Asset Class Management Plan

Pathways (footpaths and cycleways)

2020

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

Status of this document

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

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

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

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

Alignment with Auckland Council group strategic direction and transport planning requirements

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

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

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

Auckland Council Group Strategic Framework

(Transport view)

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

	What it's for	Who are the decision-makers: Auckland Council (Governing Body & Local Boards)	Joint Auckland Council and Central Government	Central Government
Aspirations for Tāmaki Makaurau	Setting out the community's aspirations for Auckland and its transport system	Auckland Plan		
Group Direction	Council-wide direction for all aspects of the transport system	Transport Policy Statement Other key documents	Auckland 30-year Transport Plan Rapid Transit Pathway	GPS on Land Transport
Decisions on investment & regulation	Investment decisions and agreed priorities for the transport system and funding shares.	Long Term Plan (and Annual Plan) Local board plans Auckland Unitary Plan Regulation policy and bylaws	Regional Land Transport Plan Develop: Auckland Regional Transport Committee Approve: Auckland Council	National Land Transport Plan

	What it's for	Who are the decision-makers: Auckland Council	AT CCO
Organisation Integration	How transport priorities and expectations will be delivered across the Council group through governance and organisational arrangements	**Group 3-year Plan** (Transport section) Auckland Roading Classification Framework	Developed with AT CCO * To be adopted alongside LTP2027-2037
Delivery	Plans for the networks, assets and interventions needed over the next decade	The Network Plan (Future Connect) The Parking and Kerbside Plan (Room to Move) The Regional Freight Transport Plan (Delivering the Goods) The Regional Public Transport Plan (RPTP) The Safety Plan (Vision Zero) The Transport Asset Management Plan The Regional General Traffic Plan The Regional Active Modes Plan	Developed with AT CCO *may be required
Operational guidance	Supporting plans and frameworks that guide implementation	• Asset class management plans • Accessibility Action Plan • Auckland Network Operation Plan • Waiheke Transport Plan • Park and Ride Framework • Roads and Streets Framework • Transport Equity Framework • Local board road safety plans • Safety infrastructure Framework • Comprehensive Parking Management Framework • Kerb Zone Management Framework • Car Share Framework	• City Centre Bus Plan • PT Safety Action Plan • Low Emission Bus Action Plan

Application within Auckland Council's shared governance model

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

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

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

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

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

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

Asset class management plan – pathways (footpaths and cycleways)

Auckland Transport
An Auckland Council Organisation

Pathways (footpaths and cycleways) asset class management plan

SharePoint link: Pathways ACMP

Status of document: Final draft

Published date: December 2020

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Auckland Transport
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Glossary

Acronym or term	Meaning
Berm	The area of a road reserve between the kerb or surface water channel and the adjoining property boundaries, excluding footpaths.
Cycleways (cycle paths)	Paths that are designed for use by cyclists. Note that a part of a road carriageway marked by painted lines or separated island and intended for use by cyclists is called 'cycle lane'
Footpaths	Paths that are designed for use by pedestrians.
LOS	Level of service: The defined service quality for a particular activity or service area, against which service performance may be measured. Service levels usually relate to quality, quantity, reliability, responsiveness, regulatory and environmental acceptability, and cost.
RAMM	Road assessment and maintenance management system: An asset management system for roads, developed as an asset inventory and treatment selection tool.
Shared paths	Paths designed for use by pedestrians and cyclists.
SOI	Statement of Intent: Auckland Transport's Statement of Intent sets out its strategic approach and priorities for the next 3 years, and how they contribute to the longer-term outcomes Auckland Council is seeking to achieve.
TDM	Transport Design Manual: It introduces consistent transport infrastructure standards for all of Auckland.
Vehicle crossing	An area designed for vehicles to cross the road channel and footpath.
Walkway	Path or passage for pedestrians, especially a raised one from the ground, connecting one road to another, or a path providing access to foot bridge, parking, shared spaces or public transport services.

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Executive summary

Pathways Purpose:

To provide accessible, safe and well-maintained networks to help make walking and cycling preferred transport choices for Aucklanders, as part of building a healthy, vibrant and equitable Auckland.

Walking and cycling have many benefits, including reduced carbon intensive car trips, especially for short journeys, and contributing to increased social connectivity and important health benefits.

Pathways are used not only by pedestrians and cyclists, but also users of mechanised aids, such as prams, walkers, bicycles, mobility scooters and wheelchairs.

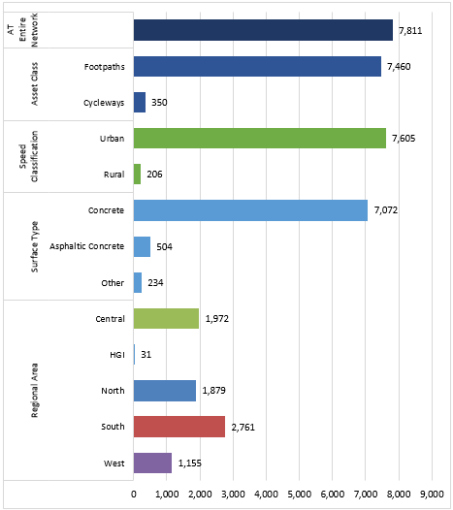
Key Levels of Service

In addition to those that apply to the road network, the following measures are specific to this asset class. Current performance for 2019/20 is also shown.

Asset Management key result area	Asset Management key service value	Performance/ service measure	Current	Target
Safe	Safer for pedestrians	Percentage satisfied with overall safety of walking in Auckland region	63%	TBD
	Safer for cyclists	Percentage satisfied with overall safety of cycling in Auckland region	21%	TBD
Effective	Customer satisfaction	Percentage satisfied with quality of footpaths in the Auckland region	55%	70%
		Percentage satisfied with quality of footpaths in their local area	55%	70%
	Condition	Percentage of footpaths in acceptable condition	99%	98%
		Percentage of footpaths in acceptable condition	98%	95%
	Responsiveness	Percentage of customer service requests relating to roads and footpaths which receive a response within specified timeframes	82%	85%
Efficient	Capacity	Daily active (cycle and walking) trips	497,778	TBD

Note: Moderate and above condition are considered 'acceptable' for pathways.

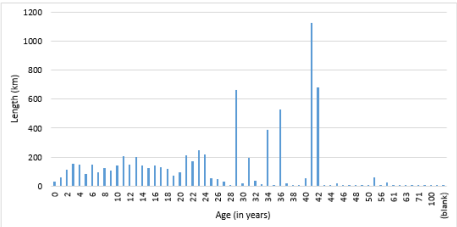
The Asset Portfolio – What we look after



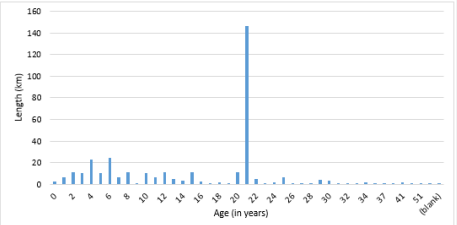
Pathway assets are a mixture of footpaths, pedestrian accessways, walkways, cycleways and shared paths.

They are grouped by their primary functions as footpaths and cycleways, as well as by material and location in the city.

Asset Age and Life - Footpaths



Asset Age and Life - Cycleways



Pathways' average expected lives are between 25 and 50 years depending on material type. Age data is reasonable for assets less than 20-25 years old, with gaps for older assets where assumptions have been made in the ACMP.

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Footpaths are classified Class A to D depending on their location (e.g. CBD, character areas, residential, industrial, etc.).

Cycleways are classified by a 3-level network hierarchy – metro, connector, and feeder functions.

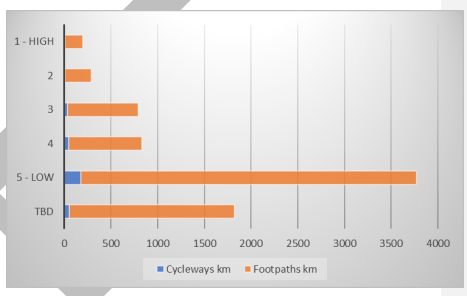
Vehicle crossings and culverts under them, while maintained by property owners, are considered in Auckland Transport work programmes.

Asset Valuation

Service potential (economic) consumption of the portfolio is around 38%, with annual depreciation of $23.9 million.

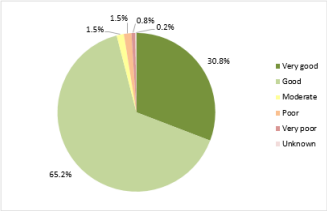
Asset	ORC $m	ODRC $m	AD $m
Cycleways	$57.8	$35.2	$1.4
Footpaths	$1233.8	$770.5	$22.5
TOTAL	**$1291.6**	**$805.6**	**$23.9**

Critical Assets



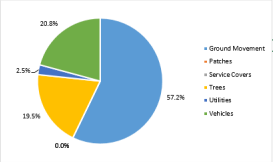
CONDITION AND PERFORMANCE

Footpaths Condition



Footpaths and cycleways are rated for both condition and aesthetics on a 1-5 scale, with aesthetics addressing consistency in colour, texture, quality and surface type.

Most assets are in good or very good condition with only 2.5% in poor or very poor condition. However, there are deterioration issues with aged paths in the CBD and town centres.



Pathway deterioration is mostly related to ground movement, potholes and vehicle damage.

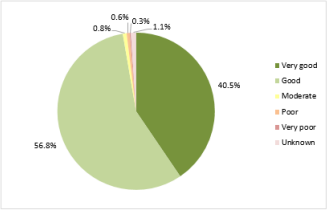
Performance Issues

Concerns relating to footpaths include:

- steep gradients or narrow widths
- lifted paths due to ground movement and tree roots
- slip resistance of old pavers

Historically, footpaths were built to different specifications across the region so visual appearance is inconsistent.

Cycleways Condition



Most cycleways are in good or very good condition with only 2% in poor or very poor condition.

However, in some older locations skid resistance is low due to inadequate maintenance or material type.

Markings on shared paths and cycleways wear out quickly with coloured materials washed into waterways during rainfall.

Performance Issues

Cycle facilities are gaining in popularity with increasing numbers of cyclists causing conflict with pedestrians in locations sharing the same space.

Historically, cycle facilities were built to different design standards or to minimum Austroads standards rather than regional standards. There are inconsistencies across the network and some poor layouts.

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Pathways (footpaths and cycleways) asset class management plan

MANAGING OUR RISKS

Asset Integrity	Natural Hazards	Safety
Risks relating to physical state, design standards, construction quality, e.g.: • Condition failure	Risks arising from exposure to natural hazards and vulnerability of assets, e.g.: • Storm damage, slips, erosion, etc.	Safety issues arising from the utilisation of assets, e.g.: • Trip hazards, too steep

Financial Risk Exposure

Criticality Level	Asset Condition																							
	Failed		Very Poor		Poor		Average		Good		Very Good		Failed		Very Poor		Poor		Average		Good		Very Good	
	(ind. depreciation)		CLC	GP	CLC	GP	CLC	GP	CLC	GP	CLC	GP	CLC	GP	CLC	GP	CLC	GP	CLC	GP	CLC	GP	CLC	GP
Low	0.10%	0.01	0.00%	0.0	0.00%	0.0	0.00%	0.0	0.00%	0.0	0.00%	0.0	0.00%	0.0	0.00%	0.0	0.00%	0.0	0.00%	0.0	0.00%	0.0	0.00%	0.0
Medium	0.01%	0.1	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0
High	0.10%	1.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0
Very High	1.00%	10.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0
Extreme	10.00%	100.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0
Total		2,000.1	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0

This risk exposure matrix shows total numbers and proportions of pathways assets by condition and criticality. Only around 3% are in the "red zone" – these pose more significant consequences to AT's customers should they fail and become unavailable for use, so are a priority for mitigation.

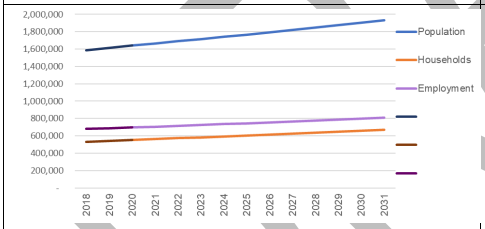
"High" asset risks specific to pathways networks, along with the mitigation plans to treat those risks, are shown in the adjoining figure. These tend to be safety related, with asset integrity and natural hazard risks being less significant.

Risk Mitigation

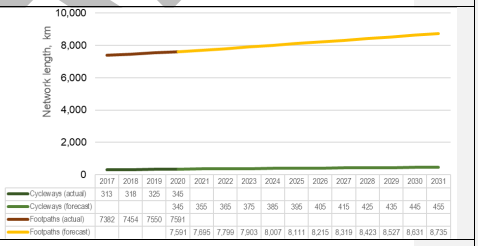
Risk category	Risk detail	Net Risk Factor	Mitigation controls
Safety	Serious injury and fatal accidents involving cyclists and pedestrian conflicting with vehicles on road, on pathways and shared spaces	High	1. Provide safe crossing points for pedestrians and cyclists 2. Provide dedicated or protected cycleways where possible 3. Provide users safety education through campaigns, warning and notices 4. Manage vehicle speed 5. Undertake safety audits to identify high risks area and implement safety improvements
Safety/ Asset integrity	Injury to pathway users from trips and slips caused by inadequate quality or poor condition of pathways	High	1. Investigate the slip resistance of footpaths and shared paths 2. Review specifications of pathway standards 3. Ensure effective maintenance and renewal interventions 4. Identify improvements and prioritise the required actions
Safety	Injury to path users, leading to Auckland Transport liability, due to inappropriate commercial use of path spaces, such as cranes, verandas, awnings, café furniture, hanging private planters and signs; or illegal parked vehicles	High	1. Enforce policies and bylaws for inappropriate use of footpaths and berms 2. Respond public complaints through call centres
Safety	Steep pathways creating hazards for people using wheelchairs and mobility aids	High	1. Review typography of land surfaces (esp. North Shore area, West area) when designing pathways 2. Implement engineering solutions to suit all types of users

GROWTH AND DEMAND

Population Growth



Network Growth



	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Cycleways (actual)	313	318	325	345											
Cycleways (forecast)				345	355	365	375	385	395	405	415	425	435	445	455
Footpaths (actual)	7382	7454	7550	7591											
Footpaths (forecast)				7,591	7,695	7,799	7,903	8,007	8,111	8,215	8,319	8,423	8,527	8,631	8,735

General Network Impacts – *how each growth factor is expected to affect the network as a whole*

Increased use of pathways assets as more people live in the city and make use of them for their journeys	A longer road network that will be accompanied by enlarged networks of footpaths and cycleways

Implications for the Assets – *how each growth factor is expected to affect this portfolio of assets*

Additional pathway assets, both through subdivision vesting and new asset development programmes such as the Urban Cycle Programme and local Community Board programmes. These will result in increased consequential operations, maintenance and long-term renewal obligations for AT. Expectations for higher levels of service focusing on safety and quality to accommodate better walking and cycling experiences.	Consequential operations, maintenance and renewal requirements in managing larger networks in the future. Increasing expectations for the safe integration of walking and cycling as preferred transport modes. Safe, attractive and well-connected footpath and cycleway networks within the transport corridor.

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LIFECYCLE STRATEGIES,

How we Manage the Asset – Objectives:

- ***Serviceability*** – focussed on safety, condition, reliability and customer requirements to meet the needs of different transport modes and users
- ***Prudent risk management*** – safer roads that are free from potential hazards and obstructions with critical routes always available
- ***Perpetuity of assets*** – addressing inter-generational loss of service potential due to asset deterioration through appropriate operational, maintenance and renewal activities
- ***Value-for-money*** – optimising and prioritising investments to achieve best whole-of-life costs, while meeting agreed levels of service

Strategies we use:

- ***Using competent and capable people*** – asset engineers, contractors and customer services staff with specified roles and responsibilities, suitable skills and experience to deliver our services
- ***Establishing asset management systems*** – processes, information management systems, governance and management structures
- ***Optimising service delivery mechanisms*** – outsourcing service delivery contracts, using competitive bidding in the open market and industry accepted procurement processes, to effectively and efficiently deliver our programmes
- ***Developing lifecycle management plans***

Operational Activities

- Regular asset inspections and monitoring – identify defects and risks
- Cleaning and clearing – obstructions and hazards
- Berm mowing – by exception
- Customer service and emergency response activities – to unexpected events and incidents

Business as usual PLUS consequential operations

Maintenance Activities

- Routine maintenance – e.g. weekly activities, keep safe
- Planned maintenance – e.g. faults, defects, utility repairs
- Unplanned maintenance – e.g. CRM reported damage
- Emergency work – ensuring health and safety in response to unexpected events

Business as usual PLUS consequential maintenance

Renewals Activities

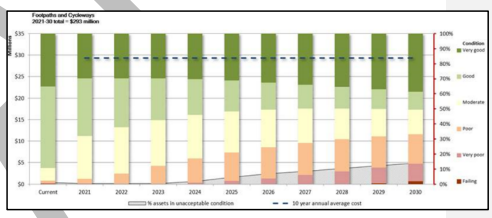
- Footpath renewals – typically programmed based on condition and integration with other road renewal works
- Cycleway renewals – as above

Renewals Drivers

- Assets in poor or very poor condition
- Assets of very poor aesthetic value
- Slip resistance issues
- Road renewals or improvement projects

The proposed renewals programme is expected to increase the number of assets in very good condition over the next 10 years, but ROM modelling projects an increase in poor or very poor condition pathways as well.

Replacement material types are defined in the Footpaths AM Strategy as shown.



Footpath class	Recommended surface finishes for renewal
Class A	Exposed aggregate concrete with black oxide
Class B	Like with like
Class C	Broom finished plain concrete with black oxide
Class D	Broom finished plain concrete with black oxide

Asset Improvement Activities

Corridor improvement programme, which responds to the following key areas:

- safety
- congestion
- freight
- accessibility
- environment
- growth
- value for money

There is expected to be significant forward investment in helping support Auckland achieve its goal of creating an accessible, well-connected, safe and sustainable region. Investment in walking and cycling facilities will be supported by the provision of more shared spaces, amenity improvements, cycleways and footpaths, better network connections, end-of-journey facilities, more and improved pedestrian crossings, signal phasing that prioritises pedestrians, and safer traffic speeds.

The street environment in Auckland's CBD is being continually improved to create a world-class city centre for people. This includes shared spaces, more and improved pedestrian crossings, signal phasing that prioritises pedestrians, and high-quality paving and seating facilities.

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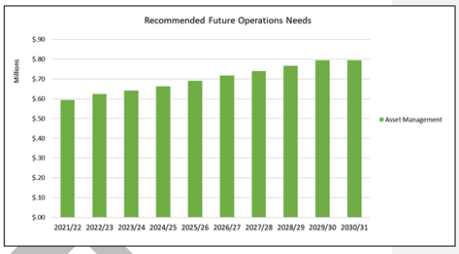
FINANCIAL PROGRAMMES

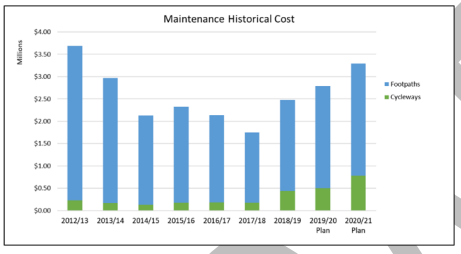
Historical Costs

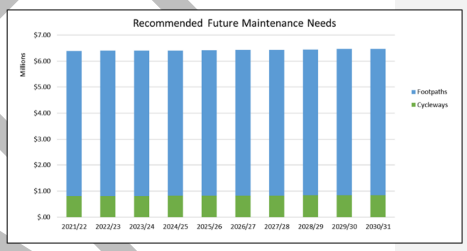
Proposed Programmes

Operations

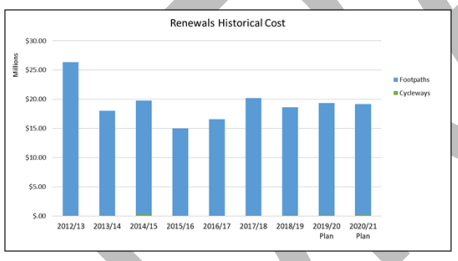


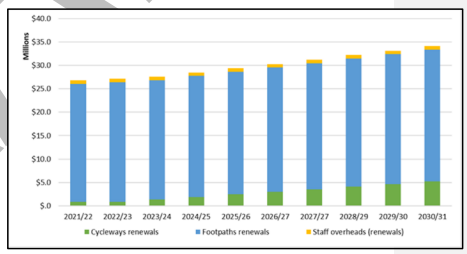
Maintenance





Renewals





Capital Improvements

Programme	Description	Programme timeline
New footpath regional programme	Construct new and widened footpaths	2018/19 – 2027/28
Urban cycleways programme	Complete the current urban cycleways programme	2018/19 – 2020/21
Walking and cycling programme	Focus on achieving maximum impact for short trips to the city centre, public transit interchanges, schools and metropolitan centres	2019/20 – 2027/28

Vested asset	2016	2017	2018	2019 – 2028 (average)
Footpath (km)	110.0	113.4	51.6	91.8

IMPROVING OUR PRACTICES

Key result area	Actions	Asset management plan section	Priority	Status
Finance	Renewals expenditure: Review and if necessary reallocate funds to cycleway renewals as it appears that expenditure is not sufficient to meet the needs of the network.	Renewals	High	Yet to start
Finance	Long-term planning: Prioritise investment for a regional approach for connecting the cycle network. Actively promote use of cycleways as a transport alternative	New works, LOS	Medium	Started
Finance	Allocate dedicated budget for pedestrian accessways so these assets can be managed proactively.	LOS, O&M, Renewals	High	Yet to start
Finance	Clarify capital threshold between OPEX and renewals and provide specific renewals forward works programmes (RFWP).	O&M, Renewals	High	Started
Finance	Allocate maintenance and renewal budgets separately for footpaths and cycleway or better management of both asset groups.	Renewals, LOS	Medium	Started
Finance	Review design standards and understand the consequential OPEX of new and vested assets	Current status, O&M, Key issues	High	In progress
Service Delivery/ Asset Management	Ownership: Clarify and confirm ownership, management and funding responsibilities for off-road cycleways through parks and recreational areas that may not be part of the transport network	Current status, O&M, Renewals	Medium	Started
Service Delivery/ Asset Management	Asset data: Collect and captured into RAMM the region's cycleways and cycling facilities asset data in terms of quantity, condition, performance and age of the cycle network	Current status, Key issues, LOS, O&M, Renewals	High	In progress
Service Delivery/ Asset Management	Develop a regional condition rating specification and undertake condition assessment regionally in a consistent manner.	Current status	High	In progress
Service Delivery/ Asset Management	Develop a complete asset inventory regionally for pedestrian accessways and record correctly in RAMM.	Current status	High	In progress

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1 About this plan

This Asset Class Management Plan (ACMP) explains how Auckland Transport will manage Auckland's pathways assets over the coming three years.

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

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

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

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

1.1 How this plan fits in our asset management framework

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

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

There are two levels of plans:

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

Figure 1-1 shows how this ACMP fits into Auckland Transport's overall asset management framework.

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Pathways (footpaths and cycleways) asset class management plan

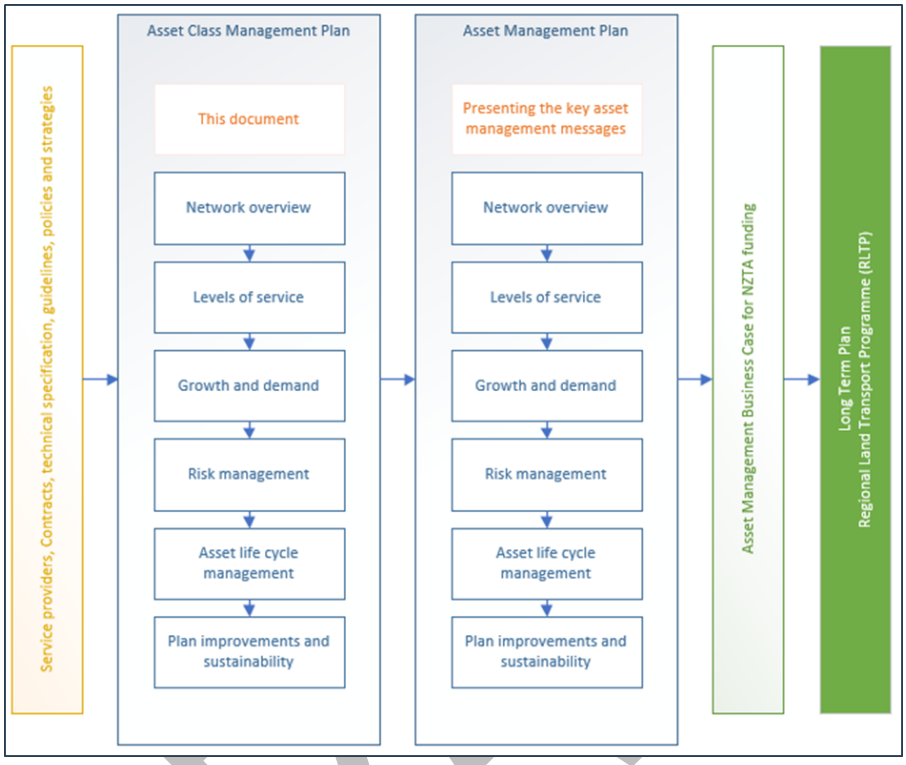

Figure 1-1: Auckland Transport's asset management framework

1.2 Relationship to regional and national plans

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

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

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

Pathways (footpaths and cycleways) asset class management plan

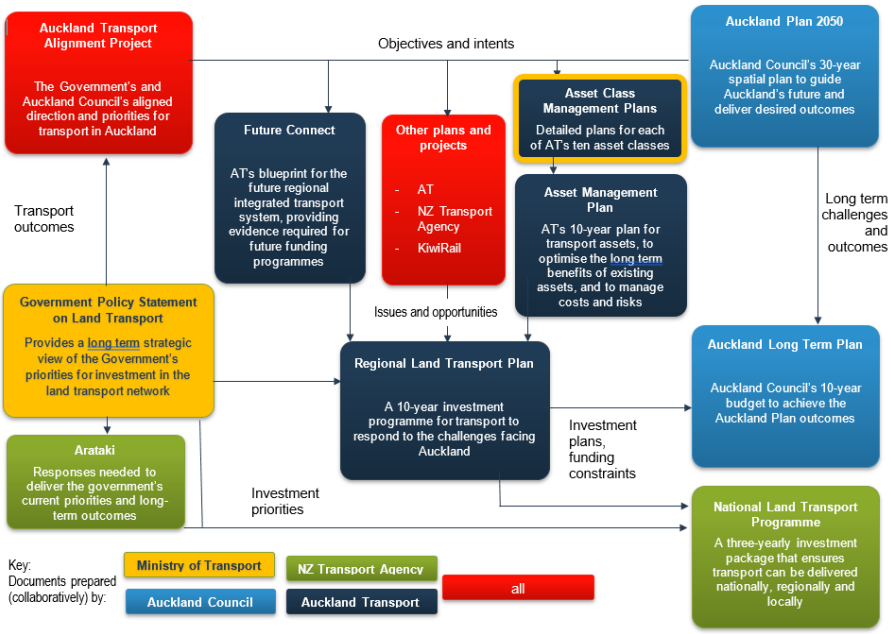

Figure 1-2: National and regional transport asset management planning documents

Source: Asset management team (to be updated)

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1.3 The importance of pathways assets

A key focus of the Auckland Council's Auckland Plan 2050 is to make walking, cycling and public transport preferred transport choices for Aucklanders, as part of building a healthy, vibrant and equitable Auckland. The plan focuses on people and promotes high-quality shared spaces that encourage walking and cycling.

Providing quality pathways encourages people to walk or cycle rather than using their private vehicles. Walking and cycling has many benefits, including reducing carbon intensive car trips, especially for short journeys, and contributing to increased social connectivity and important health benefits.

Footpaths provide the space for pedestrians to walk or jog on to their destinations, while cycleways provide a core network for cyclists within the wider transport network. Footpaths and cycleways form vital links to employment, education, town centres, and public transport interchanges. They are used not only by pedestrians and cyclists, but also users of mechanised aids, such as prams, walkers, bicycles, mobility scooters and wheelchairs.

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2 Assets covered by this plan

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

We also consider the data we need to collect to be able to manage these assets effectively, and describe how that data is collected through inspections.

2.1 Numbers and classes of assets

Auckland Transport is responsible for managing 7,376km of footpath assets and 338km of cycleway assets in the Auckland region. Together, these assets make up the pathways network covered by this ACMP,

The pathways network consists of:

- footpaths, pedestrian accessways and walkways – including dedicated paths designed for pedestrian use
- cycleways and shared paths – including dedicated off-road cycleways, and shared paths used by both pedestrians and cyclists. Most of Auckland's cycleways are shared with pedestrians.

Note that cycle lanes on the road carriageway are not included as pathways assets. See section 2.1.1 for details of how they are managed.

Figure 2-1 provides an overview of the pathways network.

