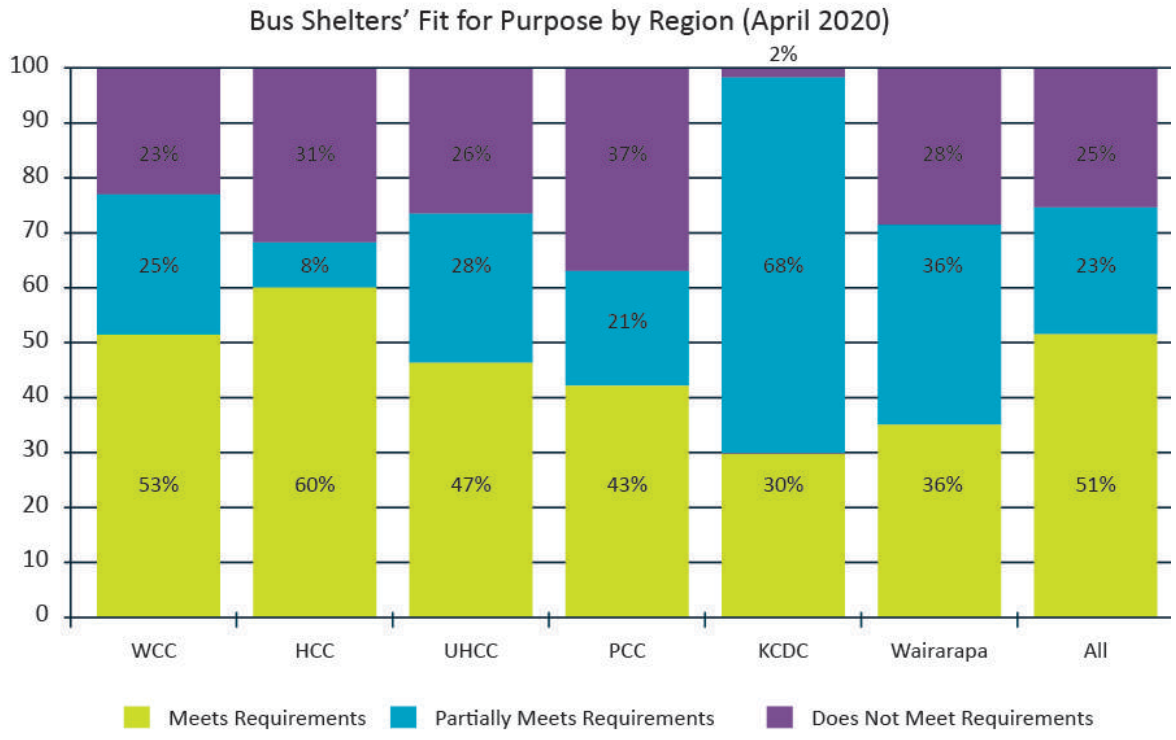


Figure 85: Bus shelters fit for purpose by region

We replace signage and timetable cases if the asset is damaged or unusable. The monthly quantity of signs replaced due to damage is approximately 5-10, depending on reporting and actual cases of damage. The signage asset's condition is recorded using the condition rating scale set out in Table 31.

Table 31: Condition rating scale

Rating	Condition	Description
1	**Very Good:** Only routine maintenance required	Sound physical condition, well maintained. Asset likely to perform adequately with routine maintenance for 10 years or more. No work required.
2	**Good:** Minor maintenance required	Generally sound physical condition, showing minor wear or deterioration, well maintained. Deterioration has no significant impact on asset performance. Only minor work required (if any).

3	**Moderate:** Moderate maintenance required	Acceptable physical condition, showing some wear or deterioration, well maintained. Some parts of the asset need replacement or repair, asset still functions safely at adequate level of service. Moderate work required.
4	**Poor:** Significant maintenance required	Poor physical condition, significant wear or deterioration, pars of the asset need replacement or repair. No immediate risk to health or safety, barely adequate level of service. Substantial work required short term.
5	**Very Poor:** Asset requires upgrading, replacement or written off	Failed or failure imminent. Immediate need to replace most or entire asset. Health and safety hazards exist or asset cannot be serviced without risk to personnel. Major work or replacement required.

Table 32 below shows that 97% of our bus and ferry signage assets have a condition rating of 3 or better and 3% of our bus and ferry assets have a condition rating of 4 or 5. These assets are programmed for replacement or refurbishment.

Table 32: Bus stop asset condition ratings

Condition Rating	1 - Very Good	2 - Good	3 - Moderate	4 - Poor	5 – Very poor	TOTAL
Metlink Sign	2025	456	147	0	0	2628
RP5 Sign	770	499	200	67	9	1545
Timetable and case	1049	1222	324	76	28	2699
Totem	26	14	0	0	0	40
% of assets	**53%**	**34%**	**10%**	**2%**	**1%**	

Asset risk

The main risks facing our bus and ferry stop assets are weather, geological hazards, environmental conditions, human-caused accidents, vandalism, capacity, and technological.

To mitigate these risks for our new bus and ferry stop installations, we carry out site specific assessments so that our planning takes into consideration location, orientation, and construction materials (including using specialist coatings to prevent permanent graffiti damage).

Our RTI displays rely on the continuous supply of electricity and telecommunications. If they are disrupted, they may also be interrupted.

As patronage increases in certain areas, our assets could no longer be fit for purpose.

Asset performance

If one of our bus stop assets fail, our bus service is likely to still operate but the level of service would diminish. Our bus stop assets have generally performed well.

