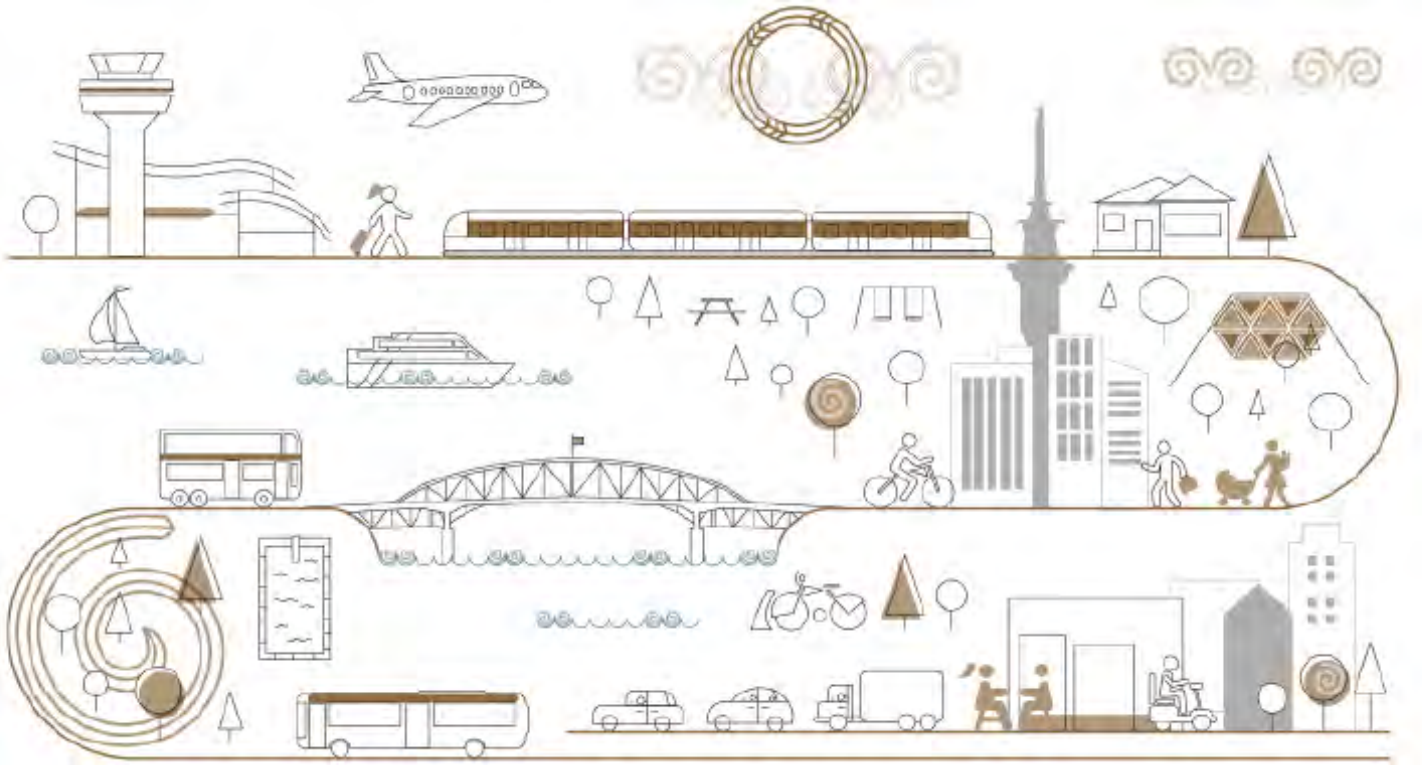
Transport and Access

Aucklanders will be able to get where they want to go, more easily, safely and sustainably.

DIRECTION	FOCUS AREA
Direction 1	**Focus Area 1**
Better connect people, places, goods and services	Make better use of existing transport networks
Direction 2	**Focus Area 2**
Increase genuine travel choices for a healthy, vibrant and equitable Auckland	Target new transport investment to the most significant challenges
Direction 3	**Focus Area 3**
Maximise safety and environmental protection	Maximise the benefits from transport technology
	Focus Area 4
	Make walking, cycling and public transport preferred choices for many more Aucklanders
	Focus Area 5
	Better integrate land-use and transport
	Focus Area 6
	Move to a safe transport network, free from death and serious injury
	Focus Area 7
	Develop a sustainable and resilient transport system



Transport and Access explained

Why Transport and Access is important

To lead successful and enjoyable lives, it is vital that people can easily, safely and sustainably reach the things that matter most to them, such as work, school, friends, recreation and healthcare.

To achieve this we need efficient ways for people, goods and services to move within and across Auckland, throughout New Zealand and across the world.

For Auckland to be a truly accessible city we also need to make sure that people of all ages and abilities, including people with reduced mobility levels, can go about their daily lives and get from one place to another easily, affordably and safely.

This means tailoring the way infrastructure and services are provided so they meet the wide range of Aucklanders' needs.

Find out more by visiting the Universal Design website[124] and the Office for Disability issues website.[125]

Transport and Access in the past

Our transport system is key to making Auckland more accessible, and for us all to benefit from growth. While great improvements have been made over the past 20 years, historic under-investment, combined with rapid population growth, means we still face big challenges.

Past decisions shaped Auckland into a relatively low-density city where private vehicles were the only viable option for almost all trips.

Auckland's continued population growth and a concentration of job growth in a few key locations have put this car-focused transport system under significant strain. Congestion has led to delays and highly variable travel times that adds cost and undermines our quality of life. Reducing the impact of congestion on people's lives is a key component of improving accessibility. However, there is now widespread recognition that we cannot simply build our way out of congestion. This means making progress requires a combination of:

- additional investment
- rebalancing effort to other forms of mobility that can avoid congestion
- focusing on changing our travel behaviour.

A big increase in transport investment over the last two decades has mostly completed the motorway network and started to develop a quality public transport system. That makes it possible for people to avoid congestion when they travel by bus, train or ferry. Auckland's rapid transit network barely existed a decade ago, but investment in the rail network and construction of the Northern Busway mean this network now carries over 26 million passengers a year, with use continuing to grow strongly.

Over the last few years there has also been increased investment in cycle ways. Read about how we're making Auckland more cycle friendly.

In some areas there have been improvements for pedestrians as well, such as the Te Ara Mua Future Streets[126] project in Māngere, ranging from how traffic is managed, to better paving, lighting and safety.

However, the legacy of past decisions is still felt today. Many projects that were first planned decades ago, such as the City Rail Link, are only now being built. This makes it difficult to address today's problems, let alone prepare ourselves for future growth. Read more on the City Rail Link website.[127]

As a consequence, people living in large parts of Auckland still don't have many choices in the way they travel. Major chokepoints and bottlenecks also remain on many main roads.

How we can improve Transport and Access

An integrated strategy

Improving Transport and Access in Auckland requires an integrated approach and is a partnership between Auckland Council and central government. The Auckland Transport Alignment Project (ATAP) developed a long-term strategic approach to address Auckland's transport challenges.

This work emphasised the need to focus on:

- getting much more out of existing infrastructure
- maximising new opportunities to influence travel demand
- ensuring investment is targeted to the greatest challenges.

For more information visit the Auckland Transport Alignment Project website.[128.]

Increased funding

ATAP confirms a major increase to transport funding in Auckland and enables a $28 billion ten year transport programme. This programme will make major improvements to Transport and Access, and help to support Auckland's growth.

ATAP also identifies key priorities for further investment and signals the need for ongoing funding and financing work, including exploring new funding tools. This recognises that traditional funding sources such as rates, fuel excise duty and road-user charges are not enough to fully meet the needs of such a fast growing area.

Alongside this ongoing investigation into increasing transport funding, we also need to ensure:

- funding is prioritised by need rather than transport mode
- the cost of projects is allocated fairly and consistently between central government, Auckland Council and the private sector

Adapting to an uncertain future

We can predict some changes to the transport system, but the further into the future we look, the more unknowns there are.

What we can confidently expect is that physical travel will be very different. The things we travel in or on may be very different than now, and the networks or infrastructure that support these ways of travelling may also be very different.

This change may be gradual, but is highly likely. The plans we make and the transport infrastructure we build must be as adaptable to the future as possible. Read more about Transport and Access in Auckland, 2050.

How we track progress

We will track progress against a set of measures.

The measures for this outcome are:

- access to jobs
- delays from congestion
- use of public transport, walking and cycling
- household transport costs
- transport related deaths and injuries

How we can implement the plan

Aucklanders have a shared responsibility for implementing the plan. Read more about implementation later in this section.

Auckland Transport Alignment Project Strategic Approach

Direction 1:

Better connect people, places, goods and services

Auckland's size and scale supports many economic, cultural, educational and recreational opportunities. These will increase as Auckland grows, but will only be realised if everyone can easily get to them when they need to.

Improving access depends on the entire transport system being managed and developed as an integrated whole, across the different networks (arterial roads, light and heavy rail, motorways, local streets, ferries) and different modes (private vehicle, public transport, walking and cycling).

See Figure 23 - Auckland's future strategic transport network

The system must also cater for the different places where people live and work, from high density urban centres to local suburbs and rural areas.

Making it easier and more affordable for people to get to work, school or training is particularly important for increasing economic productivity and everyone's prosperity.

A transport system that offers reasonable commuting times to a wide range of jobs has multiple benefits:

- it enhances the ability of employers to find suitable workers
- it boosts job satisfaction and business productivity
- it reduces the vulnerability of workers to long-term unemployment in the event of (unforeseen) employment change or job loss.

The efficient movement of goods and services is also essential to prosperity. The Ports of Auckland and Auckland Airport are New Zealand's main international gateways, so Auckland has a significant role in the distribution of freight within Auckland, to neighbouring regions as well as to the rest of New Zealand.

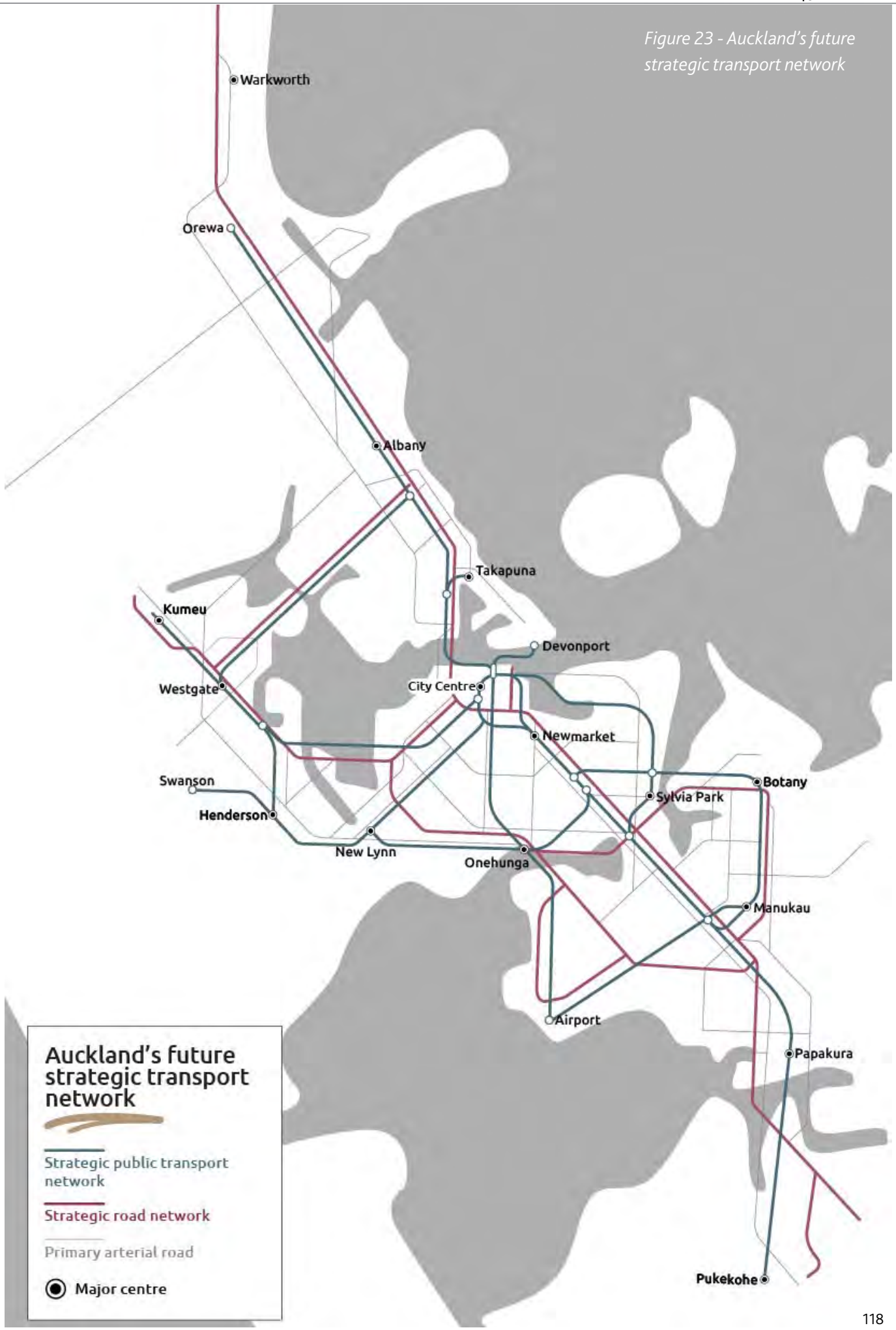
While major upgrades to State Highway 1 to the north and south of Auckland are planned or underway, these improvements may have to be complemented by future upgrades to the rail network to better connect the upper North Island.

Read about Passenger rail transport between Auckland, Hamilton and Tauranga later in this section

The vast bulk of freight and commercial travel in Auckland is by medium and small size vehicles distributing goods to retailers or to homes, and by service workers such as plumbers or electricians. Travel delays and uncertainty about trip times from congestion create real and substantial costs to businesses. This increases costs for everyone.

An integrated approach will improve our ability to ensure consistent service provision, an effective network and affordable travel choices.

Figure 23 - Auckland's future strategic transport network



Direction 2:

Increase genuine travel choices for a healthy, vibrant and equitable Auckland

Many of us lack reliable, safe and affordable choices about how we travel. This means we often depend on using private vehicles for most trips.

A lack of travel choice is often a particular problem for lower income households and in rural areas. Transport costs can be a large and unaffordable part of the household budget, making financial pressures worse.

Giving people more travel choices enables them to travel in a way that best suits their particular needs.

See Figure 24 - Graph of the morning peak travel into the city centre from 2001 to 2016 projected for 2046

A lack of choice also means that travel is often long and unreliable, with Aucklanders unable to avoid congestion that wastes precious time and reduces life quality.

By developing Auckland's rapid transit network and separating public transport from general traffic, as described on The Rapid Transit Network page, we can reduce the impact of congestion on people's lives and provide more certainty about how long a trip will take.

As Auckland grows it is essential that more people walk, cycle or travel by public transport. This will reduce pressure on our roads and free up room for freight and commercial trips, which are reliant on road travel and make major contributions to Auckland's economic prosperity. More walking and cycling will also have significant health benefits through increased physical activity. See more on the Healthy Auckland website.[129]

People-oriented streets are fundamental to the quality of experiences people have in our urban areas. We must therefore also transform how we design the transport network, so it's about people and places, not just moving vehicles.

Streets are used for a number of purposes, and should be attractive, suitable and enjoyable public spaces for residents, workers and visitors, particularly when travelling by foot.

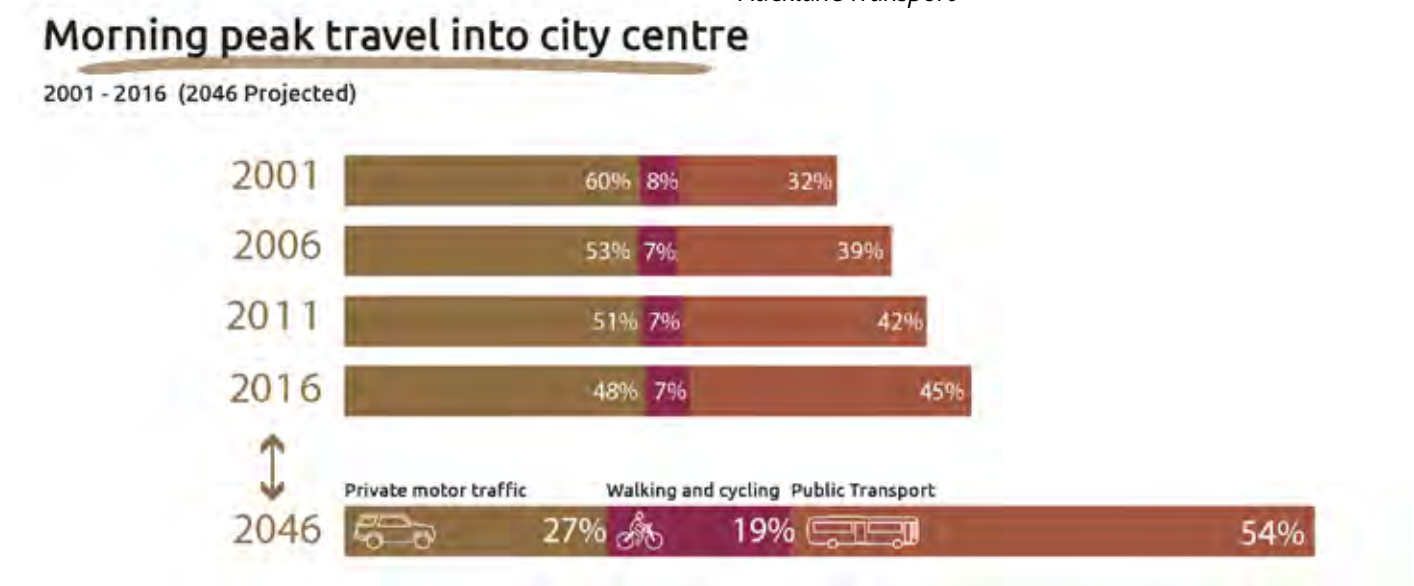
Achieving this will require a change in the way we design, manage and operate our streets and transport networks.

Our streets need to better reflect the role they play in making up a large part of our public space and in shaping Auckland's character and the way we live.

At the same time, it's important to acknowledge that moving a large numbers of people, goods and services along some key corridors is important for Auckland's economic success. This means a good balance must be struck between transport and place functions.

Allocating space for vehicles, cyclists, pedestrians, and amenities such as street furniture and trees, is a challenge. This challenge will increase as our population grows.

Figure 24 - Graph of the morning peak travel into the city centre from 2001 to 2016 projected for 2046. Source: Auckland Transport



Maximise safety and environmental protection

Our transport system creates unacceptable levels of harm to people and the environment.

Progress has been made in some areas, particularly through cleaner and safer vehicle technology, but much more needs to be done.

There has been a noticeable annual increase in traffic-related deaths and serious injuries since 2012 after many decades of decline.

Reversing this trend requires new approaches to safety. We should be guided by the 'Vision Zero' movement, which aims to eliminate transport-related deaths and serious injuries.

This approach accepts that people make mistakes, and seeks to minimise the harm from any mistakes.

Find out more on the Vision Zero Network website.[130]

See Figure 25 - Graph of the umber of rod deaths and serious injuries in Auckland from 1981 to 2017

In addition, our approach to transport safety needs to be in line with health and safety legislation which gives people the highest level of protection against harm.

Priorities are to:

- improve the safety for those walking, cycling or riding motorcycles
- address safety issues for people crossing roads and railways.
- improve personal safety and security while travelling.

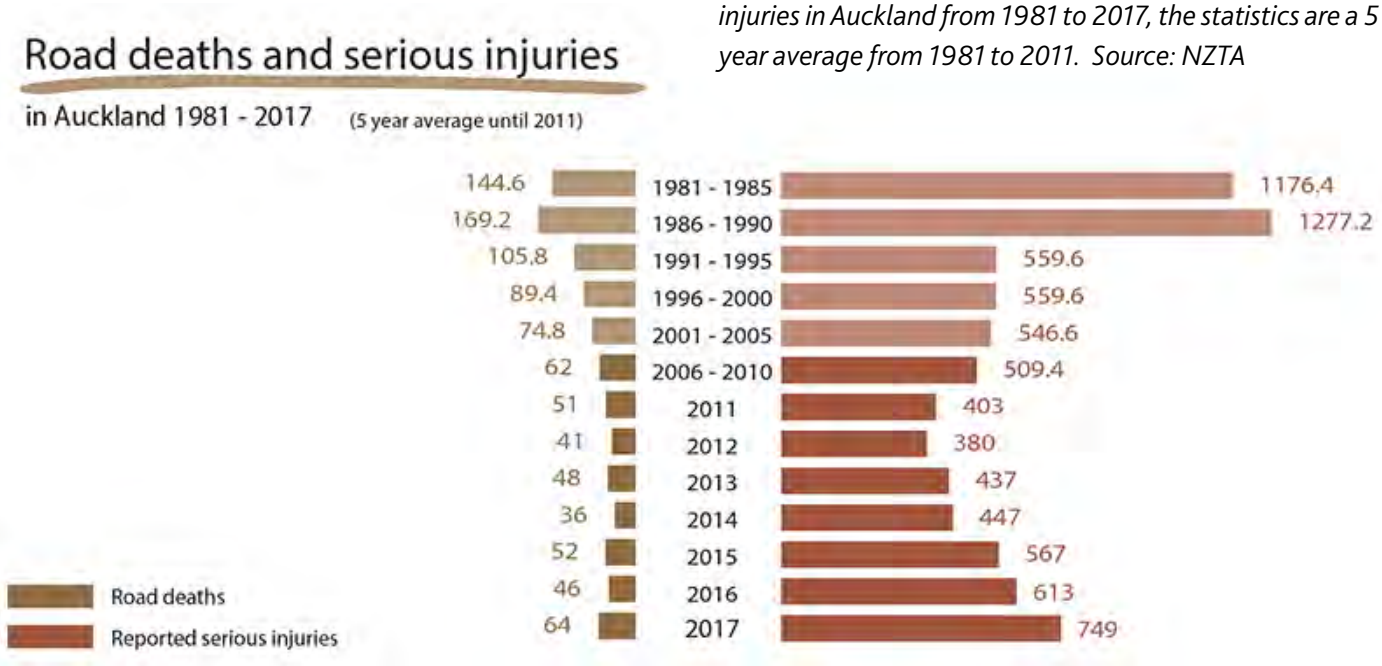
Overall, to make progress we need to give safety a higher priority in our decision-making than it has at the moment.