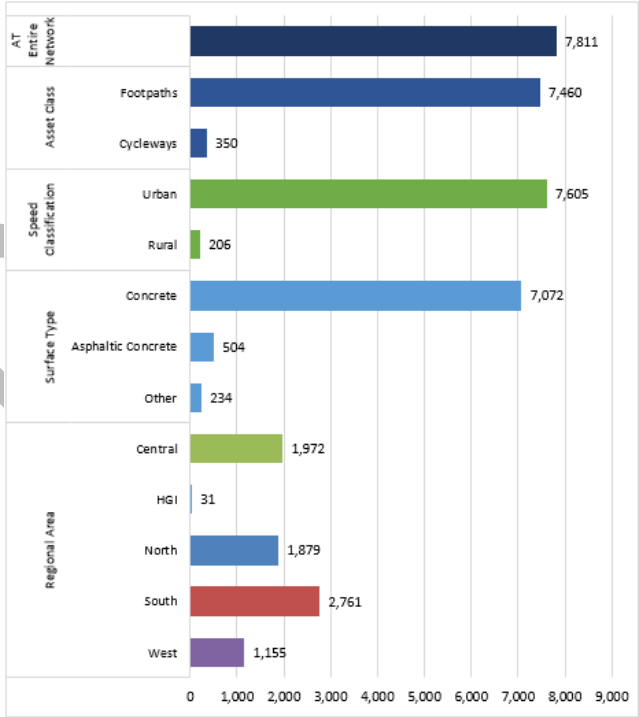

Figure 2-1: Auckland's pathways network overview (in kilometres)

Source: Auckland Transport RAMM database (March 2021)

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Figure 2-1 shows that:

- the majority (99 per cent) of the pathways network is located in urban areas
- the most common surfacing material for footpaths and cycleways is concrete, with other surfacing materials including asphalt, interlocking blocks, tiles, special pavers, timber, crushed rock and metal
- the southern asset management area has the greatest length of pathways assets. See Appendix A for more details of the network length by the asset management area.

2.1.1 Management of other cycling and walking assets

Cyclists also use the general road carriageway, which they share with other vehicle users. This includes protected cycle lanes which although part of the carriageway, involve some form of physical separation from motor vehicles. Cyclists are also encouraged to use quiet routes, and those with traffic calming treatments designed to create safer and quieter streets.

Cycle lanes on the road carriageway, and other shared spaces with vehicles are covered under the Pavement ACMP.

Cycle facilities, such as bike parking racks and bike repair stations, and pedestrian bridges are covered in the Bridges, Walls and Structures ACMP.

It should be noted that Auckland Transport is responsible for managing only those footpaths and cycleways located within the road corridor. The Community Facilities team at Auckland Council looks after recreational paths located within parks and reserve, beaches and sport fields.

2.2 The classification of pathway assets

Auckland Transport's Footpath Asset Management Strategy divides its footpath assets into four classes. These classes are based on the land use types where the assets are located, as shown in Table 2-1.

Footpath class	Description	Area (m^2)	Length (km)
Class A	High profile area – town centres, shared spaces Near public transport interchanges Near schools and universities Near commercial centres Near recreational areas (parks and beaches) Near community centres, health care centres, aged-care facilities	5,304,479	3,033
Class B	Special character area (as defined in the Auckland Unitary Plan) Heritage area (as defined in the Auckland Unitary Plan and including the Waitakere Ranges Heritage Area and areas of value to tangata whenua)	1,177,485	626
Class C	Urban residential area (general – excluding Class A) Urban local retail area	4,881,535	3,185
Class D	Urban industrial area Rural area (excluding Class B)	503,158	320

Table 2-1: Classes and extent of footpath assets

Source: Footpath Asset Management Strategy; Auckland Transport's RAMM database (March 2020)

The Auckland Cycle Network classifies cycleway assets according to a network hierarchy, despite the ownership and management responsibilities of those assets. Ownership may be varied depending on

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the individual agreement with Auckland Council and Waka Kotahi NZ. The hierarchy is based on the importance of the links that the cycleway provides within the overall network.

Table 2-2 shows the approximate extent of cycleway assets, at each level of the hierarchy, for the existing Auckland Cycle Network.

Network hierarchy	Description	Area (m^2)	Length (km)
Cycle metro	Provide regional links connecting metropolitan centres, public transport interchanges and other key regional destinations. They provide the highest level of service. Many of these routes are along motorway corridors or rail corridors.	333,000	111
Cycle connector	Provide links to the cycle metros and key local destinations (e.g. public transport interchanges, town centres, residential areas, schools). They are often along arterial roads and some are along collector roads.	369,000	123
Cycle feeder	Provide neighbourhood access and links to the cycle connectors and cycle metros, key community facilities, schools, parks and reserves, and local services. The feeder network often aligns with the local board's greenways.	258,000	86

Table 2-2: Extent of cycleway assets, by Auckland Cycle Network hierarchy

Source: TBC by Active Modes/Future Connect project

Figure 2-2 shows the long-term proposed plan for the entire Auckland regional cycle network, regardless of who owns and manages the component parts.

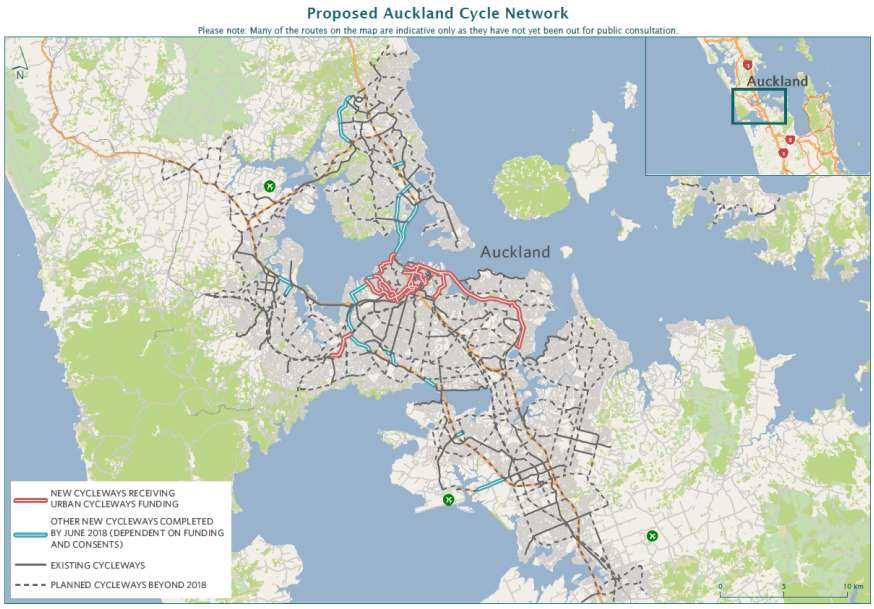

Figure 2-2: Proposed Auckland cycle network

Source: https://at.govt.nz/media/1152675/Proposed-Auckland-Cycle-Network.pdf

Figure 2-3 illustrates some of the types of footpaths, shared paths and cycleways that can found in the Auckland region.

Carrington Road, Mount Albert

Bi-directional cycle lane on Quay Street

Nelson Street cycleway/shared path

St Luke road

Grafton Gully cycleway/shared path

Low-speed mixed traffic zone

Figure 2-3: Examples of footpaths and cycleways in Auckland

Sources: Auckland Transport media; https://at.govt.nz/media/1974167/auckland-cycling-10-year-plan-july-2017.pdf

2.3 Current condition of the assets

Asset condition is the key technical measure that Auckland Transport uses to indicate the quality of its pathways assets.

We assess the condition of pathways assets using the International Infrastructure Management Manual condition grading method, which grades the condition of assets on a 1 to 5 scale (1 being 'very good' and 5 being 'very poor'). (The particular condition rating specification we use to grade footpaths is presented in Appendix B.)

To understand the condition of the pathways network, Auckland Transport undertakes regional condition rating surveys for all pathway assets. These surveys ensure that we:

- take a consist approach to fault inspection and condition assessment
- have access to quality data for proactive planning and network management
- achieve value for money, by reducing administrative overheads through a number of contracts.

Figure 2-4 shows the regional condition profile of footpaths and cycleways.

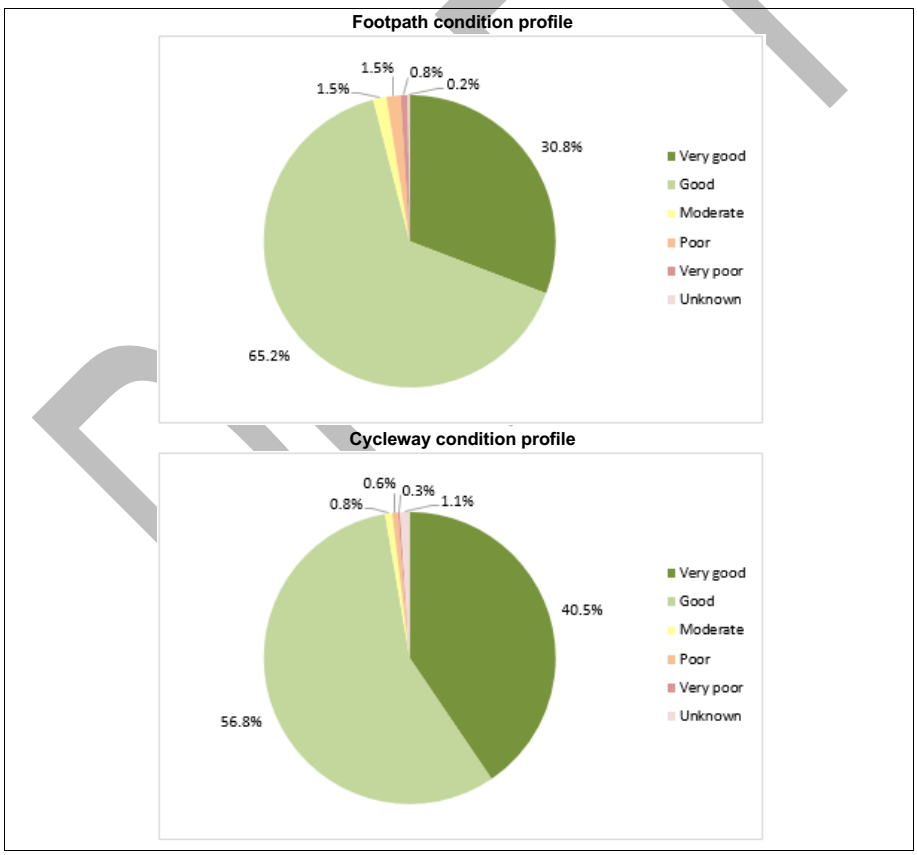

Figure 2-4: Footpaths and cycleways condition profiles

Source: Auckland Transport RAMM database (March 2021)

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Figure 2-4 shows that 97.6 per cent of footpaths and over 99 per cent of cycleways are in moderate to very good condition.

See Appendix A for a breakdown, by management area, of those footpaths that are in 'very poor' and 'poor' condition.

Figure 2-5 shows the percentage of pathway assets (by length), in each condition grade, for each management area. The figure shows that western management area has a higher percentage of pathways in poor and very poor condition, compared to the other management areas.

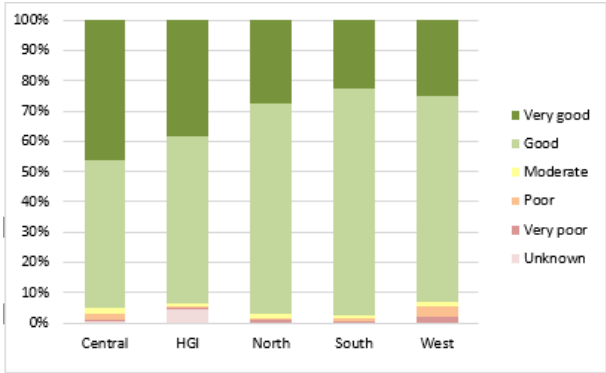

Figure 2-5: Condition of pathway assets, by management areas

Source: Auckland Transport RAMM database (March 2021)

2.4 Aesthetic rating of the assets

Auckland Transport rates the aesthetics of its pathways assets on a 1-to-5 scale, with 1 being 'very good' and 5 being 'very poor'. Each section of pathway in the network is rated in this way during the visual condition rating surveys.

Rating the aesthetics of our pathways assets helps ensure they have a consistent look and feel throughout the network.

We use the following criteria to rate the aesthetics of each pathway section.

- Pathways are consistent if their colour, texture, quality and surface types are consistent across the region.
- Pathways provide a pleasant and easy walk, suitable for all ages if:
  - the surface is even and smooth, but firm
  - the surface is clean, i.e. free of litter, graffiti and obstructions
  - the pathway has a clear width for all types of pedestrians to get passed each other
  - the pathway has a buffer between motorists and pedestrians for safety.

Figure 2-6 shows the current aesthetics ratings of Auckland Transport's pathways assets, by asset management area.

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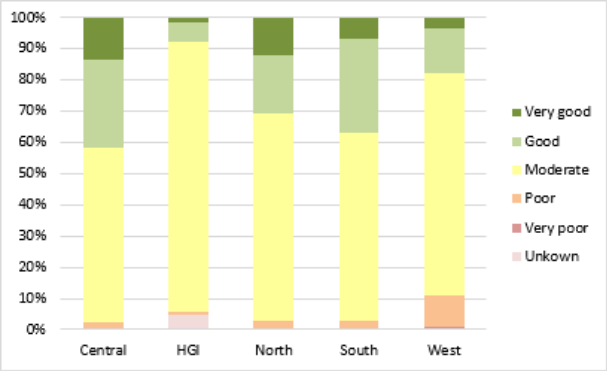

Figure 2-6: Aesthetics of pathways assets, by management area

Source: Auckland Transport RAMM database (March 2021)

Figure 2-6 shows that:

- 33 per cent of the network's pathways were rated to have good or very good aesthetics; although there is a big variation between management areas, with only 8 per cent of pathways with good and very good ratings in the Hauraki Gulf islands, and 41 per cent in the central area
- 63 per cent of the network's pathways were rated as having moderate aesthetics, with the percentage by management area ranging from 58 per cent in the central area to 91 per cent in the Hauraki Gulf islands
- the aesthetics for 4 per cent of the network's pathways were rated as poor or very poor. This result was similar for three out of the four management areas, but much higher for the west, where 11 per cent of the network was assessed as having poor or very poor aesthetics.

2.5 Age and expected useful lives of pathways

Information about the age of Auckland Transport's pathways assets is based on when they were installed or constructed, and is recorded in our RAMM database.

At present, information about the initial construction dates of both footpaths and cycleways assets is well populated in RAMM however they are not updated regularly when the sections are renewed. As a result, data confidence for accuracy of this information is low.

Although it would be desirable to have better age data, it is not a critical issue, as it is the condition and performance of pathways assets that are the main drivers for their renewal.

Figure 2-7 shows the age profile of our footpath and cycleway assets.

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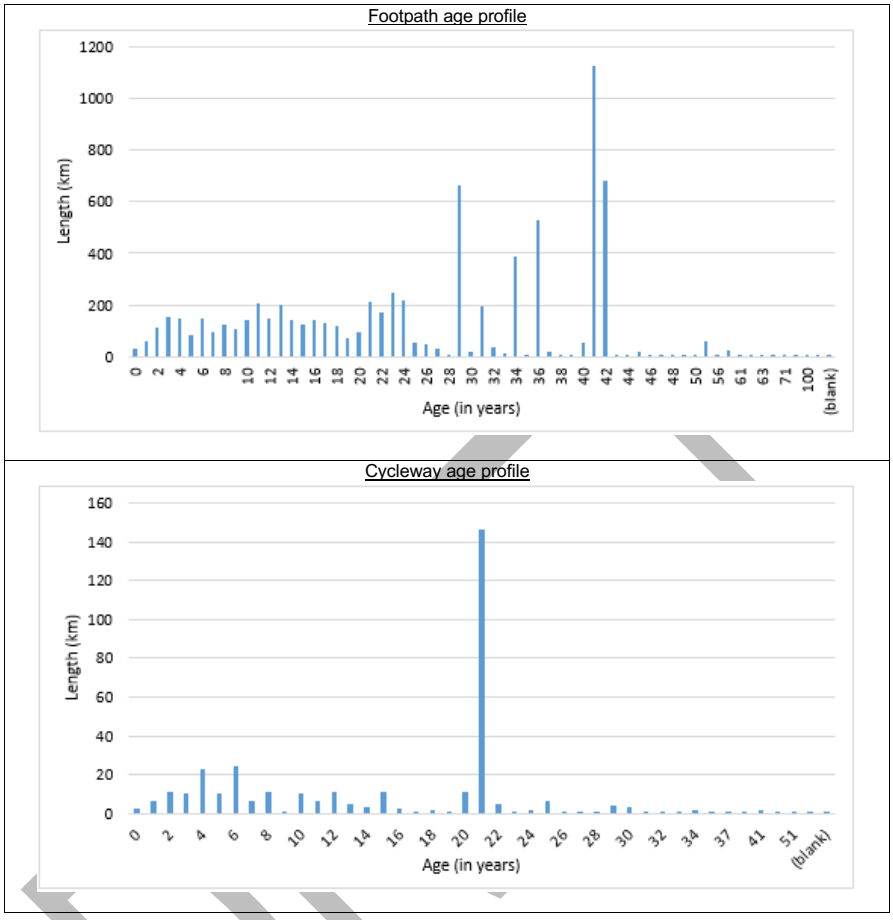

Figure 2-7: Footpaths and cycleways age profiles

Source: Auckland Transport RAMM database (March 2021)

In Figure 2-7, the spike in the footpath age profile represents the system default age in RAMM. This suggests this proportion of footpath assets have an 'unknown' age, and means that only 30 per cent of total footpath assets have known construction dates.

The average expected useful lives of pathways depends on the types of materials they are made from, as shown in Table 2-3.

Pathways material type	Average expected useful lives	Average actual lives
Concrete	50 years	40-43 years
Asphaltic concrete	30 years	25 years
Chip seal	25 years	20 years
Others	25 years	15-20 years

Table 2-3: Average expected useful lives of pathways, by material types

Based on local knowledge, it can be assumed that over 60 per cent of footpaths and cycleways in the Auckland region were constructed or last renewed during the past 15 years, and therefore, both networks have passed 50 per cent of their useful lives.

2.6 The pathways asset data we collect and need

Auckland Transport needs good data about the core attributes of its pathway assets. Having this data, enables us to manage these assets effectively and robustly.

Table 2-4 summarises the core asset data we collect.

Asset attribute	Description	Data requirements
Inventory	The intrinsic attributes of an asset	• Ownership • Age (construction date) • Location • Material • Dimensions
Unit cost	Cost of managing the asset over its full lifecycle	• Replacement cost • Maintenance cost history • Expected useful life • Expected deterioration profile
Condition	Physical condition of assets and their defects	• Based on recent inspections and asset condition rating surveys • Historical records of asset condition rating surveys
Performance	Measures the assets' safety and accessibility	• Customer satisfaction trends • Safety trends • Cycle counting and monitoring
Demand and loading	Measures demand and use of assets and services	• Monthly cycle counts • Network growth rates • Impact of growth

Table 2-4: Core asset data requirements

2.6.1 The quality of our inventory data

Good asset management planning requires good quality data. Auckland Transport is working towards improving the quality of the inventory data it holds for its pathway assets through regional condition rating surveys, and by iteratively reassessing our confidence in this data.

To this end, we have developed an asset data quality assessment tool, called Beagle, to validate the inventory data in our RAMM database.

Data quality related to completeness of pathway inventory information is summarised in Table 2-5.

	Asset Type												
	Cycleways				Cycleways KM	Cycleways %	Footpaths				Footpaths KM	Footpaths %	Total KM	Total %
	Cyclepath		Shared path				Footpath		Walkway					
Metric	KM	%	KM	%			KM	%	KM	%				
Total Assets	16		334		350		7,307		153		7,460		7,810	
Ownership Valid	13	81%	257	77%	270	77%	7,255	99%	149	97%	7,404	99%	7,674	98%
Construction Date Valid	16	100%	334	100%	350	100%	7,304	100%	153	100%	7,457	100%	7,807	100%
Location Valid	16	100%	334	100%	350	100%	7,307	100%	153	100%	7,460	100%	7,810	100%
Material Valid	16	100%	334	100%	350	100%	7,299	100%	153	100%	7,452	100%	7,802	100%
Length Valid	16	100%	334	100%	350	100%	7,307	100%	153	100%	7,460	100%	7,810	100%
Width Valid	16	100%	334	100%	350	100%	7,307	100%	153	100%	7,460	100%	7,810	100%
Not Overlapping	5	31%	327	98%	332	95%	7,263	99%	153	100%	7,416	99%	7,748	99%

Legend		
green	yellow	red
>=95%	>=85%	<85%

Table 2-5: Data quality results for footpaths and cycleways data

Source: Data Quality Report (Auckland Transport Asset Management Planning group, March 2021)

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As Table 2-5 shows, there is a high level of completeness in many areas of data attributes. Ownership is information is incomplete because the ownership and management of footpaths and cycleways that run in and out of parks and reserves is currently unclear. Moreover, as discussed in Section 2.5, pathway age information is unreliable because the construction dates are often not updated when the pathway sections are renewed or replaced.

To address the above, the service level agreement between Auckland Transport and Auckland Council is under review, enabling ownership and management issues to be addressed at a network level. This review is a key focus of our current asset data improvement tasks.

This and other improvements we are making with respect to data quality are summarised in Section 7.

2.6.2 Asset unit cost rates and valuation of assets

Auckland Transport needs replacement unit cost rates for all key assets. These rates are used to model asset performance and for investment planning. The rates are updated annually to capture fluctuations and market movements in asset construction costs.

The current unit costs and base lives for Auckland Transport's pathway assets are shown in Table 2-6.

Asset class	Asset types	Materials	Base life (expected useful life)	Unit rate (per m^2 – regional average)
Pathways	Footpaths (including walkways and pedestrian accessways)	Concrete	50 years	$68.39
		Asphalt	30 years	$113.65
		Others	25 years	$144.50
	Cycleways (including shared paths)	Concrete	50 years	$68.39
		Asphalt	30 years	$113.65
		Others	25 years	$144.50

Table 2-6: Base lives and unit costs rates for pathways

Source: Auckland Transport Road Corridor Delivery group

Auckland Transport undertakes a full valuation of its infrastructure assets every 3 years. The valuations are updated annually, based on a fair value assessment.

A summary of the latest full valuation completed in June 2017 for pathway assets is provided in Table 2-7. This valuation shows that the total replacement value for pathway assets is $1291.6 million, with a total depreciated value of $805.6 million, and annual depreciation of $23.9 million. See Appendix C for more detail of these valuations.

Asset	Optimised replacement cost ($m)	Optimised depreciated replacement cost ($m)	Annual depreciation ($m)
Cycleways	$114.7	$78.9	$2.5
Footpaths	$1405.8	$783.7	$27.6
Total	**$1520.5**	**$862.6**	**$30.1**

Table 2-7: Valuations and depreciation of footpaths and cycleways

Source: Auckland Transport Infrastructure Revaluation Report (June 2020)

2.6.3 Condition, performance and demand

Auckland Transport monitors how walking and cycling infrastructure in the region is used, to gain an understanding of the demand and perspectives of users, as well as information about the factors that cause assets to fail or underperform.

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Monitoring is done through a combination of the Auckland Region Manual Cycle Monitoring Programme, management contractors' reports and the Auckland Transport Customer Satisfaction Surveys.

The main causes of failure that effect the performance of the pathways network are tree roots, nearby construction works, utility works and unauthorised vehicles driving onto the paths. In general, pathways that are not subjected to these causes of damage can remain in a serviceable condition for a significant time without needing replacement. Those that are subject to them tend to deteriorate quickly and may require continual repair or replacement.

Other factors that can lead to asset failure include:

- vertical displacement, trip lips and cracks
- slippery surfaces, due to moss or inappropriate choice or treatment of surfaces
- steep gradients or narrow widths that limits the service provided to users (this tends to occur in areas with steep narrow typographies, in the north and the west)
- obstructions on pathways, such as poles, signposts, billboards, illegally parked cars or overhanging vegetation.

3 Levels of service provided by assets

In this section, we describe the levels of services that Auckland Transport aims to provide from its pathways assets. The levels of service stipulate how the assets are expected to perform in key areas.

Pathways assets are an essential parts of Auckland's transport network. The services that these assets provide contribute to society's need for travel and accessibility, and help achieve social, economic and cultural well-being outcomes.

By maintaining appropriate levels of service, we ensure that pathway assets are managed so that:

- the transport environment is safe for all users
- Auckland Transport provides timely and appropriate response to service requests
- transport assets are in a fit for purpose condition
- the transport network accommodates increasing demand.

3.1 Levels of service framework

Auckland Transport asset levels of service framework has been developed to demonstrate the alignment of services to the overall objectives and outcomes of Auckland Transport as well as to satisfy the ONRC framework requirements. Particularly the ONRC requirements are focused on outcomes in the key result areas of:

- Safety
- Amenity
- Accessibility
- Travel time reliability
- Resilience

This 'levels of service framework' is available through the SharePoint link here.

The levels of service performance measures aligned with the bridge network are summarised below.

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3.2 How we set levels of service

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

Figure 3-1 provides a high-level overview of how Auckland Transport links the customer outcomes, network service, asset performance and financial requirements for bridges, walls and structures to develop its levels of service. The starting point is the customer outcomes, which allow clear directives of how the overall network is managed. This in turn indicated what standard each asset must perform to and the funding required to keep all the assets on the network performing as per the customer requirements.

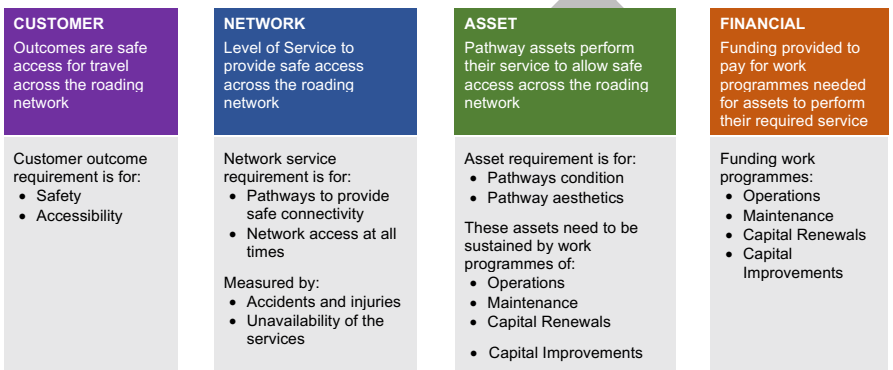

Figure 3-1: High level overview of how Auckland Transport develops its levels of service

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

Stakeholders	Areas of interest and expectations	Consultation or feedback method used

Transport customers (residential)	The main improvements suggested by:
	• residential road users:
	  ○ smooth roads Auckland-wide
	  ○ quality roads in local areas
	  ○ safety
	• footpath users:
	  ○ smooth footpaths
	  ○ more and continuous footpaths
	  ○ well-maintained footpaths
	• cyclists:
	  ○ more provision for cyclists
	  ○ wider cycle lanes
	  ○ improved safety
	• public transport users:
	  ○ more frequent services
	  ○ reduced fares
	  ○ improved punctuality and reliability (especially of trains).
		• Auckland road user satisfaction survey – residential
		• Auckland Transport research panel findings

Stakeholders	Areas of interest and expectations	Consultation or feedback method used
Transport customers (commercial)	The main improvements suggested by commercial road users: • improve traffic flow • improve public transport.	Auckland road user satisfaction survey – commercial
Auckland residents and ratepayers	Aucklanders want: • public transport, but it must be convenient, reliable and quicker • to walk and cycle, but it must be safe • better transport, but they have mixed views on how to raise the additional investment required • current funding to be reallocated more favourably towards public transport, walking and cycling.	Feedback on Auckland Council's Draft Long-Term Plan, as summarised in the Auckland Regional Land Transport Plan
Auckland Council	• Deliver the outcomes in the Auckland Plan and Unitary Plan. • Provide value for money.	• Auckland Transport's annual Statement of Intent. • Elected member liaison team.
Local boards	• Generally support Auckland Transport projects. • Central local boards favour more walking and cycling projects. • Outer (rural and semi-rural) local boards favour more sealing of unsealed roads.	Elected member liaison team
Other council-controlled organisations	Integrated planning, including: • for the CBD, with Waterfront Auckland and Auckland Council Property Ltd • for events, with Auckland Tourism, Events and Economic Development.	• Direct liaison • Joint working groups
Waka Kotahi NZ Road Efficiency Group (REG)	• One network road classification (ONRC) requirements • Deliver government policy statement outcomes. • Provide value for money. • Partnership projects, including the Auckland Transport Operations Centre.	• National ONRC levels of service requirements as stipulated by Road Efficiency Group (REG) • Direct liaison. • Non-voting member on Auckland Transport's board.
KiwiRail	Auckland Transport rolling stock and station assets are well maintained and meet appropriate safety standards.	Direct liaison
Ports of Auckland and Auckland International Airport Ltd	• Arterial road efficiency and reliability for carrying freight. • Integrated planning.	Liaison with industry groups
Mana whenua	Mana Whenua want: • a good relationship with Auckland Transport • Auckland Transport to recognise te ao Māori (the Māori world view) • a set of overarching principles for te ao Māori • the Mauri Model method (Māori values) reflected in prioritisation.	• Independent Māori Statutory Board. • Tamaki Regional Mana Whenua Forum. • Tamaki (Treaty Negotiations) Collective. • Auckland Transport Māori relationships team engagement with runanga, iwi and hapu authorities.