Our planning takes into account the lifecycle of all components of our bus stop assets. This includes ensuring the laminates on our assets are replaced in accordance with the manufacturer's guidelines, particularly age-related guidelines. We have found that if our laminates are replaced after the recommended replacement age, it is more costly to remove these laminates as the adhesive hardens.

Asset information

Our condition information is reliable. Service providers routinely inspect all our bus stop assets. This information is recorded annually within our asset management information system.

Our asset capture includes information such as condition, cost of replacement, location, and updated photographs.

Lifecycle Maintenance and Activities

Our asset management lifecycle approach for our bus and ferry stop assets is discussed below.

Planning

We use our bus stop categorisation tool to identify and prioritise our bus and ferry stop improvements.

Deliver

Once we have identified our required work programme, we undertake consultation, and finalise the delivery requirements. This can be a lengthy process. Once finalised, we instruct our service providers to undertake the work, with the exception of road marking, which is undertaken by the relevant TA.

The timeframe for this process is generally 12 months.

Operate

We ensure our bus stop sites and assets are in a clean, sanitary, and tidy state and free from items such as gum, rubbish, posters, stickers, graffiti and any other undesirable material. All

individual components within a site or a bus stop asset will be cleaned, including the signs timetable holders, posts, bus shelters and bus stop footpath areas.

The standards and methods of cleaning are shown in Table 33 below.

Table 33: Bus and ferry stop cleaning requirements

Item	Requirements	Standard
Glass/plastic surfaces	All Unauthorised Materials will be removed using approved methods. All accessible surfaces will be fully cleaned. All glass surfaces and large plastic surfaces will be washed using water and detergent, hosed down and squeegeed.	Clear of Unauthorised Materials and streak free
Seating	All Unauthorised Materials will be removed using approved methods. Seating will be hosed down using hoses that are of pressure to fully clean the surface without damaging the surface and then dried.	Clear of Unauthorised Materials, no visible stains or dirt and dry.
Shelter roofing	All Unauthorised Materials will be removed using approved methods. Underside hosed down using hoses that are of pressure to fully clean the surface without damaging the surface. Topside to be cleaned of vegetation, lichen and other materials, all spouting to be cleared	Clear of Unauthorised Materials, no visible stains or dirt and dry.
RTI Displays	All Unauthorised Materials will be removed using approved methods. Washed down using a low pressure water device, delivery of the water is to be through a soft bristled cleaning brush to remove any	Clear of Unauthorised Materials, no visible stains or dirt, dry and streak free.

Item	Requirements	Standard
	dust and dirt together with any residue from the removal of Unauthorised Materials. Each display screen or totem must then be wiped with a dry cloth to remove any residue or streaking.	
Timetable holders	All Unauthorised Materials will be removed using approved methods. Each holder cleaned with a citrus based cleaner or other Materials approved by us.	Clear of Unauthorised Materials, no visible stains or dirt, dry and streak free. Paper timetables must remain dry.
Footpath	All footpath areas will be swept and debris removed. The pavements (include the floor areas inside the shelter) will then be hosed to remove stains (from dropped food, drinks etc.), ingrained dirt and any other Unauthorised Materials.	Surface maintained in as close to 'as new' condition as possible.

Maintain

We undertake routine maintenance which consists of planned and scheduled maintenance. We also undertake non-routine maintenance which consists of reactive maintenance and emergency work maintenance in response to issues noted by us, our service providers, the relevant TA, or the general public. Routine maintenance consists of:

- reattaching signs where band / brackets have broken or come undone
- replacing damaged RP5 and Metlink signs that cannot be reused or reattached
- replacing missing sign pole wedges
- replacing damaged poles and reattaching signs
- reattaching timetable holders
- replacing timetable inserts
- realigning poles that have rotated in the wind or due to vandalism

- removal of damaged Metlink signs that cannot be reattached
- straightening of bent poles
- minor repairs to seats, spouting, and timber walls.

The response times for reactive maintenance and emergency works is shown in Table 34.

Table 34: Reactive and emergency works specified timeframes for bus and ferry stop assets

Request for Service	Response
Issue reaches the threshold for Emergency Works and is outside the Wairarapa region.	Within 2 hours
Issue reaches the threshold for Emergency Works and is within the Wairarapa Region.	Within 4 hours
Smashed or broken glass that does not meet the threshold for Emergency Works	Make safe within 24 hours, unless we notify you otherwise.
Damaged and unsafe assets that do not meet the threshold for Emergency Works	Make safe within 24 hours and replace within 2 weeks, unless otherwise notified by us.
Damaged and safe assets	Inspect at weekly inspection and rectify within 2 weeks, unless otherwise notified by us.
Offensive graffiti	Remove and clean within 24 hours.
One off cleaning	As agreed with us.

Forecast expenditure

The key investment drivers for our bus and ferry infrastructure are to improve customer experience and promote mode shift from private vehicle to our public transport network.

Our total opex for bus is $223m. The bus and ferry asset opex is forecast to remain steady over the planning period. The asset opex covers asset studies and investigations, signage changes due to timetable changes, cleaning costs, and maintenance costs as well as asset management and maintenance costs associated with assets that are part of the Metlink network but are not directly owned by us.