We must also do more to minimise the harmful environmental and health impacts of the transport system. It is therefore fundamental that the use of fossil fuels is reduced, and harmful pollutants are prevented from entering Auckland's waterways and atmosphere.

Pollutants and particulate emissions from vehicles and road dust reduce air quality and harm people's health, particularly those who have fragile respiratory systems or who live close to busy roads.

Petrol and diesel vehicles are the largest contributors to Auckland's emissions, which means transport is critical to reducing Auckland's overall greenhouse gas emissions. Making substantial progress on reducing Auckland's greenhouse gas emissions from transport will require a major reduction in the use of fossil fuels.

Figure 25 - Graph of the umber of rod deaths and serious injuries in Auckland from 1981 to 2017, the statistics are a 5 year average from 1981 to 2011. Source: NZTA



Paved and sealed surfaces that form part of the transport system, including roads, streets and parking lots, also have negative environmental impacts. Copper, zinc and sediment runoff pollutes waterways.

Impermeable surfaces prevent rainwater from recharging groundwater reserves, add to local flooding, and increase the amount of water that needs to be treated as stormwater.

Make better use of existing transport networks

Adding new roads to Auckland's transport network or widening existing ones is increasingly expensive and difficult. While investment in new infrastructure is required, existing transport corridors will need to accommodate much of the increase in travel as Auckland's population grows.

Making the best use of our existing roads, rail, footpaths, cycle ways, ferries, ports and airports is therefore essential. This will require:

- increased investment in small-scale improvements that help to optimise the existing transport network
- ongoing support for initiatives that best allocate street space between competing uses
- a coordinated approach to freight planning
- robust asset management processes to ensure we look after existing infrastructure.

Our transport system is not used as efficiently as it could be. Most infrastructure is under-utilised outside peak periods, or used inefficiently by vehicles carrying a single person. To improve this, we need to change the demand we put on the transport system.

This means better balancing our need to travel with the capacity of the transport system.

It is likely there will always be some level of congestion at times of peak demand. However to limit the increase in congestion and reduce the need for valuable land to be used as parking, we need to encourage:

- greater use of public transport, walking and cycling
- an increase in the number of people travelling in each vehicle
- taking non-essential trips outside peak times.

Travel planning, parking policies and more flexible working hours will help support these changes. However, to make a 'step change' improvement we need to provide a direct incentive to encourage people to travel more efficiently. This means moving away from the current 'flat-rate' way of charging people to use the transport system – through fuel taxes, road user charges etc. – to a system that varies the charge according to the time and location of each journey.

Before implementing this change, central government and Auckland Council will need to fully understand what effect this will have on people's travel costs so that issues of equity and affordability are understood and addressed.

How this can be done

We will make better use of existing networks by:

- identifying key routes for the movement of people, goods and services around Auckland and ensuring they operate as efficiently as possible
- increased investment into network optimisation initiatives that can deliver significant improvements through small-scale interventions, such as dynamic lanes and intersection upgrades
- progressively shifting to smarter transport pricing. Find out more at the Congestion Question[131] for information about using existing roads efficiently
- continuing to improve the way Auckland's existing transport assets are maintained, and renewed, including better co-ordinating planned maintenance with improvements. Find out more about Auckland Transport Asset management.[132]

Focus area 2:

Target new transport investment to the most significant challenges

While it's not possible to solely build our way out of our transport challenges, population growth means we need to continue to expand and upgrade our transport networks. An increase in funding from recent levels will be required to make genuine progress.

The very large scale of investment required across the whole network means that funding needs to be targeted, strategic and effective. Fixing all of Auckland's transport challenges at once is unaffordable, which means we need to focus first on the most severe challenges.

Joint strategic planning and integrated priority setting are essential for deciding when, where and how investment in new infrastructure should be made.

Working together, regionally and nationally, will help to ensure that new investments deliver best value for money, focus on the most appropriate travel mode and are made at the right time and the right scale.

The future is uncertain, so it's important to trial small-scale interventions and test decisions against a variety of futures.

The Development Strategy has detail on the key transport investments that will be needed to support development across Auckland.

How this can be done

Investment in new infrastructure and services must:

- upgrade and expand Auckland's strategic road, rail and other public transport networks to ensure they operate effectively and efficiently as the population grows
- improve Auckland's inter-regional and international road, rail, port and airport connections, as described on the Ports of Auckland page, which are critical to New Zealand's economic and social success
- use the most suitable travel mode to address the problem and ensure the different parts of our transport network operate as an integrated whole
- move to a "scenarios-based" approach to planning and decision-making, where strategies and major investments are assessed against a range of potential futures
- address disparities in access to opportunities, particularly where this exacerbates existing inequities of travel choice and cost. Find out more in The Equitable transport access across Auckland later in this section.

Maximise the benefits from transport technology

Transport technology is developing quickly and has the potential to help provide new and better travel options.

In the short-term, technology changes are likely to make real time travel information more readily available.

This will help us plan our travel more easily, help avoid the worst impacts of congestion, and help deliver improved and real time solutions (for example, dynamic traffic light sequencing, faster responses to incidents, or changing the allocation of street space between uses).

In the medium to longer-term, developing technologies like connected and autonomous vehicles (including public transport) especially when combined with ride-sharing, have the potential to fundamentally reshape the way transport is used and provided, blurring the boundaries between private and public transport.

These developments could create a number of benefits, including:

- increasing the number of vehicles that can travel on a road at the same time (particularly on motorways), lowering congestion and reducing the need for road widening
- reducing deaths and serious injuries from traffic incidents
- more efficient provision of public transport services
- new travel choices for everyone, regardless of age and ability, and to parts of Auckland difficult to efficiently serve with traditional public transport (e.g. rural areas).

There is also a risk that these technology advances could create negative effects, particularly if they lead to large-scale growth in vehicle travel or poorer quality street environments. Ongoing monitoring and regulation may be required to minimise these risks.

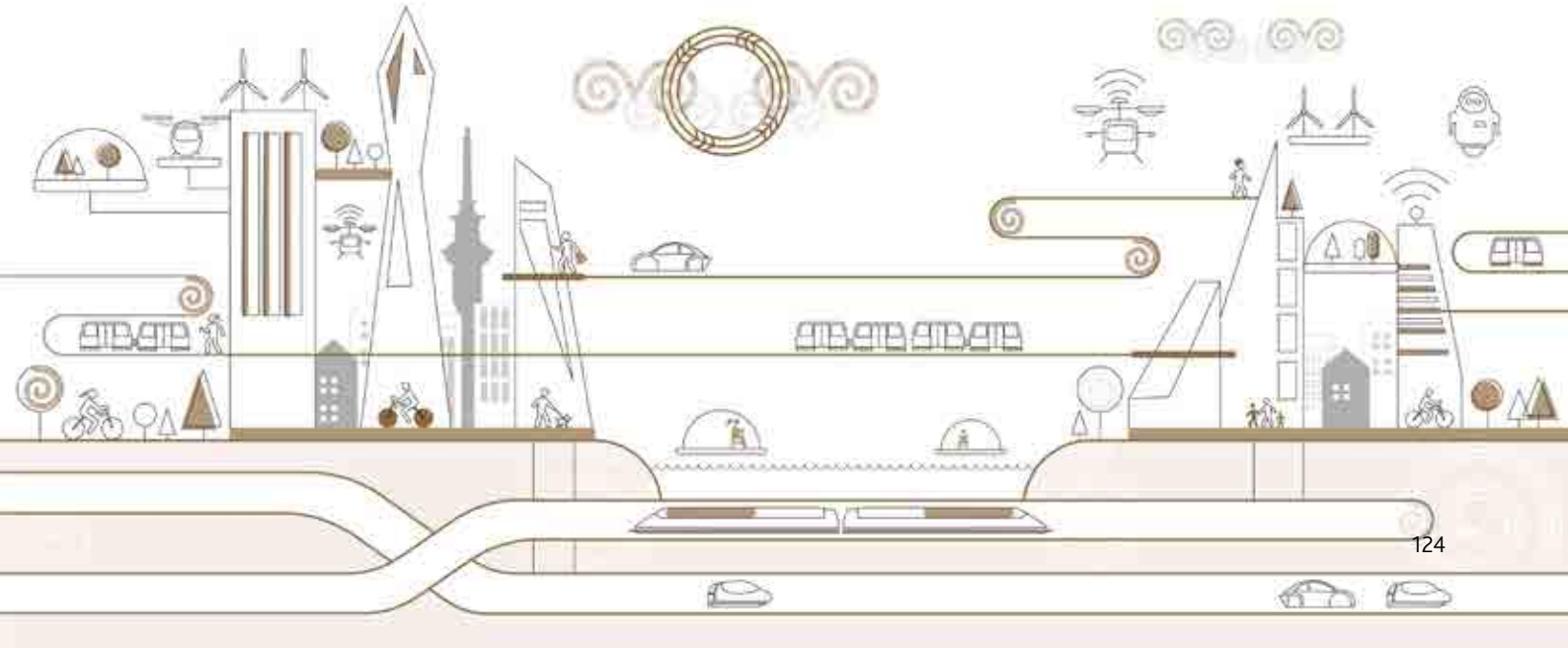
While rapid technological progress is anticipated, it's hard to know which developments will be successful or when we will be able to use them.

Realising benefits from technology will require us to focus on trials, safety, enabling regulation and supporting infrastructure.

How this can be done

Efforts to maximise the benefits of transport technologies must:

- encourage innovation and support a 'fail fast' culture where a wide variety of new transport ideas can be tested, adapted, developed or discarded
- boost the use of big data and open data to improve travel information for Aucklanders, support better network management decisions, and provide effective demand management tools
- encourage the uptake of new technologies such as more intelligent network management, connected and autonomous vehicles, and vehicle sharing. Find out more about Auckland Transport Technology Strategy.[133]



Focus area 4:

Make walking, cycling and public transport preferred choices for many more Aucklanders

More Aucklanders will walk, cycle and use public transport if it is accessible, efficient, affordable, reliable, safe, and attractive.

Substantial progress has been made in recent years. However, many parts of Auckland, particularly outer suburban and rural areas, still lack good access to these options.

To make public transport a preferred travel choice, we need an integrated system that consists of:

- a rapid transit network that provides fast, frequent and reliable travel between major parts of Auckland
- frequent, connector and local public transport services, often running in dedicated bus or transit lanes, that focus on more local trips and provide access to rapid transit
- walking, cycling and park and ride facilities that make it easy for people to access public transport.

Further detail on our approach to public transport is outlined in the Regional Public Transport Plan.[134]

While improvements are required across Auckland, a key focus of investment must remain on trips to busy locations like the city centre, metropolitan centres and other major employment areas (e.g. Auckland Airport). Large numbers of people travelling by car to these locations creates widespread congestion and requires a lot of valuable land to be used for parking, instead of more productive uses like homes and businesses.

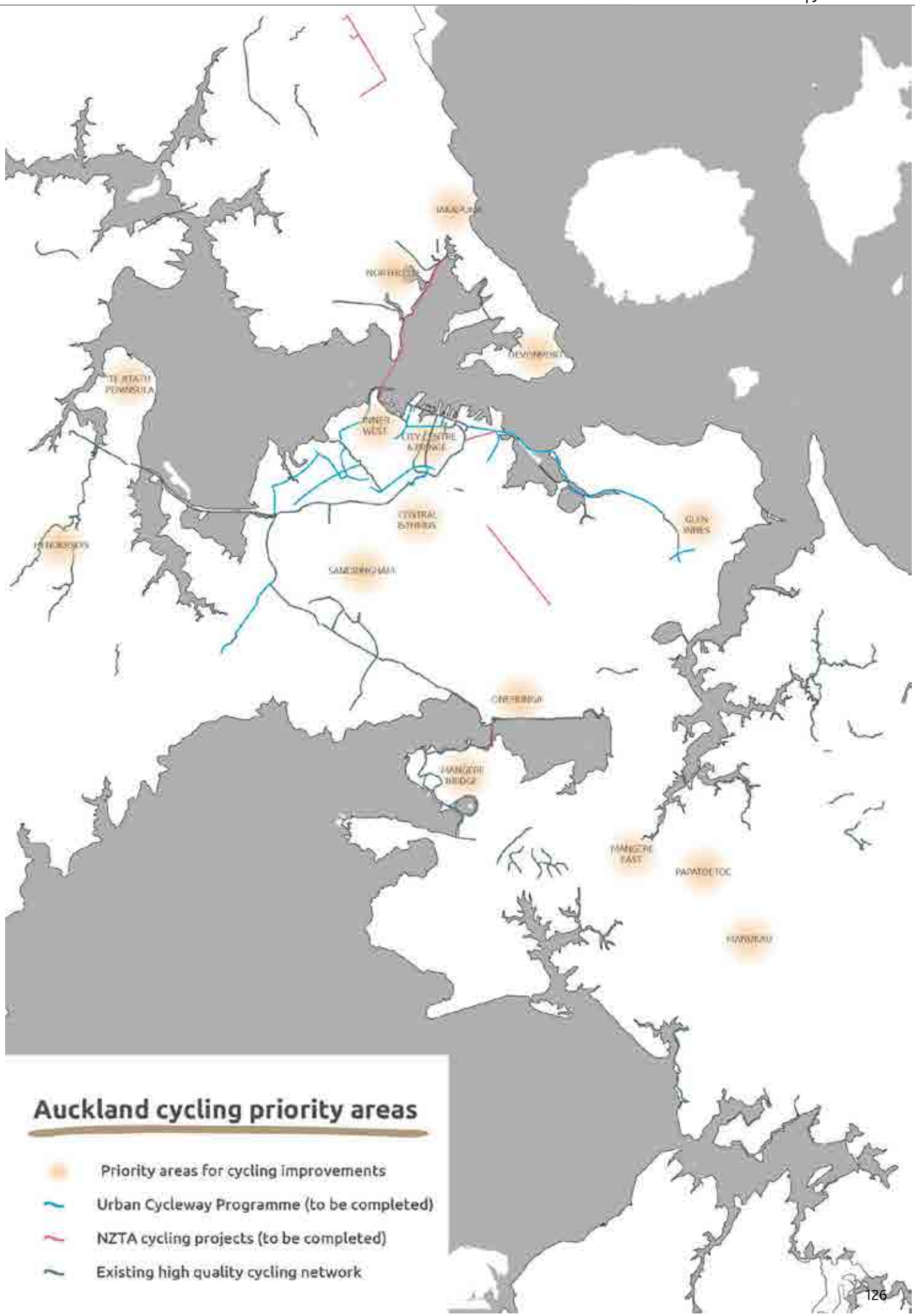
The safe cycling network is still in the early stages of its development. There has recently been a significant increase in investment, generating unprecedented growth in the number of cyclists where improvements have been made. Read more on the Making Auckland more cycle friendly page.

It is essential that walking and cycling accounts for a greater share of short- and medium-distance trips as Auckland grows to reduce pressure on the road and public transport networks, and for their inherent health and environmental benefits. This will require sustained effort and investment into safe and attractive cycling routes across Auckland.

How this can be done

We will make walking, cycling and public transport attractive travel choices by:

- continuing to implement initiatives such as dedicated bus lanes[135] and cycle ways[136] that enable faster, safer and more reliable travel, particularly where a lot of people live and work and along highly congested routes
- designing and managing streets[137] in a way that prioritises walking, cycling and quality urban spaces, including speed management and safe crossing opportunities
- making frequent, efficient, affordable and reliable public transport more widely available
- improving access to public transport through walking and cycling upgrades, feeder services, and park and ride facilities[138]
- implementing the universal design approach and embedding accessibility into all parts of the journey, to make it easier for people of any age and ability to move around. For more information visit the Universal Design website.[139]


Auckland cycling priority areas
Priority areas for cycling improvements
Urban Cycleway Programme (to be completed)
NZTA cycling projects (to be completed)
Existing high quality cycling network

Focus area 5:

Better integrate land-use and transport

Transport infrastructure and services are important for enabling and supporting population and housing growth in new and existing urban areas, while the location of growth affects how well the transport system performs. Because transport and land use are so strongly connected, all decisions need to consider their impact on the other.

Inefficient land use patterns lead to longer trip lengths and travel times. To address this challenge, we need to encourage housing and employment growth to areas with better travel options.

Encouraging growth into areas with better travel choices will result in more use of public transport, walking and cycling. This will ease some of the pressure growth places on our transport system.

Integrating land use and transport is particularly important for rapid transit. The speed and reliability of rapid transit improves the accessibility of an area, making it more attractive for redevelopment.

Unlocking growth around rapid transit corridors and stations is essential to address Auckland's housing and transport challenges. It will also maximise the benefits from the large investment required to build and operate rapid transit.

Integrating land use and transport is also required at the street level, particularly as Auckland grows and competition for street space increases. The planning and design of our streets must support quality, vibrant urban amenity and good living environments.

This means we need to find the right balance between a street's transport function and how the street space also caters for other uses, such as pedestrians and general place making.

Auckland Transport's Roads and Streets Framework[140] outlines how this will be done.

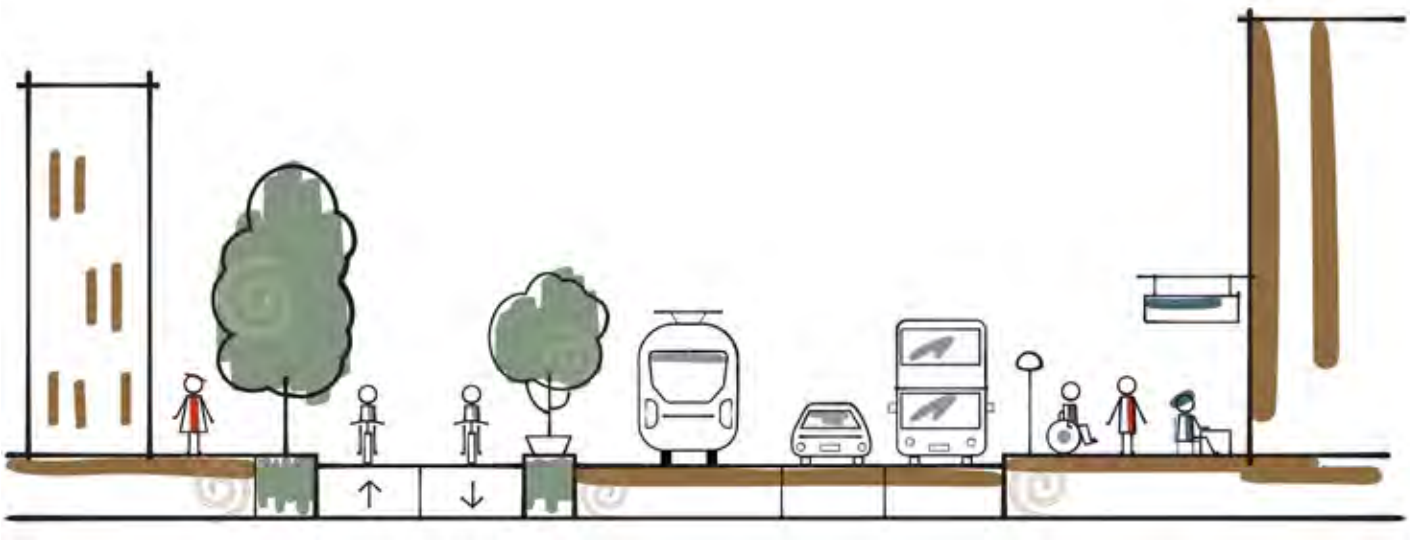
Auckland's Transport Design Manual[141] provides design and technical specifications that support this framework.

Designing streets and transport facilities to reflect Māori culture, through the use of Te Aranga design principles will help affirm Auckland's unique point of difference. Find out more about these principles on the Auckland Design Manual website.[142.]

How this can be done

Better integration of land use and transport to support quality urban living will include:

- prioritising transport investment that supports intensification in the existing urban area, supports growth in new urban areas and improves connections between these newly developing areas and the rest of Auckland. Find out more about the Supporting Growth Project[143]
- encouraging housing and employment growth in areas with better transport connections
- designing and managing streets[144] in a way that creates vibrant and inclusive places, reflects local character and our Māori identity, and uses good design to manage any trade-offs between vehicle movement and place making functions.



Move to a safe transport network free from death and serious injury

There have been substantial reductions in road-related deaths and serious injury for most of the past 30 years, despite a growing population and an increase in total travel.

However, since 2012, these trends have reversed, with pedestrians, cyclists and motorcyclists facing the greatest safety risk.

This increase suggests previous initiatives are no longer as effective and a new approach to safety, with solutions that make a real difference, is needed.

While eliminating all deaths and serious injuries may be challenging, the starting point must always be that they are unacceptable. This starting point must influence all transport decisions, including project design, regulations, enforcement and investment choices.

Moving to a truly safe transport network will require a greater emphasis on safety in decision-making. Compared to the way we have done things in the past, we will:

- allocate a greater part of the transport budget to dedicated safety projects
- change the way we evaluate potential transport investments
- place greater emphasis on safety in the design of new or upgraded infrastructure
- make necessary regulatory changes to promote safety, such as targeted speed limit reductions
- seek to improve travel behaviour by placing greater emphasis on enforcement, and through public awareness campaigns.

Real and perceived safety and security concerns discourage many people (particularly women, seniors and children) from using public transport, walking and cycling, especially after dark. Ensuring these travel options feel safe to all Aucklanders will help encourage their greater use.

How this can be done

Efforts to achieve a safer transport network must:

- increase investment into dedicated safety projects targeted to the highest risk locations (including intersections, high risk routes and road/rail level crossings). Find out more about the Regional Land Transport Plan[145].
- ensure that safety and accessibility for people of all ages or ability is central to the design of transport infrastructure, as described on the Universal Design website[146].
- introduce appropriate speed limits in high-risk locations, particularly residential streets, rural roads and areas with high numbers of pedestrians and cyclists
- upgrade rural roads, especially where urbanisation is likely to result in increased demand.
- use Crime Prevention through Environmental Design principles to improve real and perceived safety. Find out more about creating safer places[147].