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Stakeholders	Areas of interest and expectations	Consultation or feedback method used
Industry and customer groups (including the Road Users Forum, Business Forum, and walking and cycling advocates)	• Integrated planning • Network efficiency and reliability • Specific network improvements • Access to properties.	Direct liaison and through industry groups.
Utilities (e.g. Watercare, Telecom, Vector)	• Corridor access • Programming.	Direct liaison and through industry groups.
Adjoining road corridor authorities	• Network services alignment • Standards and protocols.	Direct liaison.
Transport operators	• Customer service experiences • Travel time reliability, and bus priority • Public transport demand • Network performance • Scheduling, ticketing and information systems • Service subsidies.	Through commercial franchising model.

Table 3-1: Stakeholder consultation, areas of interest and expectations

3.3 How we measure levels of service

In general, Auckland Transport uses three types of levels of services – each type focusses on different aspects of an asset's performance.

Governance key performance indicators:

- are high-level indicators related to governance relationships, such as the statement of intent between Auckland Transport and Auckland Council
- are established through agreements with our key stakeholders, based on past performance and the impact on decision-making (i.e. alignment with government policies, and the need to achieve a sustainable balance between risk tolerance, available funds and standard of service).

Customer levels of service:

- describe what key stakeholders can expect when using the services
- are mainly related to the performance of assets
- are established from customer consultation and feedback, benchmarking among peer groups, the One Network Road Classification and industry best practice.

Technical levels of service:

- describe the standards of operation, maintenance and renewal activities that relate to an asset or group of assets
- relate mainly to the condition and operating environment of the assets
- ensures assets are preserved
- help deliver on customer expectations
- build data confidence

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- are established using accepted thresholds of asset condition, operational standards, availability of funds and industry best practice.

3.4 Governance key performance indicators (KPI)

The following high-level indicators facilitate governance relationships such as the Statement of Intent (SOI) between Auckland Transport and Auckland Council and are applicable to pathways assets.

Asset management key result area	Asset management key service value	Asset management level of service	Performance or service measure	Current performance (at March 2021)	Target performance 2021-2024
Effective	Condition	Assets are well maintained	Percentage of footpaths in acceptable condition	97.4%	94%
Efficient	Capacity	Network accommodates demand	New cycleways added to regional cycle network (km)	5.25 km	5 km
			Number of cycle movements past selected count sites	3.481 million	3.922 million

Table 3-2: Governance key performance indicators for pathways

Note: Moderate and above condition are considered 'acceptable' for pathways.

3.5 Customer levels of service

Customer levels of services represent our customer's perceived performance of and satisfaction with Auckland Transport's pathway assets. The customer levels of service measures are summarised in Table 3-3.

Asset management key result area	Asset management key service value	Asset management level of service	Performance or service measure	Current performance (at March 2021)	Target performance 2021-2024
Safe	Road network safety	The road network is safer for pedestrians	Percentage of customers satisfied with the overall safety of walking in the Auckland region	68%	TBD
		The road network is safer for cyclists	Percentage of customers satisfied with the overall safety of cycling in the Auckland region	49%	
Effective	Customer satisfaction	Customers are satisfied with assets	Percentage of customers satisfied with the quality of footpaths in the Auckland region	61%	70%
			Percentage of customers satisfied with the quality of footpaths in their local area	61%	
	Responsiveness	Auckland Transport provides timely and appropriate response to requests for Service	Percentage of customer service requests relating to roads and footpaths which receive a response within specified timeframes	90%	85%
Efficient	Capacity	Network accommodates demand	Daily active (cycle and walking) trips	497,778	3,054,948

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Table 3-3: Customer level of service measures for pathways

3.6 Technical levels of service

Technical levels of service aim to interpret customer levels of service into measurable indicators that reflect effective, efficient, safe and sustainable public transport services. The technical levels of service measures are summarised in Table 3-4.

Asset management key result area	Asset management key service value	Asset management level of service	Performance or service measure	Current performance (at March 2021)	Target performance 2021-2024
Safe	Road network safety	The road network is safer for pedestrians	Deaths and serious injuries of pedestrians on Auckland local roads	95	Reduce
			Percentage of customers satisfied with the overall safety of walking in the Auckland region	68%	TBD
		The road network is safer for cyclists	Deaths and serious injuries of cyclists on Auckland local roads	43	Reduce
			Percentage of customers satisfied with the overall safety of cycling in the Auckland region	49%	TBD
Effective	Condition	Assets are well maintained	Percentage of footpaths in acceptable condition	97.4%	95%
			Percentage of cycleways in acceptable condition	98.1%	98%
Effective	Condition	Assets are well maintained	Percentage of pathways in acceptable aesthetic condition	96%	95%

Table 3-4: Technical level of service measures for pathways

Sources: Auckland Road User Satisfaction Report; Auckland Transport Statement of Intent; One Network Road Classification performance reporting tool; Auckland Transport RAMM database

Note: Moderate and above condition are considered 'acceptable' for pathways.

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4 Growth and demand

4.1 Growth of Auckland

Auckland is growing rapidly, and Auckland Transport must keep up with the growing demand for transport assets and services created by population growth and economic development.

Auckland Council has recently revised its growth forecasts to take into account data up to August 2020, including the impacts of Covid-19. The new forecasts paint an optimistic picture of population growth and economic development. Auckland's population is forecast to grow by over 260,000 people over the ten years of this plan, and there will be over 100,000 more jobs, as shown in Figure 4-1.

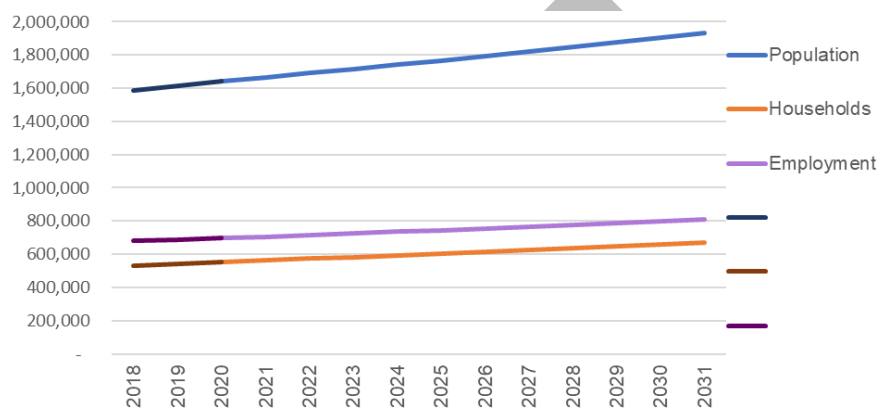

Figure 4-1: Auckland population growth 2018 to 2031

Sources: Statistics NZ; Auckland Council

There will be around 10,000 new households established each year. Figure 4-2 shows the distribution of this growth, and demonstrates that all areas of Auckland are growing. Although the rate of growth as a percentage is highest in the South Rural and North Rural areas (Franklin and Rodney local boards) the biggest growth in terms of absolute numbers of households will be on the Central isthmus.

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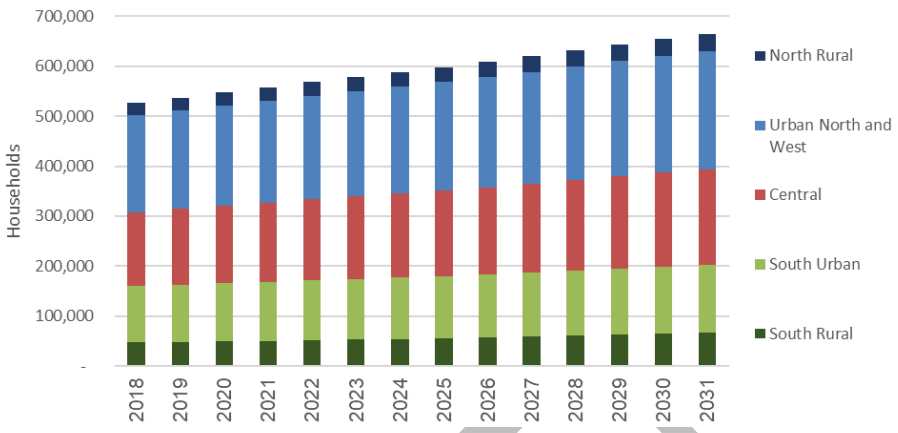

Figure 4-2: Household growth, from 2018 to 2031, by road management area

4.2 Growth in walking and cycling

AT's overall response to growth is developed in partnership with Auckland Council and Central Government through the Auckland Transport Alignment Project. To ensure that population growth does not translate into more congestion, reduced accessibility and a poorer quality city, the agreed plan increases investment walking and cycling improvements as well as public transport, to improve safety, contribute to better health and a healthier environment and address traffic congestion. These initiatives are documented in the agreed mode shift plan.

As asset managers, we need to adapt our processes and priorities for a more diverse transport network. We cannot be customer focussed if we assume that our customers are necessarily in cars. Over time the role for rail freight and public transport will expand, and more local trips will be made by walking and cycling.

It is still very difficult to access data on numbers of people walking and cycling in Auckland. Auckland Transport has a well-established programme for counting traffic, and our data on public transport trips is updated daily. In contrast, most walking and cycling trips are never recorded. Two datasets of walking and cycling demand are available:

- Walking and cycling trips into the city centre
- Cycle trips at 26 sites with automatic cycle counters.

Data on trips into the city centre are shown in Figure 4-3. Walking and cycling consistently make up 7 to 8 per cent of all morning peak trips into the city centre, with no significant trend over time apart from a dramatic reduction in all trips to the city centre during lockdown.

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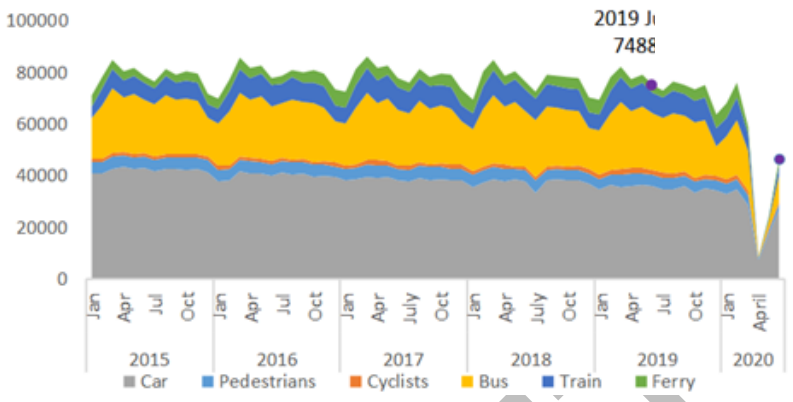


Figure 4-3: People movement into the city centre during the morning peak by different modes

Data from 26 automated cycle counters across the region is shown in Figure 4-4. The data shows an increase in cycling since 2016 but the rate of increase is not dramatic.

Community advocates have argued that the Auckland Transport data does not give a true picture of the importance of walking and cycling for local trips, especially during lockdown.

Based on counts from the past 12-months, November 2018 to October 2019, there has been a 3.8 per cent increase in cycle movements, compared with the previous 12 months. Auckland Transport also conducts manual cycle monitoring at 85 sites across the region each year.

Figure 4-4 shows the trends in cycle movement counts from 2015 to 2019.

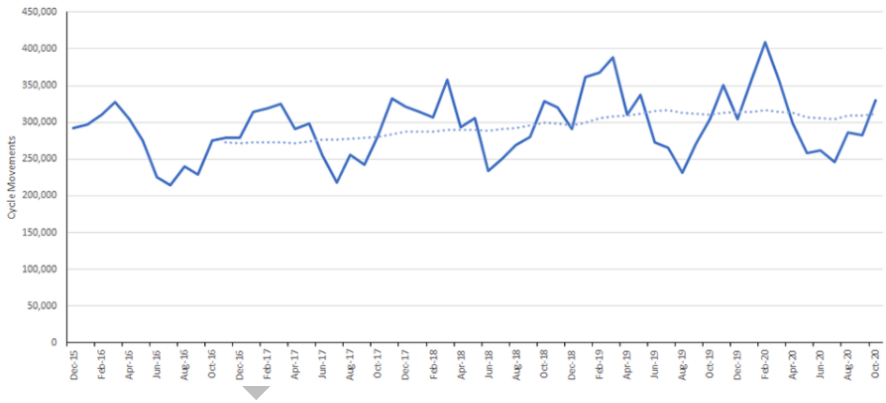


Figure 4-4 Cycle movements at 26 cycle counter sites

Source: Auckland Transport monthly cycle monitoring

In summary, increased walking and cycling are an essential component of AT's plans for dealing with Auckland's growth. While we cannot yet demonstrate with facts and figures that the strategy is working, the need for increased walking and cycling is well established

4.3 Impacts of growth on footpaths and cycleways

Pedestrians and cyclists do not physically wear out footpaths or cycleways. However, Auckland's growth is affecting the maintenance and renewal of footpaths and cycleways in three main ways:

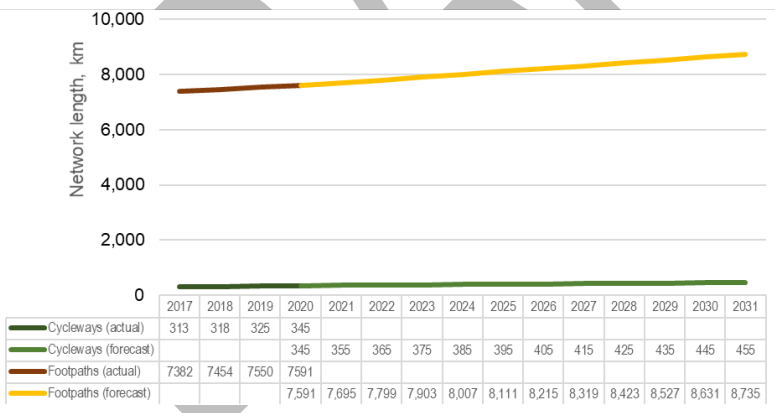
1. More assets are added to the transport network, leading to consequential maintenance and renewals costs. This includes wider footpaths as well as increased length of footpaths and cycleways.
2. Auckland Transport needs to contribute to an increased role for walking and cycling in future, by making these choices more attractive. Current levels of service for footpaths and cycleways need to improve in order to attract more people to make these choices.
3. Auckland's construction boom leads to a "seller's market", with higher prices for all of the components of road construction and repair, from aggregate to engineering advice.

These pressures apply across the whole of Auckland, because the whole region is growing as shown in Figure 4-2.

4.3.1 Network expansion

The Auckland footpath network is expanding by around 104 km per year, or 1.4%, and the cycleway network by around 10 km per year, as shown in Figure 4-5. These networks are expanding due to:

- **Urban development –** The majority of new footpaths in Auckland are constructed in greenfields growth areas such as Whenuapai and Pinehill. Some new footpaths are also constructed as part of major "brownfields" developments within the urban area.
- **Auckland Transport capital programmes –** Auckland Transport aims to construct 10 km of new protected cycleway each year, and also constructs some new footpaths, and widens footpaths in town centres.



	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Cycleways (actual)	313	318	325	345											
Cycleways (forecast)				345	355	365	375	385	395	405	415	425	435	445	455
Footpaths (actual)	7382	7454	7550	7591											
Footpaths (forecast)				7,591	7,695	7,799	7,903	8,007	8,111	8,215	8,319	8,423	8,527	8,631	8,735

Figure 4-5: Growth in the footpath and cycleway networks

The Asset Management Plan (AMP) includes a consequential opex model. The model sets out the additional costs of operating and maintaining new footpath and cycleway assets created or purchased during the 10 years of this AMP, which then need to be included in operations and maintenance budgets.

4.3.2 Restoring levels of service

Maintenance investment trends are shown in Figure 4-6 and demonstrate a steep reduction in provision for maintenance of footpaths and cycleways between 2012/2013 and 2017/2018.

This reduction in maintenance budgets impacted on AT's ability to provide a safe walking and cycling environment, and contributed to a statistically significant decline in satisfaction with footpaths between 2016 and 2018. From 2018/2019, maintenance budgets have increased again in order to restore levels of service and create an attractive walking and cycling environment, consistent with the agreed strategic goals.

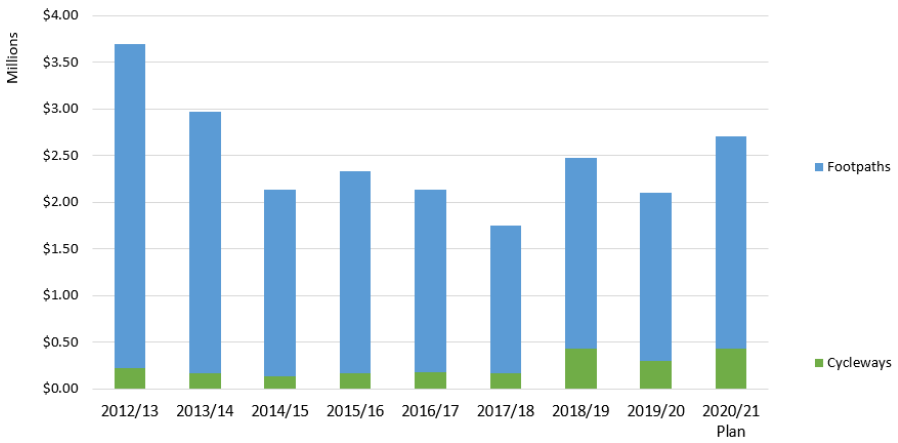


Figure 4-6: Footpaths and cycleways – past maintenance investment

4.3.3 Higher unit prices

Prior to Covid-19, Auckland was experiencing a major construction boom, with the value of building consents issued climbing above $1 billion for the first time, with more cranes on the Auckland skyline than in any city in the United States.

AT's current contracts for maintenance and renewals of road assets, including footpaths and cycleways, were negotiated in 2011. Even though the prices in these contracts are adjusted over time, the overall costs per unit of work covered by the contracts are still significantly lower than the rates being quoted for new contracts.

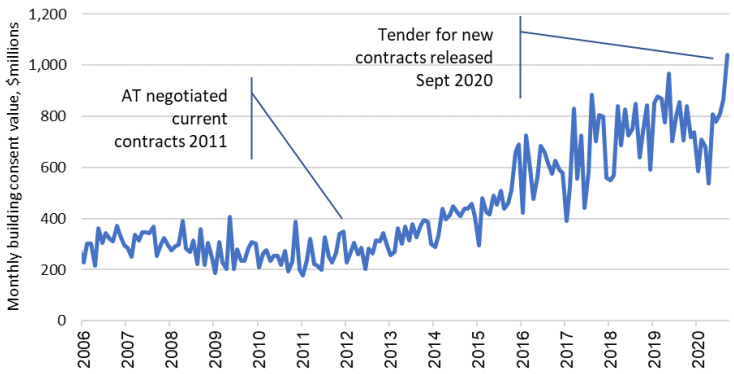


Figure 4-7: Auckland monthly building consent value, 2006 to 2020

Source: Statistics NZ

Auckland Transport
An Auckland Council Organisation

Although the impact of Covid-19 is clearly visible in the data for Quarter 1 2020, recovery has been swift. In September 2020, the monthly value of building consents issued in Auckland exceeded $1 billion for the first time.

AT is currently procuring its South and Central maintenance contracts, with the new contracts expected to be in place on 1 July 2021. Procurement will start soon on contracts for the North and West areas.

Although unit prices for the new contracts are not known at this stage in the tender process, it is inevitable that the availability of private sector work will influence the prices being quoted for the maintenance and renewal of AT's footpath and cycleway assets.

4.3.4 Cycling investment programme 2018 to 2028

The Waka Kotahi Transport Agency and Auckland Transport have confirmed a 10-year investment programme for cycling in Auckland. The proposed programme is anticipated to be completed in 10 years and at an estimated investment of $635 million. The programme prioritises the most strategic areas to start first and will benefit the community socially, economically and environmentally. Figure 4-8 shows the location of projects funded under the programme.

Reference: Auckland Cycling Investment Programme Proposed 2018 - 2028

Figure 4-8: Urban cycleway funded projects in Auckland

Source: https://www.Waka Kotahi NZ.govt.nz/walking-cycling-and-public-transport/cycling/investing-in-cycling/urban-cycleways-programme/auckland-urban-cycleways-programme/

5 Risk management

5.1 Why we manage risks

Risk can be defined as the "Effect of uncertainty on objectives" – ISO 55000:2018(E), Section 3.1.

Risk events are "events which may compromise the delivery of the organisation's strategic objectives" – International Infrastructure Management Manual, 2015.

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

Risk management is crucial for achieving the right balance between the costs of delivering services and the levels of service provided. This inter-relationship, and the trade-off involved, is illustrated in Figure 5-1.

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

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

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

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

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

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

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

5.2 How we manage risks

Auckland Transport divides its risk management activities into three groups:

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

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

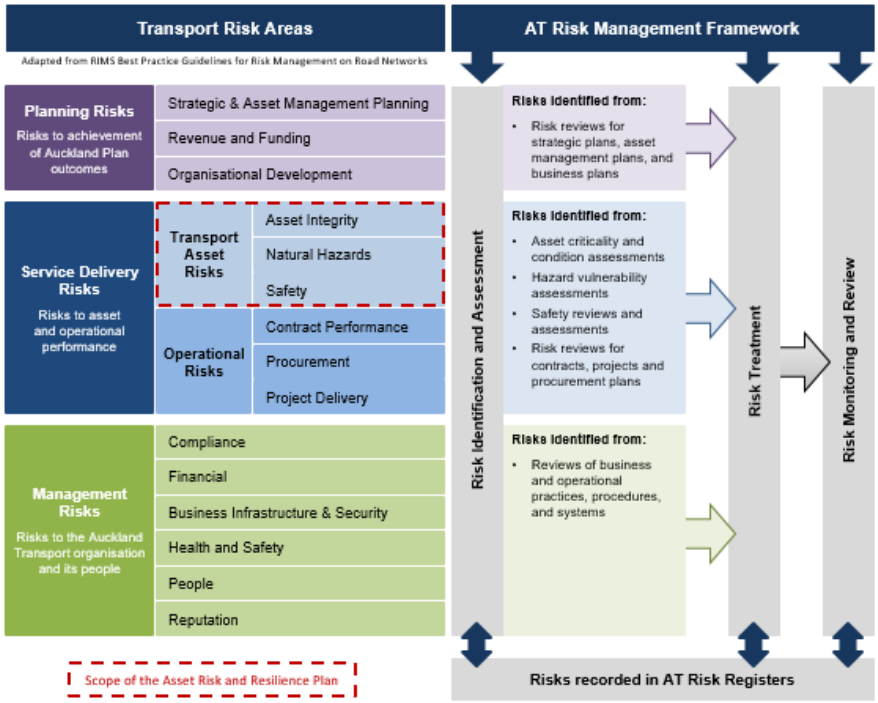

Figure 5-2: Risk management process overview

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

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

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

Auckland Transport uses Active Risk Manager (ARM) to document, manage and monitor risk information in the organisational risk register. The register provides a central repository for information about transport risks, with details of the risk owners, mitigation plans, and monitoring and reporting requirements. Our organisational risk management plans are regularly reviewed by the Executive Leadership Team and the Finance, Capital and Risk Committee of Auckland Transport Board.

5.3 Criticality framework and assessments

Auckland Transport has adopted a Criticality Framework for Transport Infrastructure.

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

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

- network-level criticality
- asset-level criticality.

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

5.3.1 Network-level criticality assessments

For network-level criticality, assessments take into account different factors, depending on the location of the asset.

For assets located in the road corridor, these include:

- One Network Road Classification – provides an established functional classification for roads, covering traffic volumes, economic criteria, accessibility, connectivity and the like
- lifeline routes – provide access to lifeline utilities (such as water, wastewater, power and telecoms) or a lifeline evacuation route that enables Auckland to respond and recover from hazard events
- essential services – provides access to facilities and services that are essential to the social wellbeing of the community.

For assets that are part of public transport and parking facilities, these include patronage, as the number of people using the facility reflects its importance in facilitating access and connectivity to transport.

The result of the network-level assessment is summarised on a scale of 1 (being 'vital') to 5 (being 'minor'). The numbers of critical street lighting assets coming within criticality level is shown in Table 5-2.

Asset	Unit	Network Criticality						
		Level 1	Level 2	Level 3	Level 4	Level 5	TBC	Total
Cycleways	km	10.2	7.4	11.5	6.0	13.8	274.2	323.2
Footpaths	km	188.0	358.6	906.4	1,112.2	4,677.1	245.0	7,487.3

Table 5-2: Critical pathway assets

5.3.2 Asset-level criticality assessments

For asset-level criticality, Auckland Transport adopts a qualitative approach to assessment that considers three key factors:

- impact of an asset failure on safety outcomes
- impact on levels of service and efficiency of operation

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- impact on cost to repair or replace – i.e. whole-of-life cost.

5.4 Current condition of critical assets

Auckland Transport inspects pathway assets and records the severity of defects of major components in 1 (very good) to 5 (very poor) condition rating.

The condition distribution of these assets based on their network criticality is shown in Table 5-3. Assets that are on high critical corridors and are in poor or very poor condition are given priority when managing the pathway network

Length (km)		Asset Condition												
		Very good		Good		Moderate		Poor		Very poor		Unknown		Total
		Qty	%	Qty	%	Qty	%	Qty	%	Qty	%	Qty	%	
Criticality Level	Vital	103.3	34.8%	180.4	60.7%	5.4	1.8%	3.7	1.2%	2.3	0.8%	1.9	0.6%	297.0
	Major	139.3	33.5%	259.5	62.4%	5.7	1.4%	4.5	1.1%	3.2	0.8%	3.9	0.9%	416.0
	Significant	339.0	34.0%	620.0	62.2%	13.8	1.4%	14.5	1.5%	7.7	0.8%	1.7	0.2%	996.7
	Local	340.1	30.1%	740.0	65.5%	17.7	1.6%	20.1	1.8%	10.2	0.9%	0.9	0.1%	1,128.9
	Minor	1,355.7	31.1%	2,840.9	65.1%	62.3	1.4%	66.7	1.5%	32.8	0.8%	2.9	0.1%	4,361.3
	TBC	171.9	28.1%	411.2	67.3%	7.9	1.3%	7.2	1.2%	3.8	0.6%	8.6	1.4%	610.7
Total		2,449.3	31.4%	5,052.0	64.7%	112.7	1.4%	116.8	1.5%	60.0	0.8%	19.8	0.3%	7,810.5

Table 5-3: Network criticality versus condition for pathway assets

Source: Network criticality assessment; Auckland Transport's RAMM database

5.5 Asset management risks

Auckland Transport groups asset management risks into three broad categories:

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

5.5.1 Asset integrity risks

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

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

Asset integrity risks	Mitigation controls
Assets are designed inappropriately	- Design and construct assets in compliance with TDM requirements, Road and Streets Framework and the asset management policies
Assets are not maintained in good condition	- Inspect and monitor condition of the asset network - Prepare maintenance and renewal plans/programmes to ensure assets are maintained at the correct level of condition to provide the agreed levels of service
Assets do not provide value for money over the life span	- Ensure whole-of-life approach is implemented through planning, design, construction and maintenance phases of assets

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	- Evaluate customer's expectations vs the delivery outcomes and implement network improvements
Assets are not fit for purpose for long term sustainability of the network	- Understand changes within and surrounding the network to address them pro-actively - Plan pro-actively and implement network improvements through emergency management plans and resilience improvement plans

Table 5-4: Asset integrity risks and mitigation controls

5.5.2 Natural hazard risks

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

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

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

Table 5-5: Natural hazard risk

Auckland Transport has assessed how exposed the transport network is to the following natural hazards:

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

The assessment utilises available published datasets for the hazard info and identify the road segments interest the hazard extents.

The interim result of this assessment is summarised in Table 5-6. The results will be used to develop a risk and resilience plan for critical infrastructure assets.

Hazard types	Road network likely to be exposed	
Liquefaction susceptibility (low elevation)	17.79%	1,360km
Liquefaction susceptibility (high elevation)	21.55%	1,647km
Floodplain	13.24%	1,012km
Tsunami	3.44%	263km
Auckland volcanic field	22.88%	1,749km
Auckland volcanic field (buffer)	15.55%	1,189km
Coastal inundation (present day 5 year)	0.10%	10km

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Coastal inundation (present day 20 year)	0.20%	14km
Coastal inundation (present day 50 year)	0.20%	18km
Coastal inundation (present day 100 year)	0.60%	47km
Coastal inundation (0.5m sea-level rise 50 year)	0.70%	50km
Coastal inundation (1m sea-level rise 50 year)	1.30%	102km
Coastal inundation (2m sea-level rise 50 year)	2.90%	220km
Coastal inundation (0.5m sea-level rise 100 year)	1.10%	86km
Coastal inundation (1m sea-level rise 100 year)	1.80%	140km
Coastal inundation (2m sea-level rise 100 year)	3.20%	242km

Table 5-6: Road network exposed to natural hazards

5.5.2.1 Natural Hazard Risk Management Framework

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

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

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

This approach is illustrated in Figure 5-3.

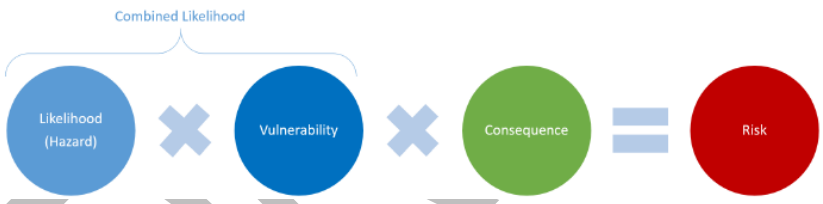

Figure 5-3: Asset Risk Management Framework

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

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

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

5.5.3 Safety risks

Safety risks relate to death and injury of transport users when failure or inadequate provision of assets and services is a key contributor.