The total capex renewal and capex improvement is $63m. The core capex investments for our bus and ferry portfolio are:

Bus Shelter New & Replacement Programme: $43.4m of investment to renew and install new bus shelter facilities. Having a place to wait for a bus service that is safe and protects the customer from environmental factors is key to customer satisfaction. This continuous programme of investment provides facilities that meet CPTED design and best practice for accessibility and encourages mode shift.

Porirua, Waikanae and Paraparumu Bus Hub improvements: $4.78m of investment to improve safety, security and accessibility. Public transport services in Porirua, Waikanae and Paraparaumu are key to a connected community and reducing congestion on the road network. There are thousands of customer movements through these hubs every day. Safety, security, and inclusive access upgrades are expected to significantly increase the overall customer experience and encourage modeshift. This initiative will actively address CPTED design and accessibility best practice to support our communities' safe use of public transport.

New CBD bus layover area including an area for EV charging: The capital cost of the new CBD layover including an area for EV charging is not included within the AMP. However, a $2m investigation has been incorporated into the LTP to develop options for consideration. Core layover and charging areas at the Lambton Interchange in Wellington's CBD are under pressure and will have insufficient layover capacity when EV charging infrastructure is installed. A proposal also exists to redevelop the current interchange area for other purposes, which will further reduce layover capacity on the CBD network. To continue to provide core services to the wider public transport network a new bus layover area with EV charging is required. We are investigating several locations.

RTI 2.01 asset infrastructure: $4.9m of investment to replace the asset infrastructure associated with the RTI 2.0 project, such as the RTI display screens. Please note the software component of the RTI 2.0 expenditure is not included within this AMP.

Figure 86 shows our bus and ferry infrastructure asset opex, asset maintenance, capex renewal and capex improvement expenditure over the planning period of this AMP.

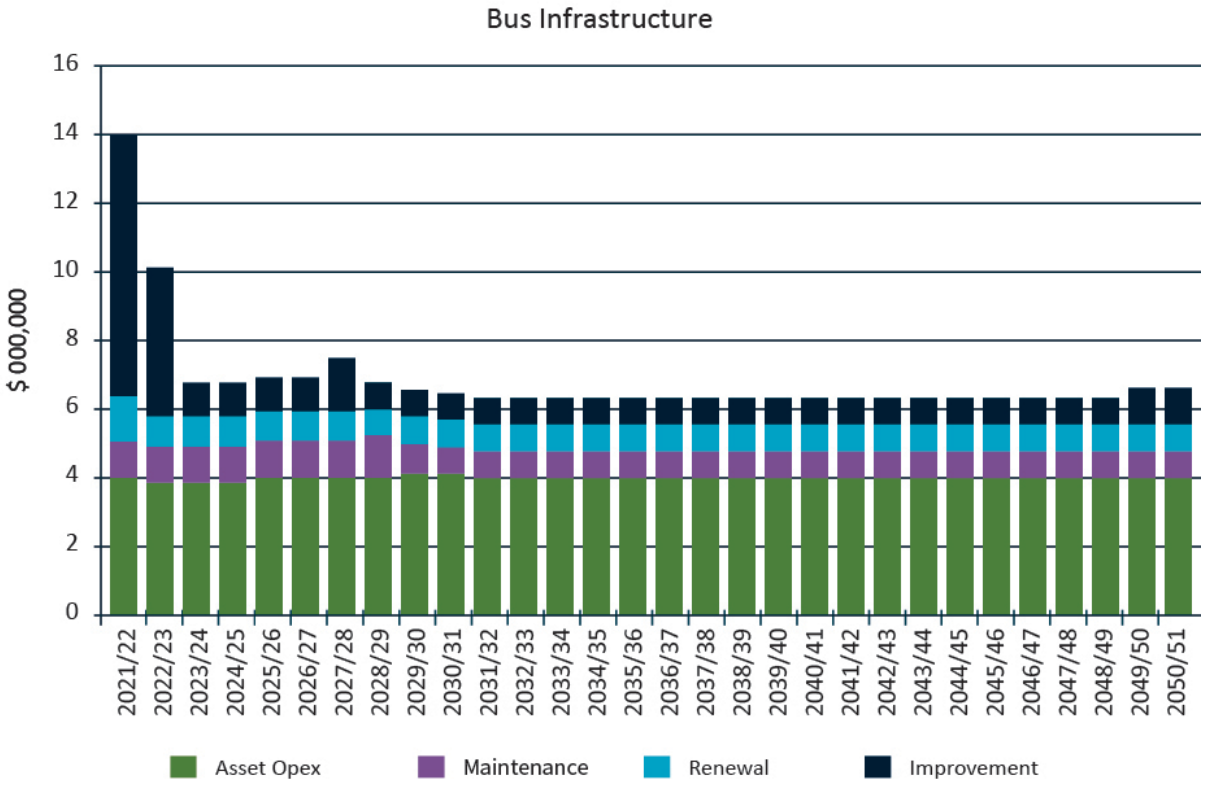


Figure 86: Bus and ferry infrastructure expenditure

Bus Fleet Contract Management Asset Class Plan

We have an extensive bus network that provides public transport within and around the cities and towns across our region. Our bus network also operates as a feeder to the rail network for journeys between centers. Whilst we do not own the bus fleet and a significant amount of the supporting fleet infrastructure, the bus fleet operating on our public transport network remains an integral component of our asset management planning and investment. This asset class plan describes our bus fleet management contract with our bus operators to ensure we deliver a safe, efficient, modern, comfortable, low emission bus fleet that provides a consistent and high-quality customer experience.