Focus area 7:

Develop a sustainable and resilient transport system

To make our transport system more sustainable it needs to:

- be more resilient in the face of increasing change
- minimise negative impacts on the environment.

Increasing the sustainability of our transport system will:

- improve Auckland's air quality
- reduce its vulnerability to future oil shocks
- reduce run-off from the road network into our waterways
- mitigate climate change - read more about climate change on the Low Carbon Auckland[148].

Improving the resilience of our transport system in response to potential long or short-term disruption is also crucial. We face a number of potential challenges in this regard, including:

- the impacts of weather events
- long-term impacts of climate change
- disruptions arising from accidents, damage or incidents on the network
- fuel shocks
- impacts from new technologies.

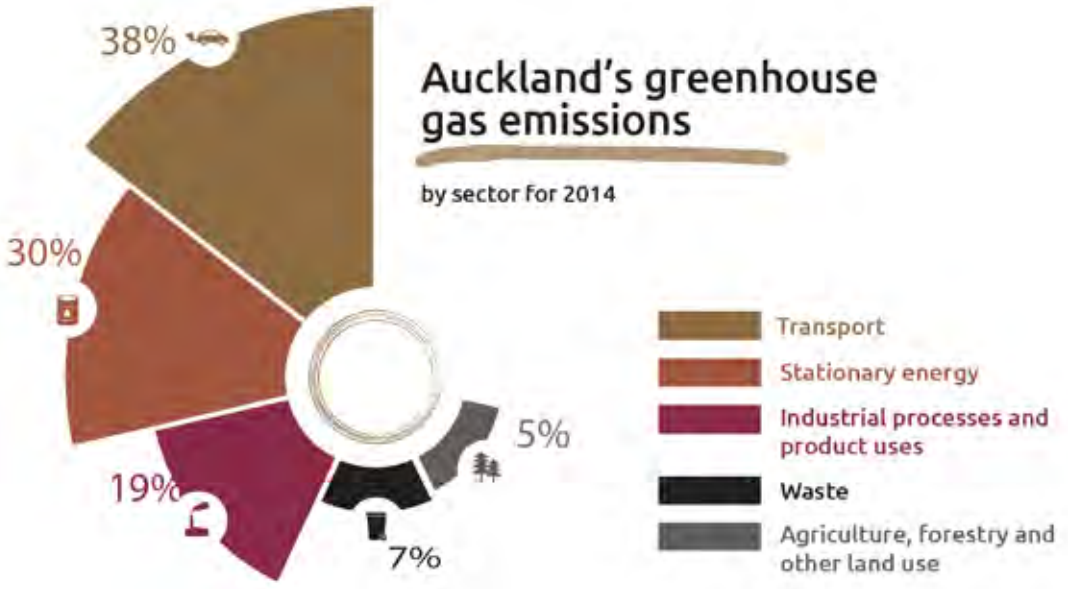
Decisions must also be made in a way that reduces the risk of investments being 'caught out' by rapid change, whether arising from climatic conditions, technological developments or other forms of change.

How this can be done

Efforts to develop a more resilient and environmentally responsible transport system must:

- progressively eliminate transport greenhouse gas emissions by reducing the need to travel, improving fuel efficiency, encouraging the uptake of electric vehicles and improving travel options (particularly walking, cycling and public transport). Find out more at Low Carbon Auckland[149]
- identify parts of the transport network where disruption would have significant and widespread impacts, and develop appropriate strategies to improve their resilience
- progressively reduce the harmful pollutants that enter our waterways and atmosphere
- reduce the impact of non-permeable surfaces on runoff and the creation of urban heat islands.

Figure 26 - Graph of Auckland's greenhouse gas emissions by sector for 2017. Source: Auckland Council



Implementing the Transport and Access outcome

Implementation partners

The New Zealand Transport Agency, Auckland Transport and KiwiRail are the main planning and delivery agencies that will develop and improve the Auckland transport network to achieve the Auckland Plan.

Auckland Airport and the Auckland ports provide key connections between Auckland and the rest of the world.

The future of the sea port on the city centre's waterfront is being considered. Any future change in location is likely to fall outside the timeframe of this plan; if any concrete decisions are made they will be reflected in the plan.

Advocacy groups play important roles in influencing how Aucklanders and businesses make transport choices.

Auckland Council will develop an implementation approach for this outcome working alongside our key partners and stakeholders. This will be built on existing programmes and ensure all new elements introduced in the Auckland Plan 2050 are planned for.

Mechanisms used to work together

Joint planning and prioritisation processes are crucial to provide the best transport solutions to support Auckland's growth.

Auckland Council and central government reached broad agreement on a long term strategic approach to developing Auckland's transport system through the Auckland Transport Alignment Project.[150]

The agreed approach is converted into action through the three-yearly Regional Land Transport Plan (RLTP)[151] which sets out the optimal timing and sequencing of projects given available funding.

Reliance on traditional funding tools is becoming increasingly inadequate to meet Auckland's transport investment needs.

Continued efforts will be needed to assess options for increasing transport funding and how to spread these costs across central and local government, users and non-users, in a fair and equitable way.

Supporting strategies and plans

Auckland Transport Alignment Project (ATAP)

ATAP is a strategic exercise to align the transport priorities of central government and Auckland Council. In 2018, ATAP was updated to place a greater weight on public transport (especially rapid transit), walking and cycling, improving safety, and realising environmental, health and growth outcomes.

Visit the ATAP website[152] for more information.

Auckland Regional Land Transport Plan (RLTP)

This is a plan to respond to growth and the other challenges facing Auckland. The Government Policy Statement on transport and the Auckland Plan set the strategic direction for the RLTP. Funding for the RLTP is provided through the Auckland Council's Long-term Plan, the National Land Transport Programme and through other central government budgets.

Low Carbon Auckland

This plan identifies the way we travel as one of five key areas of transformation to achieve a sustainable, energy resilient, low carbon future. See Low Carbon Auckland[153] for more information.

Transport safety strategies

Visit the Safer Journeys website[154] to read about the government's current strategy to guide improvements in road safety.

Auckland Transport also has a number of initiatives to support safer communities, particularly partnerships with national agencies on improving road safety and reducing the number of people killed or injured on Auckland's roads. Read about these initiatives on the Auckland Transport website.[155]

The Congestion Question

Similar to ATAP, the Congestion Question is a joint project involving the Auckland Council, the Ministry of Transport, Auckland Transport, the NZ Transport Agency, the Treasury and the State Services Commission.

The project will investigate different pricing options and test whether these could improve congestion results, taking into account the impact of these options on affected households and businesses.

Visit the Congestion Question website[156] for more information.

How to get involved

- Get inspired about places to ride, run and walk in Auckland by visiting the Auckland Transport website[157]
- Consider taking more trips by public transport. Find out more on the Auckland Transport website.[158]

Supporting information

Transport and Access in Auckland, 2050

Rapid Transit Network

Making Auckland more cycle friendly

Passenger rail transport between Auckland, Hamilton and Tauranga

Equitable transport access across Auckland

Transport and Access in Auckland, 2050

It is 2050, and Auckland's population is around 2.5 million people. The way people, goods and services move around Auckland are very different from what it was 30 years ago. The fast pace of technology development was the main factor shaping this change.

While information and communications technology have replaced some of our travel needs, the basic human desire to interact with other people means that more people are travelling around on a transport network that largely existed in 2018.

Sustained investment over the decades allowed us to broadly keep up with growth and provide much better travel choices. However, major gains in access and reducing congestion only happened through technological advances and a much more sophisticated approach to charging for using the transport network.

A much larger proportion of the vehicle fleet is now driverless, but the real impacts of technology have been in blurring the distinction between different ways of travelling, including:

- electric bikes
- driverless mini-buses
- mobility as a service
- taxi bots
- optically guided buses
- local air travel
- light rail vehicles that carry over 500 people.

Aucklanders now have a wide range of travel options available to meet their needs.

As a wider variety of travel options emerged and investment into public transport and cycleways began to complete these networks, the share of travel by traditional private vehicles declined.

A greater proportion of vehicles now move goods and services around, although driverless technology is leading to further major disruption for the transport and logistics industry.

The vehicle fleet is nearly fully electric, which contributes to the much-needed reduction in greenhouse gas emissions and to eliminating other harmful air pollutants.

Improvements in vehicle technology and a continuing commitment to road safety have also substantially reduced the road toll.

Despite these improvements, access challenges remain for Auckland in 2050. One ongoing challenge is about how we appropriately balance the allocation of street space between a greater number of residents, workers, travellers, and visitors.

Another relates to cyber-security and privacy concerns about a transport system that is ever more reliant on technology.

Finally, it has required ongoing effort to ensure all Aucklanders – not just people in more central urban areas – are able to benefit from these improvements.

Rapid Transit Network

Rapid transit forms the backbone of Auckland's public transport network.

It provides fast, frequent and high capacity services along corridors separated from general traffic and is therefore not affected by road congestion.

Auckland's rapid transit network barely existed a decade ago, but now carries over 26 million passengers a year, with use continuing to grow strongly.

This is a result of investment in:

- rail electrification and new trains
- track and station upgrades
- construction of the Northern Busway.

The rapid transit network will need to play a central role in meeting the travel needs of a fast-growing region, as well as supporting and shaping Auckland's growth and urban form.

In particular, only rapid transit can:

- efficiently move large numbers of people to intensely developed places like the city centre and other major centres
- dramatically increase the number of people able to travel between major parts of Auckland (north, central, west and south)
- provide a fast and reliable travel option that encourages people out of their cars for longer-distance journeys
- deliver long-lasting access improvements to areas near rapid transit stations, which improves their attractiveness for redevelopment.

Major improvements to Auckland's rapid transit network are necessary for it to meet these requirements. In particular, large parts of Auckland are still not served by rapid transit, while existing parts of the network will need to be upgraded to meet future demand.

We may expand or upgrade the rapid transit network through bus improvements, light rail, heavy rail or frequent ferry services.

This will depend on forecast levels of demand, integration with the existing network and cost-effectiveness.

The map below provides an indication of the location and likely mode of Auckland's future rapid transit network:

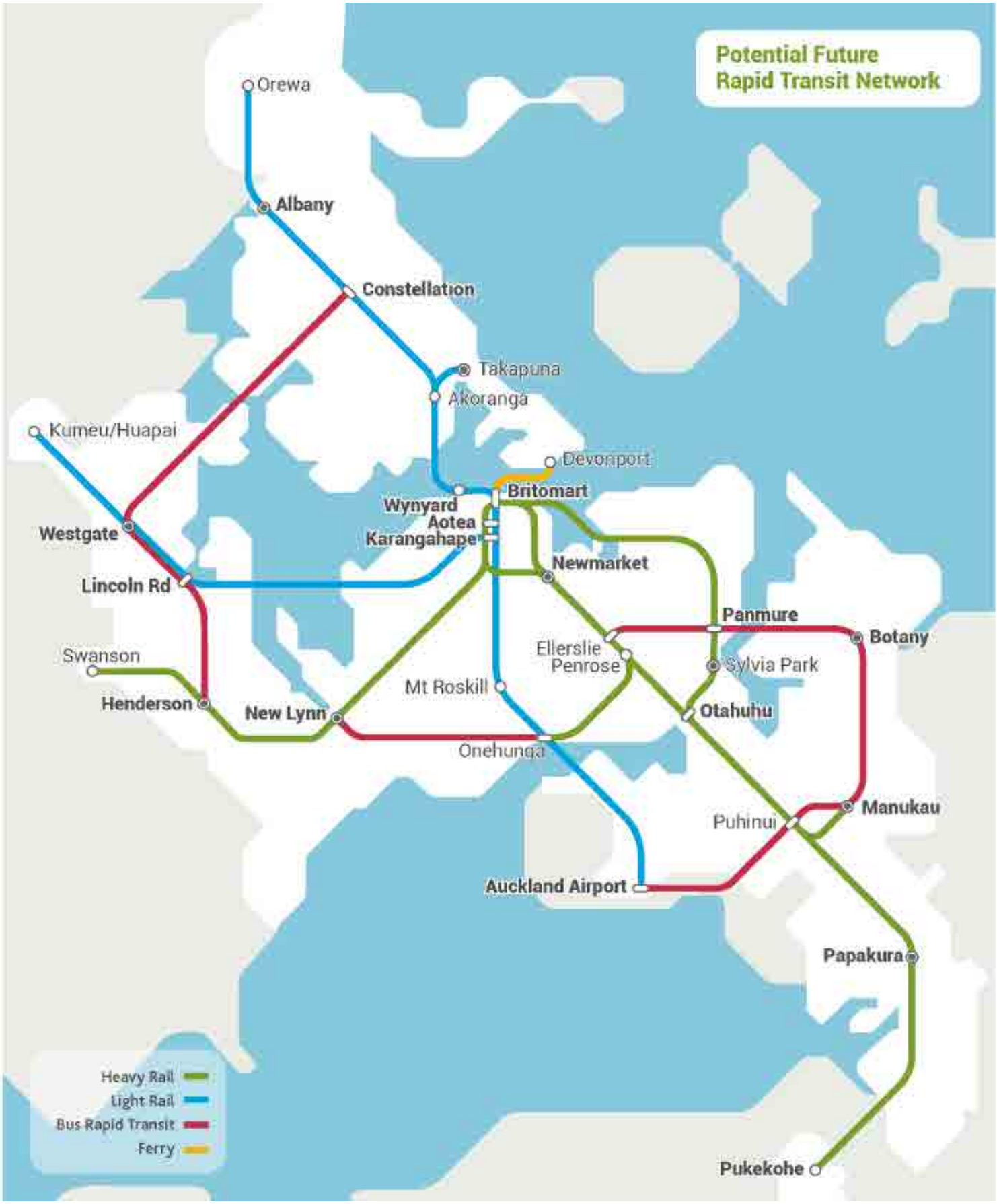
See Figure 27 - Rapid Transit Network Map.

Robust analysis will be required on a case-by-case basis to confirm the exact timing, alignment and technical specifications of each corridor.

Making the most of the rapid transit network will need complementary initiatives, including:

- improving access to rapid transit stops and stations through walking and cycling improvements, feeder bus services and appropriately placed park and rides
- providing frequent, reliable and attractive services that are intuitive and easy for everyone to use
- providing supportive land use policies that enable and encourage growth into areas within walking distance of rapid transit stations and stops.

Figure 27 - Rapid Transit Network Map. Source: Auckland Transport Alignment Project [159]



Making Auckland more cycle friendly

Cycling is often not a safe or easy way to travel for many Aucklanders. Not many people use their bikes to travel to work, school, shopping or many other daily activities.

Getting more people to cycle will help:

- ease congestion by reducing the number of people in cars, trains and buses - especially for shorter trips in busier areas
- increase people's travel choices, particularly for those living in lower income households where travel makes up a significant part of their household budget
- reduce the environmental impact of travel
- improve the health of people who cycle.

What other cities are doing

Auckland has much to learn from other cities about how to dramatically increase the number of people cycling.

For example, up to a third of all travel in Amsterdam and Copenhagen is by bike. Only 20 to 30 years ago these places had much lower levels of cycling.

In younger cities, such as Vancouver, Portland and Seattle, sustained effort into separated cycle routes has substantially increased the share of travel by bike.

What Auckland is doing

Between 2015 and 2018, central government and Auckland Council invested around $200 million in cycling. This investment was the first step towards developing complete cycle networks in and around the city centre. It included improvements such as separated cycle lanes and painted arrows on quiet residential streets.

This approach:

- improves safety for people who already cycle as their main way of getting around.
- aims to get more people to take up cycling.

The recent investment has added an additional 27 km of cycleways in central parts of Auckland and is already increasing the number of people cycling.

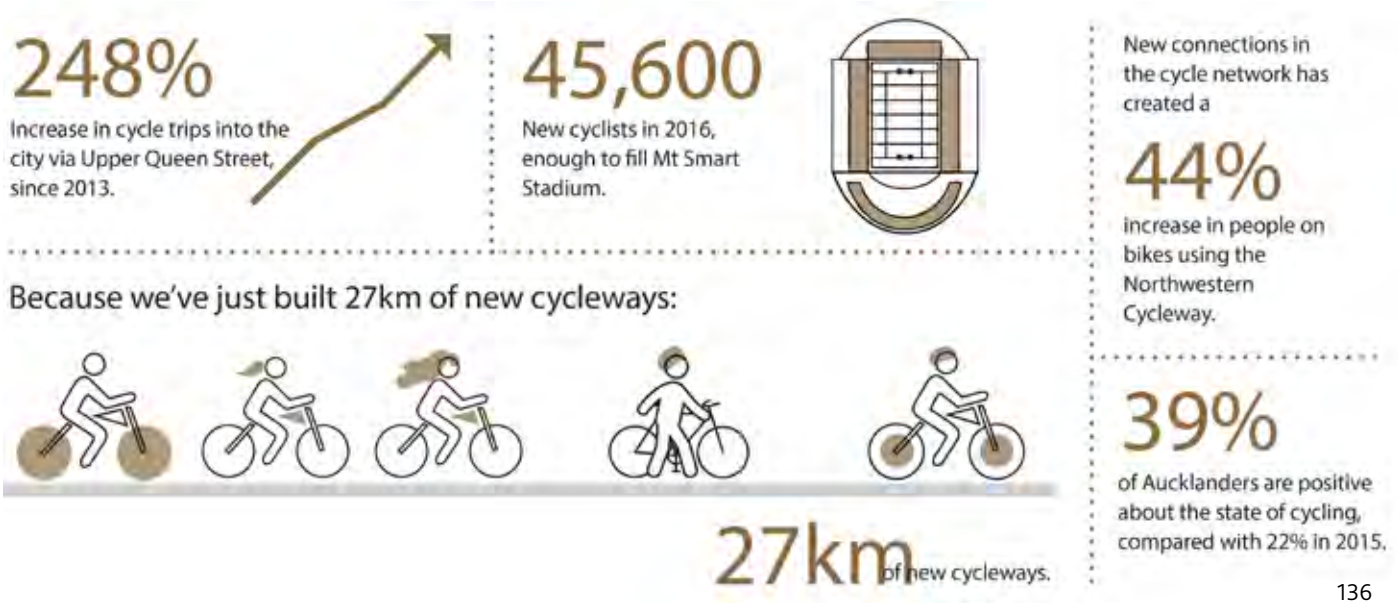
Focusing our efforts

While this recent investment has taken the first steps towards making cycling a safer and more attractive travel option, we need to maintain efforts to join up incomplete networks and extend this across more of Auckland. Efforts need to be targeted to the areas of greatest need and opportunity.

The following factors have influenced where efforts will be focused over the next decade as:

- short to medium average trip length
- high socio-economic deprivation
- concentrations of young people
- locations with poor transport choices
- high employment and education activity
- number of crashes.

The Auckland Transport Alignment Project (ATAP)[160] includes around $650 million of funding for cycling over the next decade, enabling recent progress to be continued. ATAP also signals that cycling is a high priority for additional investment if extra funding becomes available.



Passenger rail transport between Auckland, Hamilton and Tauranga

Auckland, the Waikato and the Bay of Plenty are home to just under 50 per cent of all New Zealanders (as at the 2013 Census).

Combined, these areas:

- account for half of New Zealand's gross domestic product and
- are likely to account for more than 70 per cent of New Zealand's population growth over the next 30 years.

Recent improvements to road transport between Auckland and Hamilton, in particular progress towards completing the Waikato Expressway, have created substantial travel time and safety improvements. However, at peak times journeys are likely to remain long and relatively unreliable, largely because of congestion on Auckland's southern motorway.

Fast and frequent passenger rail services between Auckland, Hamilton and Tauranga would offer a congestion-free alternative to road travel. This would also complement the upgraded road network and therefore provide a better road travel experience for those who continue to drive.

Inter-regional passenger rail has the potential to reduce travel times between Auckland and Hamilton to just over an hour, and reduce times between Tauranga and Auckland to around two hours.

Travel time improvements of this scale would be transformational for this inter-regional corridor by:

- improving economic integration between the Auckland, Waikato and Bay of Plenty regions
- supporting substantial housing and employment opportunities along the rail line as a result of inter-regional commuting becoming a more attractive travel option
- creating vibrant, affordable and successful urban areas in southern Auckland and the North Waikato.

The services would also:

- provide an express rail service within Auckland, which would reduce travel times between Auckland city centre and Auckland Airport (via connection at Puhinui Station) as well as to southern growth areas
- make better use of the existing rail network
- improve the resilience of the transport network
- reduce congestion, transport related emissions and deaths and injuries occurring on the road network.
- reduce the conflict between freight and passenger rail services within Auckland.

Past proposals for improving passenger rail services have not provided sufficiently attractive travel times and frequencies to encourage use.

This is because they have been based on the use of slow trains, limited track upgrades and have not been able to reach Britomart Station because of its capacity constraints.

For rail to be successful, it will require a substantial investment programme that includes:

- new, faster trains
- completion of the City Rail Link to enable use of Britomart Station by regional trains
- track upgrades within Auckland (including a third or fourth main line on busy sections of track) to separate fast inter-regional trains from commuter trains
- rail electrification to (and potentially beyond) Pukekohe
- track and station upgrades outside Auckland.

A high level investigation into inter-city passenger rail is under way.