Safety on the transport network depends on a number of factors, including:

- Road condition (include visibility, traffic volumes, road alignment, material, defects in design, defects in maintenance, etc.)

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- Road user behaviour (include speed, fatigue, age, etc.)
- Vehicle condition (include technical faults and defects)

Safety issues manifest as incidents or crashes and are likely to involve one or more of the factors listed above.

Table 5-7 summarises asset risks and mitigation controls with respect to safety.

Safety risks	Mitigation controls
Assets create safety hazards	- Review and improve design, construction practices and methodologies - Review and improve asset maintenance and management strategies - Identify critical assets in the network and maintain/improve asset integrity through operational activities - Identify locations of high crashes or incidents and implement network safety improvements - Comply all works with H&S standards and regulations
Assets cause adverse environmental impacts	- Ensure the use of environmentally friendly and non-toxic material in constructions - Review and improve procedures and disposable methods when handling the hazardous substances on sites

Table 5-7: Safety risks

5.6 Pathway risk register

Auckland Transport manages risks related to the pathway network through maintenance management regimes, safety programme, speed management and crash reduction implementation. Regular monitoring, review and reporting of asset risks are essential to ensure safety, network stability and overall business continuity.

In addition to the above, Auckland Transport has identified key asset risks to the pathway network, along with the mitigation plans to treat those risks. This is summarised in Table 5-8.

Item	Asset type	Risk category	Risk detail	Net Risk Factor	Mitigation controls
1	Pathways	Safety	Serious injury and fatal accidents involving cyclists and pedestrian conflicting with vehicles on road, on pathways and shared spaces	High	1. Provide safe crossing points for pedestrians and cyclists 2. Provide dedicated or protected cycleways where possible 3. Provide users safety education through campaigns, warning and notices 4. Manage vehicle speed 5. Undertake safety audits to identify high risks area and implement safety improvements
2	Pathways	Safety/ Asset integrity	Injury to pathway users from trips and slips caused by inadequate quality or poor condition of pathways	High	1. Investigate the slip resistance of footpaths and shared paths 2. Review specifications of pathway standards 3. Ensure effective maintenance and renewal interventions 4. Identify improvements and prioritise the required actions

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Item	Asset type	Risk category	Risk detail	Net Risk Factor	Mitigation controls
3	Pathways	Safety	Injury to path users, leading to Auckland Transport liability, due to inappropriate commercial use of path spaces, such as cranes, verandas, awnings, café furniture, hanging private planters and signs; or illegal parked vehicles	High	1. Enforce policies and bylaws for inappropriate use of footpaths and berms 2. Respond public complaints through call centres
4	Pathways	Safety	Steep pathways creating hazards for people using wheelchairs and mobility aids	High	1. Review typography of land surfaces (esp. North Shore area, West area) when designing pathways 2. Implement engineering solutions to suit all types of users
5	Pathways	Safety/ Asset integrity	Lifted path joints contributing trip and fall accidents to pathway users	Medium	1. Rectify problems promptly through inspections and call centre complaints 2. Undertake concrete grinding of joints to remove tripping hazards
6	Pathways	Safety	Inadequate pedestrian crossing facilities for visually impaired people	Medium	1. Provide tactile pavers at every crossing point and intersection 2. Manage crossings to avoid conflicts with cycle/e-bike users
7	Pathways	Safety/ Asset integrity	Trees roots damaging pathways and creating tripping hazards Obstructions due to encroached trees and vegetation	Medium	1. Review and implement TDM requirements around selection of trees, planting distance and sightline requirements, and provision of root protection product around tree 2. Review and apply vegetation guidelines and weed management 3. Carry out arboreal maintenance
8	Pathways	Safety/ Asset integrity	Heavy (maintenance) vehicles driving on and damaging footpaths and cycleways	Medium	1. Enforce conditions through Corridor Access Request in relation to access by external parties, such as utility service providers, private developers and contractors.
9	Pathways	Safety/ Environment	Cycleway surface green surfacing fading/peeling off and getting into waterways during road Stormwater runoff	Medium	1. Review and improve standards and specifications regarding paint solutions 2. Investigate the environmental concerns around the use of epoxies and colouring materials in road surfacing 3. Encourage environmentally friendly products
10	Pathways	Natural hazards	Critical pathway assets exposed to natural hazards	Medium	1. Identify locations that are likely to be exposed to natural hazard events 2. Plan, develop and implement mitigation actions to improve resilience of the network

Low Medium High Very high

Table 5-8: Asset risks

Source: Asset management team (Feb 2020)

5.7 How risk underpins decision-making

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

The risk management information gathered will be used to inform a risk-based decision-making process, including to prioritise and justify programmes and projects, and most importantly, to mitigate the various risks identified.

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

This process is highlighted in Figure 5-4.

Figure 5-4: Risk-based decision-making process

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6 How we manage assets throughout their lifecycle

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

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

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

6.1 Lifecycle management objectives

The objectives of our asset lifecycle management activities align with Auckland Transport's overall asset management performance measures, outlined in Section 3 of this plan. These objectives, including:

- serviceability – delivering agreed fit-for-purpose levels of service for assets, that are focussed on safety, condition, aesthetic appeal and customer requirements, to ensure the network meets the needs of different transport mode and users
- prudent risk management – providing a safe network, by ensuring pathways are free of tripping and slipping hazards and obstructions, and are always available for users in critical areas, such as the CBD
- perpetuity of assets – addressing loss of service potential due to asset deterioration, and ensuring the network remains available for future generations by implementing appropriate operational, maintenance and renewal activities
- value-for-money – optimising and prioritising investments to achieve best whole-of-life costs, while meeting agreed levels of service.

Strategies we use to deliver these objectives are:

- using competent and capable people – resourcing a team of asset engineers, contractors, and customer services staff, with specified roles and responsibilities, who have suitable skills and experience to deliver our network operations, maintenance and renewals services
- establishing asset management systems – establishing the processes, information management systems, governance and management structures needed to develop, deliver and monitor our asset management activities
- optimising service delivery mechanisms – outsourcing service delivery contracts, using competitive bidding in the open market and industry accepted procurement processes, to effectively and efficiently deliver our programmes
- developing lifecycle management plans.

These strategies will be employed alongside other Auckland Transport strategies, such as the Footpath Asset Management Strategy and the Slip Resistance Strategy for Pedestrian Surfaces.

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6.2 Operational plan for pathways

Auckland Transport's operational plan for its pathways assets includes:

- operational activities – the activities in managing these assets, including frequencies and response times
- historical operational performance and costs – how these assets have performed in the past and what it cost
- future operational requirements – what assets will be required for the future and the associated costs.

6.2.1 Operational activities

Operational activities (also known as operations) are the day-to-day network management activities required to keep the pathway network in a safe and operable state, and to prevent interruptions to the agreed levels of service. They are different from the maintenance and renewal activities associated with the network.

Key operational activities for pathways assets include:

- asset inspections and monitoring
- cleaning and clearing
- customer service and emergency responses.

In developing and delivering these activities, Auckland Transport takes into account:

- the risk of critical assets failing
- the baseline levels of service required, and any changes to the agreed levels of service.

The main operational activities for pathways assets are summarised in Table 6-1.

Activity	Description	Requirements	Work carried out by
Asset inspections and monitoring	Detailed inspections – inspections and condition rating surveys required for asset management planning, programming, asset monitoring and reporting	Annually or as required	Auckland Transport asset management consultants
	Routine inspections – routine, ongoing and repetitive activities, needed to ensure the network remains safe and accessible.	Regular weekly inspections for the network	Auckland Transport maintenance contractors
	Special inspections – specific inspections for asset management and programming purposes	As required	Auckland Transport maintenance contractors
Cleaning and clearing	Removing obstructions or hazards on pathways, including clearing vegetation and removing graffiti and debris, as identified as necessary during inspections	Regular weekly activities the network	Auckland Transport maintenance contractors
Customer service and emergency responses	Responding to requests for services through Auckland Transport's customer relationship management system and to unexpected events and incidents.	As required within specific timeframes	• Auckland Council's call centre • Auckland Transport maintenance contractors

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Table 6-1: Operational activities for pathways

Source: Auckland Transport road corridor maintenance contracts

6.2.1.1 Asset inspections and monitoring

Asset inspections identify defects that could cause assets to fail or affect their performance. Defects are recorded, so that maintenance and renewal activities can be programmed to address them.

Table 6-2 summarises the nature and frequency of the inspections carried out for pathway assets, as specified in the road corridor maintenance contracts.

Frequency of inspections of pathways by road hierarchy	Routine inspection	Detailed inspection
Regional and district arterial routes, primary routes, collector routes (10,000 to 20,000 vehicles per day), local and collector routes (5,000 to 10,000 vehicles per day)	Weekly (100% of road length)	Annually
General local sealed roads (1,000 to 5,000 vehicles per day) and cycle paths	2-weekly	Annually
General local sealed roads (<1,000 vehicles per day), unsealed roads (<1,000 vehicles per day), accessways and car parks	2-monthly (50% of road length/month)	Annually

Table 6-2: Inspection frequencies for pathways

Source: Auckland Transport road corridor maintenance and asset management contracts

Routine pathways inspections are performed at the same time as other road corridor inspections. As a result, the frequency at which a particular pathway is inspected is influenced by the importance of the road corridor it is associated with.

Contractors are required to identify and record pathways faults, defects and surface displacements during these inspections, and prioritise and programme areas that require maintenance or repairs.

6.2.1.2 Cleaning and clearing

Pathways are regularly cleaned and cleared to keep them safe. This includes:

- clearing vegetation and obstructions, and controlling weeds on edges and surfaces – as near as possible, vegetation should encroach no more than 100mm over the edge of the pathways, and trees should not encroach within 1m of the edge of pathways or within 3m above pathways
- sweeping to remove loose metal, dirt, debris, litter and other matter deposited on them – footpaths and paved pedestrian areas should not have more than 0.50kg of detritus within any $5m^2$ area
- treating slippery areas to remove surface water and grime – Auckland Transport uses chemical and mechanical treatments to remove slime and moss from pathways surfaces, and ensure they provide adequate slip and skid resistance in all weather conditions. The minimum acceptable coefficient of friction (wet) to maintain slip resistance for pedestrian surfaces is 0.40. Refer Auckland Transport's Slip Resistance Strategy for Pedestrian Surfaces. (Add hyperlink)

These activities are initiated by our contractor's inspections and reports, and in response to customers' requests.

Town centres and pedestrian areas require the highest standards of cleanliness and services. Table 6-3 summarises the frequencies of cleaning and clearing activities in these areas.

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Activities	Location	Frequency
Sweeping	CBD town centres	Daily
	Town centres	Once per week
	Minor shopping centres	Once per month
Washing	CBD town centres	Three times per week
	Town centres	Once per week or once per month (area specific)
	Minor shopping areas	Once per month
Collecting loose litter (prior to sweeping and washing)	Town centres	Daily or once per week (area specific)
	Minor shopping areas	Once per month
Removing chewing gum (prior to sweeping and washing)	CBD town centres	Once per month
	Town centres	Once per month
	Minor shopping areas	Once per month
Controlling vegetation	Major town centres	Once per month
	Minor shopping areas	Once per month
Removing lichen and moss, and treating slippery surfaces	Major town centres	As required
	Minor shopping areas	As required

Table 6-3: Frequencies for cleaning and clearing activities for pathways, by location

Source: Auckland Transport road corridor maintenance contracts and area maps

Auckland Transport's contractors will also carry out pathway cleaning and sweeping as required:

- during periods of high leaf drop
- when high levels of litter and detritus have built up
- to clean up after emergencies, incidents or spillages
- before and after special events. Special event cleaning must start within 1 hour of the scheduled end of the event and be completed within 3 hours, and includes sweeping pathways in areas adjacent to the event's location.

In addition to general cleaning activities, some special paved surfaces will require additional or special treatment to ensure they are cleaned without damaging the surface, coatings or underlying substrate.

6.2.1.3 Berm mowing

Road berms have an impact on the amenity and serviceability of pathways, and it is essential that any weeds along the edges and on the surface of pathways are controlled.

In urban areas, responsibility for mowing grass berms generally rests with the owners or occupiers of the adjacent property. In rural areas, Auckland Transport normally manages vegetation on berms to maintain safe sight lines for road corridor users.

Auckland Transport will consider mowing berms in the urban road corridor in situations where it is difficult, unsafe or inappropriate for residents to do so.

6.2.1.4 Customer service and emergency response

Auckland Transport receives requests for service for its pathways network through is customer relationship management system and emergency callouts. These may include requests to:

- clear flooding or obstructions

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- clean up following accidents on roads and footpaths
- manage temporary traffic impacts on pathways, including through warning signs, barriers and traffic controls.

Auckland Transport staff and contractors prioritise their responses to these requests as follows:

- emergency works – first priority: contractors will attend immediately
- routine high works – second priority: contractors will attend the next working day
- routine normal works – third priority: work will be included in the next work schedule
- low-priority routine normal works – fourth priority: work will be included in the work schedule when resources permit.

Response times are also based on the hierarchy of the road, as summarised in Table 6-4.

Response times for call centre incident investigation by road hierarchy	Routine high	Routine normal	Emergency response
Operations on regional and district arterial routes, primary routes, collector routes (10,000 to 20,000 vehicles per day), accessways and car parks	1 hour	1 day	1 hour
Operations on local and collector routes (5,000 to 10,000 vehicles per day) and general local sealed roads (1,000 to 5,000 vehicles per day)	2 hours	2 days	1 hour
Operations on general local sealed roads (<1,000 vehicles per day) and unsealed roads	2 days	3 days	1 hour
Response times for physical works by road hierarchy	**Routine high**	**Routine normal**	**Emergency response**
Operations on regional and district arterial routes, primary routes, collector routes (10,000 to 20,000 vehicles per day), accessways and car parks	1 week	4 weeks 1 week (vegetation)	1 hour
Operations on local and collector routes (5,000 to 10,000 vehicles per day) and general local sealed roads (1,000 to 5,000 vehicles per day)	1 week	4 weeks 2 weeks (vegetation)	1 hour
Operations on general local sealed roads (<1,000 vehicles per day) and unsealed roads	1 week	4 weeks 2 weeks (vegetation)	1 hour
All roads		5 days (clearing detritus and litter)	

Table 6-4 Call centre and emergency works response times for pathways

Source: Auckland Transport road corridor delivery contracts

6.2.2 Historical operational costs

Historically, the operational costs for Auckland Transport's pathways assets averaged $0.2 million per year.

This level of historical investment delivered the agreed:

- asset inspections and monitoring of pathway assets
- cleaning and clearing activities at required locations

- customer service and emergency responses through customer relationship management system.

Auckland Transport uses these historical costs to calculate what the future operational needs for these assets are likely to be, including the financial investment required.

Figure 6-1 and Table 6-5 show the historical operational costs for pathways for the past 8 years. These figures include operational historical costs for asset management inspection and condition rating activities only. Operational costs for cleaning and clearing activities are included in the maintenance costs.

Figure 6-1: Historical operational costs for pathways

Source: Auckland Transport SAP database (2020)

Activity type $M	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21 plan
Asset management	$0.2	$0.1	$0.3	$0.3	$0.2	$0.3	$0.4	$0.3	$0.3
Total	$0.2	$0.1	$0.3	$0.3	$0.2	$0.3	$0.4	$0.3	$0.3

Table 6-5 Historical operational costs for pathways

Source: Auckland Transport SAP database (2020)

6.2.3 Future operational requirements

The future operational investment required for operational activities for pathways is $0.7 million per year. This figure is a yearly average over 10 years and will cover:

- the current baseline level of service for operational activities
- any consequential operational needs arising from the growth of the network
- any other operational needs identified for the network, such as changes to the current level of service.

Note that future operational costs are based on current 2019/2020 contract rates, exclude escalation, and are expressed in present-day dollars.

6.2.3.1 Future baseline operational needs

Figure 6-2 and Table 6-6 summarise the future baseline operational needs for pathways assets.

These needs have been calculated on the assumption that:

- Auckland Transport will continue to deliver the current baseline operational levels of service in the future for the existing network
- the current level of operational activities will continue in the future
- operational costs incurred during the 2019/20 financial year will remain the basis for assessing future costs.

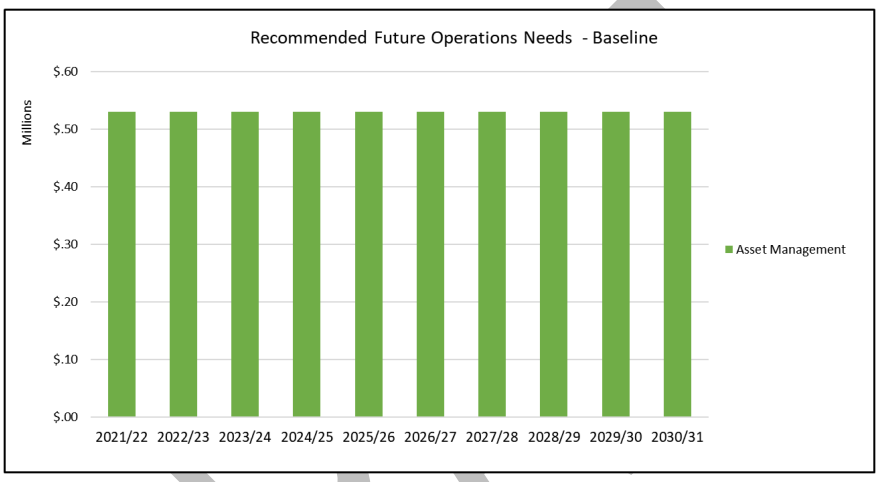

Figure 6-2: Recommended baseline operational needs for pathways

Source: Asset management financial model (2020)

Asset type $M	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	10-year total
Asset management	$0.5	$0.5	$0.5	$0.5	$0.5	$0.5	$0.5	$0.5	$0.5	$0.5	**$5.3**
Total	$0.5	$0.5	$0.5	$0.5	$0.5	$0.5	$0.5	$0.5	$0.5	$0.5	**$5.3**

Table 6-6 Baseline operational needs for pathways

Source: Asset management financial model (2020)

This level of investment will enable Auckland Transport to deliver future asset management activities related to pathway assets.

6.2.3.2 Future consequential operational needs

Consequential operational activities, that are extra to baseline activities, may arise if the pathways network expands through capital improvement projects, new subdivisions and development, city centre or town-centre upgrades, and other streetscape projects.

Auckland Transport establishes the future consequential operational needs for pathways by modelling the likely network growth, based on historical and future capital projects and projected vested assets.

Major assumptions in the model include:

- all components in an asset will deteriorate in the same fashion – no allowance has been made for early or sudden failure of the asset
- growth in the number of vested assets will be the same as the average growth per year for the past 3 years
- where projects are not split into phases, the construction cost of the project is assumed to be its full cost
- operational costs will be consistent year on year, and start in the year immediately following the asset's completion
- no allowance has been made to inflate historical costs to current dollar values.

The average historical growth of pathways assets over the past 5 years has been approximately:

- 71km (1 per cent) per year for footpaths
- 28km (2.5 per cent) per year for cycleways.

Using these figures, modelling shows that the average growth of pathways assets over the next 10 years will be approximately:

- 104km per year for footpaths
- 10km per year for cycleways.

Based on these figures, the predicted future consequential operational and maintenance needs for pathways are given in Figure 6-3 and Table 6-7.

Figure 6-3: Future consequential operational needs for pathways

Source: Asset management financial model (2020)

Activity type $M	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	10-year total
Asset management	$0.1	$0.1	$0.1	$0.1	$0.2	$0.2	$0.2	$0.2	$0.3	$0.3	$1.7
Total	$0.1	$0.1	$0.1	$0.1	$0.2	$0.2	$0.2	$0.2	$0.3	$0.3	$1.7

Table 6-7: Future consequential operational needs for pathways

Source: Asset management financial model (2020)

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This level of investment will enable Auckland Transport to deliver asset inspection and monitoring for additional 104km of footpaths and 10km of cycleways each year for the next 10 years.

6.2.3.3 Future additional operational needs

Additional operational needs may arise due to local requirements, committed activities, increased levels of service or factors such as climate change.

At present, we have not identified any future additional operational needs for the pathways network.

6.2.3.4 Future operational investment required

The future operational investment required for Auckland Transport's pathways assets takes into account all of the above operational needs.

The total recommended future operational investment required for the pathways network for the next 10 years is $7 million. This equates to an average of $0.7 million per year, and is made up of:

- baseline operational needs – $0.5 million
- consequential operational needs (due to network growth) – $0.2 million.

Figure 6-4 and Table 6-8 show how these needs are allocated over the next 10 years.

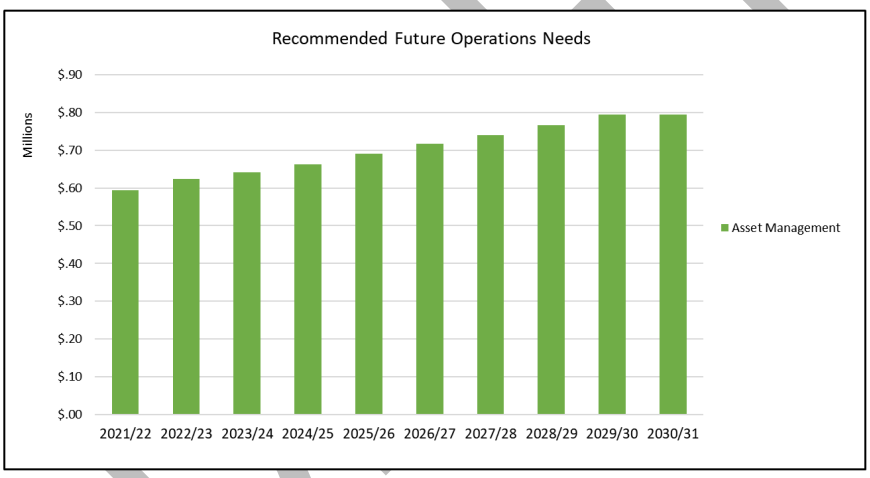

Figure 6-4: Recommended future operational investment for pathways

Source: Asset management financial model (2020)

Asset type $M	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	10-year total
Asset management	$0.6	$0.6	$0.6	$0.7	$0.7	$0.7	$0.7	$0.8	$0.8	$0.8	**$7.0**
Total	$0.6	$0.6	$0.6	$0.7	$0.7	$0.7	$0.7	$0.8	$0.8	$0.8	**$7.0**

Table 6-8: Recommended future operational investment for pathways

Source: Asset management financial model (2020)

This overall future operational investment required for the Auckland region has been split further into the 11 operational contract areas, as show in Appendix TBD. The investment for each area has been

allocated based on historical expenditure trends, contractual requirements and an assessment of operational needs for each area.

6.3 Maintenance plan for pathways

Maintenance is the work carried out to maintain assets and ensure they continue to deliver the agreed levels of service, without any interruption.

Maintenance activities enable the pathways network to be used as planned and ensure its fulfils its purpose throughout its expected life span. Without these activities, the network would rapidly deteriorate and become unsafe for users, and would require costly premature renewal works in the future.

Auckland Transport's maintenance plan for its pathways assets includes:

- maintenance activities – to describe the maintenance activities needed to upkeep the pathways network
- historical maintenance costs – to understand how the network performed in the past and the associated costs
- future maintenance requirements – to forecast and propose future maintenance programmes and the associated costs.

6.3.1 Maintenance activities

Maintenance activities for the pathway network include routine (or cyclic), planned (or programmed) and unplanned (or reactive) maintenance, and emergency reinstatement. These activities are different from both operational and renewal activities.

In planning and developing these activities, Auckland Transport takes into account:

- the risk of critical assets failing
- the agreed baseline levels of service required, and any changes to these.

Typical maintenance activities for pathways include repairs for faults and defects, or like-for-like replacement of small sections of pathway that are less than 10 meters in length. We aim to use materials of a consistent type, quality, texture and strength to the surrounding pathway, when carrying out these activities assets.

Maintenance activities for pathways are summarised in Table 6-9.

Activity	Description	Requirements	Service carried out by
Planned maintenance			
Routine maintenance	Ongoing, repetitive activities, necessary to ensure the safety of the network and respond to customer service requests	Regular weekly activities for maintenance of the network	Auckland Transport maintenance contractors
Planned maintenance	Planned or programmed repair or replacement to address asset faults and defects and reinstate assets following utility works	As required	Auckland Transport maintenance contractors
Reactive maintenance			
Unplanned maintenance and fault management	Responds to requests for services through the customer relationship management system	As required within specific timeframes	• Auckland Council's call centre • Auckland Transport

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Activity	Description	Requirements	Service carried out by
			maintenance contractors
Emergency work	Responding to unexpected events that effect public health and safety	As required by contract	Auckland Transport maintenance contractors

Table 6-9: Maintenance activities for pathways

Source: Auckland Transport road corridor maintenance contracts

6.3.1.1 Routine and planned maintenance

Planned maintenance includes regular, routine and predictable maintenance activities that can be organised, programmed and scheduled in advance. Planned maintenance covers most maintenance needs.

Planned maintenance activities are identified through network inspections and non-urgent requests from customers.

Routine (or cyclic) maintenance works involve:

- making safe areas of footpaths with faults or defects with temporary repairs, then prioritising these areas for permanent repairs
- making safe trip hazards with asphalt concrete fillets or similar repairs
- liaising with affected residents, including through letter drops, and advising on temporary restrictions to access or expected inconveniences during works on footpaths and vehicles crossings
- reinstating berms on the completion of physical road works
- responding to customer service requests within the response time.

Planned (or programmed maintenance) works involve:

- fixing defects identified through inspections, such as concrete-grinding and building asphalt mini-ramps to remedy trip lips
- repairing or replacing assets that are damaged or in poor condition
- repair or replacing uneven or non-compliant surfaces
- repairing paved areas, including re-sanding paved areas
- making safe all temporary or unsafe unattended work by utility companies or other third parties working within the road corridor.

Maintenance works are prioritised based on the criticality of assets, the severity of the faults and service level requirements. Where possible, they are integrated with other road corridor works to minimise disruption to the public.

6.3.1.2 Reactive and emergency maintenance

Auckland Transport carries out unplanned maintenance to respond to irregular, unpredicted events that require maintenance action. Emergency works respond to unexpected events that effect public health and safety.

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Auckland Transport receives requests for unplanned and emergency maintenance services for the pathway network through its customer relationship management system. Key maintenance activities in response to these requests include:

- making safe uneven or slippery surfaces (trip or slip hazards) on pathways
- remedying pathways that have been broken and uplifted by tree roots or vehicle damage
- repairing and replacing small pathway sections (<10m).

Auckland Transport categorises and allocates response times for its unplanned and emergency maintenance activities. Based on the assessment of faults and their severity, pathway issues are addressed accordingly.

See Section 6.2.1.4 for more information about how we prioritise unplanned and emergency maintenance activities, and response times when a service request is received.

6.3.2 Historical maintenance costs

Historically, the cost of maintenance activities for pathways assets has been $2.4 million per year (yearly average).

This level of historical investment delivered the agreed:

- levels of service
- asset repairs and replacements for pathway sections <10m
- customer service and emergency responses.

The historical and current year costs for pathways assets are shown in Figure 6-5 and Table 6-10.

It should be noted that these costs include both physical maintenance and lump sum contract costs. Due to OPEX budget pressures in the past, the main activities allowed under physical works maintenance were grinding and temporary footpath repairs.

Auckland Transport uses these historical costs to calculate what future maintenance requirements for pathways assets are likely to be – both for the maintenance programme and the financial investment required.

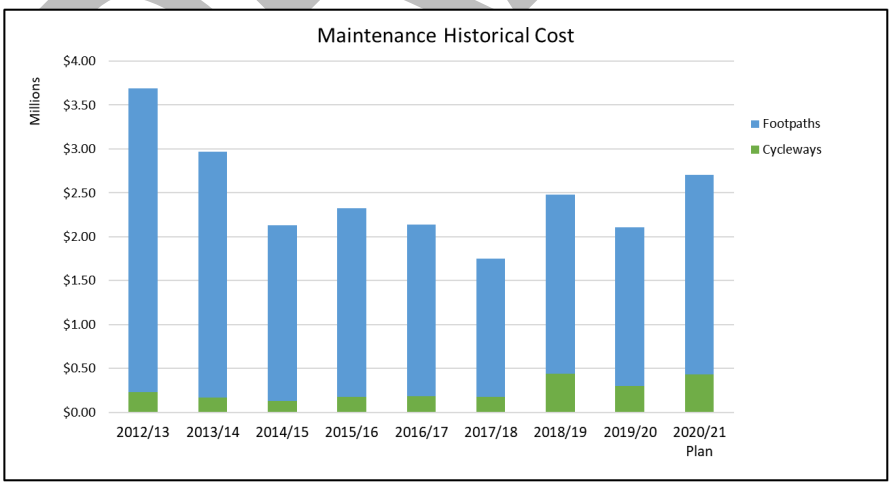

Figure 6-5: Historical maintenance costs for pathways

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Source: Auckland Transport SAP database (2020)

Asset type $M	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21 plan
Footpaths	$3.46	$2.80	$2.00	$2.16	$1.95	$1.58	$2.04	$1.8	$2.3
Cycleways	$0.23	$0.17	$0.13	$0.17	$0.18	$0.17	$0.44	$0.3	$0.4
Total	$3.69	$2.97	$2.13	$2.33	$2.13	$1.75	$2.48	$2.1	$2.7

Table 6-10: Historical maintenance costs for pathways

Source: Auckland Transport SAP database (2020)

6.3.3 Future maintenance requirements

The future investment required for maintenance activities for pathways is $6.4 million per year. This figure is a yearly average over 10 years, and will cover:

- the agreed levels of service for baseline maintenance activities
- any consequential maintenance needs arising from the growth of the network
- any other maintenance needs identified, such as changes to the current levels of service.