Bus services

Services are grouped into 'units' of routes, and operators bid to run units instead of individual routes. Our regional bus network is made up of 16 units.

In Wellington City, the units were designed to deliver a brand-new network of services. The new network gives more people access to frequent services, provides more weekend and later evening services for 15 suburbs, and new services for 11 suburbs. More cross-city routes (e.g. from Johnsonville to Island Bay and Karori to Seatoun), mean fewer services will begin or end in the CBD, resulting in less bus congestion and quicker journey times.

Our bus operators must ensure the buses that operate on our network comply with the Partnering Contract, which includes the Requirements for Urban Buses (RUB) and the Vehicle Quality Standards (VQS). As part of our contract with our bus operators, we monitor compliance.

Strategic objectives

Our overarching strategy is to build a safe, modern, comfortable, low emission bus fleet to meet rising population trends and demand for public transport.

Our key strategies for achieving this are:

- procure new electric vehicle (EV) buses to meet our strategic priority of decarbonising our public transport fleet by 2030
- ensure that the bus size requirements specified by the timetable can be met from our bus, so that no customer is left behind
- provide fit-for-purpose bus fleet compliant with contractual requirements to continually deliver a high-quality customer outcome
- ensure there are sufficient buses to keep up with patronage demand.

Bus contract overview

The contracting environment implemented through the PTOM that came into law in 2013 has enabled us to take a fresh approach to how services are delivered. PTOM focuses on

building commercially based partnering relationships with bus operators to improve services and grow patronage. The contracts offer incentives for bus operators to continually improve their performance, provide value for money services to customers, and grow patronage.

Operators are responsible for their own depots, buses and staff. Our contract lifespans are between 9 and 11 years with the majority of our current contracts reaching their initial terms in 2027. Any extension to the contract terms is at our discretion and must have the approval of Waka Kotahi. The operators do not have any right to an extension of terms. Within the contract there is agreement that we take ownership of some of the buses at the expiry of the contract. The contract details a mechanism which will be used to determine the price we will pay for these buses and also the maintenance plan that the bus operator must adhere to throughout the contract.

Our contracts also specify the requirements of bus operators. These include:

- the Peak Vehicle Requirement (PVR) of each bus size
- performance requirements and the features the buses must have as set out in the RUB and VQS
- specific exhaust emission requirements
- provision of an inventory of it buses, including spares, which make up its Metlink fleet
- maximum age of the bus
- the average age of the operator's fleet, including the spares fleet
- consultation and agreement on changes made to the fleet.

The contracts include key performance measures. Included within this are reliability and punctuality measures.

Asset characteristics - current state

The buses within our fleet comprise of various manufacturers, models, and size. The bus operator must ensure that the buses that operate on our network comply with the RUB and the VQS. All buses on our network are required to be available and be of the right size depending on the time of day it is operating (peak or non-peak).

Population

We currently have 458 buses in our active fleet, 10 of which are EVs making up two percent of our fleet. In June 2020, we have contracted for 98 new EV buses to be delivered between mid-2021 and early 2023. Of the 98 new buses, NZ Bus will source 67 large EV buses from China and Transurban will source 31 large EV buses from Kiwi Bus Builders in Tauranga. Seventy-three of the new EV buses will be used on current scheduled services with a further 25 to be progressively added to routes to meet future network growth.

The addition of EV busses to our network will take our fleet of EV buses to 108, significantly reducing our carbon footprint, and take Greater Wellington a step closer to its target of carbon neutrality by 2030. The new EV buses will retire 61 diesel buses, leading to a 17 per cent drop in carbon emissions and a similar reduction in harmful emissions.

Table 35 shows the breakdown of our bus fleet population by bus operator.

Table 35: Bus fleet population by bus operator

Bus Operator	Population
NZ Bus	160
Transurban	242
Uzabus	22
Mana	34
Total	458

Life expectancy

In accordance with the RUB, the maximum permitted vehicle age for an urban public transport bus is 20 years. In accordance with our contracts the maximum average age of an operator's bus fleet must not exceed 10 years and buses introduced to the fleet must be new buses.

Age profile

The age profile of our active bus fleet is comprised as follows:

- 276 near new buses (approximately 2 years old), mostly Euro 615 diesels with balance being Euro 5
- 10 new EV, (2-axle double deckers)
- 157 buses are from the previous fleet, with a minimum of Euro III of which 33 are approaching end of life.

Asset health

The majority of the buses within our fleet are in good condition. The majority of our buses are generally compliant with the RUB and VQS requirements, apart from a small number of outstanding VQS/RUB compliance issues which are being resolved. There are 51 buses in service which we defined as "interim buses" as they do not fully comply with VQS. These buses have been permitted to operate because at the commencement of the contracts in 2018, the bus operator was not able to bring into service the new buses that were required.

[15] The European emission standards define the acceptable limits for buses by engine energy output in g/kWh, with Euro 1 being the worst for emissions and Euro 6 being the best

The new buses that are to replace these interim buses are on order and will be delivered from 2021 through to early 2023. All these new buses will be electric.

Asset importance

Buses are fundamental to our public transport network. The network is designed around having a bus of a predetermined size (passenger loading capacity) operating on a route at a predetermined time that customers can rely on. Buses also have a range of design features (as defined by the RUB and VQS) that are important for the comfort and security of customers. The buses must comply with these features upon entering the fleet and consistently throughout their operating life.

Asset risk

The following describes the asset risks and their mitigations for our bus fleet. These risks manifest across the asset base to varying degrees.