See Figure 28 - Rapid regional rail network proposed by central government

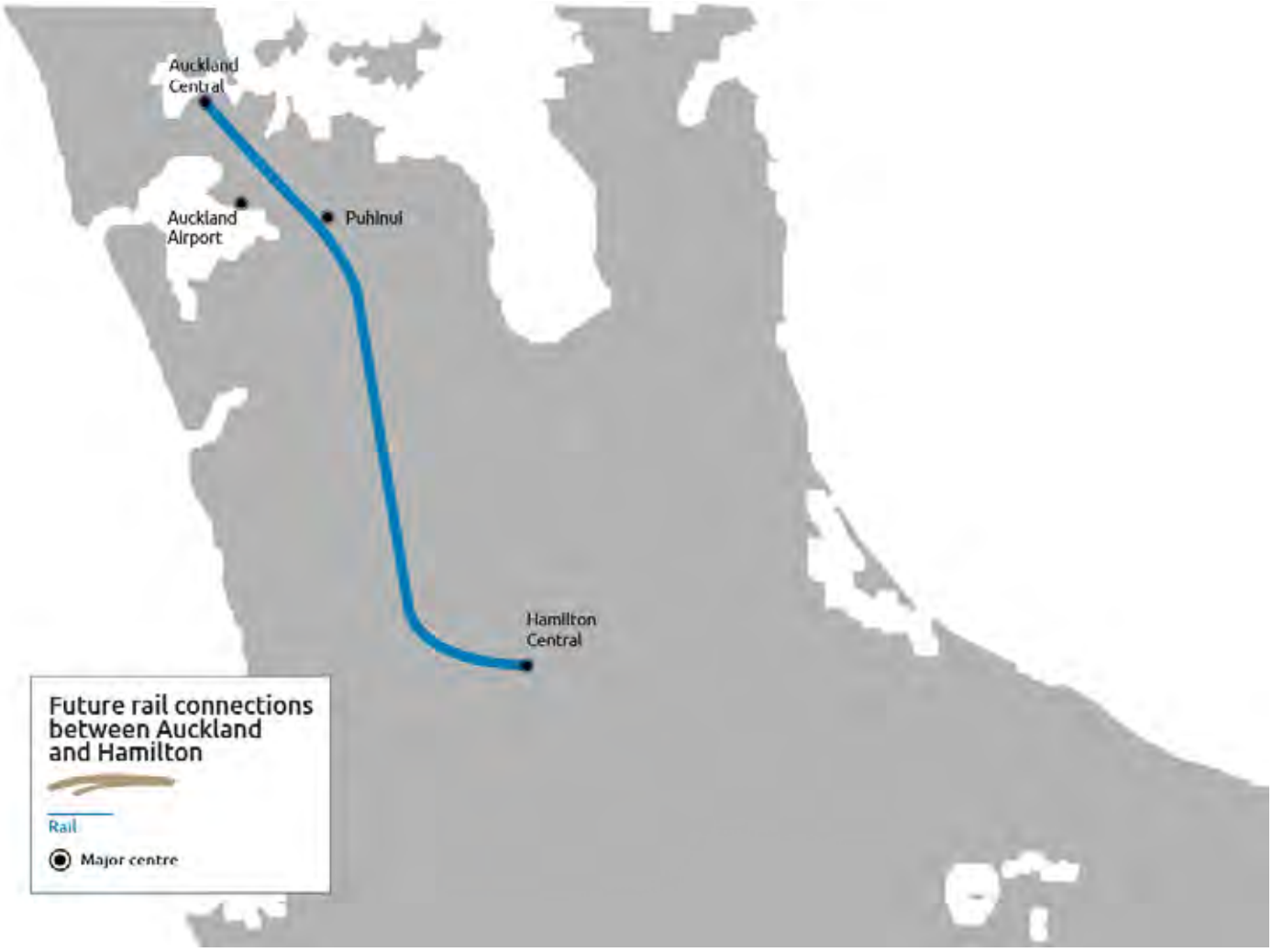
Data sources

Statistics New Zealand. (2013). 2013 census data[161] accessed 31 October 2017

Statistics New Zealand. (2016). Regional gross domestic product: year ended March 2016,[162] accessed 31 October 2017

Statistics New Zealand. (2016). Subnational population projections 2013 base to 2043 update (released 2016),[163] accessed 31 October 2017

Figure 28 - Rapid regional rail network proposed by central government



Equitable transport access across Auckland

Auckland's growth is forecast to create major challenges in getting around, especially commuting to and from work. For many people, work will be a long distance away from home, meaning long journeys.

Housing growth is expected to take place across Auckland, including in new greenfield areas on the urban periphery. At the same time, the ongoing evolution of Auckland's economy means job growth is expected to cluster in major centres.

What this means

Without major intervention, the way Auckland is expected to grow means many people (particularly those in the south and the west) may need to travel further to reach their jobs. This will put additional pressure on our transport networks and ultimately limit or reduce the number of jobs that can be reached within a reasonable commute time.

Improving access to employment is a key way of improving prosperity and lifting people out of poverty. So it is particularly concerning that the areas facing the greatest challenges in accessing employment are also some of the most economically deprived communities in Auckland.

Addressing this challenge will need to be an ongoing focus of transport and growth planning in Auckland.

What we can do about it

We need to focus on both improving the transport system and shaping the way Auckland grows. This includes:

- encouraging much stronger business growth and employment opportunities around Albany, Westgate and Manukau, so that people have more options to work or study close to where they live
- encouraging substantial housing growth in inner areas and along main transport routes
- making better use of existing transport networks, which includes increasing the share of travel by walking, cycling and public transport
- increasing opportunities to walk and cycle as low-cost travel options, particularly in areas of high socioeconomic deprivation
- targeting investment in new transport infrastructure to help ensure employment access improves over time.

See Map 8 - Access to Jobs (via Public Transport within 45 minutes) and Map 9 - Acces to Jobs (via Car with 30 minutes)

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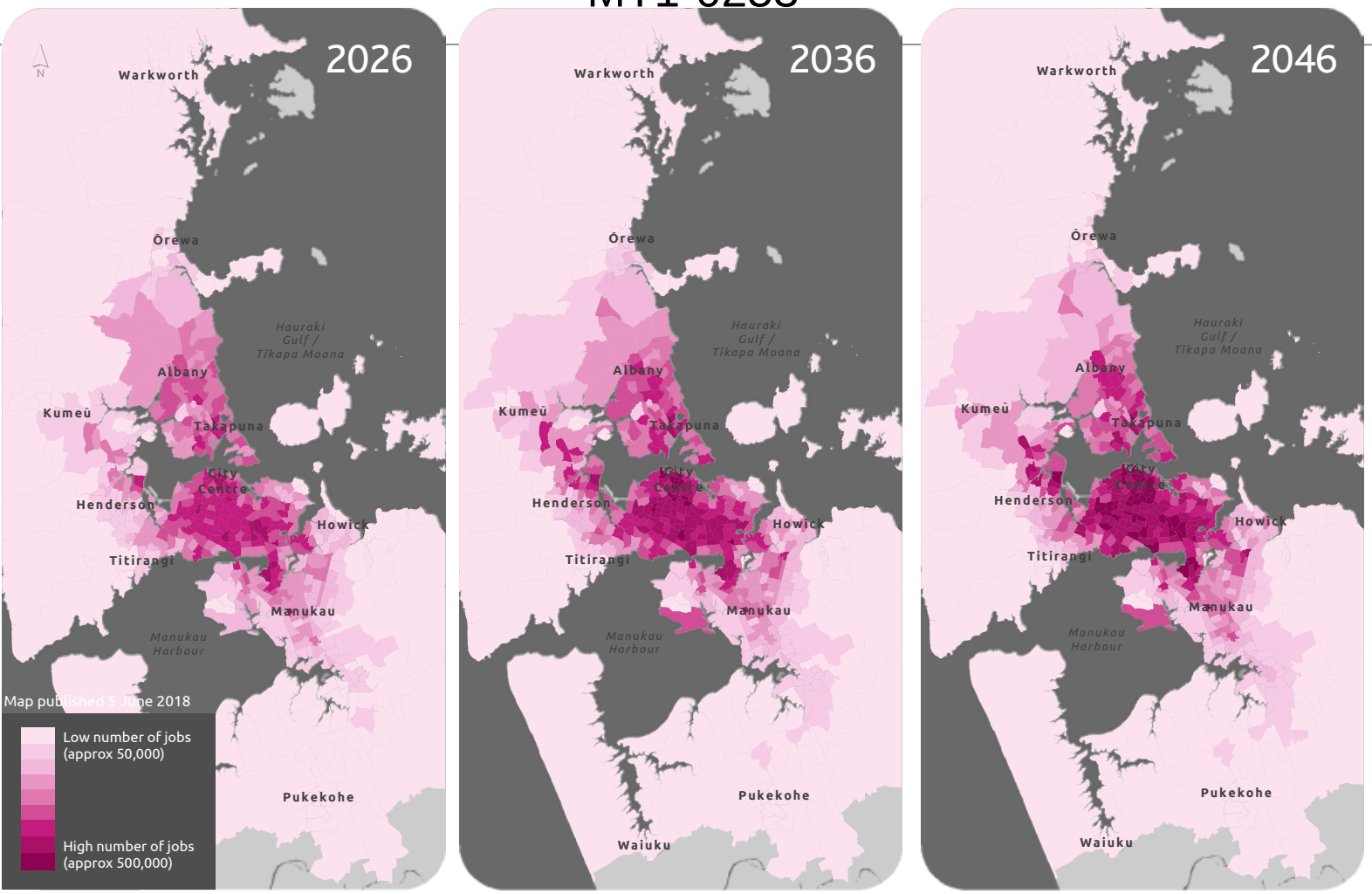
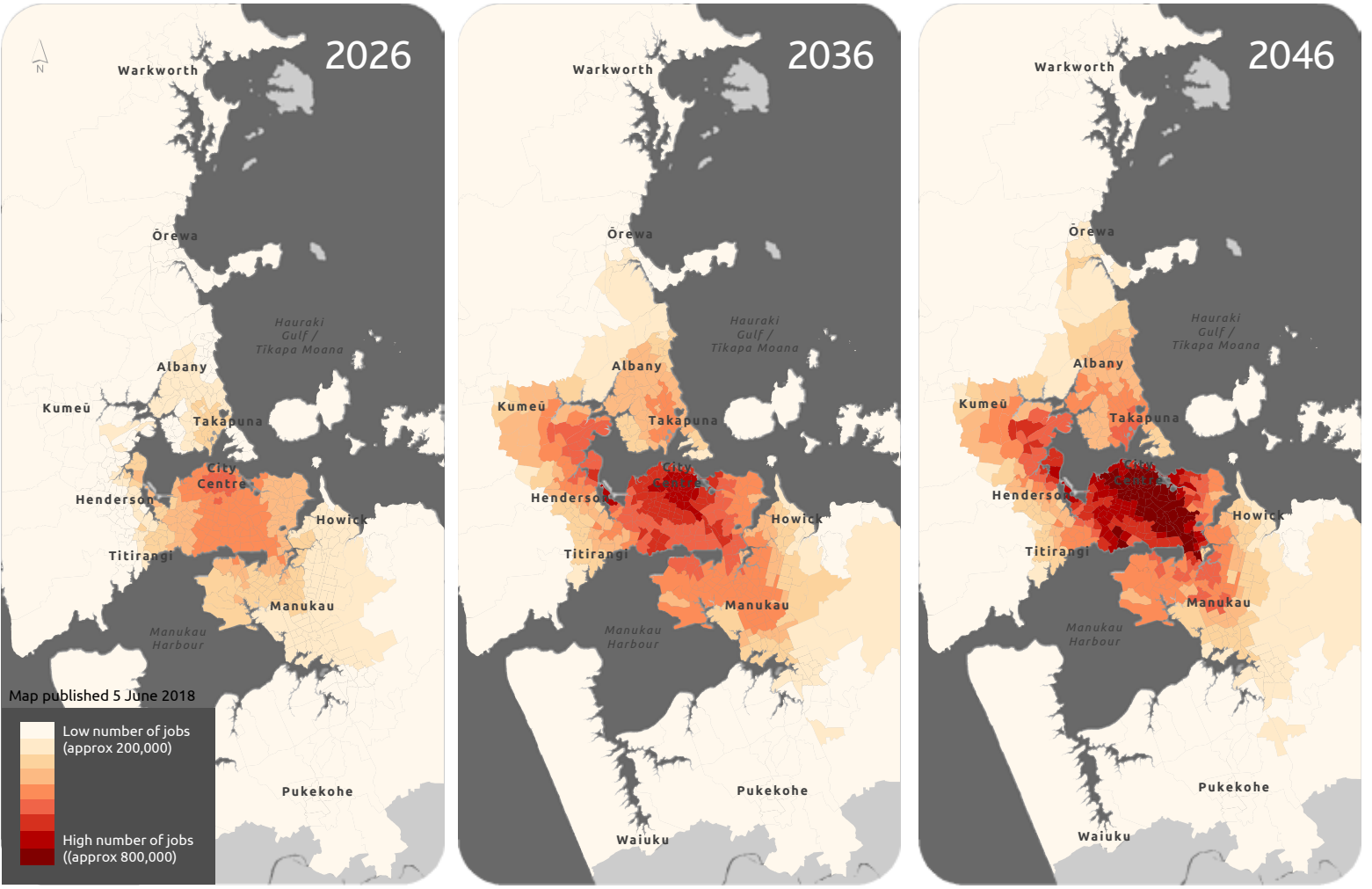

2026
2036
2046
Warkworth
Ōrewa
Hauraki Gulf / Tīkapa Moana
Albany
Kumeū
Takapuna
City Centre
Henderson
Howick
Titirangi
Manukau
Manukau Harbour
Pukekohe
Waiuku
Map published 5 June 2018
Low number of jobs (approx 50,000)
High number of jobs (approx 500,000)


2026
2036
2046
Warkworth
Ōrewa
Hauraki Gulf / Tīkapa Moana
Albany
Kumeū
Takapuna
City Centre
Henderson
Howick
Titirangi
Manukau
Manukau Harbour
Pukekohe
Waiuku
Map published 5 June 2018
Low number of jobs (approx 200,000)
High number of jobs ((approx 800,000)

Outcome:

Environment and Cultural Heritage

Aucklanders preserve, protect and care for the natural environment as our shared cultural heritage, for its intrinsic value and for the benefit of present and future generations.

DIRECTION	FOCUS AREA
Direction 1 Ensure Auckland's natural environment and cultural heritage is valued and cared for	**Focus Area 1** Encourage all Aucklanders to be stewards of the natural environment, and to make sustainable choices
Direction 2 Apply a Māori world view to treasure and protect our natural environment (taonga tuku iho)	**Focus Area 2** Focus on restoring environments as Auckland grows
Direction 3 Use growth and development to protect and enhance Auckland's natural environment	**Focus Area 3** Account fully for the past and future impacts of growth
Direction 4 Ensure Auckland's infrastructure is future-proofed	**Focus Area 4** Protect Auckland's significant natural environments and cultural heritage from further loss
	Focus Area 5 Adapt to a changing water future
	Focus Area 6 Use green infrastructure to deliver greater resilience, long-term cost savings and quality environmental outcomes

Environment and Cultural Heritage explained

The natural environment is the basis for our existence. It supports and enables all aspects of our society, economy and culture.

The natural environment is inextricably connected to Aucklanders' sense of identity and place. It affects our health and wellbeing through the mental and physical interactions we have with it, and it provides the clean air we breathe and fresh water we drink.

The natural environment

Auckland's natural environment not only supports its people, but it is home to many special local ecosystems and is essential for the survival of both indigenous wildlife and species from across the world.

For example, the Kaipara Harbour, the Firth of Thames and the Manukau Harbour provide feeding and breeding grounds for many coastal and migratory birds, including threatened species such as the wrybill, bar-tailed godwit and New Zealand dotterel.

Some native species are not found outside New Zealand and are under threat of extinction, such as:

- birds on islands in the Hauraki Gulf
- kauri in the Waitākere and Hunua forests
- unique species in our marine and freshwater environment.

Twelve of the 59 different types of New Zealand's indigenous forest ecosystems are found in Auckland. Harataonga Bay, Aotea / Great Barrier Island has Auckland's most diverse forested area.

We have a responsibility to ensure the natural environment is protected and cared for, both for its intrinsic value and to sustain life for future generations.

Our cultural heritage

The natural environment is part of Auckland's shared cultural heritage.

This term is often used to describe that which we have inherited from past generations and are looking after for the benefit of future generations.

In this plan, the term is used to mean our collective heritage of:

- air, land, and water
- biodiversity
- significant landscapes
- historic features.

The environment and our shared cultural heritage provide an anchor for the sense of belonging that communities have to their place. These connections are addressed in the Belonging and Participation outcome.

The quality of the natural environment means that Auckland has always been a desirable place to be.

It has allowed people to survive and thrive, and has given rise to other aspects of cultural heritage such as stories, art, and knowledge as well as the strong connection to sites, landscapes and structures of significance. Auckland's built heritage is, for example, an important connection for some Aucklanders. This link and the specific role of built heritage in shaping our homes, places and spaces is explored in the Homes and Places outcome.

The natural environment and our shared cultural heritage have enticed people to invest in Auckland over hundreds of years. They continue to attract migrants and are one reason why so many people call Auckland home.

Environmental protection

Preserving and managing Auckland's diverse natural environments and protecting their quality is a complex and vital responsibility for all Aucklanders.

It is particularly complex in the context of a growing population and the requirements of the commercial, agricultural, and industrial activities that form part of our economy.

Despite past efforts to protect and enhance the natural environment, it has been significantly stressed by the impacts of human activity.

It continues to be negatively affected by the:

- consequences of past decisions
- inability of infrastructure to cope with current pressures
- day-to-day lifestyle decisions people make.

We continue to see negative environmental consequences from historic land use and infrastructure decisions such as:

- combined wastewater and stormwater networks – which now overflow into our harbours
- the prioritisation of private over public transport, leading to more vehicle emissions and more road runoff
- developments through natural water courses and within flood plains which cause downstream impacts and require engineered solutions to manage increased water flows
- ineffective on-site waste water treatment in some areas.

Find out more by reading The Health of Auckland's Natural Environment in 2015 report.[164]

Doing better in the future

As Auckland grows we must do things differently. We have to achieve better environmental results through our decision-making.

There are also new problems to address.

Heat waves, droughts and tropical storms are part of our lives. However, the climate change impacts we are now beginning to experience are likely to worsen, and will have major long-term effects on how we live.

Other threats are becoming more common too. Our kauri are under threat from kauri dieback, and our marine environments are under pressure from pest species. We can also expect more frequent threats to biosecurity as the climate changes. Activities on land continue to impact our rivers and marine environments, through contaminants like sediment, heavy metals and nutrients. Waste and litter continue to impact our natural environment as well, particularly our streams and harbours.

We must take action to reduce and mitigate these threats and minimise the impacts on Auckland's people and cultural heritage.

Protecting, restoring and enhancing the natural environment is critical to ensuring our future.

How we track progress

We will track progress against a set of measures.

The measures for this outcome are:

- the state and quality of locally, regionally and nationally significant environments
- marine and fresh water quality
- air quality and greenhouse gas emissions
- protection of the environment
- resilience to natural threats
- treasuring the environment

Figure 29 - Ecosystem services. Source: WWF's Living Planet report 2016

Ensure Auckland's natural environment and cultural heritage is valued and cared for

The natural environment supports and sustains us in many different ways.

It plays a critical role in delivering social, cultural, economic and environmental outcomes for Aucklanders.

It provides us with opportunities to diversify and strengthen our economy in sectors like tourism, agriculture and horticulture and green technology innovation.

It is also part of Auckland's shared cultural heritage and provides an anchor for the sense of belonging that communities have to their place.

The natural environment and our shared cultural heritage are central to attracting the visitors, skills and investment that help to drive our prosperity.

However, many of our treasured natural environments, ecosystems, indigenous species, and sites of cultural significance are already under significant pressure from human activity, and some are in decline.

To reverse this decline, all Aucklanders must play their part in ensuring that the natural environment and cultural heritage is valued and cared for.

We must better understand and recognise the life-sustaining benefits the natural environment provides as well as the critical role it plays in shaping and sustaining Auckland's future.

We must actively seek opportunities to protect and enhance these values through our short and long-term decisions.

Find out more by reading The Health of Auckland's Natural Environment in 2015 report.[165]

Direction 2:

Apply a Māori world view to treasure and protect our natural environment (taonga tuku iho)

Te ao Māori concepts such as kaitiakitanga, rangatiratanga, whanaungatanga and manaakitanga offer Auckland an integrated approach to protecting and enhancing our treasured environments for ourselves, and for future generations.

Embedding these concepts into our thinking and decision-making supports a focus on the interrelationships between the natural environment and people.

Mana whenua have a unique relationship with the natural environment as kaitiaki.

They hold an enduring relationship with the land, marine and freshwater environments and have deep and valuable knowledge.

Their body of knowledge – both tangible and intangible – cultural practices and heritage are all linked to the whenua and its life.

Though te ao Māori in origin, these broader concepts, which acknowledge the interrelationship between the natural environment and people in how the world is viewed, can be adopted and practised by everyone.

Almost every environmental indicator is in steady decline.

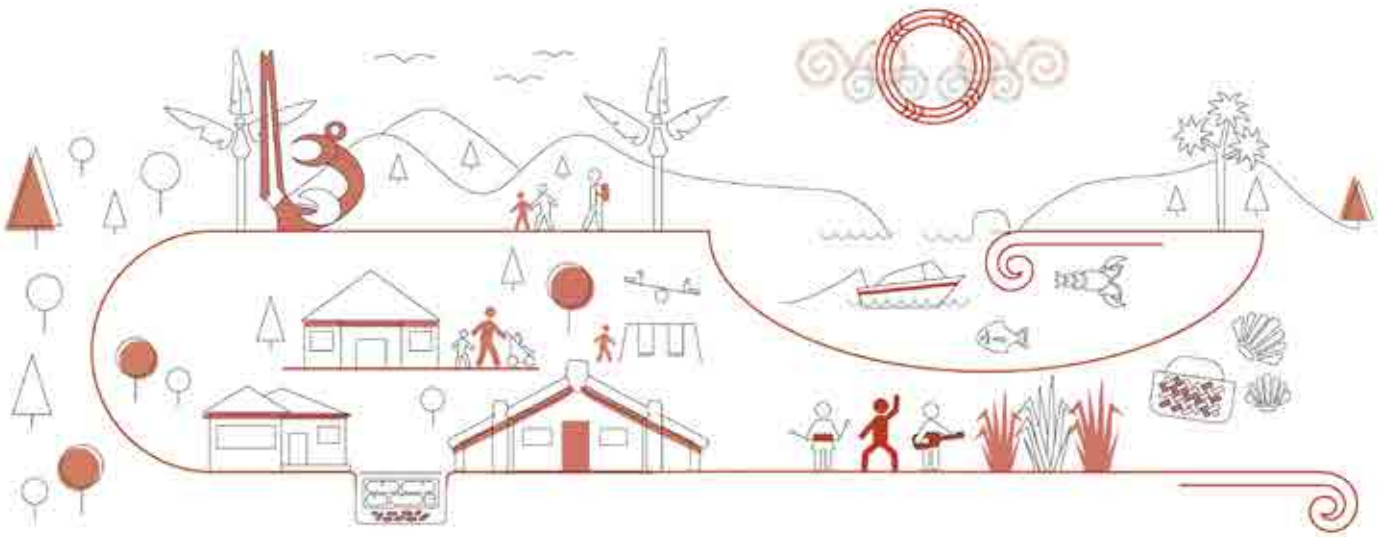
This means that current approaches and practices are not working.