Future maintenance requirements are based on current contract rates, as of 2019/2020 (excluding escalation), and are expressed in present-day dollars (as of July 2019).

6.3.3.1 Future baseline maintenance needs

To establish the future baseline maintenance needs for pathways, it has been assumed that:

- Auckland Transport will continue to deliver the current baseline maintenance levels of service in the future, for the existing pathways network
- maintenance activities will reflect the requirement in the Footpath Asset Management Strategy for isolated short-length repairs or replacements
- maintenance costs incurred during 2019/2020 and the network maintenance needs indicated in the condition-based programme, will be the basis for assessing future costs.

Based on this approach, Figure 6-6 and Table 6-11 summarise the future baseline maintenance needs for pathway assets.

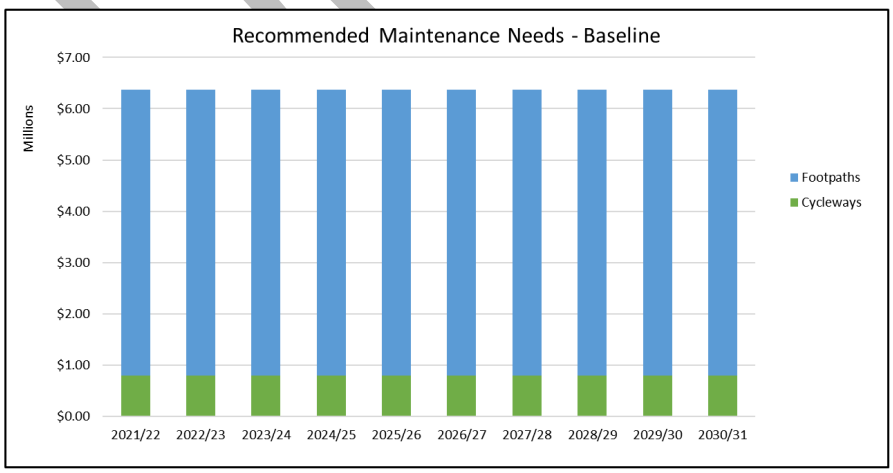

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Figure 6-6: Future baseline maintenance needs for pathways

Source: Asset management financial model (2020)

Asset type $M	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	10-year total
Footpaths	$5.6	$5.6	$5.6	$5.6	$5.6	$5.6	$5.6	$5.6	$5.6	$5.6	**$55.7**
Cycleways	$0.8	$0.8	$0.8	$0.8	$0.8	$0.8	$0.8	$0.8	$0.8	$0.8	**$8.0**
Total	$6.4	$6.4	$6.4	$6.4	$6.4	$6.4	$6.4	$6.4	$6.4	$6.4	**$63.7**

Table 6-11: Future baseline maintenance needs for pathways

Source: Asset management financial model (2020)

6.3.3.2 Future consequential maintenance needs

Consequential maintenance needs, in addition to the baseline maintenance needs, may be required if the pathways network expands, due to capital improvement projects, new subdivisions and development, city centre or town-centre upgrades, and other streetscape projects.

Streetscape and town centre upgrades, in particular, tend to create significant consequential maintenance needs, due to the high value of the block-pavers used and the intricacies of cleaning them.

Auckland Transport establishes the consequential maintenance needs for pathways by modelling the likely network growth, based on historical and future capital projects and the projected amount of vested assets.

Major assumptions used in the model include:

- all components in an asset will deteriorate in the same fashion – no allowance has been made for early or sudden failure of the asset
- growth in the number of vested assets will be the same as the average growth per year for the past 3 years
- where projects are not split into phases, the construction cost of the project is assumed to be its full cost
- maintenance costs follow a set pattern, based on the age of each type of asset type; these costs are assumed to remain at zero for a number of years initially, before increasing to a maximum cost per year at the end of the asset's life
- no allowance has been made to inflate historical costs to current dollar values.

The average historical growth of pathways assets over the past 5 years has been approximately 71km (1 per cent) per year for footpaths and approximately 28km (2.5 per cent) per year for cycleways.

The modelling shows that this average annual growth is predicted to increase to 104km per year for footpaths and 10km per year for cycleways, for the next 10 years.

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Figure 6-7 and Table 6-12 show the predicted consequential maintenance needs for the pathways network.

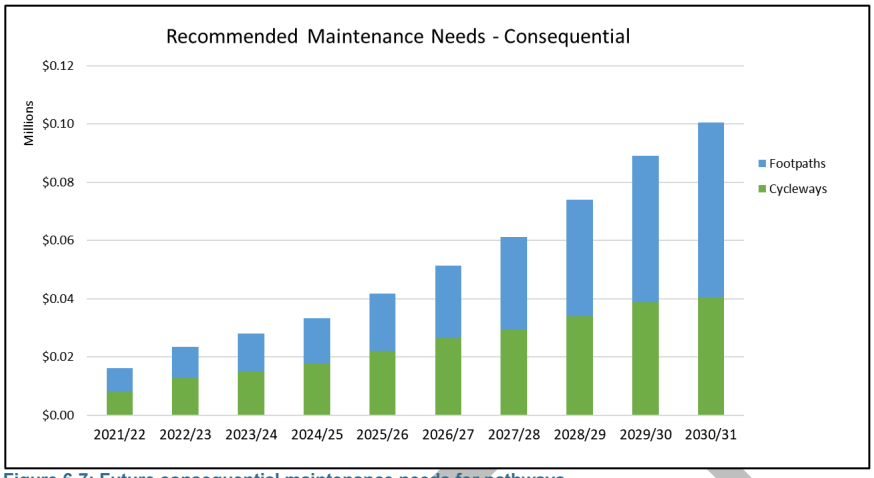

Figure 6-7: Future consequential maintenance needs for pathways

Source: Asset management financial model (2020)

Asset type $M	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	10-year total
Footpaths	$0.01	$0.01	$0.01	$0.02	$0.02	$0.02	$0.03	$0.04	$0.05	$0.06	**$0.27**
Cycleways	$0.01	$0.01	$0.02	$0.02	$0.02	$0.03	$0.03	$0.03	$0.04	$0.04	**$0.24**
Total	$0.02	$0.02	$0.03	$0.03	$0.04	$0.05	$0.06	$0.07	$0.09	$0.10	**$0.52**

Table 6-12: Future consequential maintenance needs for pathways

Source: Asset management financial model (2020)

This level of investment will ensure Auckland Transport to deliver the agreed maintenance levels of service required for 104km of footpaths and 10km of cycleways each year for the next 10 years.

6.3.3.3 Future additional maintenance needs

Additional maintenance needs can arise from local requirements, committed activities, increased levels of service and other factors, such as climate change.

At present, we have not identified any additional maintenance needs for the pathways network.

6.3.3.4 Future maintenance investment required

The future maintenance investment required for the pathways network takes into account all the above types of maintenance needs.

The total recommended maintenance investment forecast for the pathways network for the next 10 years is $64.3 million, which equates to an average of $6.4 million per year. This is made up of:

- baseline maintenance needs – $ 6.4 million per year (10-year average)
- consequential maintenance needs (from new assets due to network growth) – $0.05 million (10-year average).

Figure 6-8 and Table 6-13 show how this investment will be used over the next 10 years.

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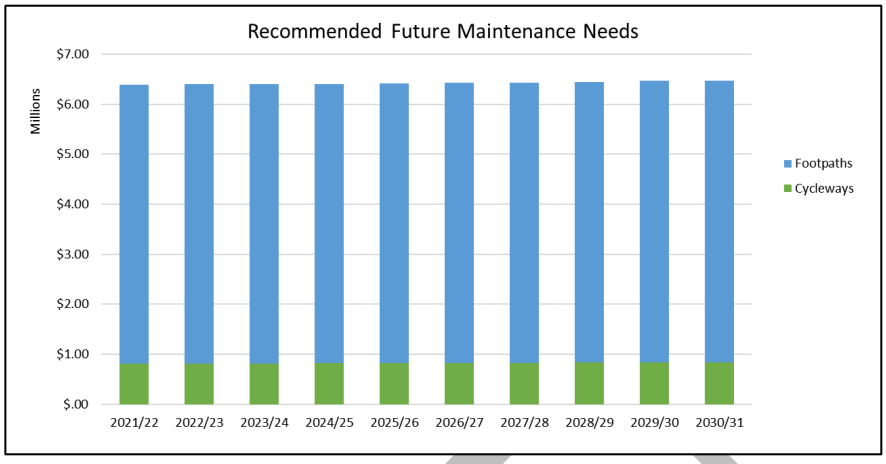

Figure 6-8: Recommended future maintenance needs for pathways

Source: Asset management financial model (2020)

Asset type $M	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	10-year total
Footpaths	$5.6	$5.6	$5.6	$5.6	$5.6	$5.6	$5.6	$5.6	$5.6	$5.6	**$56.0**
Cycleways	$.8	$.8	$.8	$.8	$.8	$.8	$.8	$.8	$.8	$.8	**$8.2**
Total	$6.4	$6.4	$6.4	$6.4	$6.4	$6.4	$6.4	$6.4	$6.5	$6.5	**$64.3**

Table 6-13: Recommended future maintenance needs for pathways

Source: Asset management financial model (2020)

This level of maintenance investment will ensure the delivery of

- Level of service and maintenance of growing pathway network
- Maintenance and repair of pathway assets for future network
- Customer services and emergency responses.

These overall future maintenance requirements for the pathways network have been split further into the 11 contract areas: details are given in Appendix TBD.

The costs for each area have been allocated based on historical expenditure trends, contractual requirements and an assessment of each area's maintenance needs.

6.3.4 Maintenance forward works programme

Auckland Transport develops it maintenance forward works programme for its pathways assets based on footpath faults identified during inspections, condition rating surveys and feedback from customers.

Table 6-14 summarises the indicative costs of the maintenance forward works required for pathways assets in each contract area, based on the condition of the assets.

Contract area	Indicative cost	Total length with poor and very poor condition faults (m)
Central	$1,762,545	17,253
Central east	$852,878	7,872
Hauraki Gulf islands	$31,569	300
North rural	$159,307	1,620

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North urban east	$600,046	6,393
North urban west	$551,594	4,547
South rural	$438,759	3,540
South urban east	$341,808	2,854
South urban west	$1,493,830	11,764
West	$1,417,342	12,662
Total	$7,649,678	68,805

Table 6-14: Indicative maintenance needs for pathways

Source: Condition-based pathway indicative forward works programme (v2.1, June 2019)

Once they have been field validated, candidate sites for maintenance works will then be identified and the costs of the works confirmed, depending on the maintenance type.

Note that maintenance works are often integrated with renewals of full sections of pathways, in which case the costs of those works are covered under renewal, instead of maintenance.

Summary of Auckland Transport's current road maintenance contracts is included in Appendix D.

6.4 Renewal plan for pathways

Renewals are planned work activities that respond to asset degradation where the risk of the asset failing and the consequential disruption to services has become unacceptable to road users. This may include the effects of both direct disruption if the asset fails and any subsequent disruption while the asset is being reinstated.

The decline of an asset's condition or performance can be assessed using:

- level of service criteria – the asset no longer achieves the required condition or performance expected at an acceptable risk tolerance level
- economic criteria – it is more cost effective to replace the asset, rather than continue to maintain or repair it[1].

6.4.1 Our renewal planning approach

Figure 6-9 illustrates a typical ongoing deterioration pattern for an asset, from "as new" through to eventual "end of life" and "failure".

[1] The net present value (NPV) of the treatment rises above zero, thus balancing future discounted maintenance costs against the cost of the treatment

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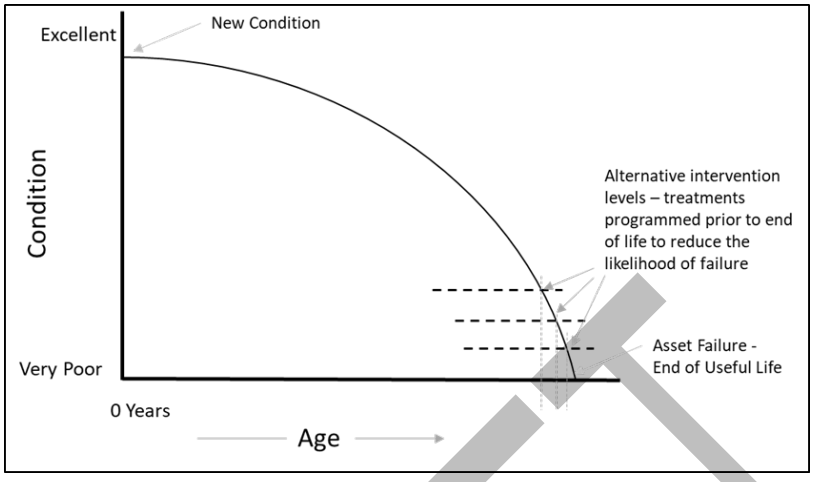

Figure 6-9: Typical deterioration curve for an asset

The decision to intervene and replace an asset, before it fails, might be taken if the risk of disruption from that failure is too great. This means considering progressively earlier interventions, and not allowing the asset to fall below a set condition or performance level that will affect customer safety.

Typically, this approach considers assets on the busier and more important roads to present higher levels of risk, while assets on quieter local roads can be allowed to deteriorate a little more, but not to the point of failure.

Renewals planning can also be viewed from the perspective of exposure to financial risk. This approach involves mapping the asset's replacement cost (from the asset valuation) against risk, taking into account likelihood and consequence of an asset failure.

While the likelihood of an asset failing can be difficult to assess, its condition and age provide an indication of this likelihood. The worse the asset's condition, the more likely it is to fail. Assets that are both very important and more likely to fail should have a higher priority, and be replaced or rehabilitated earlier in their lifecycle, than others. For less important assets, a lower renewals priority is suitable.

By mapping the replacement cost of the asset and its known condition data, by One Network Road Classification category, a picture can be formed of the potential financial exposure or renewal liability for the asset, using its criticality (or importance) and condition as guides.

6.4.1.1 Approach used to analyse 10-year asset renewal needs

Auckland Transport determines its 10-year asset renewal needs for pathway assets by following a comprehensive process using a range of inputs, as shown in Figure 6-10.

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Pathways (footpaths and cycleways) asset class management plan

This is the common approach adopted for all the assets we manage, although not all inputs are appropriate for all asset classes (e.g. dTIMS does not apply for pathways).

Figure 6-10: Inputs used to determine 10-year asset renewal needs

The process uses modelling tools and considers significant trends that are or will affect the road network in the future. It also integrates both 'top-down' and 'bottom-up' considerations, enabling any incremental programme changes derived from these inputs to be compared.

The process starts with the ROM model and follows the steps shown in Figure 6-11.

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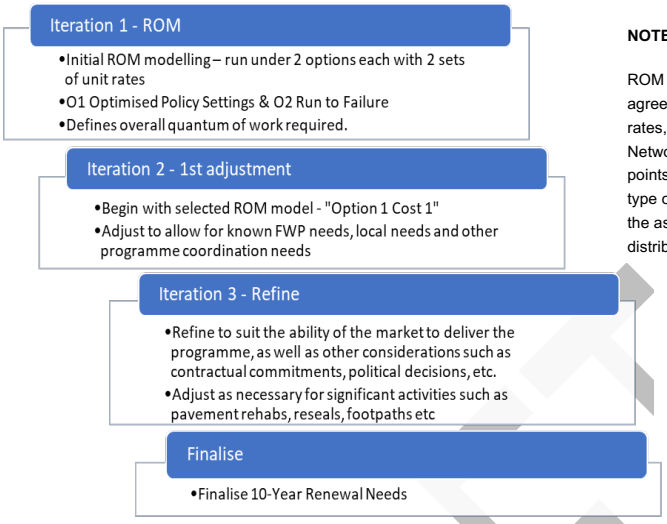

NOTES:

ROM modelling uses reviewed and agreed policy settings and inputs (unit rates, useful lives, backlog policy, One Network Road Classification intervention points and deterioration curves). The type of deterioration curve is based on the asset class and its current condition distribution on a 1 to 5 grading system.

Output from ROM provides 10-year indicative investment needs for asset classes, as well as their expected condition profile and backlog profile. This can be reported as required by contract areas.

Figure 6-11: Steps taken to determine 10-year asset renewal needs

6.4.2 Renewal activities

Renewal activities involve the planned like-for-like replacement of sections of pathway, which are 10m or more in length. Replacement occurs when the condition of the asset has deteriorated to the point where it is neither economically efficient nor prudent to continue to maintain it. Likewise, it can happen when an asset has been damaged though natural phenomena.

Table 6-15 sets out typical renewal activities for pathways.

Activity	Description	Waka Kotahi NZ work categories
Footpath renewals	Programmed renewals Programmed replacements to address level of service requirements and risks, considering the whole-of-life asset costs. Other renewals Local board requests for pathway renewals or upgrades. These renewals tend to occur in conjunction with other road corridor renewal projects or safety improvements within the area	125: Footpath maintenance
Cycleway renewals	Same as above	124 Cycleway maintenance

Table 6-15: Renewal activities for pathways

Table 6-16 shows the key intervention points for programmed pathway renewals, along with the renewal approach that will be taken and any timeframes.

Key intervention points for programmed renewals	Renewals approach and timeframes
Assets in 'very poor' condition – when asset failure is imminent and will have a serious negative safety impact for users	Urgent temporary repair is to be completed as per contract requirements. To be included in the forward works programme for current year for permanent replacement.

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Assets in 'poor' condition – when asset failure is likely to occur in the short term and will have significant risk for the safety for users	To be included in the forward works programme to be completed within 2 years.
Assets that are aesthetically very poor	Depending on the location and importance to the wider community, replacement may be required. Local board input is required to secure funding and confirm implementation of works.
Assets that have slip-resistance issues	Depending on the performance of the treated surfaces, replacement may be required to comply with the required standard. Opportunities to integrate with other roading or kerb and channel projects.
Assets impacted by other road renewals or improvements	Assess pathways in conjunction with the road corridor renewal or improvement works – such as kerb and channel upgrades and pavement resealing and rehabilitation, utility improvements, etc. Note that early renewals to enable wider corridor improvements are to be funded under the capital budget.

Table 6-16: Key intervention points for programmed renewals for pathways

The main causes of deterioration for pathways assets are ground movements, trees, vehicles and utilities, in that order, as shown in Figure 6-12.

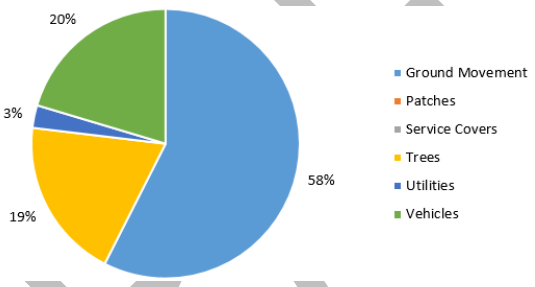

Figure 6-12: Causes of pathway asset deterioration

Source: Auckland Transport RAMM database (March 2020)

6.4.2.1 Renewals for pathway surface finishes

When renewing pathways, Auckland Transport considers whether their visual appearance and aesthetic value is consistent with the rest of the network.

Auckland Transport's Footpath Asset Management Strategy specifies the recommended surface finishes that different classes of footpath assets should have, as shown in Table 6-17. Refer Table 2-1 for description of footpath classes.

Footpath class	Recommended surface finishes for renewal
Class A	Exposed aggregate concrete with black oxide
Class B	Like with like
Class C	Broom finished plain concrete with black oxide
Class D	Broom finished plain concrete with black oxide

Table 6-17: Recommended surface finishes for footpaths, by class

Source: Auckland Transport Footpath Asset Management Strategy

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All surfacing renewals works must comply with the specifications in the Auckland Transport Design Manual.

In sensitive rural landscape areas, such as the Waitakere Ranges Heritage Area, Auckland Transport is required to maintain rural and natural character and avoid 'urbanisation' through cumulative small-scale changes, such as the introduction of white concrete footpaths. Footpaths in those areas should be renewed on a like-for-like basis, particularly where asphaltic concrete or basalt-stone kerbing has been used. The exception is where a service-level improvement is required, or the local board requires a higher level of service. Specific and more detailed design requirements that apply in heritage areas are outlined in the Transport Design Manual.

Where a different surface treatment is required in high-profile areas or sensitive rural landscape areas, local board input will be required into any proposed alternative surface finish. Any such proposal must also be reviewed and approved by the Auckland Transport Road Corridor Delivery Manager.

For cycle ways, a good riding surface is critical for ensuring safe and comfortable cycling conditions. Smooth transitions between cycleways and adjacent surfaces is also needed to enable cyclists to get on and off the facility and continue their journey.

In general, asphalt (or hot mix) or concrete surfacing is used on cycleways to provide smooth, lower friction, comfortable and efficient travel for cyclists. The specification requirements are detailed in the Transport Design Manual.

6.4.2.2 Renewals for vehicle crossings

Auckland Transport requires property owners or occupiers to maintain their vehicle crossings to Auckland Transport's standard. The condition of vehicle crossings, in the areas that are shared with pedestrians, are taken into account when planning for footpath renewals.

Auckland Transport will consider replacing part of vehicle crossings when renewing footpaths and shared paths associated with the crossings.

When Auckland Transport renews a footpath that is associated with a vehicle crossing:

- it will replace the footpath area shown as 'a' in Figure 6-13
- it will replace the area of vehicle crossing on either side of the footpath to a distance of 500mm from the edge of the footpath or construction joint, shown as area 'b' in Figure 6-13, if it has been damaged due to footpath renewal works
- it may consider replacing the area between the footpath and the kerb, shown as area 'c' in Figure 6-13, if there is a level change or a kerb and channel upgrade at the time of the renewal,
- it may consider, on a case-by-case basis, replacing any part of the vehicle crossing, if there is damage due to a public tree root, utilities or rubbish trucks.

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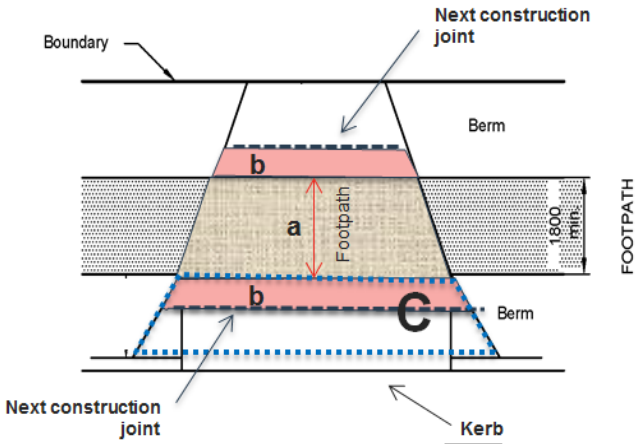

Figure 6-13: Footpath renewals associated with a vehicle crossing

Source: Auckland Transport Footpath Asset Management Strategy

Any existing 'Takapuna' crossings are now non-standard and need to be removed, where possible, when a footpath renewal occurs.

The crossing then needs to be reshaped to accommodate smooth vehicle access into the property, in accordance with the standard in the Transport Design Manual.

6.4.2.3 Renewals for culverts under vehicle crossings

The ownership and maintenance of culverts under private vehicle crossings lies with the crossing owner.

Auckland Transport may undertake maintenance or renewals of culverts under vehicle crossings under one or more of the following circumstances:

- The culvert is installed or altered as part of an Auckland Transport roading project
- The works are required as part of emergency operational maintenance
- Auckland Transport is required by regulatory or consent compliance requirements to undertake the works
- The works are required as part of a Stormwater or drainage project not associated with a road upgrade.

6.4.3 Renewal history

On average over the past 3 years Auckland Transport has invested on average $19 million per year in pathway renewals.

Figure 6-14 compares historical asset renewals costs with current budgets to 2020/21.

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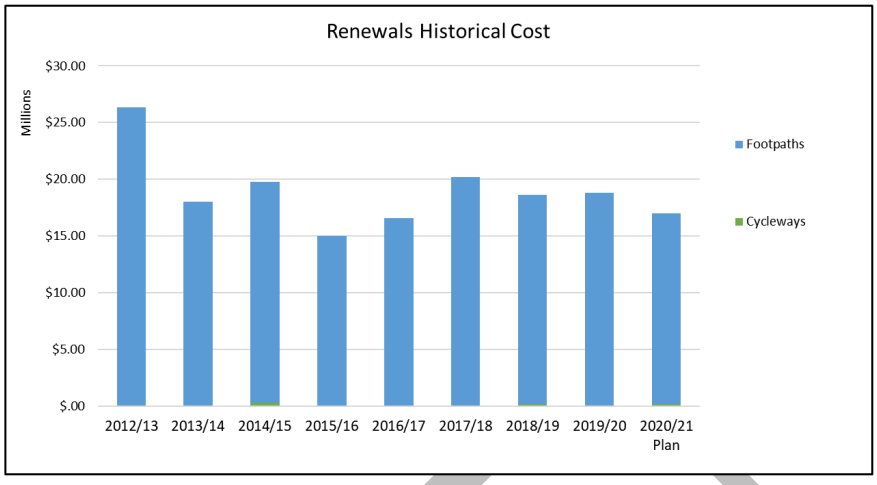

Figure 6-14: Historical and planned renewal costs
Source: Auckland Transport SAP database (2020)

Asset type $M	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21 Plan
Footpaths	$26.4	$18.0	$19.5	$15.0	$16.6	$20.2	$18.4	$18.8	$16.8
Cycleways	$0.0	$0.0	$0.3	$0.0	$0.0	$0.0	$0.2	$0.0	$0.2
Grand Total	$26.4	$18.0	$19.8	$15.0	$16.6	$20.2	$18.6	$18.8	$17.0

Table 6-18: Historical maintenance costs for pathways
Source: Auckland Transport SAP database (2020)

6.4.4 Renewal issues

This section describes the main issues affecting Auckland Transport's renewal programme.

6.4.4.1 Condition, performance and risk

Table 6-19 shows the distribution of current replacement cost value by asset condition, which is linked to the likelihood of pathway failure.

The top right corner represents an unacceptable financial risk exposure justifying early intervention. A run to failure strategy for renewal would result in more assets moving towards the right or into the top right quadrant.

Road hierarchy	Replacement cost by condition and failure risk				
	Condition: As New	Condition: Good	Condition: Average	Condition: Poor	Condition: Very Poor
	Failure risk: Very Rare	Failure risk: Rare	Failure risk: Seldom	Failure risk: Common	Failure risk: Frequent
Regional					
Arterial					
Primary collector					
Secondary collector					

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Road hierarchy	Replacement cost by condition and failure risk				
	Condition: As New	Condition: Good	Condition: Average	Condition: Poor	Condition: Very Poor
	Failure risk: Very Rare	Failure risk: Rare	Failure risk: Seldom	Failure risk: Common	Failure risk: Frequent
Access and low volume					

Table 6-19: Asset replacement cost, by condition and failure risk

6.4.4.2 Growth impacts

Growth issues affecting the road network, including pathways, include:

- overall network growth due to population growth, land use changes and safety requirements
- new subdivisions and urban development which add to the size of the pathway portfolio.

6.4.4.3 Construction cost trends

Unit rates have increased significantly in recent years, such that current road contract maintenance rates are up to 80 per cent higher than the rates used in the 2018 Auckland Transport Asset Management Plan (the planning rates) for resurfacing work, and 175 per cent higher for rehabilitation work.

A variety of factors have contributed to increased unit rates. These include, but are not limited to:

- increased traffic management costs, due to improvements in safety standards and regulations.
- rates negotiated for contract extensions taking into account the increased input costs
- changes in the cost of delivery due to inflation.

6.4.5 Renewals programme development

Auckland Transport develops its renewals programme for its pathways using ROM modelling.

The modelling takes into account the current condition of assets, the risks associated with the condition profile, and the levels of service to be delivered. Various iterations of the model are run.

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6.4.5.1 Iteration 1

The first iteration involves testing two alternative strategies – run to failure and optimised – against two sets of unit rates and the following intervention settings shown in Table 6-20.

Scenario	Unit Rates Input	Renewal Intervention Level (IL) Input
O1-C1	"Cost 1" – unit rates based on a 3-year rolling average (2017/18 to 2019/20)	Optimised Policy Settings – IL ranges from 12 to 14 based on ONRC categories
O1-C2	"Cost 2" – unit rates based on 2018 AMP rates	Optimised Policy Settings – IL ranges from 12 to 14 based on ONRC categories
O2-C1	"Cost 1" – unit rates based on a 3-year rolling average (2017/18 to 2019/20)	Run to failure – IL 15 for all road lengths
O2-C2	"Cost 2" – unit rates based on 2018 AMP rates	Run to failure – IL 15 for all road lengths

Table 6-20: Intervention settings used in ROM modelling for renewals

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The modelling process produced the scenarios and forecast costs for the renewal programme in Table 6-21. These figures cover all pathway renewal costs.

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Scenario	Year 1	10-Yr Total	Comment
O1-C1	$4.4M	$302.3M	**Preferred** - This is the base case for further iterations of programme needs
O1-C2	$2.9M	$164.5M	Demonstrates the impact of lower unit rates
O2-C1	$4.7M	$308.3M	Run to failure – Purpose is to benchmark the "Preferred" option
O2-C2	$3.1M	$172.9M	Run to failure – Purpose is to benchmark the "Preferred" option

Table 6-21: Outcomes from ROM modelling for renewals

6.4.5.2 Iterations 2 and 3

These iterations allow the issues described in Section 6.4.4 to be incorporated in the programme forecast, as shown in Table 6-22.