Bus breaks down: The operator has approx. 10% more buses then the PVR of each bus size to allow for routine maintenance and breakdowns. We work with the operators to ensure that maintenance plans are appropriate & focused on preventative/predictive practices.

Bus is damaged in an accident: The operator has approx. 10% more buses then the PVR of each bus size to allow for routine maintenance and breakdowns. We track damage causes and ensure that roading infrastructure is not the cause.

Insufficient buses to meet future patronage demand growth: We are further developing our forward planning processes to identify the operator's future fleet requirements.

Buses that are operational in a fault condition. We track customer complaints and follow up on trends and individual cases.

Bus fleet performance

As part of the VQS we have a vehicle condition assessment programme in place. This programme identifies the items to be audited and provides a non-conformance scaling system to rate the performance and determine the corrective action timeline and actions must be taken.

A strategic driver for the management of our bus fleet is the planning activities associated with growth and decarbonization of our bus fleet.

Carbon Emissions

Bus travel emits far less CO_2 per passenger per km compared to other forms of non-electric transport, especially during peak times when buses are full. CO_2 emissions from the bus fleet contribute less than 1% of the regional total from all transport sources. Currently the biggest impact we can have on reducing regional CO_2 emissions is to get more people on

buses, even those that run on diesel. Encouraging people into active modes of transport, biking and walking, will also contribute to reducing regional emissions. Figure 87 illustrates the reduction in carbon emissions that result from a mode shift from private vehicle use to public transport use, even those public trust vehicles that are run on diesel. This reinforces to us the importance of continually investing in our network to ensure good customer experience as this will encourage mode shift from private vehicle to public transport. Mode shift to public transport is a significant contributor to reducing our carbon footprint.

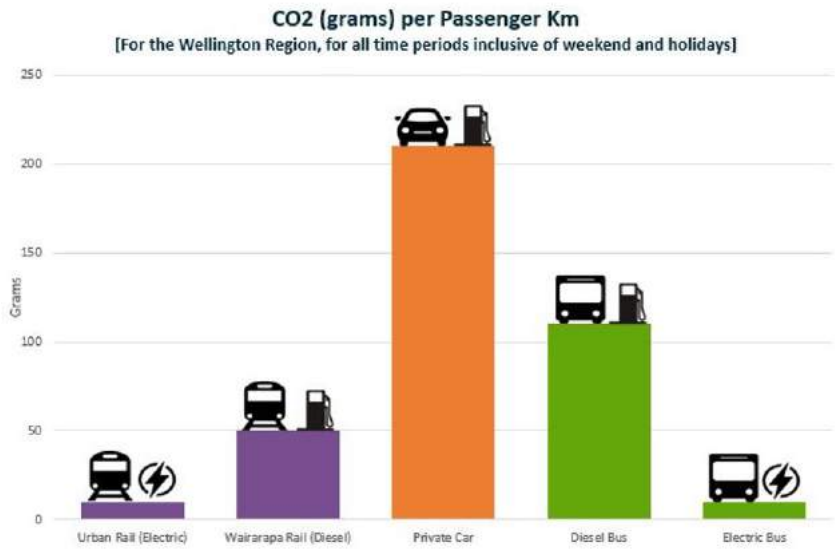


Figure 87: CO2 (grams) per passenger Km

We are on a pathway to provide a zero-carbon bus fleet for the Wellington region, with the ambition to be the first in New Zealand to have a fully electric bus fleet. We have collaborated with Victoria University and Emissions Impossible to develop new tools for understanding bus emissions. Through this we have been able to calculate the likely emissions for every bus and route. This modelling will assist us to ensure we can get the best carbon reduction through electrification. For example, buses which are only heavily used within peak times may not be our first priority; whereas buses used all day can produce more total carbon emissions. The impact of the investment in converting our bus fleet from to diesel to electric is shown in Figure 88.

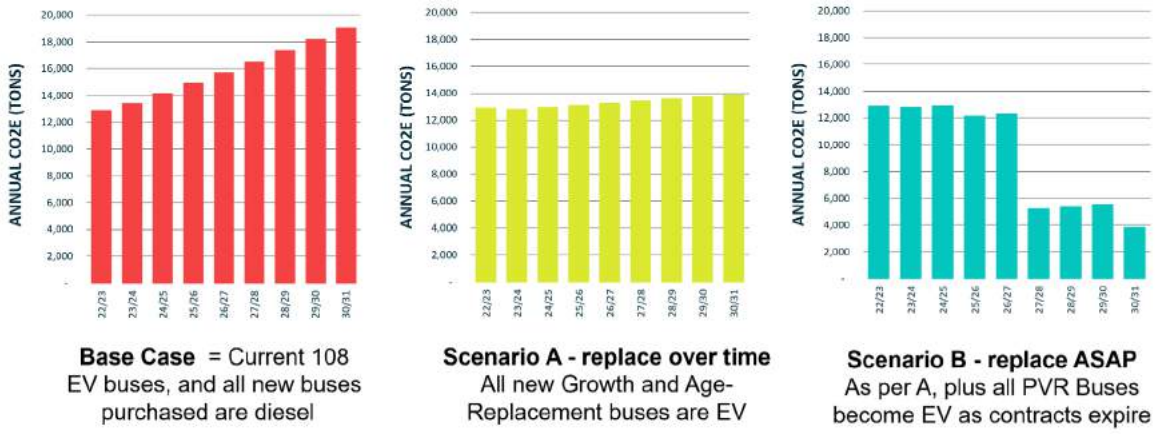


Figure 88: Annual carbon emissions (tons) by investment scenario

Scenario B is our preferred option, however Greater Wellington's LTP consultation process will confirm which option will be adopted.