We have to change our way of thinking about the natural environment and make the links between what we value and our own behaviours and decisions.

Adopting a Māori world view as an approach provides us with a viable alternative.

Integrating this knowledge into our behaviours and decisions is essential to successful and sustainable environmental management, and ensuring we protect and enhance the mauri of the natural environment.

For more information read the Māori identity and wellbeing outcome.



Use Auckland's growth and development to protect and enhance the natural environment

Continued population growth and urban development are likely to increase the severity and intensity of pressure on Auckland's already stressed environment.

However, with awareness and effort, and by doing things differently, future development can deliver significant environmental improvements.

Auckland must ensure that development is sustainable and has minimal negative impacts on the natural environment.

It can be done by embedding sustainable environmental practices in our buildings, infrastructure and places and spaces. For example:

- using resources efficiently and sustainably
- green infrastructure
- lowering emissions from transport and industry
- technological innovation in the construction and form of our buildings.

Auckland's future growth will bring greater levels of investment. Transport, stormwater and wastewater investments in particular will be some of the largest ever made in Auckland.

We can use these investments, and others, to not only perform their technical function but to protect or enhance the overall health of the environment and ecosystems.

As these investments have to be made to service growth, they provide ideal opportunities to make meaningful environmental gains.

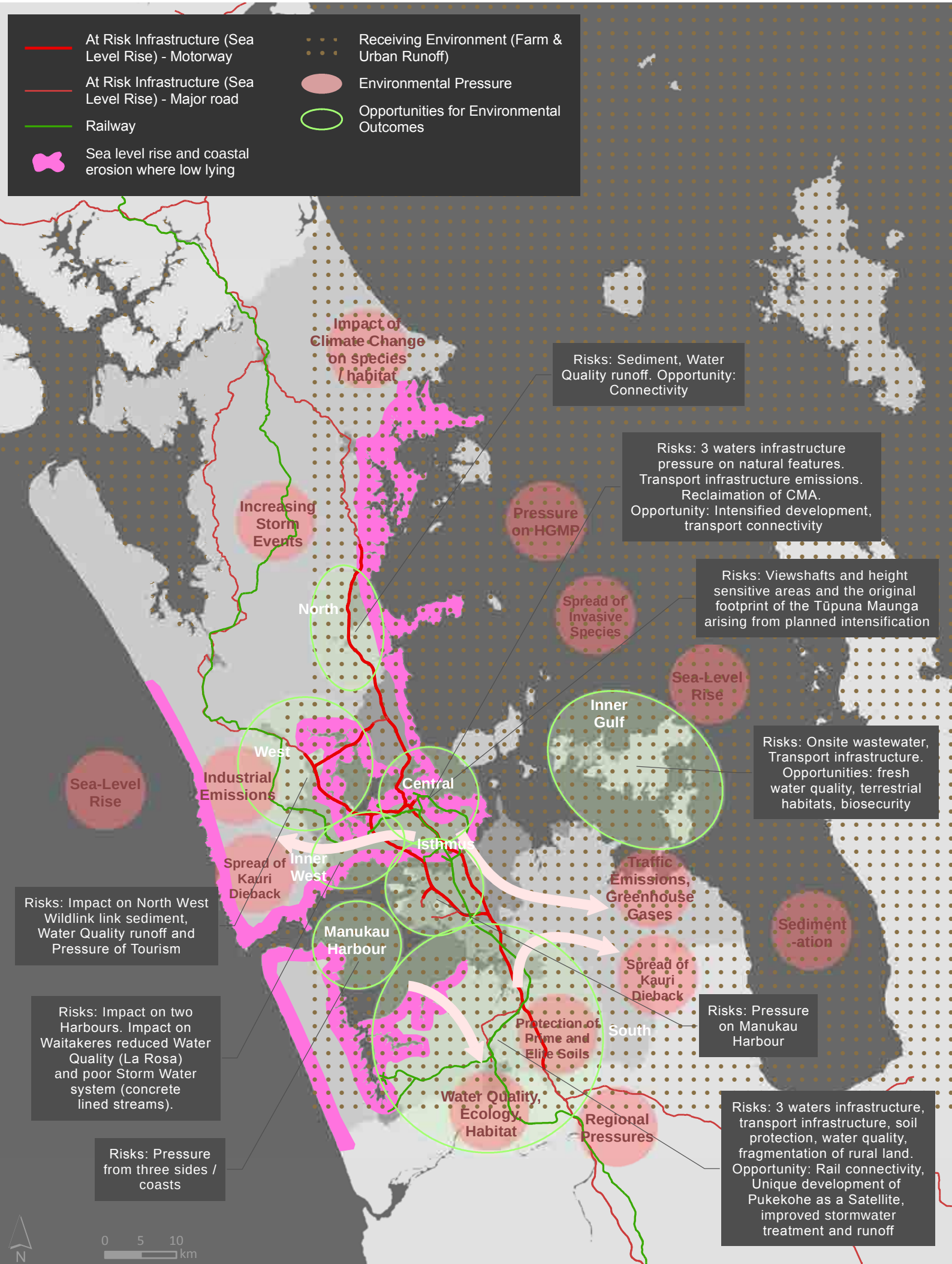
This requires different expectations or minimum bottom lines from these investments, starting from their initial conception through to execution.

We can also create buildings that minimise their impacts and maximise the experiences of their inhabitants through the use of green building principles.

Our buildings can be used to generate electricity, food, heat and water, reducing pressure on our already scarce resources.

By embedding more sustainable design principles in the planning, design, construction and operation of our buildings, Auckland can take a whole-of-life approach to protecting and enhancing the natural environment.

See Map 12 - Risks and opportunities for more information on the infrastructure at risk to environmental change, areas of evironmental pressures and opportunties


At Risk Infrastructure (Sea Level Rise) - Motorway
At Risk Infrastructure (Sea Level Rise) - Major road
Railway
Sea level rise and coastal erosion where low lying
Receiving Environment (Farm & Urban Runoff)
Environmental Pressure
Opportunities for Environmental Outcomes
Impact of Climate Change on species / habitat
Risks: Sediment, Water Quality runoff. Opportunity: Connectivity
Risks: 3 waters infrastructure pressure on natural features. Transport infrastructure emissions. Reclaimation of CMA. Opportunity: Intensified development, transport connectivity
Increasing Storm Events
Pressure on HGMP
Risks: Viewshafts and height sensitive areas and the original footprint of the Tūpuna Maunga arising from planned intensification
North
Spread of Invasive Species
Sea-Level Rise
Inner Gulf
West
Industrial Emissions
Sea-Level Rise
Central
Risks: Onsite wastewater, Transport infrastructure. Opportunities: fresh water quality, terrestrial habitats, biosecurity
Isthmus
Spread of Kauri Dieback
Inner West
Traffic Emissions, Greenhouse Gases
Sediment -ation
Risks: Impact on North West Wildlink link sediment, Water Quality runoff and Pressure of Tourism
Manukau Harbour
Spread of Kauri Dieback
Risks: Impact on two Harbours. Impact on Waitakeres reduced Water Quality (La Rosa) and poor Storm Water system (concrete lined streams).
Protection of Prime and Elite Soils
South
Risks: Pressure on Manukau Harbour
Water Quality, Ecology, Habitat
Regional Pressures
Risks: Pressure from three sides / coasts
Risks: 3 waters infrastructure, transport infrastructure, soil protection, water quality, fragmentation of rural land. Opportunity: Rail connectivity, Unique development of Pukekohe as a Satellite, improved stormwater treatment and runoff
N
0 5 10 km

Ensure Auckland's infrastructure is future-proofed

It is essential that Auckland's infrastructure can withstand short-term shocks, such as flooding. It also needs to work well in the long-term, particularly in the face of longer-term climatic changes. Transport infrastructure can have harmful environmental impacts such as runoff from roads which pollutes waterways. This is addressed under the Transport and Access outcome.

Climate change will put additional strain on our infrastructure. New infrastructure will need to recognise future pressures, and be resilient and adaptable.

Much of our infrastructure such as water supply, wastewater and stormwater networks, and power supply networks, is ageing and does not always meet modern requirements or expectations.

This can have negative impacts such as:

- poor water quality from ageing wastewater networks with insufficient capacity
- increased greenhouse gas emissions from fossil fuel-dependent transport
- reduced resilience to climate change.

New infrastructure involves significant time and investment. We have to start now to create the systems and services we want in the future.

This means that:

- we need to build flexibility and adaptability into infrastructure design to ensure it is easier to modify and respond to changing needs
- we must reduce and potentially eliminate the impacts of inefficient infrastructure through retrofits and upgrades and finding alternative ways to deliver core services.

New ways of delivering core services can range from decentralising power supplies to recycling wastewater and turning waste into resources.

We also need to consider bolder initiatives, such as retreating from some coastal areas and avoiding flood inundation zones[166] to ensure development is sustainable over the long-term.

Photograph of a stormwater improvement project from above

Focus area 1:

Encourage all Aucklanders to be stewards of the natural environment, and to make sustainable choices

Aucklanders interact with the natural environment each and every day.

Early Māori expressed their culture and whakapapa in the natural environment. This included the meaning and significance of cultural practices, physical landscapes and their waahi tapu.

This continues with all people of New Zealand.

In our own ways we all value and enjoy the natural environment. We must therefore all engage in its protection and conservation and act as stewards of the natural environment. It also means we have to ensure our many interactions with the natural environment are sustainable.

As the impacts of climate change become clearer, this will become more and more important.

See Map 11 Environmental Assets - an interactive version of the map is available at aucklandplan.govt.nz

How this can be done

This approach needs to be part of our daily decisions, whether we are acting as individuals or as businesses and industries. As our population grows, so does our shared responsibility to take care of the natural environment.

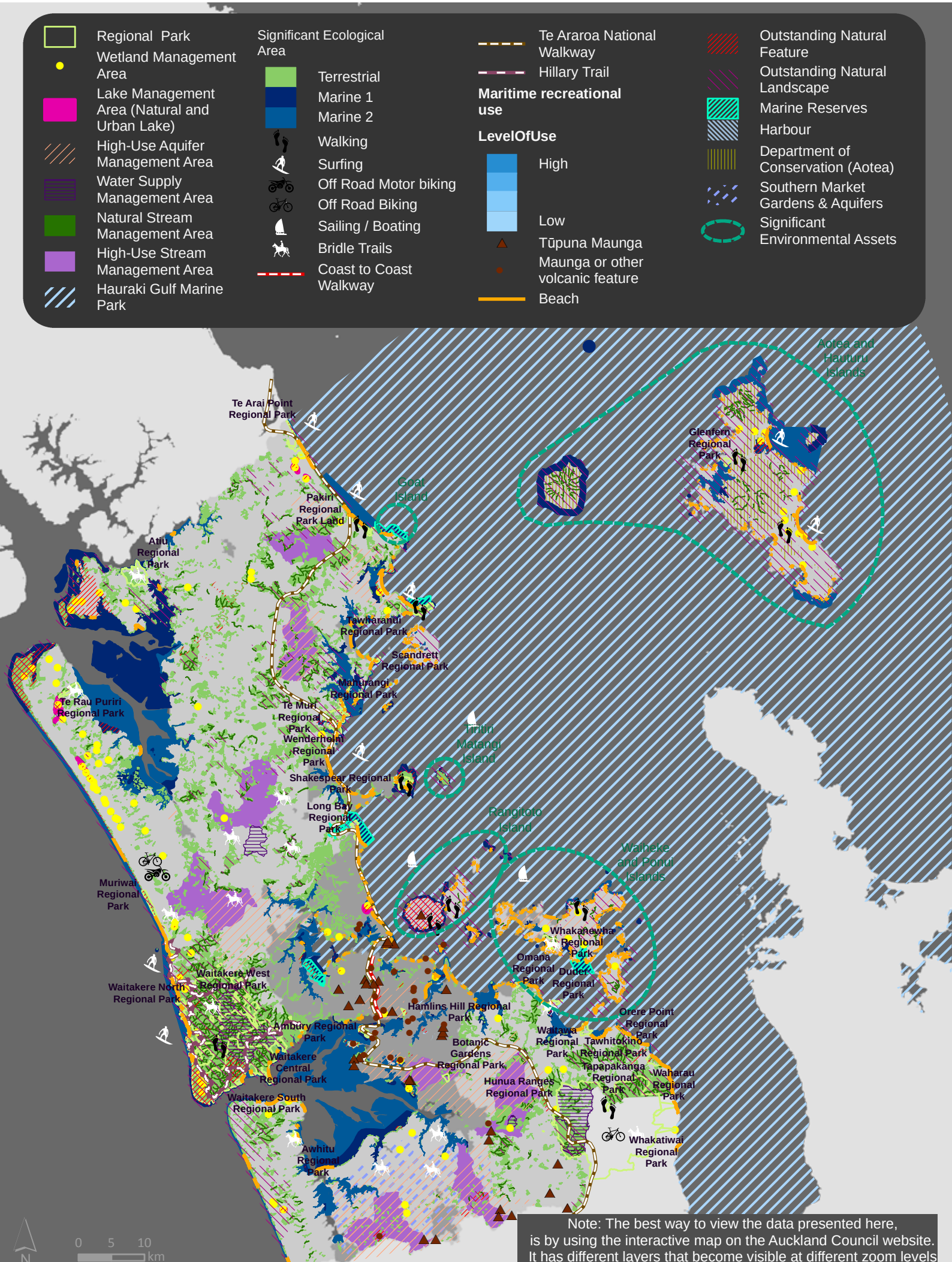
Our choices and behaviours have a direct impact on the natural environment, whether they are, for example:

- the choices we make about the food and other products that we consume and use
- how we travel to work or school
- the products we use to construct and maintain our buildings
- the way we manage manufacturing processes
- how we deal with waste, by reusing or recycling resources.
- choosing to buy and use fewer non-recyclable products.

We all can, and must, shift from simply using and drawing on the natural environment to becoming active stewards of it.

Find out more about what you can do for the environment.[167]

See how we'll minimise and manage our waste.[168]



Note: The best way to view the data presented here, is by using the interactive map on the Auckland Council website. It has different layers that become visible at different zoom levels

Focus area 2:

Focus on restoring environments as Auckland grows

Auckland can use the processes of development and redevelopment to restore degraded ecosystems and places of cultural significance where appropriate. This is a key contributor to protecting and enhancing the environment.

Consistent population growth, and development to support this growth, has meant numerous areas and natural environments across Auckland have been degraded. Past activities or simple neglect has a lasting impact on the natural environment.

As growth and redevelopment happens in these areas opportunities arise to restore ecosystems and create new spaces for people to enjoy.

These opportunities need to be targeted, for example:

- remediate residual contamination - as described on the Ministry for the Environment website[169]
- enhance and restore existing ecological systems find out more at Auckland Growing Greener[170], Auckland Council's roles and commitments to deliver environmental outcomes for Auckland
- create new habitats for flora and fauna find out more about Auckland Council's Indigenous Biodiversity Strategy[171]
- identify local opportunities, like stream daylighting, revegetation, tree planting as part of development.

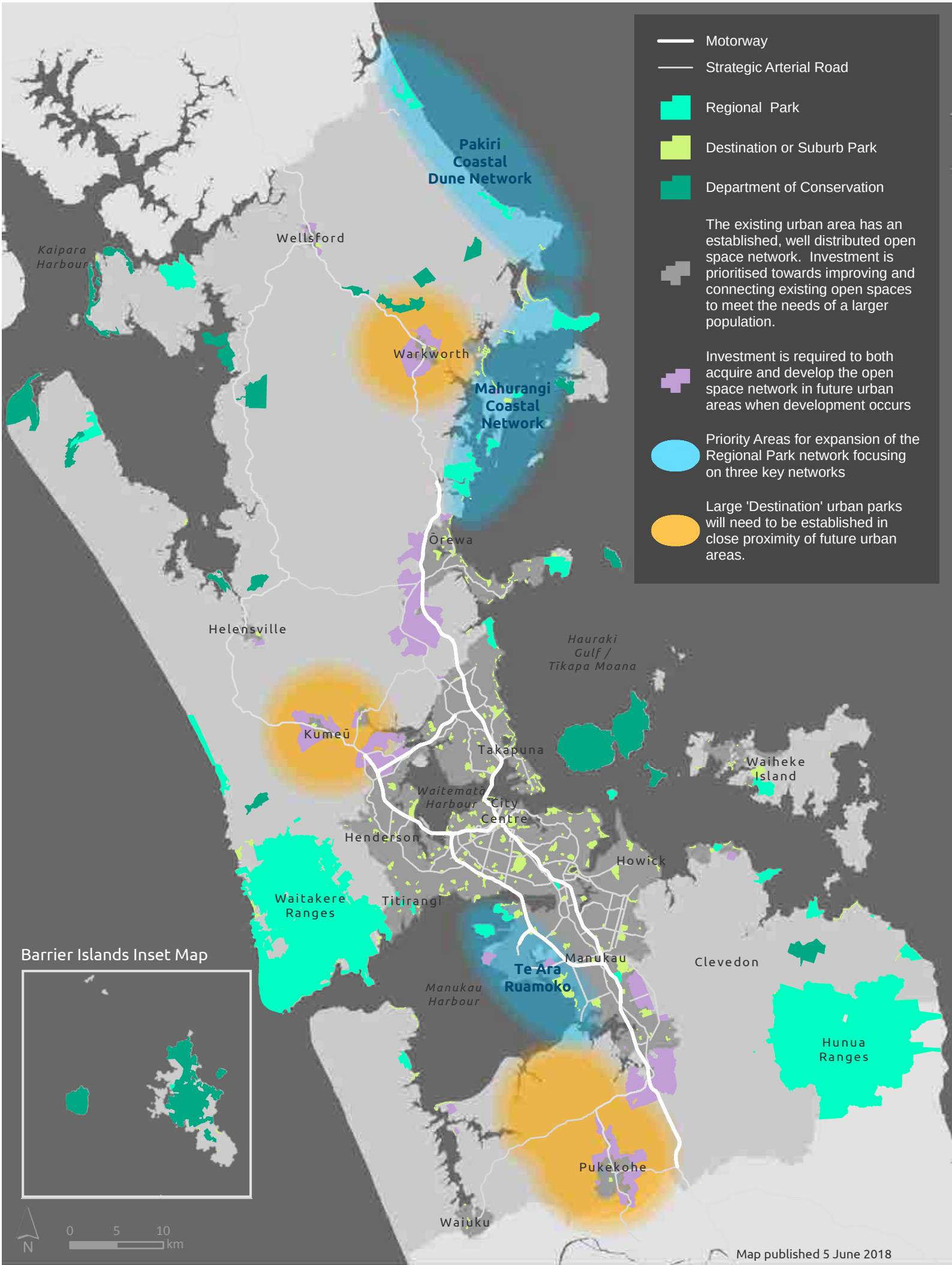
In turn, this can provide new natural environments for local communities to connect with and enjoy, further building and creating Auckland's shared cultural heritage.

See Map 13 - Open space

How this can be done

We can:

- better understand where and how our natural environments are degraded
- actively seek out opportunities to restore natural environments and ecosystems as growth and redevelopment happens
- set minimum expectations for new development and the contribution they have to make
- ensure the impacts and opportunities of our developments are integrated from the start, rather than having to invest further resource to fix up mistakes later.


Motorway
Strategic Arterial Road
Regional Park
Destination or Suburb Park
Department of Conservation
The existing urban area has an established, well distributed open space network. Investment is prioritised towards improving and connecting existing open spaces to meet the needs of a larger population.
Investment is required to both acquire and develop the open space network in future urban areas when development occurs
Priority Areas for expansion of the Regional Park network focusing on three key networks
Large 'Destination' urban parks will need to be established in close proximity of future urban areas.
Pakiri Coastal Dune Network
Mahurangi Coastal Network
Te Ara Ruamoko
Kaipara Harbour
Wellsford
Warkworth
Ōrewa
Helensville
Hauraki Gulf / Tīkapa Moana
Kumeū
Takapuna
Waiheke Island
Waitematā Harbour
City Centre
Henderson
Howick
Waitakere Ranges
Titirangi
Manukau
Clevedon
Manukau Harbour
Hunua Ranges
Pukekohe
Waiuku
Barrier Islands Inset Map
N
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Map published 5 June 2018

Focus area 3:

Account fully for the past and future impacts of growth

Auckland must learn from the past, and embed more sustainable approaches in any future developments. Auckland's consistently growing population will continue to put pressure on the natural environment.

Decision-making needs to fully account for the immediate and ongoing impacts of population and urban growth and its related projects.

Developments do not exist in isolation. They have effects beyond the immediate and cumulative small impacts may combine to generate significant larger issues.

Depending on how it is managed, growth can also exacerbate threats such as climate change or the spread of invasive species.

For example, development in areas already susceptible to flooding increases the risk and intensity of flood events by generating higher volumes of run-off.

We need to reverse environmental decline as well as eliminate ongoing impacts. We also need to avoid short term solutions that create long-term costs and consequences.

How this can be done

More sustainable practices could include:

- assessing future threats and integrating how we deal with them into the design of developments, for example by ensuring resilience to climate change impacts
- minimising greenhouse gas emissions from all phases of development, from construction and use through to deconstruction and disposal Find out more about Low Carbon Auckland[172]
- maximising the flexibility and adaptability of developments, both in terms of form and of function, for example by creating public open spaces that also assist with flood management, as described on De Urbanisten website[173]
- requiring an assessment of the long-term environmental, social and economic impacts of all developments and verifying these impacts post-construction.

Much of this is in the hands of decision-makers who set legislation, policy and regulation for growth and development in Auckland.

They must use the experiences of the past as well as new knowledge and research to account for the long-lasting effects of growth decisions.

This will contribute significantly to making more sustainable choices now.

Protect Auckland's significant natural environments and cultural heritage from further loss

Auckland is home to a number of diverse and unique natural environments that are significant both in New Zealand and internationally.

Find out more about protecting Auckland's marine environments later in this section.

Our marine environments, for example, provide unique habitats for species and places for Aucklanders to enjoy.

Many of these environments are threatened by how they are currently treated and, unless we actively protect them, are likely to decline further as Auckland's population grows.