Iteration	Factors and impacts included
Iteration 2 – "Local Needs"	Adjustments to Scenario O1-C1 base programmes to the FWP for year 2021/22 – 2022/23 and increased by 1.5% afterwards Coordinated pathway renewal works with other programmes, in particular pavement rehab and drainage renewals

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Table 6-22: Iteration to align with the 10-year asset renewal plans

The allocation in this iteration are based on local experience and the ~~field-validated~~ forward works programme. These will be further refined with more detailed work around asset renewals, including an assessment of the effect of the Covid-19 pandemic.

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These iterations resulted in the incremental changes in the renewals programme needs set out in Table 6-23.

Scenario O1-C1 Cost Element	Iteration 1 - ROM		Iteration 2		Iteration 3	
	Year 1 $m	10-Yrs $m	Year 1 $m	10-Yrs $m	Year 1 $m	10-Yrs $m
Footpath renewals	$4.0	$274.9	$20.2	$212.3	$20.2	$212.3
Local needs			$5.0	$52.7	$5.0	$52.7
Cycleway renewals	$0.4	$27.4	$0.8	$27.8	$0.8	$27.8
Other costs[1]	$0.8	$7.5	$0.8	$7.5	$0.8	$7.5
TOTAL RENEWALS	**$5.2**	**$309.8**	**$26.8**	**$300.3**	**$26.8**	**$300.3**

Table 6-23: Iterations considering financial impacts from events

6.4.5.3 Comparative analysis

Figure 6-19 compares the renewal forecast and depreciation.

<needs to be updated with new valuation and information and actual renewal profile>

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Depreciation Analysis Assumptions:

Replacement costs and annual depreciation as per the 2017 valuation increased by 35%

An annual increase in the asset base of 2.5% pa – this increases annual depreciation each year

Renewals budget is Iteration 3

Conclusion:

This shows that renewals are tracking ahead of depreciation, suggesting that economic value is being restored through the proposed strategy.

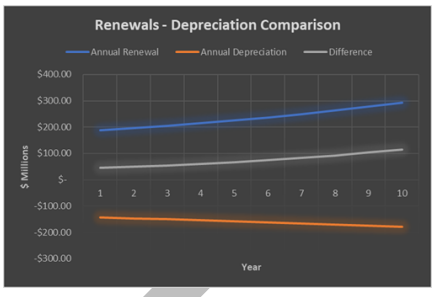

Figure 6-15: Comparison of renewals and depreciation of the assets

6.4.5.4 Refine programme

The condition-based indicative pathway renewal forward works programme (2020-2024) has been utilised to refine the renewal programme. This is summarized in Section 6.4.9.

6.4.6 Programme recommendations

Auckland Transport recommends that there is a 10-year programme for pathways with a total cost of $300.3 million, an average of over $27.2 million per year with $26.8 million allocated in the first year.

This is an increase over the current 3-year average renewals programme cost of $8.2M per year.

Table 6-24 and Table 6-25 summarise how the recommended future renewals costs will be spread over future years.

Asset type $M	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	10-yr Total
Cycleways renewals	$.8	$.9	$1.4	$1.9	$2.5	$2.9	$3.5	$4.1	$4.6	$5.2	$27.8
Footpaths renewals	$25.2	$25.5	$25.5	$25.8	$26.2	$26.6	$27.0	$27.3	$27.7	$28.1	$265.0
Staff overheads (renewals)	$.8	$.8	$.8	$.8	$.8	$.8	$.8	$.8	$.8	$.8	$7.5
Total (million)	$26.8	$27.1	$27.6	$28.5	$29.4	$30.3	$31.2	$32.2	$33.1	$34.1	$300.3

Table 6-24: Future renewals costs for pathways

Source: Asset management financial model (2020)

Asset type	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	10-yr total
Footpath (km)	133.5	135	134.7	136.7	138.6	140.6	142.6	144.7	146.8	148.9	**1402.1**
Cycleways (km)	4.4	4.5	7.3	10	13	15.6	18.4	21.7	24.6	27.8	**147.3**

Table 6-25: Future renewals quantities for pathways

Source: Asset management financial model (2020)

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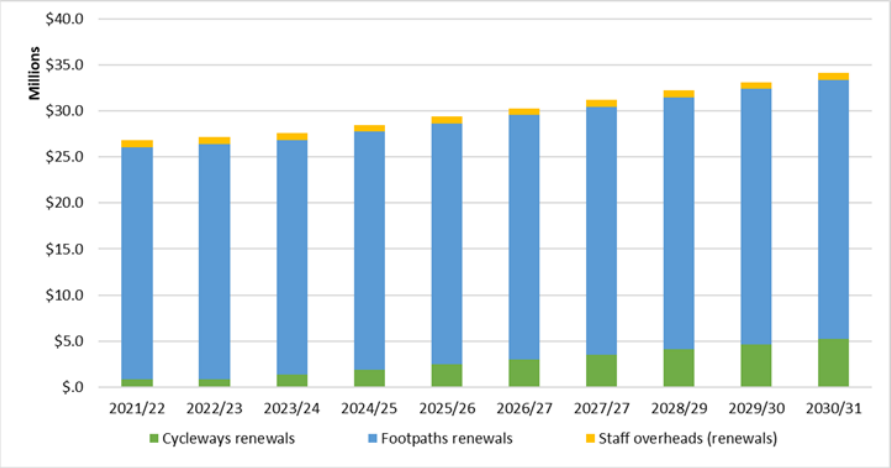

Figure 6-16: Future renewal costs for pathways

6.4.7 Comparison with 2018-21 Long Term Plan

Figure 6-17 compares the recommended renewals for pathways with those forecast in Auckland Council's Long-Term Plan 2018.

Overall, the recommended renewals align with the approved renewals budgets in the long-term plan. Recommendation to increase the first two years is to address the rapid deterioration of the pavements due to growth related construction traffic and heavy commercial vehicle usage.

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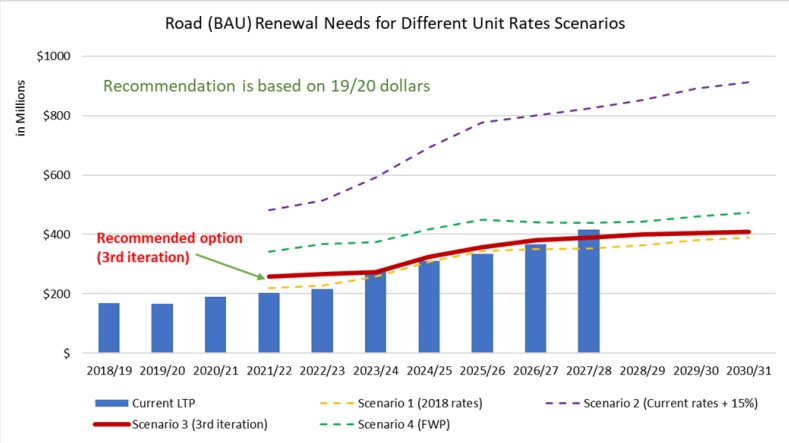

Figure 6-17: Renewal programme cost comparison with the long-term plan (all roading)

6.4.8 Future condition profile

The future condition profile of pathways, under the recommended renewal programme, is predicted to behave as shown in Figure 6-18.

There is a trend of assets moving from the moderate and good condition to the very good condition. However poor and very poor performing assets are indicating a slightly negative trend over the next 10 years.

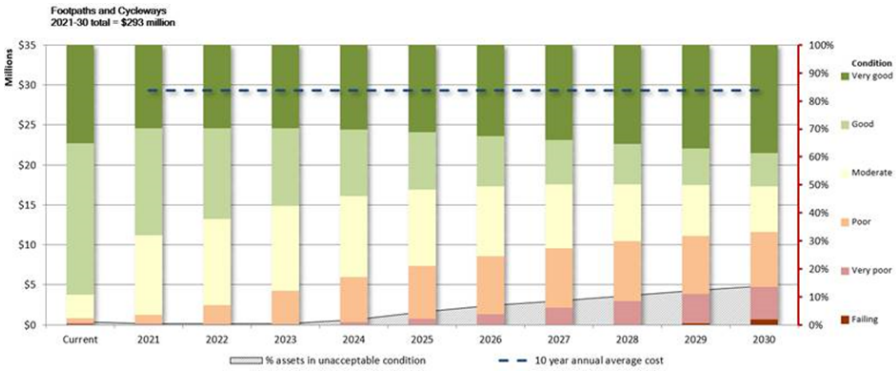

Figure 6-18: Future condition profile for pathways

6.4.9 Renewals forward works programme

Auckland Transport has developed pathway renewal forward works programme through the process of:

- identification – identifying sites for renewal based on their condition, and local knowledge and requirements
- prioritisation – assigning a condition-based ranking to sites needing renewal, assuming no budget constraints
- optimisation – making a risk-based selection of sites for renewal, to fit a constrained budget
- integration – validating the scope of the renewals works required and integrating these works with other projects.

The key asset management factors that we use during this process are:

- the condition and aesthetic rating of the asset
- the level of service to be delivered
- the risk associated with any faults
- the renewal intervention point
- the asset's base life
- the renewal unit rate.

The condition-based renewals forward work development process is shown in Figure 6-19.

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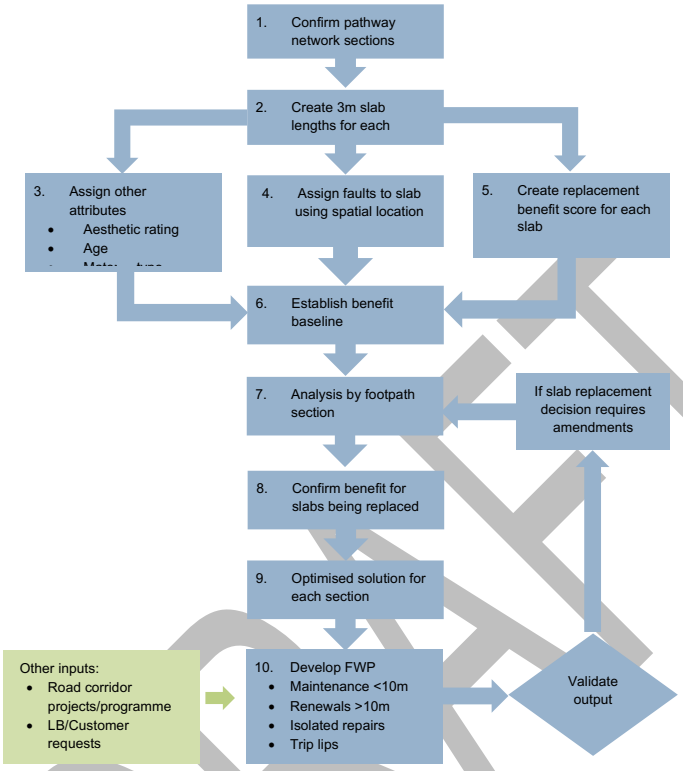

Figure 6-19: Process for developing the condition-based renewal forward works programme for pathways

Table 6-26 summarises the current indicative condition-based renewal forward works programme for pathways.

Contract area	2020/21		2021/22		2022/23		2023/24	
	Cost	Area (sqm)	Cost	Area (sqm)	Cost	Area (sqm)	Cost	Area (sqm)
Central	$3,561,781	30,488	$3,521,111	31,165	$2,978,282	26,176	$4,269,653	39,579
Central East	$3,562,512	31,122	$3,392,965	31,076	$3,228,387	28,512	$153,491	1,330
Hauraki Gulf Islands			$43,175	410	$121,283	1,152	$38,090	362
North Rural	$384,111	3,920	$330,583	3,373	$146,964	1,496	$210,573	2,149
North Urban East	$1,249,541	13,236	$1,517,961	16,086	$1,361,446	14,441	$664,699	7,042
North Urban West	$1,249,131	10,601	$700,296	6,002	$953,733	8,445	$122,561	987
South Rural	$499,974	4,051	$1,284,654	10,409	$1,315,491	10,668	$1,057,207	8,555
South Urban East	$1,249,165	10,532	$561,381	4,733	$2,404,355	20,271		
South Urban West	$1,249,547	9,893	$2,724,191	21,568	$3,252,078	25,747	$2,577,268	20,453
West	$3,497,757	31,044	$5,727,565	50,900	$2,602,751	23,202	$5,507,830	48,771

Grand Total	**$16,503,518**	**144,886**	**$19,803,882**	**175,721**	**$18,364,771**	**160,110**	**$14,601,372**	**129,227**

Table 6-26: Renewals forward works programme for pathways, 2020-2024

Source: Condition-based pathway renewal forward works programme 2020-2024_V3

Not that the renewal candidates are confirmed on a yearly basis depending on field validation, prioritisation and integration with road corridor works.

6.4.10 Process to develop a fundable renewals plan

Unlike maintenance, renewals can be postponed in order to redistribute costs over time, although this will impact on levels of service and increase the level of managed risk.

In the face of funding constraints including the impacts of Covid-19 on both Auckland Council and Auckland Transport revenue, Auckland Transport has developed a set of adjustments to its asset needs renewals programmes.

An overview of the costs of the scenarios considered is shown in Figure 6-20.

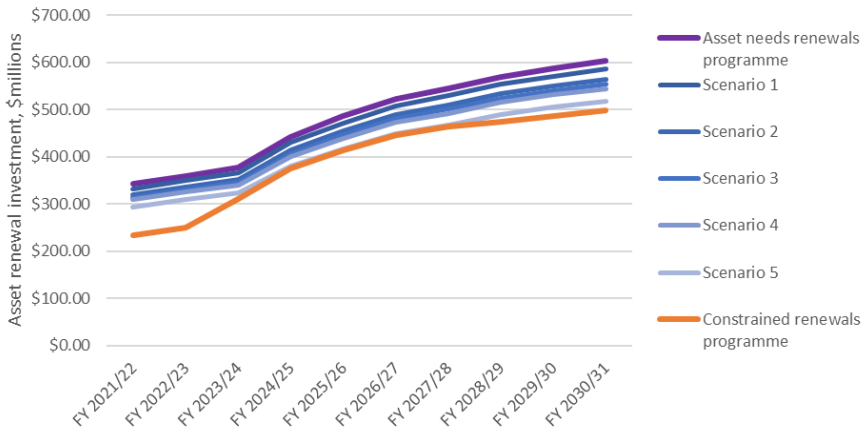

Figure 6-20: Asset investment programmes considered

6.4.10.1 Asset needs renewals programme

The asset needs renewals programme has a total cost of $4.832 billion over 10 years. It includes the pathway renewal programme which has been the focus of this ACMP. The process by which the asset needs renewals programme was developed is described in detail in Section 6.4.9 of this ACMP, and in Section 6.2 of the Asset Management Plan. Renewals are prioritised based only on asset needs and delivery constraints. This programme did not consider affordability.

The asset needs renewal programme will contribute to the RLTP initiatives by:

Supporting growth

Providing $185 million (inflated) over 10 years for renewals complementing development. This programme would enable Auckland Transport to take up cost-effective opportunities to integrate with developers, especially in brownfields sites, to renew assets with modern equivalent assets in support of a consistent level of service in growth areas.

Providing $53 million (inflated) over 10 years to address intensification impacts in greenfield and brownfield development areas, where construction traffic has irreversibly damaged existing road pavements.

Providing $53 million (inflated) over 10 years to renew roads impacted by construction traffic but outside of direct development areas, including key routes to quarries, cleanfill and landfill sites.

Improving safety

Providing $133 million (inflated) over 10 years for a programme of slip remediation to "build back better" and create a road network that is less prone to disruption and safety risks during extreme weather events.

Providing $160 million (inflated) over 10 years for seismic retrofitting of Auckland Transport bridges, gantries and buildings to meet earthquake safety standards.

Accelerating better transport choices

This objective is more relevant to the capital improvements programme than to renewals. The renewals programme supports these projects by ensuring that new assets are connected to an effective network of existing transport assets.

Addressing sustainability issues especially climate change

Providing $100 million (inflated) over 10 years to begin targeted climate change resilience improvements to sealed roads, stormwater systems, and retaining walls on links that have been identified through AT's natural hazard risk assessment as at risk of coastal inundation and/or surface flooding. The investment in slip remediation will also contribute to improving network resilience to climate change impacts.

Improving connectivity

Providing **$16 million** (inflated) over 10 years to support local needs for road corridor renewals, prioritising those opportunities identified by local boards to complement local board improvement projects. The investment in slip remediation will also contribute to improving connectivity.

6.4.10.2 Scenarios in response to funding constraints

In response to current funding constraints, Auckland Transport has developed a set of scenarios that postpone some renewals activities in order to arrive at a more affordable option. These scenarios are:

Scenario 1 – **$4.694 billion**

This option addresses the backlog of assets that are below AT's current levels of service at a slower rate than the AMP recommendation, but includes all of the initiatives listed above to contribute to RLTP outcomes.

Scenario 2 – **$4.524 billion**

This option addresses the backlog at the same rate as Scenario 1, and also delays the implementation of AT's climate change response.

Scenario 3 - **$4,446 billion**

This option is the same as Scenario 2, but also delays Auckland Transport's growth response initiatives. This will reduce the ability of Auckland Transport to invest in renewals complementing development, and to address the impacts of intensification on existing assets, in the early years of the RLTP.

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Scenario 4 - **$4,368 billion**

This scenario delays implementation of almost all of the ATAP/RLTP initiatives listed above, with the one exception of renewals to meet local needs.

Scenario 5 - **$4,152 billion**

This scenario introduces an additional delay to the programme to address the backlog of assets below levels of service, and postpones investment in all of the identified ATAP/RLTP initiatives.

6.4.10.3 The constrained renewal programme

This represents a sixth scenario, with a total cost over ten years of **$3,951 million**. This programme has the lowest cost, and the highest level of managed risk, of all of the options considered. It defers all of the RLTP initiatives beyond the first three years, and postpones climate change investments beyond the ten years of this RLTP. Reduction in the backlog of assets already in very poor condition is slower under this option, however the programme has been optimised to:

- restrict impacts on levels of service to less critical assets
- ensure that assets are safe and serviceable
- avoid additional costs caused by unexpected asset failure.

The funding constrained renewals investment plan will be included in AT's draft 2021 RLTP.

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6.5 Capital improvements for pathways

6.5.1 Auckland Regional Land Transport Programme

The Auckland Regional Land Transport Programme takes a strategic approach to the transport challenges faced by the Auckland region.

The programme summarises these challenges under key areas:

- safety
- congestion
- freight
- accessibility
- environment
- growth
- value for money.

The long-term capital investment programme set out in the Regional Land Transport Programme will enable Auckland to address these challenges and take advantage of future growth, while at the same time enabling the creation of an accessible, well-connected, safe and sustainable region.

The Regional Land Transport Programme will also support the move away from a city where the dominant mode of travel is by single-occupant private vehicles, to a city where public transport, walking and cycling play a more important role. Significant investment in transport infrastructure such as light rail, mass transit, bus priority measures and cycleways, supported by improvements to bus, rail and ferry services, will support Auckland to achieve these goals. This will be supported by a much greater focus on customer needs and improving customer experience.

Investment in walking and cycling facilities will be supported by the provision of more shared spaces, amenity improvements, cycleways and footpaths, better network connections, end-of-journey facilities, more and improved pedestrian crossings, signal phasing that prioritises pedestrians, and safer traffic speeds.

Addressing the negative impacts of the transport system is a core element of the programme, in particular to reduce deaths and serious injuries. This will be achieved through a comprehensive programme of safety improvements, including targeted initiatives such as improvements to high-risk intersections and corridors, and speed management.

Minimising the impacts of transport on the environment is also a core focus of the programme, and will be achieved through better design, greater use of more sustainable travel options, the rollout of LED lighting, the installation of pollutant traps to minimise the impacts of road stormwater damage, and promotion of electric vehicles.

Improving network capacity and performance by making the most of the existing transport system will also be key. For example, optimising the network through targeted changes such as improving the coordination of traffic lights, using dynamic lanes at peak times, and removing bottlenecks to mitigate congestion. Maximising the benefits from new technology and taking opportunities to influence travel demand by encouraging car sharing and mobility as a service (MaaS) are also important. In the longer term, we will also consider introducing pricing to address congestion.

While the primary focus of the Regional Land Transport Programme is to reduce people's reliance on private cars, there is still a need to invest in roads. In tis respect, the programme addresses congestion on the arterial road network, supports the movement of freight including access to key freight locations, the port and Auckland Airport, and enables public transport to support housing and development.

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6.5.2 Opportunities for walking and cycling

There is a significant opportunity for walking and cycling to play a greater role in improving access and creating a more effective transport system for Auckland.

For cycling, there is an opportunity for it to:

- be used more short-to-medium distance commuting trips, with particular value where it can remove car trips from congested networks
- provide connections to and within Auckland's public transport network, increasing its catchment and improving access to jobs and other opportunities
- improve access to transport for groups with lower transport choices(for example, children and young people, and other people with poor access to public transport or private vehicles) by providing a low-cost, convenient transport option
- provide a convenient transport choice for everyday household trips, taking pressure off networks serving key metropolitan and town centres.

The Regional Land Transport Programme seeks to increase cycling, and reduce deaths and serious injuries among cyclists, by providing safe and attractive cycling infrastructure. This investment in infrastructure will be supported by activities to promote behaviour change, and by bicycle parking facilities, speed management measures and other innovations.

The Regional Land Transport Programme also seeks to increase walking by:

- creating streets that give greater priority to pedestrians, and support more compliant and alert driving behaviour
- reducing traffic speeds
- making it easier to cross the road safely
- providing good quality footpaths, including increasing their widths, and providing more and improved pedestrian crossings
- providing high-quality education to promote active transport modes
- tailoring any improvements to community needs.

The street environment in Auckland's CBD is being continually improved to create a world-class city centre for people. This includes shared spaces, more and improved pedestrian crossings, signal phasing that prioritises pedestrians, and high-quality paving and seating facilities.

The Safer Communities programme is another key mechanism used for increasing walking in selected neighbourhoods. In te programme, priority areas are chosen for development based on safety risks, the high numbers of people living there, and the presence of large numbers of trip generators, such as town centres, schools and recreational facilities.

Particular walking and cycling activities included in the current Auckland Regional Land Transport Programme include:

- urban cycleways programme – this programme started in 2015 and will now be completed (for example, completing the Glen Innes to Tamaki Drive shared path)
- walking and cycling programme – to achieve maximum impact for short trips to the city centre, public transport interchanges, schools, and local and metropolitan centres
- SeaPath – a shared path between Esmonde Road and the Auckland Harbour Bridge
- SkyPath – a shared path across the Auckland Harbour Bridge

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- Manukau Harbour crossing – a dedicated shared path crossing between Onehunga and Mangere Bridge
- new footpaths regional programme – to construct new and widened footpaths
- other major projects that incorporate walking and cycling components as part of their design.

6.5.3 Pathways development programmes

To respond to the challenges outlined above, Auckland Transport has developed three programmes to develop new and better pathways in Auckland, as shown in Table 6-27.

Programme	Description	Programme timeline
New footpath regional programme	Construct new and widened footpaths	2018/19 – 2027/28
Urban cycleways programme	Complete the current urban cycleways programme	2018/19 – 2020/21
Walking and cycling programme	Focus on achieving maximum impact for short trips to the city centre, public transit interchanges, schools and metropolitan centres	2019/20 – 2027/28

Table 6-27: Walking and cycling development programmes

Source: 2018 Regional Land Transport Plan

New footpaths and cycleways built by Auckland Transport are generally a service level improvement and not associated with growth. Provision of new footpath are included in special projects associated with city centre, sub-regional and town centre streetscape upgrades.

In addition, Auckland Transport has worked with Auckland Council and the Waka Kotahi NZ to develop the Auckland Cycling plan. The plan is a 10-year proposed investment programme for cycling, for 2018 to 2028[2].

6.5.4 Vested footpath assets

In addition to Auckland Transport's own pathways development programmes, a large number of new footpaths are added to the pathways network every year, through vesting, as a result of sub-division development. New footpath data and as-built plans are then added into RAMM database.

The average length of footpaths vested in Auckland Transport, both actual and predicted, from 2016 to 2028 are summarised in Table 6-28.

Vested asset	2016	2017	2018	2019 – 2028 (average)
Footpath (km)	110.0	113.4	51.6	91.8

Table 6-28: Vested footpath assets, 2016 to 2028

[2] Auckland Cycling Plan (https://at.govt.nz/media/1974167/auckland-cycling-10-year-plan-july-2017.pdf

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New cycleways as part of the motorway development projects are associated with growth and are mostly handed over to Auckland Transport for maintenance.

Consequential OPEX will be required for on-going maintenance of these new footpaths and cycleways.

6.6 Disposal plan for pathways

Pathways assets are formally disposed of as part of project completion processes, with any abandoned assets recorded as part of the completion of new or upgraded assets.

6.6.1 Reusing and recycling materials

Auckland Transport encourages its contractors to reuse and recycle materials when constructing pathways.

Increasingly, old construction materials are being crushed, recycled and reused, where suitable, in order to save costs and reduce environmental impacts. Current practices in the Auckland region include using recycled crushed concrete for bases, asphalt milling and trialling permeable pavers.

These practices need to become more widespread across the region.

Any use of recycled material in footpaths and cycleways construction must comply with the Auckland Transport VOLUME 6: Series 0800: Specification for the Supply Aggregate (draft).

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7 Improvement initiatives

Asset management practice improvement is an on-going task which has been recognised as essential to achieve excellence in our AM practices.

AT's enterprise business plan outcomes are linked to the asset management goals as illustrated below. The continuous AM improvement programme will ensure these goals are achieved efficiently and effectively.

Enterprise Business Plan Key Deliverables		Asset Management Goal
Deliver Safe Outcomes		We make safety a priority by integrating it into our approach to asset development, maintenance, and management.
Excellent Customer Experience		Our asset management approach supports a "customer-centric" approach and puts accessibility and user-experience at the forefront of decision-making.
Effective Transport Journeys		Our asset management practices enable Auckland Transport to operate a transport system that is optimised, innovative, and progressive.
Integrated Transport Networks		Asset management approaches and practices enable integrated network outcomes across Auckland Transport and its delivery partners to create a stronger network framework and improved service outcomes.
Financial Accountability and Benefit Realisation		We achieve value for money by increasing the efficiency and effectiveness of asset management and delivery.
Collaborative Partnering		We cooperate with other agencies to effectively deliver and manage assets and integrate the transport system region wide.
Enhance Capability		Our asset management practice captures feedback from system performance to improve outcomes whilst continuing to evolve and provide for emergent requirements.
Enable our Business		Our asset framework supports Auckland Transport's strategic direction and provides a robust framework for other parts of our organisation that operate across the asset lifecycle so our strategic outcomes can be achieved.

Table 7-1: Enterprise Business Plan key deliverables and Asset Management goal

A comprehensive asset management improvement programme is currently underway which has been developed over the last three years by taking into account the feedback received from a number of assessments and audits. These include improvements sourced from:

- Waka Kotahi NZ Audits (2018 & 2019)
- AECOM 2018 Business Review
- 2020 Infrastructure Management Assessment
- 2020 Road Efficiency Group Excellence Programme
- Integration with Auckland Transport systems and policies, including Enterprise Asset Management (EAM), Active Risk Manager (ARM) and Central Management System for street lighting.

There are 102 improvement tasks altogether and they will be implemented over a period of time as highlighted in Table 7-2.