Planning for growth and decarbonisation

Our plan is to reduce public transport emissions is by decarbonizing our public transport fleet by 2030. We have three opportunities for decarbonization, these are:

- purchasing new EV buses for growth capacity
- replacing end of life diesel buses with EV buses
- making zero emissions a requirement at renewal of contracts.

Our bus patronage is also growing. Prior to the Covid-19 pandemic, it was estimated that demand for travel on the Wellington City bus system during peak commuter periods would exceed capacity within the next five to ten years. Out patronage growth is based on population growth forecasts both within and outside Wellington City. Once we account for the impact of Covid-19, our forecasts show only a slight change, and patronage will exceed the capacity of our bus fleet. This means we need to increase the capacity of our bus network to ensure we continue to provide services at the level expected by our customers. Therefore, we have the opportunity, when considering additional buses for our network, to decarbonize our bus fleet.

Our challenge, when considering how to both supply the increase capacity and meet our decarbonisation goals, is how to address the constraints imposed by the unique geography in Wellington, characterised by very hilly, narrow roads, with a lot of on-street parking, which reduces a lot of suburban streets to single lane. To manage any capacity constraints before they impact our service levels, we typically require the highest capacity growth buses (i.e. 3 axel 100 passenger double decker buses) in areas where the patronage is growing. These high capacity, long multi axel buses are difficult to operate in the Wellington

environment. We also have capacity constraints and space constraints on the Wellington City network, particularly on the Golden Mile. These already impact on service reliability and journey times. Space constraints on the Golden Mile mean that only a limited number of buses can reliably run on this corridor (in the order of 60-100 buses per hour per direction). This make is difficult to add more buses without creating bus-on-bus gridlock, reliability issues, and safety issues for vulnerable users. Outside the Golden Mile, immediate capacity constraints relate more to the availability of high-capacity buses and route clearance to permit high-capacity buses. We already have 51 high-capacity growth buses in our fleet that are only needed at peak times.

To address both decarbonisation targets and capacity constraints, within the Wellington context we have, for the moment, compromised by buying a larger number of slightly smaller buses so that we can have more electric buses in our fleet. These new electric buses will replace 51 buses that are near the end of their life and are of the Euro 3 & 4 emissions rating. The addition of a higher volume of smaller buses to our network will require network design changes, increased service frequency, and more drivers for us to achieve the additional capacity required for growth.

To make a significant contribution to our decarbonisation targets, the EV buses will need to operate on high use routes. To achieve this, our operators will need to organise their depot and driver duties to make sure that the EV buses are used as desired.

Constraints and challenges when planning for EVs and EV infrastructure

As noted above there are a number of constraints and challenges we have addressed when planning for EVs on our network. These are:

1. **New skillsets are needed for an EV network that aren't required for a diesel bus network**. This includes understanding the requirements for development of depots and the utilization of the electric fleet. The strategic importance of depots and their placement, due to the cost and difficulty of setting up an EV depot compared to its diesel.
2. **Opportunity charging or depot charging**. Two axle double decker buses require opportunity charging. The design of larger EV buses do not facilitate the carrying of sufficient battery capacity to operate for a full day without charging. But the single deck electric buses can carry large enough battery packs to operate all day based on an overnight depot charge. Opportunity charging consists of an on-street fast-charging operation of bus batteries. A layover area at the end of some routes will be required to provide the space and time for opportunity charging. Our experience is that opportunity charging is harder to deploy than depot-based charging. Placement of the charger is tricky with the Wellington topography. It is also challenging to obtain buy in for placement of the charger from local residents. Additionally, the

range for our opportunity charged buses is currently 120km, which means that they cannot stray far from the route on which the charger is placed. As a result, network is more limited. The preferred option is buses that can be depot charged and operate all day on a single charge. These bus types are more flexible and, like the existing diesel fleet can be adapted to variations in network design.

3. **Capability of the electrical network.** Opportunity chargers need to be placed at the end of a route to allow sufficient time between trips for bus charging. Our current opportunity charger, is placed in an outlying area at the extremity of the electrical network. This posed some challenges with electrical capacity to the charger.

4. **Land constraints.** Land constraints are a real issue as we do not own any land with the bus network. With the additional EV buses, another opportunity charger will be installed at the Lambton bus interchange. We have had to redesign the interchange to fit the charger and allow the charging, resulting in a significant loss of layover space. We have also had to arrange, in a short space of time, additional land to be procured for layover and staging in a location that does not require us to re-design the timetable.

Customer Information Assets Asset Class Plan

This asset class plan provides a description of our customer information assets.

Our customer information assets are categorised into the following three areas:

- Real Time Information (RTI) system
- On-bus next-stop announcement system
- Metlink website and commuter app

These are described separately below.

The expenditure for our RTI displays are covered in our Bus and Ferry Infrastructure Asset Class Plan. The expenditure for our on-bus announcement system, website, and commuter App is not covered within this AMP. We have included the description and planning activities for these assets for completeness.

Description of our customer information assets

Our customer information assets covered in this asset class plan comprise the RTI system, the Bus Announcement system, and our website and commuter app. These are described below.