Unique cultural sites, landscapes and sites of significance to Māori must be protected from the pressures of growth as well as other emerging threats and risks.

These sites and landscapes include the:

- extensive archaeological landscapes of Āwhitu Peninsula
- the Tūpuna Maunga and other Auckland Isthmus volcanic cones
- Ōtuataua stone fields
- Franklin volcanic fields.

See Map 14 - Historic Heritage

How this can be done

Corridors such as the North-West Wildlink[174] create safe, connected and healthy habitats for native wildlife.

They must be recognised for their important role in providing interlinked spaces across Auckland where wildlife can breed safely and move between conservation hotspots. More links like this can be created.

Auckland's network of public spaces and parks also support conservation of habitats and species, while providing recreational and tourism opportunities.

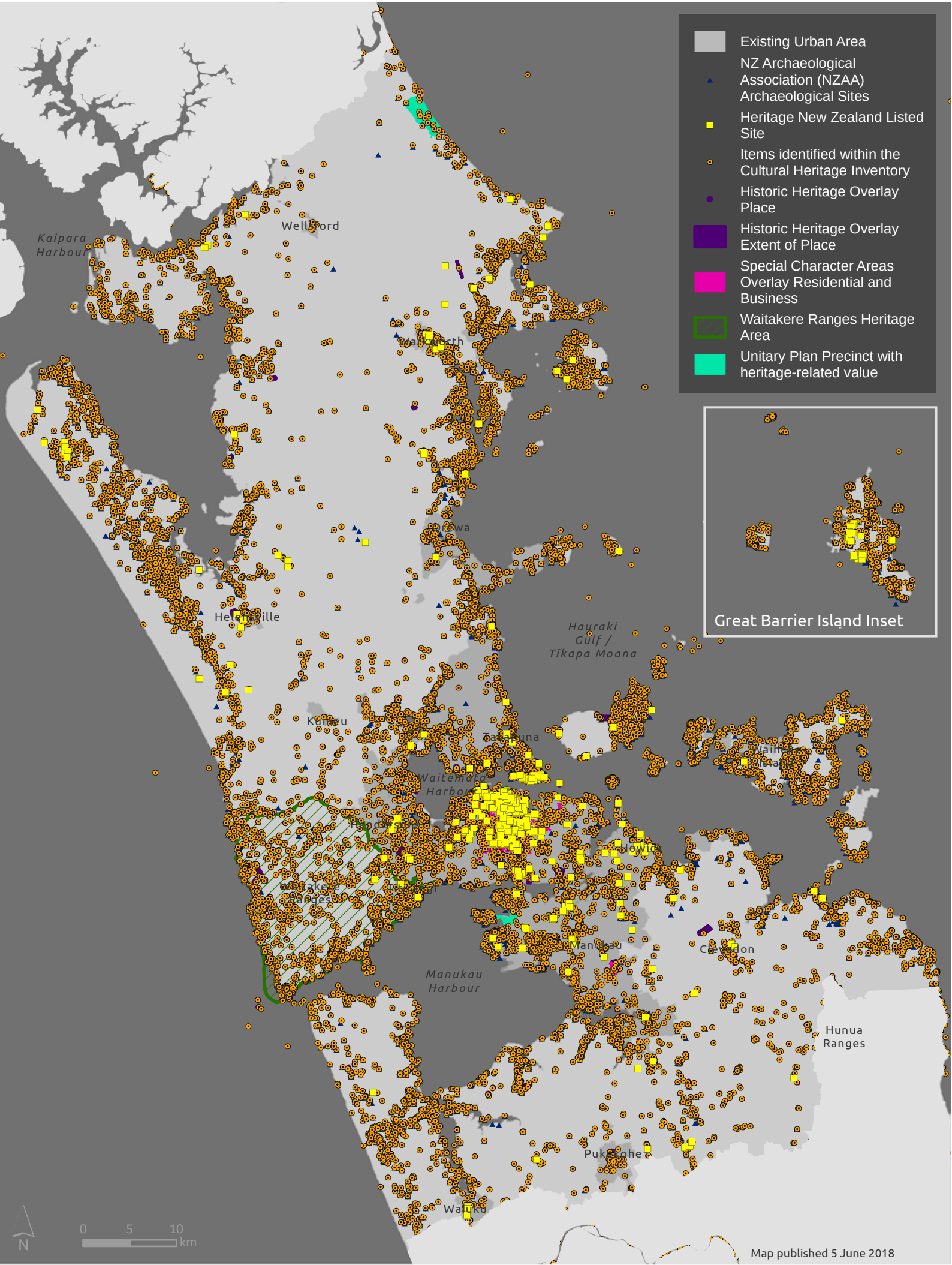
As Auckland grows, additional pressure will be put on these spaces, and additional spaces will be needed.

Some of Auckland's cultural heritage sites, cultural landscapes and sites of significance to Māori are also under pressure from development, either directly or from incompatible uses or activities close by. The Tūpuna Maunga, in particular, are vulnerable to new development compromising people's enjoyment of them, and their long-term protection.

There needs to be greater awareness of, and more investment made into ensuring the long-term protection and integrity of our cultural heritage sites, cultural landscapes and sites of significance to Māori.

We must also take care to safeguard against loss of habitat and sites of cultural heritage in areas that are currently flourishing and protected.

Maungakiekie / One Tree Hill. Photograph credit - Tūpuna Maunga Authority



Map published 5 June 2018

Adapt to a changing water future

Auckland is surrounded by rich marine and freshwater environments.

They provide:

- clean drinking water
- opportunities for recreation
- habitat for diverse species
- flood resilience and natural treatment of run-off
- economic development through tourism.

Water quality and quantity are both significant issues that will escalate as the population grows and the impacts of climate change become increasingly apparent.

We must do things differently if we are to ensure wildlife, people, and rural and urban businesses have adequate clean water supplies.

In both urban and rural areas, water quality has declined and freshwater environments have been compromised. They are showing the stress of decades of pressure – which will continue to increase if we do not change what we do.

The reduction of water quality has also affected the marine environment. This has resulted in poor ecological and amenity outcomes and, in some areas, beaches where it is unsafe to swim due to wastewater overflows.

More extreme weather events, as a result of climate change, mean that at times there will be too much water in some places. That is, parts of Auckland may experience flooding and coastal inundation.

At other times there may not be enough water and we will become increasingly reliant on the resources of neighbouring regions – who will be facing the same problems.

How this can be done

Auckland needs to proactively adapt to this changing water future and develop long-term solutions.

We can:

- start working towards solutions for meeting Auckland's long-term drinking water requirements. This may include finding alternative supplies and will require reducing consumption
- minimise our negative effects on water quality and quantity, in both freshwater and marine environments
- actively work to improve swimmability across the region
- maintain and improve water quality in freshwater environments
- improve our ability to manage and respond to the water-related impacts of climate change such as flooding and droughts
- consider the impacts of a changing water future on the industries and activities that rely on water, such as agriculture, power generation and food processing.

Focus area 6:

Use green infrastructure to deliver greater resilience, long-term cost savings and quality environmental outcomes

Infrastructure is a large part of any urbanised land. Using green infrastructure means replacing or supplementing traditional built infrastructure with natural and semi-natural systems.

For example, restored wetlands and roadside raingardens can be used to purify water, as well as minimise floods and erosion.

Increasing our urban forest by planting more trees can:

- reduce the urban heat island effect
- deliver enhanced air quality
- enhance people's mental and physical wellbeing.

These natural systems are often able to perform more effectively and efficiently than traditional 'hard' infrastructure solutions. They also provide opportunities to improve degraded natural environments, improve local amenity and enhance long-term environmental resilience.

As well as these benefits, the overall cost of green infrastructure can also be a fraction of constructed infrastructure solutions, due to lower ongoing maintenance costs.

These approaches help us to minimise the impacts of climate change, by improving our resilience and allowing infrastructure to adapt to change.

How this can be done

To realise the opportunities that green infrastructure can provide, we can:

- ensure our decision-making gives sufficient consideration and weight to the value of the natural environment and its role in delivering outcomes
- identify green infrastructure opportunities at the early stages of any development. This is important to ensure existing natural systems are enhanced rather than replaced, and to maximise the integration of other functions, such as public amenity and active transport opportunities
- engage with local communities to provide the strong sense of collective ownership that supports long-term usefulness.

Implementing the Environment and Cultural Heritage outcome

Implementation partners

Mana whenua, Auckland Council, central government, and community organisations are key partners in the ongoing protection and enhancement of Auckland's Environment and Cultural Heritage.

As kaitiaki, mana whenua have the responsibility of ensuring that the spiritual and cultural aspects of resources are maintained for future generations. This involves the ongoing protection of mauri from damage, destruction or modification.

Central government has several important functions. The Ministry for the Environment (MfE) has multiple implementation functions arising from a range of legislation including the Resource Management Act, Climate Change Response Act, and Environmental Reporting Act. MfE contributes to Auckland's environmental well-being through the following activities:

- provision of environmental management laws, regulations and national environmental standards
- national direction through national policy statements and strategies
- guidance and training on best practice
- information about the health of the environment.

In addition, central government is also involved in day-to-day environmental management activities in Auckland through the Department of Conservation's operational work programmes.

Auckland Council has several policy and regulatory levers, undertakes waste management and waste minimisation programmes, education and monitoring, and funding of grants for environmental enhancement.

Transport is a key contributor to the health of Auckland's environment. As Auckland Transport and the New Zealand Transport Agency make improvements to Auckland's transport system, there is an opportunity to deliver more sustainable options like low-emission vehicles, improved public transport frequency and green infrastructure approaches.

Wastewater and stormwater infrastructure play an important role in improving the quality of the environment. Watercare is a significant partner in ensuring Auckland's wastewater goals are met.

Non-governmental and community organisations involved in sustainability and environmental projects are important partners in delivering on-the-ground, local projects, such as working with businesses on sustainable practices, restoration planting and stream and beach clean-ups.

Individuals, businesses and developers can support the uptake of green technologies, like solar energy and better building technologies.

Auckland Council will develop an implementation approach for this outcome working alongside our key partners and stakeholders. This will be built on existing programmes and ensure all new elements introduced in the Auckland Plan 2050 are planned for.

Mechanisms used to work together

The Auckland Unitary Plan and structure planning process provide a framework and method for delivering positive environmental outcomes.

Environmentally sensitive approaches such as water-sensitive design, quality urban design and future-proofed infrastructure can be embedded in developments from the start, rather than retrofitting later or doing expensive restoration projects.

Collaboration between agencies, and the development of region-wide strategic approaches, can be achieved through fora such as the mana whenua Kaitiaki Forum, Hauraki Gulf Forum, and the Land and Water Forum.

Supporting strategies and plans

Auckland Growing Greener

Auckland Growing Greener[175] prepared by Auckland Council, is an ongoing initiative to restore and protect the environment while providing for the vitality and energy that a growing population brings. It has been developed in consultation with mana whenua, and anticipates a partnership model to develop and deliver identified commitments.

Low Carbon Auckland

Low Carbon Auckland[176] prepared by Auckland Council, together with key industries and partners, is a strategy for transitioning Auckland to a liveable, low carbon future.

Indigenous Biodiversity Strategy

The Indigenous Biodiversity Strategy[177] provides a framework for protecting and enhancing biodiversity, delivering on Auckland Council's statutory responsibilities.

Waste Management and Minimisation Plan

The Waste Management and Minimisation Plan[178] supports reducing waste, reusing and recycling more to achieve a zero waste goal by 2040.

Tūpuna Maunga Integrated Management Plan

The Tūpuna Maunga Integrated Management Plan[179] is a single integrated management plan to set the direction for maunga restoration, protection and management.

Asset Management Plans

- Auckland Council's Stormwater Asset Management Plan[180] determines how stormwater is managed, and supports the use of green infrastructure and minimisation of contaminants making it into the environment.
- The Watercare Asset Management Plan[181] plays a critical role in setting the framework for a safe and resilient Auckland water supply.
- The Open Space Strategic Asset Management Plan[182] recognises that as the city grows, there will be increasing demands on our parks and open space networks.

Hauraki Gulf Marine Spatial Plan

The Hauraki Gulf, known by many as Tikapa Moana and by others as Te Moananui ā Toi, is rightly recognised as a national taonga. Sea Change – Tai Timu Tai Pari[183] is a marine spatial plan designed to safeguard this treasure.

Auckland Council's strategies, policies and plans have acted as an important input in the development of Auckland Plan 2050. With the adoption of the plan, the council will assess these documents to ensure they remain fit for purpose.

How to get involved

- Get involved with community environmental projects[184] co-ordinated by Auckland Council
- Find out about options to manage your waste[185]
- See what you can do for the environment[186] or find out how you can get involved with. freshwater projects[187]
- See how you can choose plants to support ecosystems[188]
- For businesses, get involved with organisations like the Sustainable Business Network[189] and Sustainable Business Council[190]

Supporting information

State of Environment Reporting[191] measures the quality of the environment using long-term Auckland-wide datasets covering air quality, marine, freshwater and terrestrial environments.

Auckland Council's assessment of potential impacts of different growth scenarios on Auckland's natural environment (2017) can be found on the Knowledge Auckland website.[192]

The Hauraki Gulf Forum[193] publishes an independent State of the Gulf report every three years.

Ministry for the Environment's long-term environmental goals[194]

For more information on the role, purpose, implementation activities and monitoring and reporting of Ministry for the Environment in relation to air, climate change, freshwater, marine environments, land, waste or the Resource Management Act go to the Ministry for the Environment website.[195]

Find out more about the Environmental Protection Authority.[196]

Supporting information

Green Infrastructure

Our cultural heritage

Climate change

Ridge to Reef: Auckland's marine environments and their relationship to the land

Green infrastructure

What is green infrastructure?

Green infrastructure can have many forms, such as:

- a widened and replanted stream bank that helps to manage floodwater
- a permeable paved path that reduces the amount of stormwater entering the piped system
- a row of street trees or a whole urban forest
- a green roof or vertical wall
- a rain garden or an urban farm.

Broadly, the term refers to any system that fuses natural and built environments to reduce the environmental impact of core infrastructure and the built environment.

Further information on green infrastructure is available at:

United States Environmental Protection Agency website[197]

ESRI Living Atlas of the World website[198]

Examples of green infrastructure

Green roof and swale at the Auckland Botanic Gardens

The Auckland Botanic Gardens has planted native plants on the roof of its public toilet facilities, that absorb and treat rainwater.

This 'living roof' is combined with a vegetated swale - an area designed to manage water runoff - which further slows down and filters the flow of water, delivering relatively clean water to lakes in the gardens.

The swale works by increasing the time available for large sediment particles and contaminants to settle and be absorbed by the soils and plants.

Read more on the Auckland Botanic Gardens website.[199]

Natural stormwater solution, Te Auaunga Awa/ Oakley Creek

Significant flooding issues affected a 1.3 kilometre section of Te Auaunga Awa/Oakley Creek[200] in Mt Roskill and Mt Albert. To overcome these issues, Auckland Council replaced the existing concrete channel with a wider, naturalised stream channel.

The use of natural plants – native trees, ferns and flaxes – increased the water-carrying capacity of the watercourse and provided greater potential for stormwater to naturally soak into the ground.

This had several effects:

- reduced the effects of flooding on surrounding areas
- provided natural filtration and cleaning of collected stormwater
- reduced the pressure on stormwater systems further downstream.

The landscaping and planting was designed to support the rehabilitation and restoration of native ecosystems in the area. It also established an accessible river park for the local communities.

Green roof and swale at the Auckland Botanic Gardens

By using a natural stormwater solution with greater and more flexible carrying capacity, the potential for climate change and population growth to increase the rate and intensity of flooding events was also alleviated.

The project involved:

- increasing the stream capacity by removing the existing concrete channel and providing a wider naturalised stream channel
- rehabilitating of Te Auaunga Awa / Oakley Creek through landscaping, planting and water quality improvement
- replacing Beagle Ave and Richardson Road culverts with new bridges to improve stormwater capacity
- constructing two new pedestrian bridges across the stream
- upgrading the park, including new paths and cycleways, an outdoor classroom and adventure playground and traditional Māori play elements.

Urban forests

Green infrastructure is often thought of as specific and isolated things, such as a green roof, or a rain garden. However, bigger systems can also support green infrastructure objectives.

For example, urban forest initiatives that focus on increasing the overall tree canopy cover of cities also deliver a range of benefits to the environment and local communities. Increasing the tree canopy can reduce the urban heat island effect, deliver better air quality and improve residents' mental and physical wellbeing.

The Auckland Mayor's Million Trees Programme[201] aims to plant a million trees across Auckland over a three year period.

Auckland Council is also currently developing an Urban Forest Strategy that seeks to:

- green urban Auckland
- offset carbon emissions
- protect water quality by planting along rivers and coastlines
- improve our living environment.

Our cultural heritage

What is cultural heritage?

Cultural heritage is the term used to describe the ways of living developed by a community and passed on from generation to generation.

These include:

- customs
- practices
- places
- objects
- artistic expressions
- values.

It is also the legacy of knowledge, things and intangible attributes of a group or society passed from generation to generation. Cultural heritage includes:

- tangible culture such as buildings, monuments, landscapes, books, works of art, and artifacts
- intangible culture such as folklore, traditions, language, and knowledge
- natural heritage including culturally significant landscapes and biodiversity.

Auckland's cultural heritage

Auckland's cultural heritage is rich and diverse and includes Māori and non-Māori heritage.

It includes the Auckland War Memorial Museum/Tāmaki Paenga Hira and the Auckland Domain/Pukekawa.

It encompasses the extensive archaeological landscapes of

- Āwhitu Peninsula
- the Tūpuna Maunga and other Auckland Isthmus maunga
- Ōtuataua stone fields
- Franklin volcanic fields.

It includes post-war architecture such as the Group Architect houses, engineering feats such as the Grafton Bridge, and our Victorian and Edwardian buildings.

Our cultural heritage places comprise sites, features, areas, townscapes, streetscapes, landscapes, settlements, and other historical places.

Why is our cultural heritage important?

Many Aucklanders are passionate about our cultural heritage.

Our cultural heritage adds to the richness of our lives by reinforcing our sense of history and identity, and helps define what is distinctive about Auckland.

It enriches our environment, provides authenticity to our spaces, and continuity in our communities. Our cultural heritage is a source of pride.

Cultural heritage is of fundamental importance to tangata whenua, their culture and traditions.

How is cultural heritage addressed in the plan?

Cultural heritage is addressed in a number of parts of the Auckland Plan 2050.

Recognising the value of our cultural heritage and the importance of its protection is a core component of the Environment and Cultural Heritage outcome.

The key role that our shared cultural heritage plays in building cohesive and connected communities is addressed in the Belonging and Participation outcome. The specific role of built heritage in shaping our homes, places and spaces is addressed in the Homes and Places outcome.

How is cultural heritage managed?

Managing heritage comprises three key phases:

Understanding and sharing:

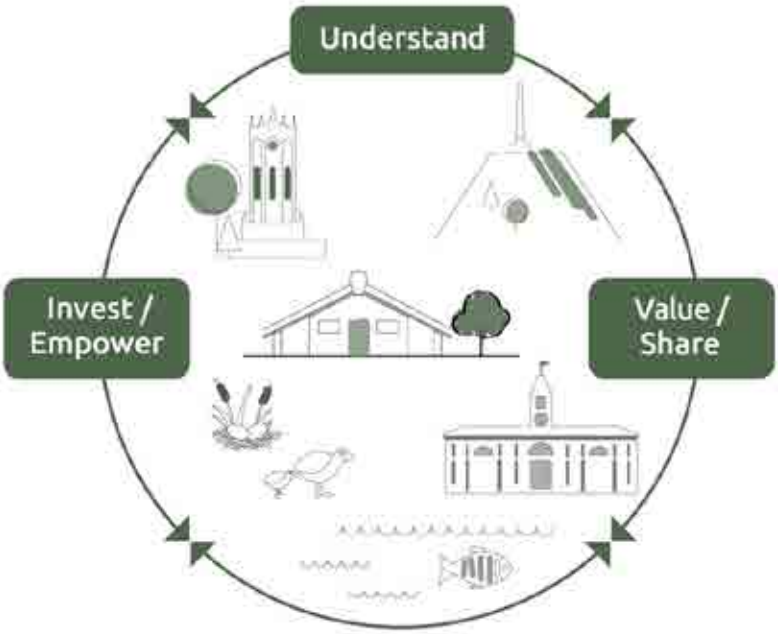
- providing a robust information base
- identifying, protecting and conserving our significant places – locally, regionally, nationally, and internationally
- encouraging greater understanding and enjoyment.

Investing:

- informing development, investment, and regeneration
- inspiring high quality and responsive design
- recognising and reinforcing the contribution to the character, quality, authenticity, and sustainability of our homes and places
- promoting economic development, including through appropriate use of existing heritage places.

Empowering collective stewardship:

- empowering the community and tangata whenua in active kaitiakitanga.



Climate change

Overview

Auckland faces climate-related risks such as heat waves, droughts and tropical storms.

The climate is constantly changing as a result of natural processes, and there is strong scientific consensus that greenhouse gas emissions (GHG), particularly from the use of fossil fuels, are causing the climate to change at unprecedented rates.

While the effects of climate change will become more severe and pronounced, local and global records for rainfall and temperature are already being broken on a regular basis.

How we address the implications of climate change will affect Auckland and Aucklanders for decades to come.

We must:

- tackle climate change by making significant reductions in global GHG emissions and moving to a low carbon economy
- develop ways to protect and increase our ability to withstand and recover from the adverse effects of a changing climate.

Mitigating and adapting to climate change is a challenge.

It means doing things that will have wider positive effects, such as reducing the environmental impact of transport, creating more green space, planting more street trees, and having cheaper and more reliable electricity and water.