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Pathways (footpaths and cycleways) asset class management plan

The progress highlights achieved so far is summarised below:

- AM Risk Deep Dive Review
- Working with Risk & Assurance Team
- Seeking to retender AM Prof Services year early
- Statement of Intents for AM, AM Data, SLAs and Comms plan progressing well
- Asset Management Centre of Excellence Knowledge Hub to be revamped
- Transport for NSW collaboration

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Pathways (footpaths and cycleways) asset class management plan

IIMM Cat		Improvement Required	Source	Priority	Improvement Owner	Gen 1 Outcome	Gen 1 End Date	Gen 1 Status
AM Policy and Strategy	1.1	Draft / Complete the AT Asset Management Strategy. The AM Strategy forms a major component of the AT Asset Management System and should describe AT's strategy for the management of physical assets over their life cycle and demonstrate the organisational approach to the coordination of asset management outcomes across the various asset portfolios and the organisation as a whole. The AM Strategy should establish the asset management objectives, set out how AT will achieve these objectives and provide direction for downstream activities that are documented in the AT Asset Management Plans.	DHCL IIMM AMMA Apr 20	1	Myles Lind	AM Strategy based on ISO55000 AM Policy reviewed and approved to ensure alignment with Strategy	Dec-20	Underway
	1.2	Develop an integrated ISO 55001 Asset Management System (for either alignment or certification purposes).	AECOM BIP - Roads Apr 18			AM Document Hierarchy (Legislation --> Supporting Elements)	Oct-20	Underway
	1.3	Develop AM policy and strategy using ISO55000	Group Future Work Plan			2020 AM Policy	Jun-20	Underway
	1.4	Strengthen key strategic themes and KPIs to drive "sustaining and maintaining the resilience and integrity of existing infrastructure".	AECOM BIP - Roads Apr 18			Document key strategic themes / principles as they apply to AM. Identify KPIs for AM Identify AM feedback loops (where appropriate)	Dec-20	Underway
	1.5	Develop and review asset related guidelines, policies and strategies	Group Future Work Plan			Document catalogue of guidelines and supporting elements (Sharepoint)	Aug-20	Complete
	1.6	Update the AM Policy to include assets that are currently not included i.e. harbour master and airfield assets.	DHCL IIMM AMMA Apr 20			Confirm asset classes not covered in legacy AM Policy and ensure included within AM Strategy.	Aug-20	Complete
	1.7	Develop a graphic for inclusion in the AM Strategy and AMP that clearly depicts the separate components of the AT Asset Management System. This system can be defined as a set of interrelated or interacting elements of the organisation that establish the asset management policies and objectives, as well	DHCL IIMM AMMA Apr 20			Graphical representation of the AT AM System	Jul-20	Underway
	1.8	Once AM Policy has been updated have it independently reviewed prior to final approval.	DHCL IIMM AMMA Apr 20	3	Myles Lind	AM Policy External Review	Sep-20	Assigned

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Levels of Service and Performance Management	2.1	Review the current levels of service for each portfolio, confirm they remain appropriate and where these do not currently exist establish new levels of service and related performance measures.	DHCL IIMM AMMA Apr 20	2	Siri Rangamuwa	Identify Level of Service gaps and where Levels of Service may no longer be appropriate	Dec-20	Assigned
	2.2	Establish a process for engagement both internally and externally to secure acceptance of agreed levels of service.	DHCL IIMM AMMA Apr 20		Siri Rangamuwa	Engagement process designed and documented. (Part of 2.1 above)	Dec-20	Assigned
	2.3	Agree Stormwater levels of service with Auckland Council and introduce governance overview of performance to agreed levels.	DHCL IIMM AMMA Apr 20	2	Cathy Bebelman	Process of agreement and governance developed and documented. (Part of 2.1 above)	Dec-20	Assigned
	2.4	Develop a trade-off model to assess options for increasing or decreasing levels of service, which considers risk, costs and benefits across the portfolios.	DHCL IIMM AMMA Apr 20	2	Siri Rangamuwa	Identify Levels of Service that could benefit from being included in a trade off model (may be all or just some - link to investment drivers, legislation and operational context)	Dec-20	Assigned
Forecasting Demand	3.1	Consider additional resources to increase traffic, pedestrian and cycle counting capabilities.	DHCL IIMM AMMA Apr 20	3	Delia Sahinovic	Following item 3.1a below. Develop position descriptions / Prof Services scope / training requirements for additional resource requirements (Capacity / capability).	Jun-21	Assigned
	3.1a	R.11.2 Develop and implement an effective, network-wide, activity counting programme, that provides accurate multi-modal volumes and trends.	Waka Kotahi - Investment Audit Report 2019	2	Delia Sahinovic	Complete strategic case for traffic/mode counting (identify benefits to inform investment / SSBC)	Jun-21	Assigned
	3.2	Incorporate the roles of other AT teams in the demand forecasting process in subsequent maturity reviews.	DHCL IIMM AMMA Apr 20	2	Siri Rangamuwa	Identify roles/responsibilities to be included in demand forecasting process for next AMM Assessment.	Nov-20	
	3.3	Monitor and respond to the impacts of rapid heavy vehicle growth on roads and structures	AECOM BIP - Roads Apr 18	2	Delia Sahinovic	Review / GAP on existing AT approaches to understanding HV impacts on AT assets.	Sep-20	On Hold
Asset Register Data	4.1	Develop a data management guideline or policy that provides rules and procedures around data ownership, transfer, management and maintenance of asset data. Ensure the guideline aligns to requirements of EAM Project.	DHCL IIMM AMMA Apr 20	1	Myles Lind	Draft AM Data Policy	May-20	Complete
	4.1a	R.11.1 Ensure appropriate process controls are created to assure all data entering the system complies with the data quality dimensions of timeliness, accuracy and completeness.	Waka Kotahi - Investment Audit Report 2019		Charmaine Okros	Review RAMM reports on data quality and associated socialising and decision making based on these reports.	Jun-20	Complete

4.2	General asset data improvements	Group Future Work Plan	1	Brett Elston	Prioritised programme of data improvements across asset classes. Asset data scope/specifications provided to Maintenance contract retender. Asset management data scope reviewed ahead of professional services retender.	Nov-20	Complete
4.3	Make improvements to data across a range of areas – including asset inventory, criticality, condition and maintenance history.	AECOM BIP - Roads Apr 18		Siri Rangamuwa	Part of 4.2 above - Measurable reduction in data quality issues (timeliness, accuracy, completeness)	Dec-20	Underway
4.4	Review the quality of the data that should be used to make tactical and operational decisions and develop improvement actions (including reporting) to improve the quality where required	DHCL IIMM AMMA Apr 20		Myles Lind	Investigate existing sector solutions for data decision making frameworks - expressly with data requirements for operational and tactical decision making.	Sep-20	Underway
4.5	Complete asset ownership review and ensure this is widely understood by key stakeholders.	DHCL IIMM AMMA Apr 20	1	Siri Rangamuwa	Part of 4.6 below - Data Ownership Issues & Options Paper	Dec-20	Underway
4.6	Provide input to improve the AT Guidelines for asset ownership and maintenance responsibilities, including system/database update.	Group Future Work Plan		Siri Rangamuwa	SLAs between CEAM, P&I and RCD teams / (ownership / inputs / deliverables)	Oct-20	Underway
4.7	Review vested assets process to ensure that quality information is secured during the transfer process	DHCL IIMM AMMA Apr 20	3	Delia Sahinovic	Review current vested asset process, identify gaps and information requirements for process update	Jun-21	Underway
4.8	Revise/update the process for check/validation of the As-built Information, AOMs and Data Quality Assurance for PT new Assets	Group Future Work Plan		Delia Sahinovic	Review current as-built validation process, identify gaps and information requirements for	Apr-21	Underway
4.9	Develop an Improvement Plan to review and update the process for the as-built information management associated with the vested assets - AC	Group Future Work Plan	2	Charmaine Okros	Strategic Case for As-Built Information Management (BIM & ISO 19650 Adoption)	Mar-21	Assigned
4.9a	R.11.3 Establishes a control point where the vesting of the asset to Auckland Transport is reliant on the developer providing the as-built data.	Waka Kotahi - Investment Audit Report 2019		Delia Sahinovic	Part of 4.7 above - Programme BC for As-Built Control point.	Jun-21	Assigned
4.10	Review the AT as-building process for renewal works - RCD	AECOM BIP - Roads Apr 18		Charmaine Okros	Strategic Case for As-Built Information Management (BIM & ISO 19650 Adoption)	Mar-21	Underway
4.11	Check and validate as required As-built Information, AOMs and Data Quality Assurance for new and upgraded PT assets (consultant input required) - SPM	Group Future Work Plan		Delia Sahinovic	Part of 4.7 above - Programme BC for As-Built Control point.	Jun-21	Assigned

	4.12	Check and validate as required As-built Information and Data Quality Assurance for new Roading and Structures Assets (AT Capital and AC/DE projects) - RAMM	Group Future Work Plan		Delia Sahinovic	Part of 4.7 above - Programme BC for As-Built Control point.	Jun-21	Underway
Asset Performance and Condition	5.1	Review requirements for reporting and consider development of automated dashboard of performance measures to provide more timely indicators.	DHCL IIMM AMMA Apr 20	2	Myles Lind	Develop ELT / Board Level dashboards through Bridges Pilot / EAM	Jul-20	Underway
	5.2	Review and increase transparency on the use of condition and performance data in decision making throughout the organisation	DHCL IIMM AMMA Apr 20	1	Charmaine Okros	Data Quality Reporting (quarterly) Accuracy, completeness, timeliness (from RAMM) Mike Alford	Jun-20	Complete
	5.3	Roading Structures - Improve condition inspection/assessment reporting	Group Future Work Plan	1	Myles Lind	EAM Report of AMP FWP Programme vs Completed FWP	Dec-20	Assigned
	5.4	PT Metro Assets - Improve condition inspection/assessment reporting	Group Future Work Plan		Myles Lind	EAM Report of PT Facilities Inspection Programme vs Completed	Dec-20	Assigned
	5.6	Stormwater Assets - Improve condition inspection/assessment reporting	Group Future Work Plan		Myles Lind	EAM Report of Stormwater Inspections Programme vs Completed	Mar-21	Assigned
Decision Making	6.1	Review and document the decision-making process. AT is a large and complex organisation with a large budget. This environment makes it more important to have a robust coordinated decision-making process.	DHCL IIMM AMMA Apr 20	1	Myles Lind	Review and document core AT decision making process for AM	May-21	Assigned
	6.2	Establish a formal decision-making process in line with existing processes for stormwater.	DHCL IIMM AMMA Apr 20		Myles Lind	Document the stormwater decision making business process for AM.	May-21	Underway
Managing Risk	7.1	Review the current risk profile for the Integrated Networks Group to ensure all high-level risks across all portfolios are captured, understood, and where necessary escalated.	DHCL IIMM AMMA Apr 20	1	Myles Lind	Review and transfer strategic AM risks into corporate ARM System	Jun-20	Complete
	7.2	In line with the improvement above improve reporting of major asset risks to enable the appropriate level of visibility at senior level.	DHCL IIMM AMMA Apr 20		Myles Lind	Develop AM risk reporting protocols / dashboards.	Sep-20	Complete
	7.3	Elevate risk management and reporting processes to Board level: (1) Convey understanding of broad nature of risks (e.g. slope failure, retaining walls) – "no surprises".	AECOM BIP - Roads Apr 18		Murray Burt	Reporting protocols to be designed / tested through AM.IPSG.	Dec-20	Complete
	7.4	Improve risk management processes: (1) Identification of critical assets – what assets can't be allowed to fail? (2) Develop from current corporate risk management processes, tools and reporting, more granular.	AECOM BIP - Roads Apr 18	1	Siri Rangamuwa	Document existing asset criticality approaches.	Dec-20	Underway

Pathways (footpaths and cycleways) asset class management plan

	7.5	Identify assets at high risk and develop suitable management strategies	Group Future Work Plan		Siri Rangamuwa	High risk / criticality assets identified and reported to FCR.	Jun-20	Complete
	7.6	Develop Resilience scorecards and assessments – test current vs desired (e.g. routes, key sites).	AECOM BIP - Roads Apr 18	2	Siri Rangamuwa	Resilience Scorecards designed.	Dec-20	On Hold
	7.7	Assess the resilience of the critical assets of the transport network against factors such as climate change, sea level rise, extreme weather events, seismic events etc.	Group Future Work Plan		Siri Rangamuwa	First pass resilience assessment completed for priority factors	Apr-21	Underway
	7.8	Create Emergency Preparedness Procedure/Resilience Plan for key assets	Group Future Work Plan		Siri Rangamuwa	Emergency preparedness plans designed (template)	May-21	
	7.9	Develop and Implement a Climate change adaptation plan	Group Future Work Plan	2	Cathy Bebelman	Investigate / research good practice CCA Plans.	Dec-20	
	7.10	Strengthen the AM culture around long term risk and service outcomes – a "stewardship" focus.	AECOM BIP - Roads Apr 18	2	Myles Lind	Ensure stewardship key theme in AM COP ToR	Jun-20	Complete
Operational Planning	8.1	Embed the criticality framework across each of the asset portfolios ensuring that those tasked with delivery operations are fully aware of the framework and what it means operationally.	DHCL IIMM AMMA Apr 20	1	Siri Rangamuwa	Criticality Framework gaps identified, workplan to review, update and/or develop critical asset strategies established	Dec-20	Underway
	8.2	Where budgets do not align with asset requirement ensure this is escalated as a priority risk and the consequences fully detailed and communicated.	DHCL IIMM AMMA Apr 20	1	Myles Lind	Industry research to benchmark AT budgets with sector peers.	Dec-20	Underway
	8.3	Review the process for building maintenance budgets to ensure input from all areas of the business (such as technical input) is considered.	DHCL IIMM AMMA Apr 20	1	Siri Rangamuwa	Maintenance budget development gaps identified (including external review of consequential Opex and unit	Dec-20	Underway
	8.4	Ensure that project work is classified correctly and funded from the relevant Activity Class and Work category.	Waka Kotahi - Technical Audit 2018	1	Matiul Khan	Provide evidence to NZTA that recommendation has been resolved.	Jul-20	Complete
	8.5	Review the consultant's role to improve the development of the structures renewal and improvement programmes.	Waka Kotahi - Technical Audit 2018	1	Matiul Khan	Provide evidence to NZTA that recommendation has been resolved.	Jul-20	Complete
	8.6	Develop diagnostic and forward thinking processes, such as root cause analysis and the application of smart technology, in order to adapt forward AM strategies	AECOM BIP - Roads Apr 18	2	Siri Rangamuwa	Sector research on peers use of RCA and IoT etc	May-21	
Capital Works Planning	9.1	Develop a more integrated planning process that works across AT to optimise the opportunities to renew, improve levels of service or increase capacity for growth.	DHCL IIMM AMMA Apr 20	1	Siri Rangamuwa	SLAs between CEAM, P&I and RCD teams / (inputs / deliverables)	Sep-20	Underway

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	9.2	Improve the project closeout processes to ensure accurate and timely information is passed to AT and captured in appropriate systems.	DHCL IIMM AMMA Apr 20	2	Delia Sahinovic	Review and update the legacy Asset Handover Completion Handbook (2015 version)	Sep-21	Underway
	9.3	Develop more integrated planning process that work across AT to optimise the opportunities to renew, improve level of service or increase capacity for growth	DHCL IIMM AMMA Apr 20	2	Myles Lind	Establish AM COP with ToR	Jun-20	Complete
	9.4	Escalate the vested asset risk within the risk management system and aim to mitigate the issues.	DHCL IIMM AMMA Apr 20	2	Delia Sahinovic	Review current vested asset process, identify gaps and information requirements for process update (TDM)	Nov-20	Complete
Financial Planning	10.1	Complete a review of the renewals model to determine its accuracy.	DHCL IIMM AMMA Apr 20	1	Siri Rangamuwa	External review requirements scoped	Oct-20	Underway
	10.2	Implement ROM improvements- Stable software platform for ROM system, Improved ROM condition profile and cross asset optimisation	Group Future Work Plan		Myles Lind	Investigate pros / cons of including ROM Model within EAM project	Dec-20	Underway
	10.3	Continue to develop scenario planning tools (e.g. Renewals Optimisation Model (ROM)) – to enable strategic use of risk, service and cost levers to test alternative AM investment scenarios.	AECOM BIP - Roads Apr 18		Siri Rangamuwa	Documentation of ROM model and design of maintenance and improvement plan for ROM model.	Mar-21	Underway
	10.4	Review the consequential Opex model to determine its accuracy. Complete a review of the renewals model to determine its accuracy.	DHCL IIMM AMMA Apr 20	2	Siri Rangamuwa	External review requirements for Opex Model scoped	Apr-21	
	10.5	Programme to document and review unit rates model (IIFMM? Watercare approach?)	Group Future Work Plan		Siri Rangamuwa	External review requirements for unit rates scoped	Jul-21	
	10.6	Strengthen the linkage between new Capex and consequential Opex in budgets: (1) Ensure that a standardised whole-of-asset life cost approach is adopted on all projects Options Analysis and Design phases. Ensure the costs of mitigating residual safety-in design risks are include	AECOM BIP - Roads Apr 18		Siri Rangamuwa	Links to Item 8.3. Whole of Life / AT approach designed into Consequential Opex Model	Dec-20	Underway
	10.7	Improve the capture of maintenance expenditure by asset.	DHCL IIMM AMMA Apr 20	2	Myles Lind	Asset data scope provided to Maintenance contract retender. Asset management data scope reviewed ahead of professional services retender	Nov-20	Complete
	10.8	Review the Transport Agency's Lifecycle Management Plan against the Bridges, Structures and Walls ACMP.	Waka Kotahi - Technical Audit 2018	1	Matiul Khan	Provide evidence to NZTA that recommendation has been resolved.	Jul-20	Complete
Asset Management Leadership and Teams	11.1	Develop a communication strategy and plan that enable leaders at all levels to deliver a consistent asset management message across the organisation. The plan and messaging should be approved at ELT level to ensure it has the appropriate level of support.	DHCL IIMM AMMA Apr 20	2	Siri Rangamuwa	Sector research on existing AT, peers use of communication strategy. Design communication strategy ToC.	Dec-20	

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	11.2	Ensure roles, accountabilities and responsibilities are well defined for the end to end (Structures AM) process	Waka Kotahi - Technical Audit 2018	1	Matiul Khan	Provide evidence to NZTA that recommendation has been resolved.	Jul-20	Complete
	11.3	Review current FTE numbers. Determine what is missing (by number and function) to enable the level of asset management capability required.	DHCL IIMM AMMA Apr 20	1	Myles Lind	GAP Analysis of AM resourcing to support 2024 AMP Development	Dec-20	Underway
	11.4	Review the role of AM in the organisation and develop an AM competences framework. In addition: (1) Implement a comprehensive succession planning process (2) Strengthen internal geotechnical engineering capability. (3) Strengthen internal Bridges and Structures capability	AECOM BIP - Roads Apr 18	1	Myles Lind	Investigate sector solutions for possible competency frameworks. REG? IPWEA? Other	Nov-20	Underway
	11.5	Strengthen in-house capabilities to update the asset inventories	Group Future Work Plan	2	Myles Lind	Complete Strategic Case for AM Capability Investment	Jul-21	
	11.6	Benchmark against like organisation in terms of asset team size.	DHCL IIMM AMMA Apr 20	2	Myles Lind	Identify sector benchmarking initiatives (performance and funding) and/or identify benchmarking peers.	Sep-21	Underway
Asset Management Plans	12.1	Develop the asset management planning processes to more effectively engage other teams within AT such as RCD, Finance and Planning and Investment.	DHCL IIMM AMMA Apr 20	1	Siri Rangamuwa	Establish AMP Development Committee	Jun-20	Complete
	12.2	Develop ways to summarise / aggregate customer information for interpretation in AMPs / AM strategies.	AECOM BIP - Roads Apr 18		Siri Rangamuwa	Investigate sector approaches regarding customer information and AMPs.	Nov-20	Assigned
	12.3	Foster more collaboration across the AM business cycle.	AECOM BIP - Roads Apr 18		Myles Lind	Establish AM COP with ToR	Jun-20	Complete
	12.4	Review the format and content of the AMP and ACMPs, considering the audience, purpose and timing. Develop a more streamlined format that allows each to be updated more efficiently.	DHCL IIMM AMMA Apr 20	2	Siri Rangamuwa	Investigate sector solutions to AMP format and structures. Implement / pilot sector acceptable format / template	Sep-20	Complete
	12.5	Strengthen the main AMP as a roll-up of all transport Asset Class Management Plans (AcMPs) (also known as Lifecycle Management Plans) and align with new Capex.	AECOM BIP - Roads Apr 18		Siri Rangamuwa	Investigate sector solutions to AMP format and structures. Implement / pilot sector acceptable format / template	Sep-20	Underway
	12.6	Document specific asset management business processes (i.e. development and prioritisation of FWPs.)	Group Future Work Plan	1	Myles Lind	Identify business process mapping tools available to AT.	Sep-21	Assigned
	12.7	Improve alignment between AMP and FWP	Group Future Work Plan		Siri Rangamuwa	Report AMP FWP Programme vs Completed FWP	May-21	Underway
Management Systems	13.1	Ensure relevant AM practices are included within the AT Quality Assurance Framework.	DHCL IIMM AMMA Apr 20	1	Siri Rangamuwa	AT Quality Assurance Framework updated	Sep-20	Assigned
	13.2	A number of processes are being reviewed as part of the EAM project. Identify the processes that are not being reviewed through the EAM project and review and update where required.	DHCL IIMM AMMA Apr 20	2	Siri Rangamuwa	Catalogue of non-EAM business processes captured.	Jun-21	

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	13.3	Develop and implement asset management business processes	Group Future Work Plan		Siri Rangamuwa	Identify and prioritise missing business processes for mapping / documenting and maintaining.	Jun-21	
	13.4	EAM Project Transition	Group Future Work Plan	1	Myles Lind	Identify EAM System owners and include duties into JDs. (BIRST, IPS, & dPEM Modules)	Dec-20	Underway
	13.5	Develop and adopt a common asset management language across the organisation. This can be reinforced by ensuring all asset management documents contain a common glossary of terms and abbreviations aligned to ISO5500 terms and abbreviations.	DHCL IIMM AMMA Apr 20	2	Myles Lind	Engagement with AT COP and National Data Standards team to align data structure / dictionary efforts for AM	Sep-20	Complete
Asset Management Information Systems	14.1	Investigate the benefits of a data standard. Develop in line with EAM requirements.	DHCL IIMM AMMA Apr 20	1	Myles Lind	Engagement with NZTA and National Data Standards team to align data structure / dictionary	Sep-20	Underway
	14.2	Develop an Asset Information Strategy and provide clarity around the implementation of EAM vs the future of RAMM.			Charmaine Okros	Identify AIS used by peers that could be applicable to AT. All AM	Nov-20	Complete
	14.3	Complete the pilot for EAM for bridge assets and agree the next steps forward.	DHCL IIMM AMMA Apr 20	1	Myles Lind	Statement of Work One Review. Inform SOW 2.	Jun-20	Complete
	14.4	Develop more timely ways of providing information and graphical analysis to the organisation (potentially through EAM or through better use of business intelligence tools).	DHCL IIMM AMMA Apr 20	2	Siri Rangamuwa	Develop key (ELT / Board Level) dashboard reporting as part of Bridge EAM pilot project / UAT	Jul-20	Underway
	14.5	Complete the update of the data base information manual.	DHCL IIMM AMMA Apr 20	2	Delia Sahinovic	AT DOM Review for Roading.	Apr-21	Underway
	14.6	Transfer and maintain the CEAM risks in legacy systems and spreadsheets into the AT Corporate ARM Risk System	AT Business Plan	1	Myles Lind	ARM Training completed. Gain access to ARM System.	May-20	Complete
	14.7	Review and maintain resource consent compliance status and supporting evidence within the AT Corporate CRM System	AT Business Plan	1	Myles Lind	CMS Training completed. Gain access to CMS System. Develop core compliance status reports. Review assignment of consents in CMS.	Jun-20	Complete
Service Delivery Mechanisms	15.1	Develop an internal Service Delivery responsibility and accountability matrix. Identify where key interdependencies and decision points are to ensure successful programme delivery.	DHCL IIMM AMMA Apr 20	1	Siri Rangamuwa	SLAs between CEAM, P&I and RCD teams / (ownership /inputs / deliverables)	Sep-20	Underway
	15.2	Develop a more robust contract performance management framework. This will need to be done prior to contract renewal in order for it to be ready a contract renewal time.	DHCL IIMM AMMA Apr 20	1	Myles Lind	Industry / peer sweep to identify good practice in contract performance management.	Oct-20	Underway

Table 7-2: Asset Management improvement activities

Other key improvement initiatives relating to footpaths and cycleways include those shown in Table 7-3.

Ref	Key result area	Actions	Priority	Status
Pathways	Finance	Review and reallocate funds to operation and maintenance of pathways	High	In process
Pathways	Network planning	Prioritise investment for a regional approach for connecting the cycle network. Actively promote use of cycleways as a transport alternative	Medium	Started
Pathways	Asset Management & Service Delivery	Develop and deliver renewals forward works programmes (RFWP).	High	Started
Pathways	Asset Management	Review design standards and understand the consequential OPEX of new and vested assets	High	In progress
Pathways	Service Delivery/ Asset Management	Clarify and confirm ownership, management and funding responsibilities for off-road cycleways through parks and recreational areas that may not be part of the transport network	Medium	On-going
Pathways	Service Delivery/ Asset Management	Collect data for cycling facilities into the database and monitor the condition	High	Yet to start
Pathways	Asset Management	Develop a regional condition rating specification and undertake condition assessment regionally in a consistent manner.	High	Started
Pathways	Service Delivery/Asset Management	Incentivise the use of new innovative practices and products for pathway inspection and work programme development.	Medium	Yet to start

Low Medium High Very high

Table 7-3: Improvement initiatives (TBC)

Source: Asset management team (June 2017)

Three data improvement initiatives are currently underway as summarised below:

- BEAGLE: This is an inhouse inventory audit tool developed to run alongside RAMM. Its main purpose is to identify and highlight gaps in the completeness of inventory data for all asset types including pavements. It allows Auckland Transport to identify and rectify the incomplete or incorrect data by scrutinising all aspects of the inventory, identifying the problem to the highest detail possible and providing a weekly trend to track progress.
- Asset condition data improvements as part of pavement condition modelling contracts. This allows Auckland Transport to utilise data that has been modified by industry experts. The modified data removes erroneously recorded entries, finds the best fit for missing attributes and replaces out of date data with sensible values based on renewal & maintenance history.
- There is a heavy vehicle modelling study that is being conducted to understand the impact of heavy commercial vehicles and double decker buses on key routes. This will allow Auckland Transport to identify the impact on the pavement assets, collect more relevant data and improve investment recommendations.

Combined data improvements will allow more confidence in the decisions taken and allow Auckland Transport to avoid unnecessary activities on the network.

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8 Sustainability (TBC)

Auckland Transport aims for the environmental and economic sustainability of its transport network that do not compromise the well-beings of future generations.

For the footpath and cycleway network, this will be achieved through:

- Emissions Trading Scheme (ETS) responsibilities – minimise the network's carbon footprint
- Pollution control – minimise air pollution
- Economic sustainability – provide assets and services at least whole-of-life cost.

Table 8-1 details the specific management processes, approaches and activities that Auckland Transport will use to achieve sustainability for its footpath network.

Impact	Mitigation Plans
Environmental	
Carbon footprint Air pollution	Walking and cycling for short journeys is a simple and often quite pleasant way to substitute for short car trips that are carbon intensive. Auckland Transport's mitigation plans include: • Improving pedestrian amenity and providing safe and accessible footpath and cycle facilities that encourage walking and cycling instead of private vehicle use. • Applying principles of the Ministry of Environment's New Zealand Urban Design Protocol such as: - Fitting into the built fabric (by considering the role of networks in the structuring neighbourhoods, towns, cities and regions, and by keeping the footprint of the street to a minimum) - Connecting modes and communities - Designing sustainably - Designing an experience in movement along streets - Creating self-explaining road environments - Achieving integrated and minimal maintenance design. • Reducing air pollution by encouraging walking and cycling and use of public transport such as: - Providing reliable and accessible public transport services - Creating attractive pedestrian streets and shared spaces that encourage people out of their private vehicles - Providing targeted programmes for school and workplace travel planning to encourage walking.
Social	
Health, personal security and amenity	Walking and cycling are widely recognised as healthy activities by the community. They contribute to increased social connectivity and strengthens communities, enhances health and increases the sustainability of the environment. Providing shared spaces to facilitate pedestrian and cycle movements, prioritising their movement and revitalising urban areas will help pedestrians and cyclists enjoy 24/7.
Economic	

Whole-of-life costs	Auckland Transport's mitigation plans include: • Reusing and recycling of materials in construction, including crushing aggregate for footpath bases and some asphalt milling. These practices need to become more widespread and material reuse and innovative practices increased, with incentives for major project and renewal programmes. • Application of other innovative practices and products such as the use of recycled materials, such as trialling permeable pavers where appropriate • Understanding the life-cycle costs when planning, designing and constructing of an asset • Adopting appropriate levels of service and interventions during an asset's life • Adopting and implementing a robust regional asset management strategy for the network

Table 8-1: Footpaths and cycleways sustainability (to be updated)

It shows that overall the 10-year approved LTP budget is sufficient to address the network renewal needs until 2024. The variance between the budget requirements beyond that period needs to be reviewed and addressed in the LTP budget refresh.

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9 Key issues (TBC)

Table 9-1 summarises the key issues that impact Auckland Transport's footpath asset portfolio and the action plans to resolve those issues.