RTI System

RTI electronic displays provide our customers with real-time bus departure time information. Our current "Vix" RTI system was introduced in 2011. At that time, the RTI system was designed to provide on street real-time information to customers via digital signs at bus stops and railway stations. Our RTI displays vary from having three lines of information, which is the most common, to six, eight, or 18 lines. A few key locations have LCD televisions displaying real time information.

Our RTI system currently covers approximately 300 bus stop and railway station signs and tracking devices are installed on each of the buses in the fleet. It also includes the tracking software. Rail services are tracked through a KiwiRail system connected to their rail network management. This feeds data into our Vix RTI system for rail customer information.

Over time, we have adapted the RTI software to provide real time information through the Metlink website and App and data for Greater Wellington's operator performance management systems, which are required for managing operator contracts. Our online channels are a popular source of information for customers with 85% of customers using the website and 37% using the app. Mobile is increasingly becoming the most popular platform for use. Use of our customer information system continues to grow.

On-bus next-stop announcement system

The primary purpose of the on-bus next-stop announcement system is to provide information to people with visual and cognitive disabilities so they can confidently get off at their stop. As part of our Public Transport Transformation Programme and our commitment to the disability community, our bus announcement system with this functionality is a core component of our goal to provide a 'fully accessible' bus fleet. The system will also improve accessibility for passengers who are new or unfamiliar with a bus route.

We are in the process of evolving and extending the use of the on-bus next stop announcement system.

Under the PTOM partnering contracts vehicle quality standards (VQS), all new buses introduced since May 2018 have been required to include screens and speakers. These are owned by the bus operators and form part of each bus. This specification remains for all new buses entering the fleet (including the proposed 98 new electric buses due from mid-2021). Full region-wide implementation of the system (including the procurement, development, and region-wide deployment of the media players, software and interface) on our buses is ultimately required.

For example, the on-bus announcement system will provide audio-visual information along each bus route about the next bus stop, key interchanges, the current location of the bus, and network related information (such as public health messages and conditions of carriage).

With the advent of Covid-19, the system has also played a key role in promptly broadcasting important public information about safe bus travel or changes in service (for instance changes to physical distancing rules or payment methods).

Metlink Website and Commuter App

In 2016, we launched a website that combined all modes of public transport and included real-time information. This was followed by the launch of an App in 2017 specifically targeted at commuters. This change significantly improved customer engagement with our online channels to the point where our website is now the most popular channel for obtaining information (currently used by 85% of customers, and the App is used by 37%).

Our upgraded website and App provides useful information to customers and, with continual improvement, it will keep pace with customers' expectations of usability and accuracy. We seek to increase our reach and target patronage growth by continuing to invest in the provision of customer information through third-party, independent websites, and apps through provision of our open-source data and Application Programming Interfaces that allow easy integration of data and information. Independent travel

information websites and apps can also provide a higher level of specialisation and innovation.

The universal challenge of managing online channels is the need to keep pace with our customers' rapidly evolving expectations driven by their daily experience of using numerous online channels. For us, this means providing a user experience consistent with other public transport information providers such as Google Maps.

Strategic context

With the increasing dependence of customers on digital interactions to undertake day-to-day tasks and an increasing expectation that those interactions will be intuitive and helpful, our real-time customer information systems, website, and commuter App are an essential part of our strategy for retaining and growing public transport patronage. Our customers have come to expect accurate and responsive information to help them plan their public transport journey.

As well as influencing the accessibility and satisfaction of our public transport service with existing customers, insights from our customer segmentation survey also highlight the benefit of providing rich digital information to infrequent and new public transport customers to promote the value of public transport and encourage its adoption.

Expectations of accuracy and responsiveness have increased based on customers' experiences with other digital services. The expectations of our customers include:

- accurate real-time information with the ability to see where a vehicle is now and know when it will arrive
- comparisons between travel modes that allow an informed travel choice to be made:
    - The actual door-to-door cost for different travel modes such as public transport, driving (including fuel, wear-and-tear and parking), and on demand and traditional taxi services.
    - The actual time, including the influence of travel conditions for the journey, such as the weather, road works, planned disruptions, and road congestion
    - Connections with micro-mobility modes in journey planning.
- information about loading and comfort on public transport vehicles, such as whether seats are available on any given service.

The availability of travel information online is increasingly providing customers access to a wider range of travel choices. To be competitive with other modes of travel, we must start providing information that allows our customers to compare the benefits of different modes of travel.

A range of independent travel apps, such as Google Maps, have been using our data for some years to display our services as an option, comparing door to door travel times and costs, alongside other travel modes such as driving or catching an on-demand taxi service.

Strategic objectives

The overall objective for our customer information assets is to encourage mode shift to our public transport service through the provision of information to help customers plan their journey, and to meet our customer's evolving information needs and expectations by:

- providing more accurate real-time information through a system that is future-proofed to meet increasing demands for accuracy
- providing a greater range of information to allow customers to make a more informed choice about their travel
- providing robust open-source data and information through our customers' channel of choice, including third-party/independent travel websites and apps to increase the reach of public transport information and to access best practice digital innovation.
- ensuring our data and information can be easily integrated into future 'smart travel' and 'Mobility as a Service' platforms so our service is competitive in a digital travel market place.

Our key strategy for achieving these key objectives is:

- upgrading our current customer information systems to a more open and componentised architecture to improve accuracy of data, usability, and adaptability.