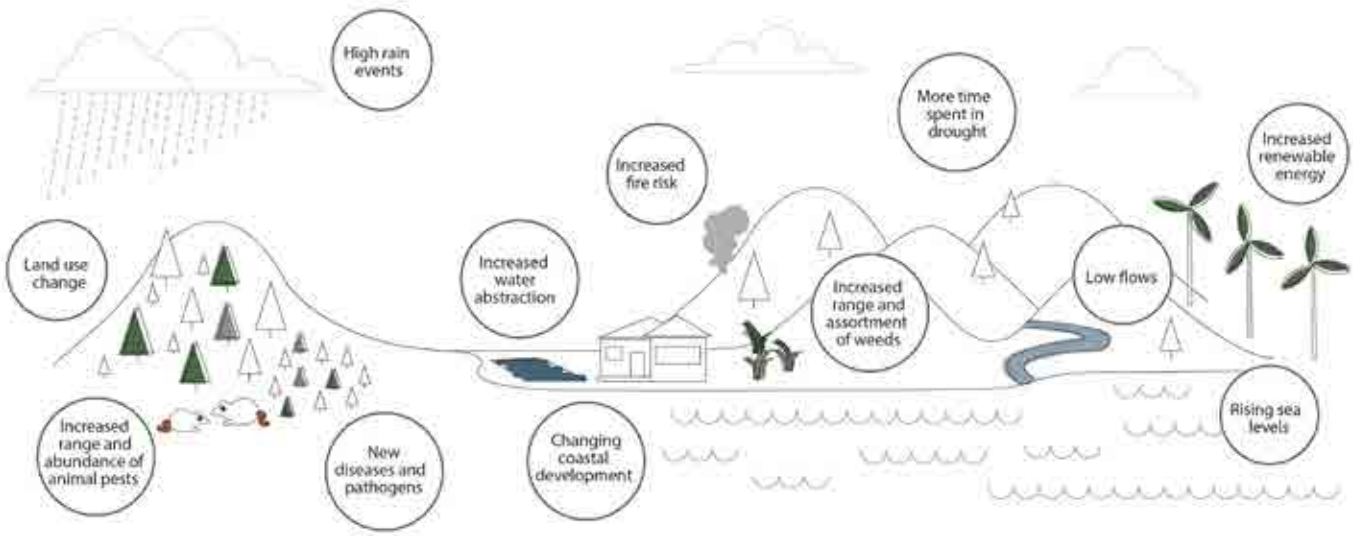
Auckland needs to be committed to a low emissions and a low carbon future to realise long-term economic, social and environmental benefits. This requires multi-sector collaboration.

Key climate-related risks for Auckland include:

- our natural and human made systems won't work as well as a result of changing climate conditions or damaging extreme events
- direct impacts on biodiversity, cultural heritage, productivity or changes in market demands for goods and services
- unequal distribution of impacts, with those such as the elderly, the very young, those living in poverty or with chronic health issues more likely to be negatively affected.

Key climate-related opportunities for Auckland include:

- innovation and savings through the transition to a low carbon economy but also significant risks to our competitiveness if we are left behind
- significant cost savings from embedding long-term climate change considerations into planning decisions
- significant cost-savings from reducing the need for major retrofitting or land-use changes as impacts become more frequent and severe.



The international context

Increasingly stringent international climate change policy affects New Zealand, and may reduce our ability to sell products and services in important economic sectors and export industries including tourism and agriculture.

For example, there is a risk that rising climate change awareness could undermine the willingness of people overseas to buy New Zealand produce, due to issues such as an increase in conscious consumerism, awareness of water quality impacts of dairying as well as concerns around 'food miles'. It may also reduce the viability of New Zealand as a tourist destination.

New Zealand and Auckland policy frameworks

New Zealand is a signatory to the United Nations Framework Convention on Climate Change (UNFCCC) Paris Agreement and has committed to reduce GHG emissions by 30 per cent below 2005 levels by 2030. Read more on the Ministry for the Environment website.[202]

Auckland became a member of the C40 Cities Climate Leadership Group in 2015, a strategic global network of over 90 cities working together to reduce GHG emissions and climate risks. Find out more on the C40 Cities website.[203]

Research and analysis by the C40 Group has identified the upper limit of carbon that cities can emit if the temperature rise scenarios in the Paris Agreement are to be achieved. This 'carbon budget' was divided amongst member cities.

For Auckland this means we must dramatically increase action to reduce emissions. Our current emissions, while starting to decrease in per capita terms, are still increasing overall along with that of New Zealand as a whole, demonstrating the need for a step up in ambition.

Auckland Council's energy resilience and low carbon action plan, Low Carbon Auckland[204] sets a target for Auckland to achieve a 40 per cent reduction in GHG emissions by 2040 (based on 1990 levels).

Urgency

The projected long-term effects of climate change are that they will become more severe.

However, the immediate effects already pose significant risks and opportunities. Find out more about Auckland region climate change projections and impacts.[205]

The scientific and economic consensus, notably the Stern Review into The Economics of Climate Change[206], and research by the World Bank and by the New Zealand Treasury, show that the longer we delay reducing emissions, the more expensive and difficult it will become.

How Auckland can respond to climate change

Auckland's urban areas

In 2011 the United Nations estimated that cities account for 70 per cent of global GHG emissions. They are also strongly affected by climate change. Read more on the ZDNet website.[207]

Over 90 per cent of all urban areas are coastal, putting most of them at risk of flooding from rising sea levels and powerful storms. In response, cities around the world are leading the way in moving to a low-carbon future.

While Auckland's membership of the C40 Group supports actions in our urban area, we also need to be conscious of the role of our rural areas in combatting climate change.

Auckland's rural areas

Only six per cent of Auckland's GHG emissions come from agriculture. However, transforming forestry, agriculture and natural carbon assets are key opportunities to enhance Auckland's resilience to climate change and reduce our GHG emissions.

Opportunities include:

- growing the extent of our urban and regional forests
- turning forest and organic residues into energy
- enhancing local food production
- exploring the potential for coastal and marine areas to trap carbon.

Auckland Council's role

Auckland Council is committed to working with central government, business and local communities to ensure we are ready to deal with the risks, uncertainties and opportunities associated with critical climate change and energy issues.

Auckland Council has reduced energy, waste production and water use through its own operations, resulting in between $1.5 to $2 million annual savings.

For further information on Auckland Council's organisational GHG emissions reduction, see the Low Carbon Auckland updates[208] on the council website.

Inventory of Auckland's GHG emissions

Auckland Council has been monitoring and reporting on Auckland's GHG emissions through Low Carbon Auckland.[209]

The inventory provides guidance on Auckland's low carbon action investment priorities and tracks progress against our emissions reduction targets.

The emissions inventory shows that the vast majority of Auckland's GHG emissions arise from:

- transport
- burning fossil fuels for electricity generation and for other uses like domestic heating - so-called 'stationary energy' sources.

New Zealand already produces about 80 per cent of its electricity from renewable resources. We will need to maintain that percentage, at the very least, as our population grows and energy demands increase. Otherwise we will become increasingly reliant on imported fossil fuel supplies, and vulnerable to increases in the cost of energy.

Adapting to a changing climate

Adapting to a changing climate requires flexibility and adaptability in all our decisions.

For example, future development of land will need to be located away from coastal and low-lying areas vulnerable to sea-level rise, flooding and coastal erosion.

The risk and opportunities map shows the areas of land that may be affected by sea-level rise in the future

We may also need to design our buildings and infrastructure differently.

Other opportunities to embed climate change resilience include the use of green infrastructure and adapting to a changing water future.

Because of transport's contribution to GHG emissions, transforming how we travel is one of the key mechanisms to reduce the overall carbon footprint.

In addition, improving energy efficiency and accelerating the shift to renewable energy resources will help to address the stationary energy component of Auckland's emissions profile.

Whatever measures we take to reduce GHG emissions, some impacts are unavoidable due to emissions already in the atmosphere.

We therefore need to prepare, build understanding and increase resilience across our environment, economy and communities.

As the effects of climate change are still uncertain and subject to change over time, it will be necessary to monitor climate change impacts and projections and to gather local environmental data.

This will enable us to identify the most appropriate climate change responses in relation to the risks, costs and benefits involved, and to adapt plans as more information becomes available.

Low carbon economy

Evidence and economic modelling indicate that shifting to a low carbon economy – an economy which reduces the causes and effects of climate change – has numerous benefits.

There are many short-term challenges associated with this shift, yet it also has the potential to deliver long-term, resilient economic growth and increased productivity.

Many components of a low carbon economy – more sustainable and active transport choices, cleaner energy, greater public green space provision, and a higher-quality and safer built environment – also deliver improved economic and social wellbeing outcomes.

A low carbon economy reduces energy insecurity and potential increases in the cost of power. This is particularly important since many low-income families spend a disproportionate percentage of income on energy.

There are also well-documented air quality and health costs associated with the burning of fossil fuels.

What the shift to a low carbon economy means for jobs is not certain.

Some sectors may see job losses and affected workers may need training and new skills. Some new industries will be created. Others will survive and do better.

Overall, the investment in more resilient infrastructure is almost certain to drive both job creation and growth in our gross domestic product as well as stimulate growth and innovation throughout the economy.

Circular economy

The concept of a circular economy is one that focuses on restoring and recapturing value within a product's lifecycle.

A circular economy finds new ways to reduce waste. It places more emphasis on building linkages between businesses delivering better outcomes for people and planet as well as profit for businesses.

A circular economy can also be defined partly by what it is not – it's not an inefficient and wasteful linear economy that simply extracts, consumes, and disposes.

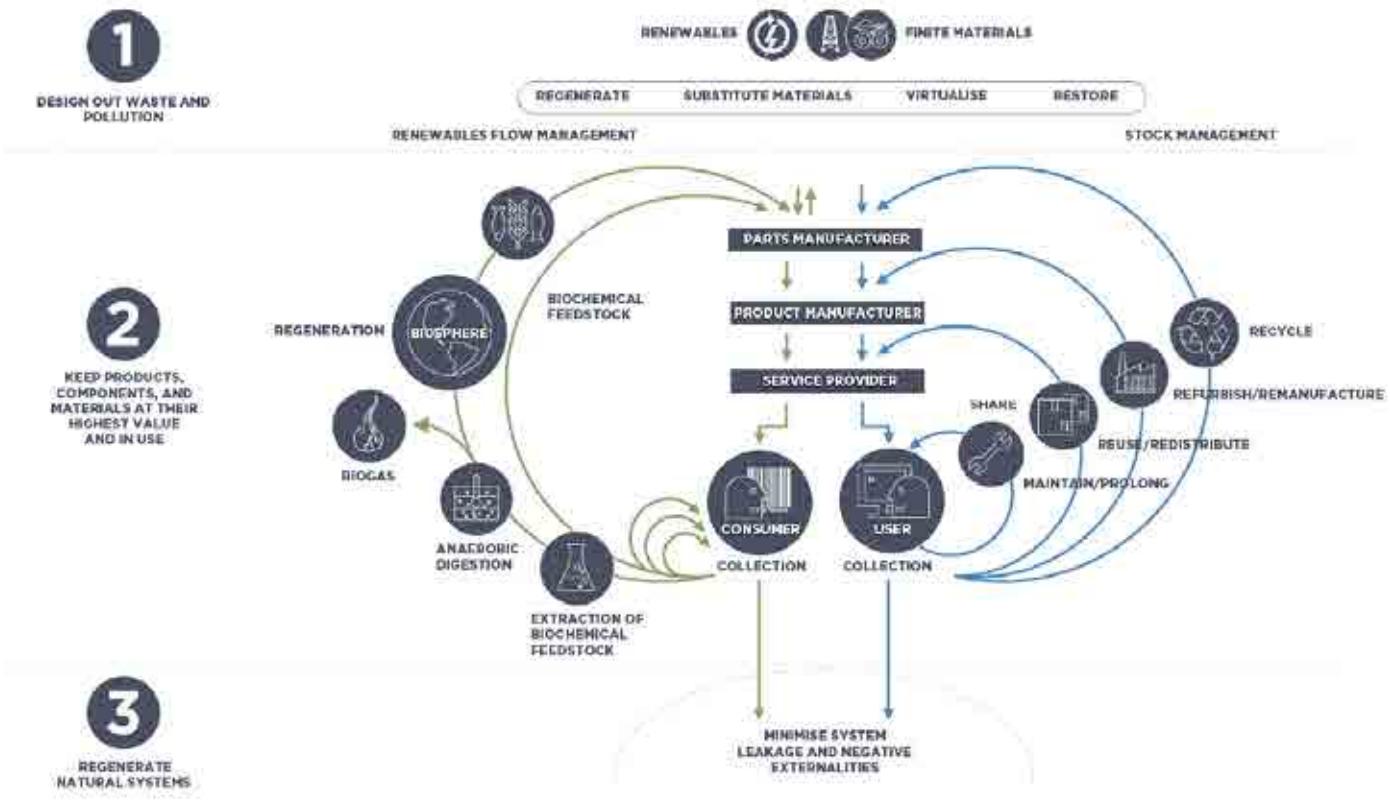
Like any economy, a circular economy can exist at any scale, starting locally and expanding into organisational supply chains and the global economy. True circularity maintains strong local roots to deliver enduring local benefits and value.

Economic and environmental opportunities from creating a more circular economy are clear and enticing. The globally-recognised Club of Rome found that countries from France to Finland can simultaneously grow jobs and reduce carbon emissions.

For instance, Finland could cut up to 70 per cent of its carbon emissions, France could gain half a million jobs, and Sweden could drop emissions by two thirds while adding jobs at three per cent of the labour force.

Read more on the Club of Rome website[210]

Figure 30 - Circular economy



Ridge to Reef: Auckland's marine environments and their relationship to the land

Auckland is defined by its three large harbours - the Hauraki Gulf, the Kaipara and Manukau harbours.

Smaller harbours, such as the Mahurangi and Whangateau harbours contribute further to Auckland's coastal setting.

Our marine environments are taonga. They are valued by Aucklanders for the range of uses they support, and for their intrinsic value as unique environments, which contribute to Auckland's identity.

They support a range of uses that include:

- habitat for unique species
- recreation
- fishing
- transport
- marine farming.

Marine environments are, however, under pressure from what happens in and on the water and, very importantly, what happens on the land. Our land and marine environments are connected, and depend on each other. All on-land activities have downstream impacts on our harbours.

Climate change will impact marine environments, which will in turn impact the land. We can expect more frequent storm events, increased risk of coastal erosion, and sea-level rise, which will impact on-land activities near the coast.

Read more at Knowledge Auckland[211]

How on-land activities impact our harbours

Stormwater, wastewater, litter, sediment and heavy metals all eventually end up in the harbours, and impact on their ecology. This compromises the things we value about the marine environment, like clean beaches, safe water for swimming and abundant kaimoana.

Sediment runoff from the land has a significant impact on streams and on the marine environment. Excessive sediment generation blankets important habitats, like seagrass meadows and shellfish beds. Sediment also affects water clarity, making it less pleasant for swimming and affecting plant growth.

Nutrients, especially nitrogen and phosphorus which are key components of fertiliser, have serious impacts as they can increase algae growth.

Impervious surfaces in our urban environments, like roads and carparks, collect heavy metals such as lead, nickel and zinc, which are quickly washed into streams and stormwater systems and then into the marine environment when it rains. Heavy metals are toxic to both people and animals, even at relatively low concentrations.

Even the relatively low population density across Auckland, and the infrastructure that supports it, has had a significant effect on our marine environment. As the city grows, develops and intensifies, we need to embed new ways of managing its impacts.

In some cases, growth is a great opportunity to improve the downstream impacts of land uses choices, for example, by improving how we manage and treat stormwater and wastewater.

In other cases, it creates additional pressure, with increased sediment generated during development, and more impervious surfaces resulting in more contaminants being washed into waterways.

Waste from urban areas also has an impact on marine environments.

Just like other contaminants, waste such as plastic bottles and packaging are easily transported downstream, eventually ending up in the sea. This waste affects many species, including birds, fish and marine mammals. It also reduces people's enjoyment of the marine environment.

To protect and enhance these special places we need to take a 'ridge to reef' approach, recognising that everything that happens on the land has a downstream impact.

Hauraki Gulf and Waitematā Harbour

Auckland's east coast is defined by the Hauraki Gulf and Waitematā Harbour. The Hauraki Gulf is internationally recognised as a significant marine environment.

In 2000, the Gulf's importance and diversity of uses was recognised by the creation of the Hauraki Gulf Marine Park. The marine park designation is for the protection of nationally and internationally important environments and recognises the Hauraki Gulf's quality as a habitat for species unique to New Zealand. Read more about the Hauraki Gulf Marine Park Act 2000 on the New Zealand Legislation website.[212]

The Hauraki Gulf supports diverse uses from aquaculture to tourism and recreation. Some of its islands, in particular Waiheke, support high levels of tourism, and some, such as Hauturu / Little Barrier, provide pest-free habitat for threatened species. The islands are treasured icons of the region.

The Gulf's beaches are loved as places to swim, surf and walk.

The range of habitats, from intertidal zones to open sea, provide habitat for species as diverse as shellfish, snapper, dolphins and whales, and the Gulf is an internationally significant seabird habitat.

Four marine reserves in the Hauraki Gulf also protect habitats and provide recreational opportunities, such as snorkelling at Goat Island in the Cape Rodney – Okakari Point marine reserve. Find out more on the Department of Conservation website.[213]

Auckland Council monitoring and research has tracked the impact of urban areas on the marine environment. The upper Waitematā, in particular, shows the stress of years of urban run-off, particularly through heavy metals in sediment, increased muddiness and high levels of *E*.coli bacteria at beaches, making them unsafe for swimming. Some beaches are now permanently closed for swimming. Find out more by reading Wai Ora-Healthy Waterways[214] and is your beach safe for swimming.[215]

Kaipara Harbour

Auckland's west coast, home to rugged black sand beaches, is also home to the Kaipara and Manukau harbours. The Kaipara is New Zealand's largest harbour, with over 800 km of coastline. Auckland Council and the Northland Regional Council share responsibility for the harbour.

The Kaipara is formed from a system of drowned river valleys, and is broad and shallow, famous for its unpredictable currents, shifting sands and treacherous entrance.

The Kaipara is home to diverse habitats, like seagrass in the shallow, upper reaches that support young snapper, and high current environments at the entrance that attracts large predators.

The Kaipara's catchments are mostly rural, with agriculture and forestry land uses dominating. There are however, urban and future urban areas, like Kumeu, Huapai and Helensville within the catchment.

These towns are forecast to grow and expand over the next 30 years. The key pressures on the Kaipara are sediment accumulation, *E*.coli bacteria and nutrient run off.

Manukau Harbour

Further south, the Manukau Harbour shares lots of similarities with the Kaipara, such as a significant tidal range and shallow form.

The Manukau's catchment is significantly more developed, with urban and industrial land use affecting its quality.

The Manukau supports a range of habitats for shellfish, fish and seabirds, and is fringed on its north-west corner by the Waitakere Ranges regional park, a significant environmental and recreational asset for the region.

Managing the pressures on our marine environments

The health of the harbours is an important element to Auckland's overall success in protecting the environment.

The choices Auckland makes about where and how we develop on the land, has a direct impact on the health of our harbours. The Auckland Unitary Plan[216] seeks to protect and enhance the marine environments, through setting rules for what activities can occur where.

Alongside that, there are other programmes underway which aim to improve the health of our marine environments. Auckland Council's water quality programme[217] provides an overall framework for driving better water outcomes, for which a protected and enhanced marine environment is a key goal.

The following are some examples of programmes underway:

A collaborative Marine Spatial Plan for the Hauraki Gulf: SeaChange Tai Timu Tai Pari

This plan was produced by an independent working group, and released in December 2016.

SeaChange[218] is non-statutory and non-binding on any organisations. The plan sets an ambitious vision, aiming to ensure that the positive health of the Hauraki Gulf is the key planning objective for all activities in the gulf and in all its catchments. The objectives of the plan provide a basis for collaboration between organisations active in the Gulf.

The Wai Ora Healthy Waterways programme

The Wai Ora Healthy Waterways programme[219] was established to implement the National Policy Statement for Freshwater Management.

The programme's objectives are to support communities in caring for freshwater and coastal environments, address the complex water issues in Auckland and meet the Auckland Unitary Plan's water management requirements.

The approach recognises that what happens on the land has direct impacts on the marine environment.

Integrated watershed plans

These plans are developed in partnership by the Auckland Council and local communities. They are designed to improve both freshwater and marine environments.

The plans are based on assessing the current state of catchments, the values and goals that the community identifies for the catchment, and take into account their implementation cost.

Improving our freshwater environments has direct, downstream impacts on marine environments. The plans are being developed progressively for each watershed.

Improvements to infrastructure

Improved infrastructure delivers better outcomes for our marine environment. As Auckland's population has grown, there has been increasing pressure on wastewater and stormwater networks, resulting in the systems overflowing, severely reducing marine water quality, limiting the number of days it's safe to swim and affecting the safety of kaimoana.

These networks also struggle to cope with the volumes of litter they must trap.

Watercare's asset management plan

Watercare's asset management plan[220] details how it will upgrade the water and wastewater infrastructure to improve environmental impacts and to keep up with forecast population growth and urban spread. Auckland Council management of stormwater infrastructure is detailed in its Stormwater Asset Management Plan.[221]

Water sensitive design

This design places water quality and water conservation at the heart of urban design and development. The goal is to protect and enhance natural freshwater systems, sustainably managing freshwater resources and mimicking natural processes.

Implementing water sensitive design has benefits for freshwater and marine receiving environments. Water Sensitive Design is supported in the Auckland Design Manual.[222]

State of environment monitoring programmes

Auckland Council operates several long-term programmes that monitor the health of the Hauraki Gulf. These programmes report on a range of marine data, including water quality, ecology and sediment.

These marine water programmes are complemented by a freshwater monitoring programme, and data is reported regularly[223] The Hauraki Gulf Forum[224] publishes an integrated triennial report, which includes data from its member organisations, such as the Department of Conservation, Ministry of Primary Industries and local councils.