Code	Consequence category	Issue	Ranking	Mitigation	Outcome
IR FC FI 1	Finance	The current condition profile may not reflect the network needs. In particular, shared paths are deteriorating faster than expected in the CBD and town centres. The recommended maintenance and renewals budgets may not be sufficient to retain the current Levels of service for the network.	High	Improve data to help better planning and decision-making	Whole-of-life costs are considered in decision-making
IR FC FI 2	Finance	The current condition profile may not reflect the network needs. In particular, shared paths are deteriorating faster than expected in the CBD and town centres. The recommended maintenance and renewals budgets may not be sufficient to retain the current Levels of service for the network.	High	Get inputs from local operation teams to review the adequacy of the proposed maintenance and renewal budget forecasts	Whole-of-life costs are considered in decision-making
IR FC FI 3	Finance	Consequential OPEX of cycleways and budget requirements: Auckland Transport is delivering the Urban Cycle Programme and kilometres of shared paths and cycleways are being built progressively. On the other hand, Auckland Transport has been handed over cycleways that are built as part of the network upgrades and local board initiatives. The consequential OPEX needs of the new cycleways, especially those that are vested to Auckland Transport, are not understood or budgeted properly.	High	An accurate maintenance estimation is needed for cycleways to be used for the discussions with Council for funding purpose	Whole-of-life costs are considered in decision-making

IR FC SD 1	Service Delivery/Asset Management	Inaccurate condition and age data in RAMM: The construction date of footpaths was not recorded adequately in the RAMM previously and RAMM does not hold the replacement information of footpaths under 20m. As a result, the outputs of data analysis are inaccurate and the projected budget forecasts are inadequate.	High	Validate existing data and carry out system and data improvements	Increased data confidence. Effective asset management
IR FC SD 2	Service Delivery/Asset Management	Cycle facilities were implemented in the past to different design standards or to minimum Austroads standards rather than regional recommended standards. This has created inconsistencies across the network with poor design outcomes.	Low	Develop partnerships with AC and Waka Kotahi NZ on planning and designing of network	Levels of service targets achieved
IR FC SD 3	Service Delivery/Asset Management	Users conflict (2): Free left turns for vehicles at intersections pose particular dangers for cyclists	High	Investigate to reduce the number of free left turns	Danger is minimised
IR FC SD 4	Service Delivery/Asset Management	Users conflict (2): Free left turns for vehicles at intersections pose particular dangers for cyclists	High	Provide advance stop boxes where there is space to implement	Danger is minimised
IR FC SD 5	Service Delivery/Asset Management	Users conflict (2): Free left turns for vehicles at intersections pose particular dangers for cyclists	High	Extend the kerb lines at junctions to reduce motor vehicle approach speeds	Danger is minimised
IR FC SD 6	Service Delivery/Asset Management	Different methods have been used in the past to grade condition of footpaths, giving inconsistent information	High	Regional condition rating contract is underway to address the issue with inconsistency in condition rating and reporting. This has been identified as a high-priority improvement action for the coming year.	Consistency is achieved
IR FC SD 7	Service Delivery/Asset Management	Skid resistance of some old off-road cycleways is low due to inadequate maintenance and material choice for surfaces	Low	Confirm a regional policy or standard for this issue	Adopt 'optimised' decision to prioritise challenging or expensive options

IR FC SD 8	Service Delivery/Asset Management	Skid resistance of some old off-road cycleways is low due to inadequate maintenance and material choice for surfaces	Low	Inspect skid resistance of designated cycleways in the region	Adopt 'optimised' decision to prioritise challenging or expensive options
IR FC SD 9	Service Delivery/Asset Management	The greening and white line markings wear out quickly and the coding materials are being washed out into the waterways during Stormwater runoff	Low	Use controls around design, applications and quality of coding materials as detailed in the Auckland Transport Design Manual	Adopt 'optimised' decision to prioritise challenging or expensive options
IR FC SD 10	Service Delivery/Asset Management	There are also environmental concerns regarding the use of epoxies and colouring materials in the surfacing	Medium	Investigate the environmental issues and find out more environmentally products from the coding industry	Adopt 'optimised' decision to prioritise challenging or expensive options
IR FC SD 11	Service Delivery/Asset Management	Users conflict (1): Cycle facilities are gaining in popularity attracting increasing numbers of cyclists causing conflict with pedestrians in certain locations where both modes share the same space	High	Widening of paths or providing separators in locations where volumes of cyclists and pedestrians are particularly high	Danger is minimised
IR FC SD 12	Service Delivery/Asset Management	The ownership and management of shared paths or cycleways that run through parks and recreational areas, are unclear between Auckland Transport and AC Parks	Medium	Review and agree Service Level between Auckland Transport and AC Parks	Increased data confidence. Effective asset management
IR FC SD 13	Service Delivery/Asset Management	Users conflict (1): Cycle facilities are gaining in popularity attracting increasing numbers of cyclists causing conflict with pedestrians in certain locations where both modes share the same space	High	Education and campaigns to encourage 'share with care' between pedestrians and cyclists	Danger is minimised
IR FC SD 15	Service Delivery/Asset Management	In the past, the footpaths were built using different specifications across the region so they are not consistent in visual appearance.	Low	Adopt the Regional Footpath Asset Management Strategy and this ACMP for policies and recommended management approaches	Adopt 'optimised' decision to prioritise challenging or expensive options

IR FC SD 16	Service Delivery/Asset Management	Increasing demand in integration of walking as a preferred transport mode: Walking is being promoted as a sustainable transport mode long term. A safe, attractive and well-connected footpath network is needed within the transport corridor	Medium	Investigate good urban design features for safe and attractive footpaths, and implement with redevelopment projects.	Adopt 'optimised' decision to prioritise challenging or expensive options
IR FC SD 17	Service Delivery/Asset Management	The ownership and management of shared paths or cycleways that run through parks and recreational areas, are unclear between Auckland Transport and AC Parks	Medium	Identify and transfer ownership and management of those assets	Increased data confidence. Effective asset management
IR FC SD 18	Service Delivery/Asset Management	RAMM information presents data which offers uncertain consistency in location, age and material type	High	Confirm and implement a regional approach to the collection and storage of data for cycle facilities Off-road cycleways data has been collected and entered in RAMM recently. Validation of data is currently underway.	Increased data confidence. Effective asset management
IR FC SD 19	Service Delivery/Asset Management	The quality of footpaths does not meet user's expectations: Footpath quality is a key issue for customers and a relatively high proportion of call centre requests for service relate to footpaths.	High	Plan and programme to bring existing assets up to LOS standards	Levels of service targets achieved
IR FC SD 20	Service Delivery/Asset Management	The quality of footpaths does not meet user's expectations	High	Ensure maintenance contractors give footpath complaints high priority to ensure that footpaths are safe for use	Levels of service targets achieved
IR FC SD 21	Service Delivery/Asset Management	The quality of footpaths does not meet user's expectations	High	Grind joints, as this can be an economical method of removing tripping and scooter hazards, and in some cases extending the life of footpaths before slab replacement.	Levels of service targets achieved

IR FC SD 22	Service Delivery/Asset Management	Cycle facilities were implemented in the past to different design standards or to minimum Austroads standards rather than regional recommended standards. This has created inconsistencies across the network with poor design outcomes.	Low	Adopt the Auckland Transport Design Manual and comply with the specifications	Levels of service targets achieved
IR FC SD 23	Service Delivery/Asset Management	Cycle facilities were implemented in the past to different design standards or to minimum Austroads standards rather than regional recommended standards. This has created inconsistencies across the network with poor design outcomes.	Low	Plan and programme to bring existing facilities up to the standards	Levels of service targets achieved

Low Medium High Very high

Table 9-1: Key footpath and cycleway assets issues (to be updated)

Source: Feedback from various stakeholders

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Appendix A – Asset information

Poor and very poor footpaths by asset management area

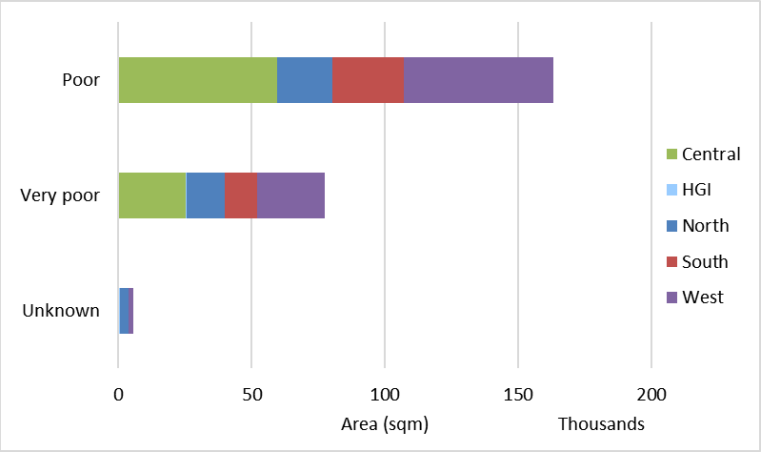

Figure 9-1: Footpaths in poor and very poor condition, by area

Poor and very poor cycleways by asset management area

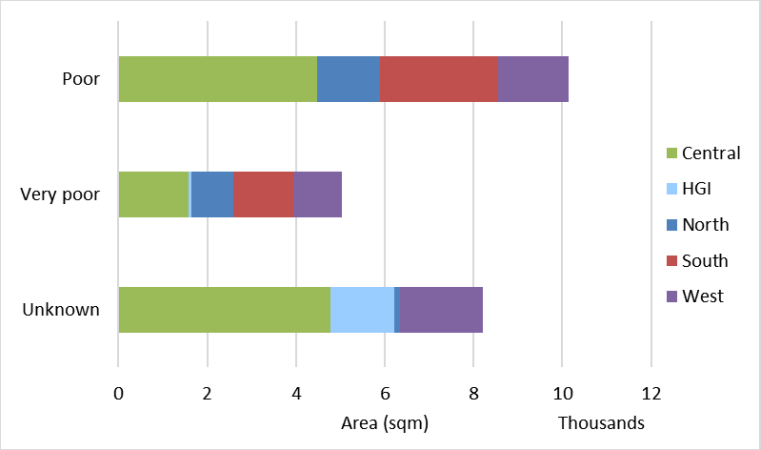

Figure 1-2: Cycleways in poor and very poor condition, by area

Appendix B – Condition rating specification

Grades	Grading description	Example photo
CG1	Very good condition As new condition or sound physical condition. Asset likely to perform adequately without major work for 10/15 years or more. No physical maintenance required. Visually excellent. Comments: New; no fault; no patches of different materials; no uneven surface; cracks no wider than 1mm; no pitted or eroded cobblestones; uniform width and colour or surface throughout.	
CG2	Good condition Acceptable physical condition with minimal short-term failure risk but potential for deterioration in long term (10 years or more). Asset still functions safely at adequate level of service, but may not be visually acceptable. Comments: A few patches; uneven surface not more than 5mm; minor cracks not more than 3mm in width; irregular edges; almost uniform width; colour or surface at repairs.	
CG3	Moderate condition Significant deterioration evident. No immediate risk for health or safety without major repairs for up to 3 years. Minor repairs may be required to ensure asset remains safe. Comments: Uneven patches with small bumps and depressions resulting in ponding; cracking or settlement over trenches up to 10mm vertical displacement; not major safety hazard or dangerous; some weed infestation in joints.	

CG4	Poor condition Failure likely in short term; becoming dangerous with significant risk for health or safety of public. Asset unlikely to function without major repairs or replacement of asset within 1-2 year. Comments: Large cracks exceeding vertical and/or horizontal displacements of 10mm that could cause pedestrians to trip; bad ponding; unstable slabs; widespread infestation of weeds through joints.	
CG5	Very poor condition Failed or failure imminent; dangerous and serious impact on asset performance and presence of hazards. Major work or replacement required urgently. Temporary repair and permanent repair to be completed within specified timescale. Comments: Large cracks exceeding vertical and/or horizontal displacements of 15mm; disintegrated or badly settled; missing sections; unstable slabs; severe sunken trench lines; widespread cracking; obstruction of path with mature weeds.	

Table 1-1: Regional footpaths condition ratings specification

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Appendix C – Aesthetic rating specification

Aesthetics of the footpaths can be measured in terms of consistent appearance and pleasantness to walk around. Auckland Transport ensures that the Auckland's footpaths are constructed consistently across the region and the pedestrians are satisfied with the state of the footpaths.

Footpaths are consistent if

- The colour, texture, quality and surface types are consistent across the region

Footpaths provide a pleasant and easy walk suitable for all ages if

- The surface is even and smooth but firm
- The path is clean i.e. free of litter, graffiti and obstructions
- The path has a clear width for all types of pedestrians to get passed each other
- The path has a buffer between motorists and pedestrians to achieve safety.

Footpaths can be rated in one to five scale (one being 'very good' to five being 'very poor') based on the above-mentioned aesthetic values. The example photos are shown in the table below with explanations.

Aesthetics rating	Example photo	Explanation
1. Very good		- Footpath is consistent with the adjacent footpaths or other footpaths in similar land use areas. - Footpath surface is even, firm, clean and clear.
2. Good		- Footpath is reasonably consistent with the adjacent footpaths or other footpaths in similar land use areas. - Footpath surface is reasonably even, firm, clean and clear.

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3. Moderate		- Footpath is moderately consistent with the adjacent footpaths or with other footpaths in similar land use areas. - Footpath surface is moderately even, firm, clean and clear.
4. Poor		- Footpath has poor consistency in colour, texture, quality and surface types with the adjacent footpaths or other footpaths in the similar land use areas. - Footpath has some faults, defects, or minor obstructions that could trigger inconveniences or unpleasantness for pedestrian to walk on.
5. Very poor		- Footpath has very poor consistency in colour, texture, quality and surface types with the adjacent footpaths or other footpaths in the similar land use area. - Footpath has faults, defects or obstructions that trigger inconveniences or unpleasantness for pedestrian to walk on.

Table 1-2: Regional footpaths aesthetic rating specification

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Appendix D - Supporting maintenance and renewal analysis

Historical trends

The historical trends for footpath maintenance and renewals are based on the following facts:

- Condition of footpaths in the region were assessed using different methodologies.
- Footpath maintenance and renewal were reactive based on service requests.
- Legacy council practices influenced footpath renewals. For example, the Central area had a strategy to proactively replace asphalt (hot mix) footpaths with aggregate concrete. This had resulted in a renewal programme for the Central area based more on material type than condition or age
- Treatment lengths for footpath maintenance were considered inconsistently across the region. For example, the South area undertook multiple small section isolated repair, rather than long length renewal, and considered them maintenance. The north and the central replaced 20+m longer length sections.
- The condition and age information of the renewed sections has not been updated in RAMM accordingly. As a result, recently renewed footpaths may be put forward as candidates for future renewals unnecessarily until sites are validate.

There is insufficient information on historical expenditure for the cycle network as it has not been allocated correctly for the cycleways operations and maintenance activity. A future asset-management improvement will implement consistent tracking of expenditure by asset type and expenditure type over time. This will enable robust expenditure-trends analysis in future.

Historically, the footpath forward works programme (FWP) were developed by different consultants responsible for each management area and as a result, the outcomes were inconsistent.

Asset decay curves

An asset type's decay curve is assessed and selected from the following:

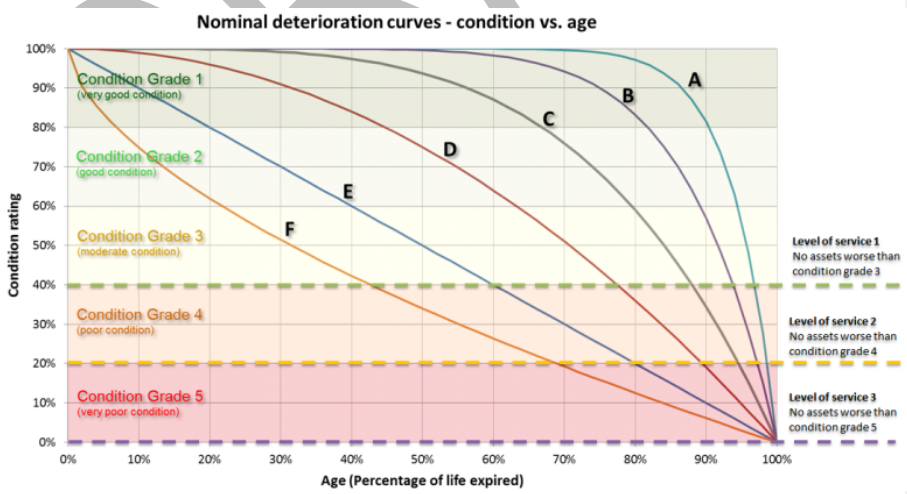

Figure 1-3: An asset decay curve
Source: NZ Infrastructure Asset Valuation and Depreciation Guidelines (1997)

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Footpath optimum condition profile: The following is the optimum condition profile set for Auckland Transport's footpath network. This is based on the asset deterioration curves i.e. "CD".

Valuation and depreciation

Asset Group	Asset Type	Unit measure	Quantity	Replacement value (ORC)	Current value (ODRC)	Annual depreciation
Cycleways	Cycleway base	m2	159,925	$16,108,701	$9,623,105	$398,554
Cycleways	Cycleway surface	m2	159,925	$41,710,696	$25,537,607	$1,046,808
Footpaths	Footpath surface	m2	11,560,597	$1,233,811,618	$770,485,574	$22,496,821

Table 1-3: Valuation and deprecation of footpaths and cycleways

Source: Auckland Transport Infrastructure Revaluation Report (June 2017)

Funding plan

Footpath maintenance and renewal are currently not subsidised by Waka Kotahi NZ, so the majority of footpath expenditure is funded by ratepayers. However, from June 2019 onwards, footpath maintenance and renewals will be subsidised by Waka Kotahi NZ under work category WC 125.

Cycleways maintenance and renewal is subsidised by Waka Kotahi I NZ under work category WC 124.

Footpath capital new works to improve safety and levels of service may be subsidised by Waka Kotahi NZ if they are part of a regional strategy. However, much of the new CAPEX expenditure on footpaths is unsubsidised. Footpath new works that have cycling or shared space components can also be eligible for Waka Kotahi NZ subsidy.

Footpath capital new works are generally funded from general rates, targeted rates or loans. Some capital improvement components of the renewals programme such as increasing footpath widths or thicknesses may be funded from renewals budgets. Footpath capital new works to cater for growth are generally funded and provided by developers in new subdivisions.

Cycleways capital new works to improve safety and Levels of service are generally funded from rates or loans.

Some capital improvements to cycleways may also come with the footpaths renewals and new works programmes funded from those budgets.

Capital new works to cater for growth are generally funded and provided by developers in new subdivisions, but this is not expected to be significant for cycleways.

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Road Corridor Maintenance Contracts

Contract Name	Vendor Name	Original Award Contract Value (4-year)	Contract Term	Year Awarded	Start Date
South East Urban Maintenance	Fulton Hogan	78,188,617.85	4+2+2	2012	01-Jul-12
South West Urban Maintenance	Downer New Zealand	128,316,295.69	4+2+2	2012	01-Jul-12
South Rural Maintenance	Broadspectrum	89,398,358.44	4+2+2	2012	01-Jul-12
West Maintenance	Fulton Hogan	140,533,013.69	4+2+2	2013	01-Jul-13
Central Maintenance	Downer New Zealand	129,373,562.78	4+2+2	2013	01-Jul-13
Central East Maintenance	HEB/Higgins JV trading as Liveable Streets	109,982,923.66	4+2+2	2013	01-Jul-13
Hauraki Gulf Islands Maintenance	Downer New Zealand	41,444,029.80	4+2+2	2013	01-Jul-13
North Rural Maintenance	Downer New Zealand	93,786,307.58	4+2+2	2014	01-Jul-14
North West Urban Maintenance	Broadspectrum	67,084,267.99	4+2+2	2014	01-Jul-14
North East Urban Maintenance	Fulton Hogan	76,797,052.90	4+2+2	2014	01-Jul-14
Total		**954,904,430.38**			

Table 1-4: Auckland Transport road corridor maintenance contracts

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Appendix E – Capital plans and projects

Footpaths new works strategy and plan

New or upgraded footpath assets are created to meet increased demand. Key drivers for the construction of new or upgraded footpaths include:

- Service level improvements to improve safety issues that cannot readily be solved with a renewal solution
- Improve amenity value in an urban area to encourage pedestrian activity as part of transformation projects
- To provide an integrated transport system for safe and convenient pedestrian movement alongside roads or linking roadways and public spaces
- New subdivisions to cater for growth
- Raised construction standards for concrete footpath widths, thicknesses and material strength.

Consideration may also be given to reinstating the Central area 'new footpaths programme' for road sections that have either no formed footpath or only footpath on one side of the road. This applies particularly to the Gulf islands. Network expansion is currently not a key driver for the footpath new works plan.

Footpaths new projects are generally prioritised as per the following criteria and scored with a rating, after requests are received from the local boards and public:

- Proximity to schools, public transport and community facilities
- Existence of footpaths parallel to requested location (areas with no footpaths scored higher)
- Addressing the gaps in the existing footpath network (connectivity)
- Inclusion in Metropolitan Urban Limit boundary, as identified in the Auckland Plan. This includes the traditional urban core as well as areas identified for growth on the urban fringe (where most requests originate).

The footpaths which score the highest then undergo engineering assessment and the most feasible requests go forward for construction.

New footpaths are identified as part of Walking and Cycling programme, minor safety projects, community transport projects and school travel plan.

Some new footpaths are included under other projects and budgets such as major road or streetscape improvements and some are under Local Board initiatives (e.g. Greenway plan)

A summary of capital new works expenditure for footpath assets is presented in (un-inflated).

Cycle ways new works strategy and plan

A contributing factor to Auckland's health and sustainable transport initiatives is to provide a well-connected cycle network that is integrated with other transport modes.

The implementation and delivery of the Auckland Cycle Network is strategically fit with the objectives set out in the Auckland Plan. Auckland Transport has set the target to deliver 70 per cent of the Auckland Cycle Network by 2023. This will be achieved through major capital investment programmes such as Waterview, AMETI as well as through minor safety improvement projects and road corridor renewals.

The long-term plan consists of the total proposed new cycleway segments of 339 km throughout Auckland which includes both on-road and off-road cycle lanes and paths. Each segment of new cycle facilities has been assessed and prioritised using a multi-criteria analysis.

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Footpath and cycleway projects

There are some key new projects associated with footpaths and have high profile with Auckland Council and Waka Kotahi NZ as well as many other stakeholders and the community.

Footpath & Cycleway: Auckland Harbour Bridge Pathway

A crossing over the Auckland Harbour Bridge (AHB) has been identified as a strategic link in the cycle network of off-road routes as part of Auckland Transport's Regional Cycle Network. Delivering a connected strategic network of cycle and walking facilities across the region is a core outcome of the Regional Cycle Network. The project is being championing by the Auckland Harbour Bridge Pathway (AHBP) Trust which is a team of private individuals with professional skills. The Trust has developed a business case for AHB pathway.

Waka Kotahi NZ has completed a structural feasibility study on the AHB to determine the available load capacity to support the proposed pathway. The "SkyPath" is seen as the missing link for walking and cycling access across the AHB. A range of patronage assessments have been undertaken but needs further work.

There are many benefits of the SkyPath as follows:

- Achieve commuter, tourism and recreational benefits
- Increase access to the city centre
- Reduce delay in providing this connection
- Privately funded walk and cycleway
- Preferred option by Waka Kotahi NZ
- Links into future walk and cycle projects at both ends.

The estimated capital cost is $31.5 million which includes strengthening work to AHB. Operational costs have been estimated at $1.3 to $2 million per annum.

The SkyPath will be provided through a private funding scenario that will be responsible for:

- Providing 100 per cent of the construction funding
- Cover the operation and maintenance costs
- Collect admission charges projected at $3.25 to 5.5 million per annum (and share the "up-side").

It is proposed Auckland Council will:

- Underwrite 75 per cent of gross revenue
- Assume operations after 20 years.

Auckland Transport will be involved through technical support and as a key stakeholder for integrated transport planning.

Footpath & Cycleway: Tamaki Drive Boardwalk

This project is for the widening of the shared cycleway and pedestrian path on Tamaki Drive between Takaparawha point and the Millennium Bridge, Mission Bay. It will provide a boardwalk for a satisfactory shared cycleway and pedestrian footpath with clear separation in order to minimise conflicts and accidents. It will also improve the amenity value in the area on the seaward side of Tamaki Drive. The works include the construction of approximately 1,000m of basalt stone seawall relocated seaward to accommodate the upgraded 5m wide shared path and to replace the existing seawall which is in poor to average condition.

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This project is currently being assessed to be integrated with the corridor upgrade project planned later in the 10-year period.

Footpath & Cycleway project: Waterview shared paths

The Waterview shared paths is the missing link in the off road cycle network linking Manukau/Waitemata harbours and the CBD. The cycleway follows the path of the SH20 Waterview motorway project.
The SH20 Waterview Board of Inquiry conditions outline that Auckland Transport is required to prepare a concept design and obtain the necessary land owner and statutory approvals for these shared paths. Waka Kotahi NZ is required to complete the detailed design and construction of those shared paths.
This project will provide for a 4m off road cycleway and footpath facilities connected by bridges across the rail corridor and Oakley Creek.
The proposed budget to progress investigations and land negotiations prior to utilizing Waka Kotahi NZ contribution is identified in the current cycle and walking capex budget.

Footpath & Cycleway: Auckland Harbour Bridge (AHB) Skypath

The AHB Pathway Trust has identified the lack of walking and cycling access on the Auckland Harbour Bridge as the most critical gap in the Auckland Region's walking and cycling network. To address this AHB Trust have for the past several years been developing a proposal to fund, build and operate a dedicated walking and cycling pathway on the AHB.

Footpath & Cycleway: Glen Innes to Tamaki Drive shared path

It is a joint project between Auckland Transport and Waka Kotahi NZ and will deliver a seven-kilometre-long path connecting Auckland's eastern suburbs to the city centre, constructed in four stages between 2015 and 2018. This staged approach and the two organisations sharing resources means an efficient and cost-effective project.

The path will complete a missing link in the Auckland Cycle Network and connect with cycle routes to Pt England and the shared path along Tamaki Drive.

Cycleway project: Nelson Street Cycleway

The proposed Nelson Street Cycleway will link the Upper Queen Street Bridge to Quay Street via a shared path and separated cycleway, which will be delivered jointly with the Waka Kotahi NZ in two phases.

The route will connect to and expand on the existing cycle network and align with the long term vision of Auckland Transport and the NZ Transport Agency to build world class cycling infrastructure that promotes cycling as a safe and convenient mode of transport.

Phase one – completion toward the end of 2015: A shared path from the Upper Queen Street Bridge to Nelson Street, via Canada Street and connecting by bridge to the disused Nelson Street off-ramp (shown in green on the map below). This section will link with the existing shared path on Upper Queen Street Bridge. An on-road separated two-way cycleway on the western side of Nelson Street between Union Street and Victoria Street (shown in red on the map below). Consultation on this section is open until 30 January 2015. Please provide your feedback below.

Phase two – completion in early 2016: A separated two-way cycleway on Pitt Street between Karangahape Road and Vincent Street, then a shared path between Vincent Street and Nelson Street. An on-road separated two-way cycleway between Victoria Street and Quay Street. This route is still under investigation and the dashed lines indicate different route options.

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Appendix F – Sustainability details

New Zealand Emissions Trading Scheme (NZ ETS) responsibilities

Improving pedestrian amenity

Auckland Plan wishes a transformational shift to make the city centre more attractive for visitors, support businesses, and improve pedestrian amenity. Providing safe and accessible footpath facilities has a role in reducing congestion by encouraging walking instead of using private vehicles.

Urban design is an important discipline that Auckland Transport has adopted for all its projects. This will help achieve the mayor's vision of creating the world's most liveable city and implementing the Auckland Transport's vision delivering transport choices to get where you want, when you want. Ministry of Environment's New Zealand Urban Design Protocol is followed as well as Auckland Transport's own Urban Design Principles. There are seven principles in total with footpaths directly relevant to the following:

- Fitting into the built fabric (by considering the role of networks in the structuring of neighbourhoods, towns, cities and regions and by keeping the footprint of the street to a minimum)
- Connecting modes and communities
- Design sustainably
- Designing an experience in movement along streets
- Creating self-explaining road environments
- Achieving integrated and minimal maintenance design.

Federal Street Upgrade

Shares spaces are opportunities to facilitate easy pedestrian movement and revitalise urban areas. Federal Street is the next area to be transformed into a shared space. It is located in the CBD that attracts city centre workers as well as domestic and international visitors, particularly with the presence of the iconic Sky Tower. The current built environment is not very inviting with narrow streets, no public seating and a limited number of places to eat, drink and shop. The planned shared space will be safe for pedestrians to use and enjoy 24/7 where they will have priority over cars. However, this higher amenity, higher specification CBD footpaths may come at a higher price than the basic concrete Auckland Transport Code of Practice specification used elsewhere in the region.

O'Connell Street shared space

The upgrade of O'Connell Street is one of many city centre streetscape and open space upgrades inspired by the City Centre Master Plan 2012. O'Connell Street was opened for public on the 19th of September, 2014. The purpose was to protect and enhance the historic character of the street while transforming it into a 'shared space' for the public to enjoy, dine and spend time.
The project includes reconstruction of road as a single level surface using granite pavers laid over reinforced concrete slabs and featuring the road with architectural design including stone seats engraved with passages of historic information about the street as well the planting of locally-grown Nikau palm trees and the installation of feature lighting. The reconstruction was cost $2.25m and was funded by the CBD targeted rate, a rate paid by city centre businesses.

Innovative practices and products

The current practice for reuse of existing materials in footpaths construction includes crushing aggregate for footpath bases and some asphalt milling. The practice is not widespread and material reuse and innovative practices could be increased with the right incentives for major project and renewal programmes.

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There are many other ideas on innovative practices and products for footpath development with the use of recycled materials such as crushed glass and crushed concrete for footpath bases as well as trialling new permeable pavers. The current construction and maintenance standards does allow for a percentage of footpaths to use recycled materials.

Pollution control

The transport sector is the predominant contributor to air pollution especially in the summer period. In Auckland, private motor vehicles are the main source of nitrogen dioxides (NO2) with concentrations at peak traffic sites often exceeding air quality targets. Although the amount of NO2 in the air is declining, levels are still of concern and may cause adverse health problems. NO2 and CO2 levels are the highest at roadside sites because motor vehicle emissions are the major source of these air pollutants.

Footpaths asset helps to reduce air pollution by encouraging walking and access to the use of public transport instead of people using their motor vehicles, including:

- improving the urban environment to create attractive pedestrian streets and shared spaces which encourages people out of their private vehicles.
- providing footpath facilities that integrate with public transport modes
- providing targeted programmes for school and workplace travel planning to encourage walking

Economic sustainability

Auckland Transport's key asset management principle to meet the service levels and manage risk while minimising whole of life costs. This ACMP provides the detailed analysis for condition-based renewal planning for the footpath asset group and requires a degree of current, complete, accurate and available information which is inconsistent or not uploaded and available in RAMM database so that assets are renewed at the optimum time. Too late may result in poor service levels and too early would be economically wasteful if good condition assets are renewed prematurely.

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