Asset Importance

Approximately 80% of our customers use public transport by choice rather than through necessity. The quality and reliability of our digital customer information assets is essential for positive brand reputation and for improving customer satisfaction. It is also a significant contributor to encouraging people to move from private vehicles to public transport. With the increasing dependence of customers on digital interactions to undertake day-to-day tasks and an increasing expectation that those interactions will be intuitive and helpful, our real-time customer information systems are an essential part of both regional and national strategies for retaining and growing public transport patronage.

The effective performance of our customer information assets includes the provision of information that can be used in specific applications that support accessibility, and the provision and storage of data to inform network design and performance improvements, including monitoring operator performance.

Asset and Service Performance

RTI

Our current RTI system is reaching the end of its life. It is failing to meet customer and business expectations of accuracy and reliability required for journey planning and contract management involved for the 40+ million annual public transport trips currently delivered. The provision of timely and accurate customer information is currently our most significant customer pain-point. There has been a notable decline in customer satisfaction with the current RTI system in recent years.

Replacement of the real-time information system for our customers and network operators will improve overall network accessibility and performance. It is one of our highest priorities.

On-bus next-stop announcement system

The assets associated with the On-bus next-stop announcement system are being scoped and deployed. As such there are no current performance measures for the On-Bus next stop announcement system.

Metlink Website and commuter App

As one of our primary touchpoints with our customers, the quality of the online experience has a significant influence on customer satisfaction, brand reputation, and cost to serve. The universal challenge of managing online channels is the need to keep pace with customers' rapidly evolving expectations of improving functionality which is driven by their daily experience of using numerous online channels. For us, this means providing a user experience on par with other public transport information providers such as Google Maps.

Since the launch of our website, we have received significant customer feedback on how our online channels could be improved. Since 2017, customer satisfaction with our information and online channels has declined significantly.

Therefore, we undertook a comprehensive usability review of our website. As a result, a programme of work has been completed that has upgraded the online experience for our customers. The programme of work has resulted in:

- an upgrade of the Metlink website and commuter App
- improved user experience for mobile consumers of the website
- improved notifications about cancelled bus services on homepage (including unplanned cancellations as well as planned)
- improved visibility/access to vehicle location function
- improved usability for people with disabilities
- improved quality of journey planning results
- increased frequency of RTI updates - smoothing of vehicle location function

Improvements to the usability and functionality of our website and commuter App has been an opportunity to:

- increase customer satisfaction with the delivery of Metlink information and overall perceptions of service delivery
- encourage the increased adoption of online information channels and move customers away from more expensive information channels, such as printed timetables
- reduce the cost of providing automatic notifications to customers.

Asset risk

Our customer information systems rely on the continuous supply of electricity and telecommunications. If they are disrupted, our information systems may also be interrupted.

Secure back-up and storage of data is also essential. If data storage is damaged or 'hacked', information systems may be disrupted.

Planning

Our planning ensures that our investment in customer information assets is targeted and prioritised to meet national and regional strategic priorities. Our planning for customer information assets covers is set out below.

The planned replacement of our current RTI system is an opportunity to make a step change in the quality of our current customer experience and to assist us to retain and grow public transport patronage.

Accurate RTI provided through the current system is also a key dependency for contract performance management and enabling good business intelligence. The current system provides data for measuring bus operator punctuality, reliability, and vehicle allocation. This information determines the level of payment given to our operators. Inaccuracies in the current data have made it difficult for us to set and administer robust and consistent performance standards with operators.

Replacement of the RTI system is required because:

1. As an asset, most components of the system (the software, signage and servers) are due for their planned replacement. The current contract with the, Vix Technology Systems, ended in 2019. An extension has been put in place for a further 3 years to allow for transition to a replacement system.
2. Digital information has become a key dependency in the public transport customer experience. The quality of information the current system provides no longer meets public transport customers' expectations of accuracy,

responsiveness and insight. An improvement to digital information is a key part of our strategy for retaining existing customers and growing patronage.

3. Real-time information has become a key dependency in managing operator performance and remuneration. The quality of information the current Vix system provides is reliable; however, the downstream systems we use are no longer fit-for- purpose, requiring us to use multiple data sources to measure performance. An improvement in real-time information will enable more precise and efficient performance and contract management for us and our operators.
4. The intelligence of digital technology has improved significantly since 2011. Replacement of the current RTI system is an opportunity to innovate and reduce ongoing costs as the network evolves and new modes of transport are potentially added to the Metlink service (such as MRT and on-demand travel). The creation of a more open real-time data environment will allow a broader range of uses for the data (such as improving the quality of data to third-party transit information providers and operators) and remove the current reliance on expensive proprietary hardware (such as on-street signs and tracking devices) provided under the current contract. We have launched an Open Data Portal which the website uses to pull data from our systems.

The outcomes of our investment will:

- deliver a new, more open RTI system that reduces the reliance on costly proprietary software, signage, and tracking devices, and can be easily implemented onto new modes of public transport.
- keep pace with customers' expectations of improved accuracy and responsiveness from real-time information – improving the customer experience – so we can retain and grow patronage.
- result in more robust and consistent performance measurement of operators to ensure transparency and equity for us and our operators.
- provide accurate open data, so Metlink is future proofed to participate in a digital market place for transit (Mobility as a Service), ensuring public transport can retain and grow patronage in a more competitive transit market.

For more information please contact Metlink:

Metlink
Greater Wellington
Regional Council
PO Box 11646
Wellington 6142

www.metlink.org.nz/
info@metlink.org.nz
Facebook
Twitter