Safeswim monitoring programme

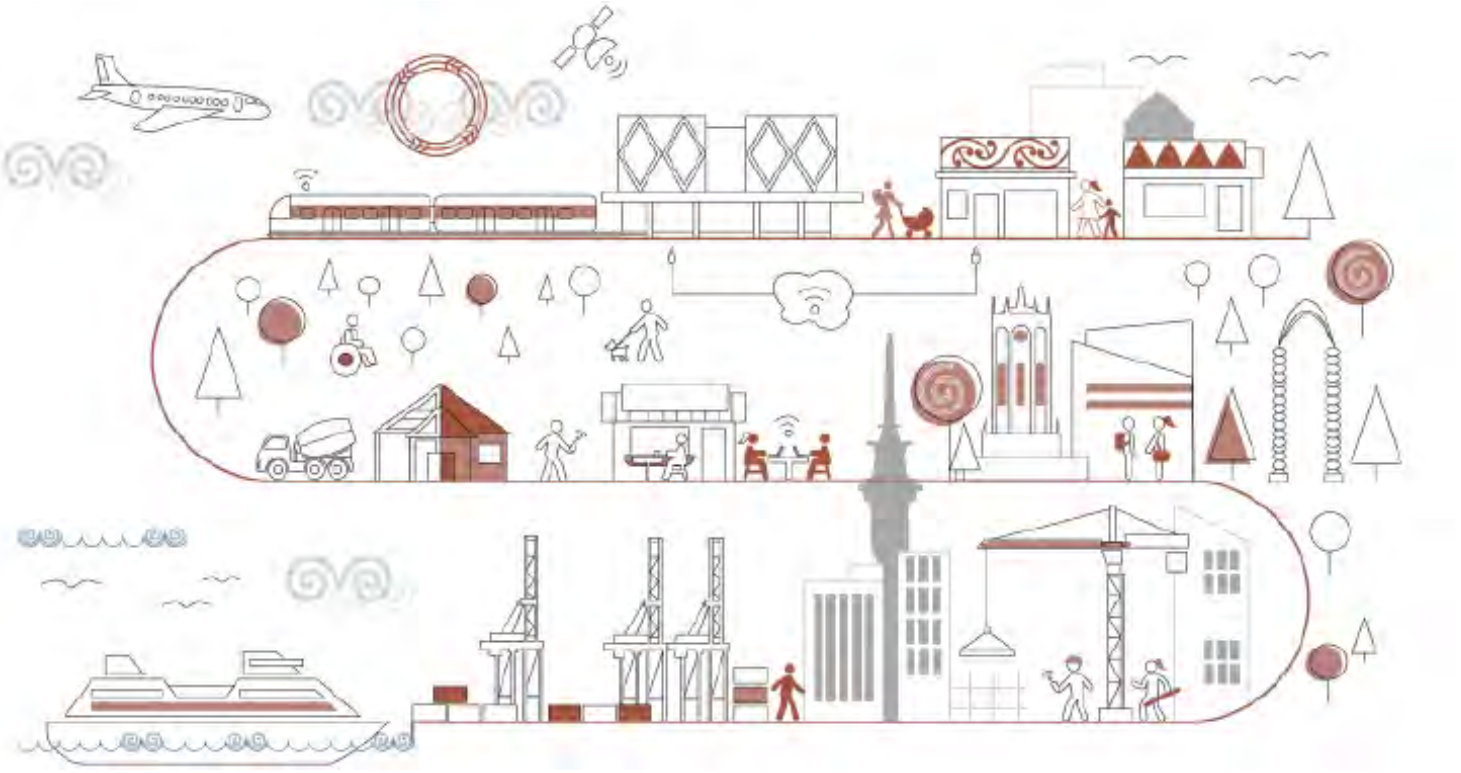
The Safeswim website[225] currently provides Aucklanders with water quality forecasts and up-to-date information on risks to health and safety at 84 beaches and 8 freshwater locations around Auckland.

Safeswim is a joint initiative between Auckland Council, Watercare, Surf Lifesaving Northern Region and the Auckland Regional Public Health Service. The programme is being upgraded to provide improved real-time information, and to integrate other information such as rainfall, tides and currents.

Opportunity and Prosperity

Auckland is prosperous with many opportunities and delivers a better standard of living for everyone.

DIRECTION	FOCUS AREA
Direction 1 Create the conditions for a resilient economy through innovation, employment growth and raised productivity	**Focus Area 1** Harness emerging technologies and ensure equitable access to high quality digital data and services
Direction 2 Attract and retain skills, talent and investment	**Focus Area 2** Ensure regulatory planning and other mechanisms support business, innovation and productivity growth
Direction 3 Develop skills and talent for the changing nature of work and lifelong achievement	**Focus Area 3** Advance Māori employment and support Māori business and iwi organisations to be significant drivers of Auckland's economy
	Focus Area 4 Leverage Auckland's position to support growth in exports
	Focus Area 5 Increase educational achievement, lifelong learning and training, with a focus on those most in need



Opportunity and Prosperity explained

Auckland's economy needs to be constantly agile and innovative. This is particularly important in an age of rapid technological change.

International connectivity is also critical to Auckland's economy and success. We must deliver products and services to markets across the globe in timely and sustainable ways.

In recent decades there has been an increase in Asia's prosperity. Auckland's proximity to Asia provides multiple opportunities for developing trade and economic engagement, as described on the Tripartite Economic Alliance page.

We also have immense potential in the growing numbers of young people living in Auckland who will need to play a significant role as future innovators and entrepreneurs within the economy.

Disruption and a changing world

Technology is already disrupting business models, employment opportunities and consumer behaviour. The predicted scale of change is so great it has been described as the fourth industrial revolution.

This revolution will continue to alter both labour participation and productivity. The scale and rate of change, although difficult to quantify, will affect many industries in different ways and at different speeds.

Innovation among enterprises of all sizes can provide Auckland with the resilience to adapt in a rapidly changing world.

The potentially high-quality employment opportunities that come from innovation must however be connected across Auckland by good transport and digital networks.

Changes for individuals and organisations will be both positive and negative as new jobs are created and existing jobs disappear.

It is often predicted that automation will disproportionately affect low skilled jobs, yet recent developments in artificial intelligence indicate that jobs of all types and levels are likely to be affected.

Therefore, while some of the most vulnerable in society and those least able to adapt to change may be affected first, technological developments will affect everyone.

Education, training and skills

To prepare Aucklanders for these shifts, we need to develop timely training and re-training opportunities. Targeted investment in education, training and skill development for all ages is vitally important.

Higher levels of literacy, numeracy, and other skills along with educational achievement allow for more people to participate in the economy, to find quality work and to raise their income levels.

Children and young people in particular need access to first-rate formal and informal education to set a solid foundation for development throughout their lives.

Having the right skills for the future requires everyone involved to work together to provide appropriate skill development in innovation areas. These include the creative and information technology sectors.

We must also fill skill gaps such as those in the construction sector and in core public services such as nursing and teaching.

Culture and practices need to change to ensure learning opportunities are available, starting in early childhood and extending throughout life, so that continuous learning becomes second nature.

This will provide people with the life skills they need to be fulfilled and to thrive in their families, communities and in their work.

How we will measure progress

We will track progress against a set of measures.

The measures for this outcome are:

- labour productivity
- Aucklanders' average wages
- employment in advanced industries
- zoned industrial land
- level of unemployment
- use of internet in the home relative to income
- educational achievement of young people.

Create the conditions for a resilient economy through innovation, employment growth and raised productivity

Auckland already has a strong economic sector. However, it has a strong focus on domestic consumption, and productivity levels are low.

Innovation and entrepreneurship will strengthen Auckland's economy in a globally competitive environment, enabling the economy to better meet the needs of our growing population.

Innovation is a means of lifting productivity that leads to increased wages and the creation of new jobs, even as existing ones disappear.

See Map 6 - Jobs in advanced industries

It is about new ideas and new ways of doing things in response to opportunities. In an economic sense, industry sectors, businesses and entrepreneurs innovate in a number of ways:

- introducing a new or improved product, service or process
- opening up a new market
- adopting a new technology
- changing the way they organise themselves.

The creative sector contributes to innovation and growth in other sectors as it generates creative capacity in business and services across Auckland as a whole.

For more on this, read the Creative Sector 2017: Industry Snapshot for Auckland[226].

Innovative business practices and technological advances can create the economy of the future. Competitive entrepreneurial activity can drive economic progress, but to be truly successful Auckland needs sustainable prosperity that puts people and the environment at the centre of economic progress.

To do this we need a socially responsible and environmentally sustainable economy that enables increased profit, productivity, resilience and job growth. Such an economy reduces environmental risks, supports green technology and mitigates the potential impacts of growth and development.

The ability to innovate becomes even more important if Auckland is to compete globally. Creating the conditions for innovation, employment growth and raised productivity requires collaboration between all stakeholders, including our neighbouring regions.

A big factor in raising productivity is the sophistication of the business sector. Visit the World Economic Forum website, The Global Competitiveness Report 2016-2017.[227]

One of the other ways both productivity and resilience can be improved is through how we plan for business locations.

The city centre is expected to remain the primary business centre for Auckland. However, the Development Strategy's multi-nodal approach emphasises three other 'nodes' as major business assets.

These nodes will provide flexibility and choice for business across the region by providing business opportunities and business land in close proximity to deep labour pools with an interconnected transport network.

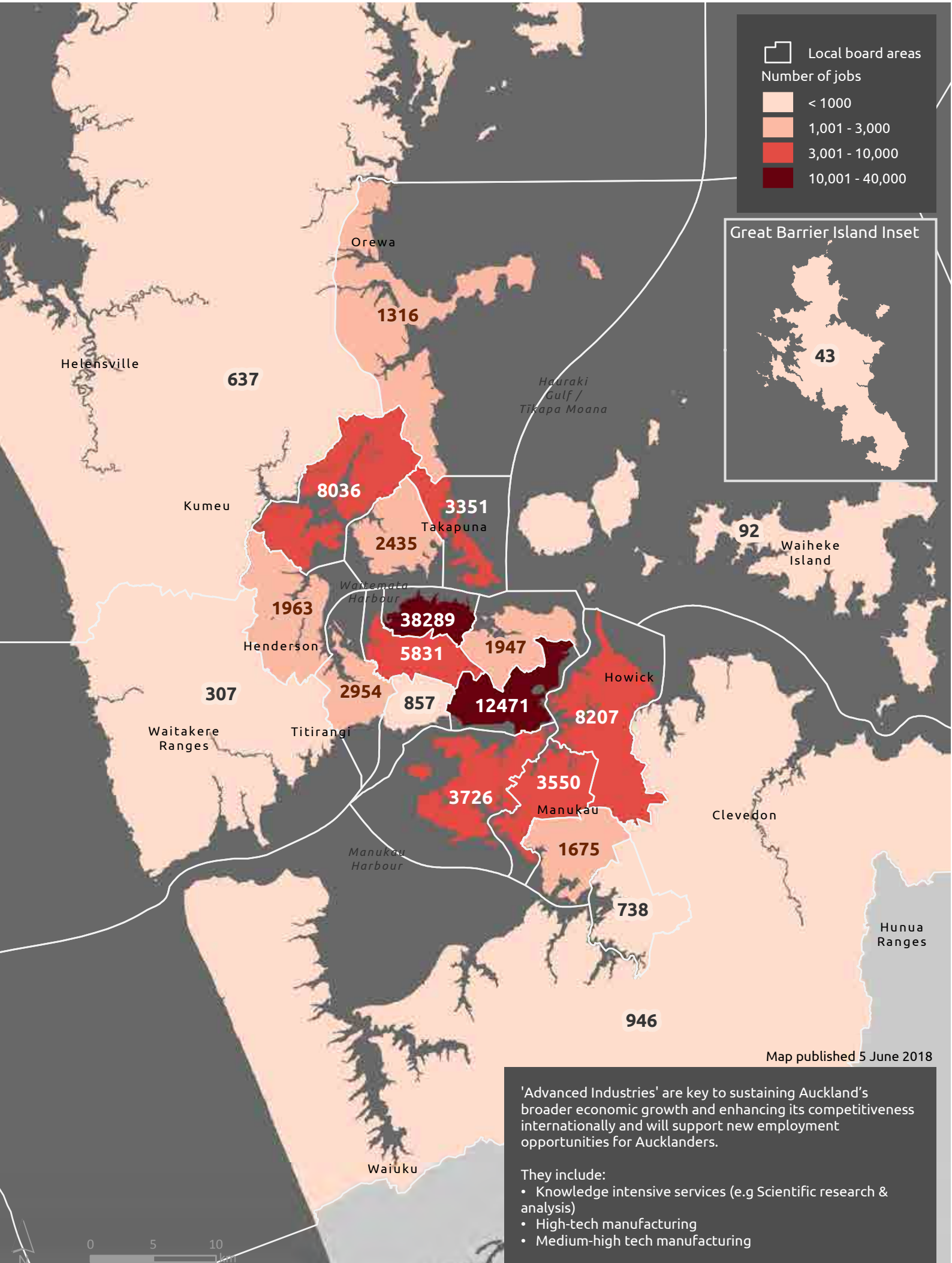
This has the potential to make more jobs and educational opportunities accessible to more people.

Though of a much smaller scale, job creation and economic performance is equally important at a local level. Initiatives to support this are often driven by local boards.

For more information read Local Board Plans[228].

Businesses and entrepreneurs ultimately determine the levels of innovation. Central government, and to a lesser degree local government, need to ensure the regulatory environment is straightforward, flexible and responsive so firms can take advantage of emerging opportunities. Strategic alignment between local and central government policy is particularly important to create the conditions for enabling economic growth in Auckland.

Most importantly, Aucklanders need to be poised to take advantage of these conditions and be ready to participate in the economy as employers, as entrepreneurs, and as workers.



Map published 5 June 2018

'Advanced Industries' are key to sustaining Auckland's broader economic growth and enhancing its competitiveness internationally and will support new employment opportunities for Aucklanders.

They include:

- Knowledge intensive services (e.g Scientific research & analysis)
- High-tech manufacturing
- Medium-high tech manufacturing

Attract and retain skills, talent, and investment

Auckland is competing globally for investment and talent. This is challenging given talented people are internationally mobile and actively sought after across the world.

The combination of our Māori identity, population diversity, Pacific connections and beautiful natural environment, creates a vibrancy and an authenticity that Aucklanders value and which attracts people from around the world.

A creative city rich in arts and culture also helps to attract people to Auckland and makes them want to stay. This results in a more vibrant city that delivers benefits which can be shared by all Aucklanders.

Read the Toi Whītiki Arts and Culture Strategic Action Plan for more information.[229]

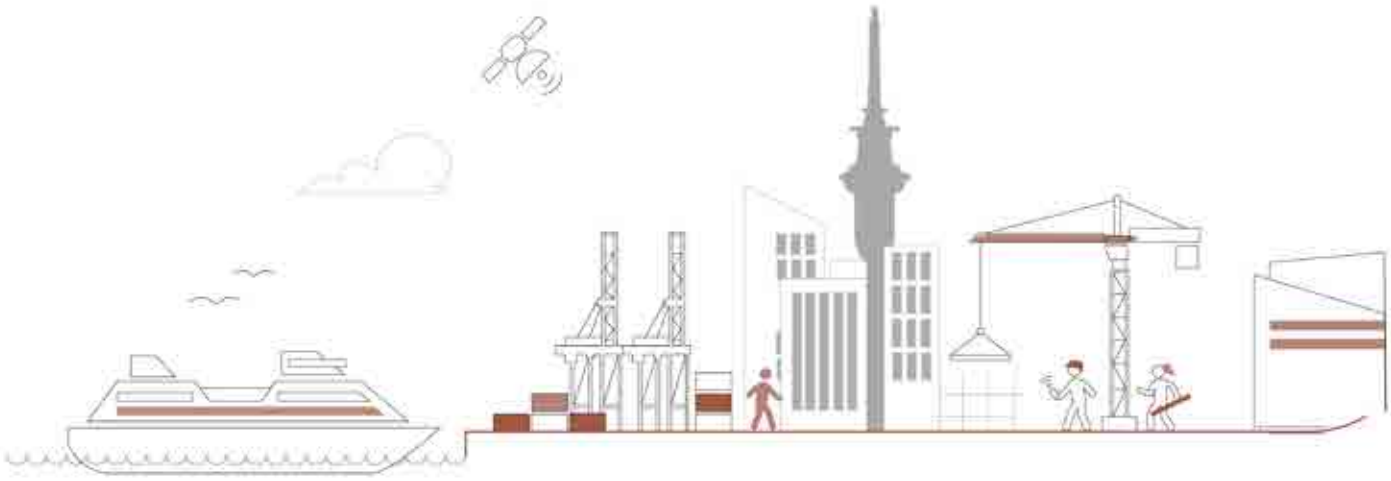
Growing awareness of Auckland's attractiveness as a dynamic cosmopolitan centre attracts talent, in particular young people with talent, to move and stay here. This will help to off-set the impacts of an ageing population and workforce.

A diverse, energetic and environmentally aware Auckland will continue to entice creative people with an entrepreneurial spirit who will lead innovation in the years to come.

As well as talent, Auckland needs to attract 'smart' capital, meaning capital that comes with associated skills, knowledge and capability. Access to smart capital helps to break down the barriers to growth that result from our size and distance from important markets.

New Zealand's regulatory settings, international reputation as relatively free from corruption and a good place to do business in, makes Auckland a good option for foreign investment.

However, we need to improve the cost of living, housing affordability, and infrastructure and connectivity – both physical and digital. This will create a better quality of life for existing residents and make Auckland a more internationally attractive business proposition.



Direction 3:

Develop skills and talent for the changing nature of work and lifelong achievement

The way we work, and the skills that Auckland's economy requires, is constantly evolving. It is crucial that current and future workers have the relevant tools to succeed.

This means ensuring:

- our younger generations are equipped with the skills of the future
- our current working population is ready for change.

Rapid technology growth is changing the nature of work and the structure of workplaces, and the rate of this change is expected to increase.

Technological advances have created new jobs, for example, in robotics, the development of software applications, animation and fashion influencing, and have eliminated other jobs such as book keepers and machinists.

See Map 6 - Jobs in advanced industries

Technological changes generate opportunities and challenges, requiring different business models and changes for workers.

We may have more flexibility and be able to:

- work part-time
- work digitally or from home
- be self-employed or have multiple jobs.

It is important to ensure this does not occur at the expense of a decent standard of living.

To flourish in this changing economic landscape, Aucklanders will have to continuously increase their skills, retrain on the job and develop throughout their lives.

We have to strengthen systems and opportunities to enable this continuous learning. Business, industry, and unions have important roles in proactively supporting their workforce to retrain and develop.

Industry and the education sector will need to work even more closely together to be responsive to this changing environment and to create opportunities for people to develop the right skills at the right time.

All sectors have a role to play. We need to create a system-wide approach that lifts employment for all Aucklanders across the spectrum of low to high skilled roles.

Workplaces need to build more flexible cultures that attract and best utilise the talents of older workers, younger workers and everyone in between. Greater emphasis needs to be given to those who experience sustained poor employment outcomes such as disabled Aucklanders. As technology becomes faster,

Figure 31 - Jobs in the US from 1980 – 2012 requiring social skills and math skills . Data for this chart was sourced from The World Economic Forum (2016). New vision for education: fostering social and emotional learning through technology [230]

more affordable and accessible, it will enable more employment opportunities for people of all abilities.

Over the next 30 years, it can be assumed that many current jobs will be automated, or replaced by artificial intelligence, and there will be new jobs requiring new skills. In future, soft and creative skills are likely to become more valuable than at present.

See Figure 31 - Jobs in the US from 1980 – 2012 requiring social skills and math skills .

Learning and developing skills do more than improve labour market outcomes; they improve many socio-economic outcomes for individuals and families. By building soft skills and creative and technical skills, as well as general knowledge, throughout our lives, Aucklanders will develop the resilience necessary to meet this changing future.

Focus area 1:

Harness emerging technologies and ensure equitable access to high quality digital data and services

The rapid rate of change and disruption that will occur in businesses means that Auckland's economy is vulnerable if it fails to adopt new technologies and innovate accordingly.

Adopting new technologies and business practices is also a way to create a much needed lift in productivity.

Auckland is well positioned to take advantage of opportunities presented through technology as it:

- has a relatively high-skilled labour market
- has strong educational institutions
- is a place that can attract talent based on its lifestyle offer.

High quality digital services are fundamental to advancing technology uptake for current and growing business and for the long term development and growth of skills required for the future.

Homes, schools and businesses need access to high speed internet to keep up with the modern economy. Meeting the challenge of providing affordable access to the internet and quality digital services to all Aucklanders means removing barriers, including:

- inadequate internet connectivity and the slow rate of expansion of high speed connectivity to rural areas
- low household incomes that make internet services and devices unaffordable
- limited digital skills
- cybersecurity threats
- lack of awareness of the opportunities and risks of digital services.

How this can be done

The focus should be on how people and businesses get the most benefit from technological change. The fast pace of the digital revolution needs to be matched by ensuring everyone can make the most of online opportunities.

There needs to be affordable and accessible digital infrastructure and plentiful opportunities for people to continuously develop their digital literacy.

Formal education at all levels must respond to the digital new environment. This includes enhancing the entrepreneurial, science, technology, engineering and mathematics offer for all ages.

Ensure regulatory planning and other mechanisms support business, innovation and productivity growth

Innovation needs a business-friendly, supportive environment. It requires strong connections between the individuals and organisations involved in developing new and improved products, services, processes and markets.

Although most innovation occurs in business, a range of other organisations have knowledge, skills, ideas and technology that can improve the chances of innovation being successful, or help a business avoid wasting resources in the process. They include:

- universities and research institutes
- innovation hubs
- government agencies
- industry associations
- financiers.

For example, a dynamic creative sector can be an incubator for future entrepreneurs and innovators. Or research and development, when coupled with the commercialisation of ideas, can significantly increase the success of an innovative product.

How this can be done

Regulatory and policy settings need to promote innovation and help business. Regulatory processes should see rules applied consistently, without distracting innovative enterprise with unnecessary time and costs.

Laws and regulations regarding copyright, intellectual property rights, and transport regulation should all contribute to a socially responsible and innovation-friendly business environment.

The Development Strategy addresses the supply of business land and supporting infrastructure as one means of enabling innovative businesses to set up and benefit from co-location.

On the other hand, some digital industries and many start-ups can operate successfully anywhere. We must be sure that development and regulation supports both approaches.

Figure 32- Environment for business innovation, ATEED

Focus area 3:

Advance Māori employment and support Māori business and iwi organisations to be significant drivers of Auckland's economy

A prosperous Auckland economy will include more opportunities for Māori, especially rangatahi, to gain the essential skills to increase their employment and income levels and to help drive Auckland's economic growth.

Tāmaki Makaurau presents Māori with economic opportunities across many sectors. There is potential for innovation, entrepreneurship and increasing international business opportunities.

Māori business leaders, iwi, Māori collectives, local government and others in the private sector need to work together to take up commercial and digital opportunities.

Support systems for Māori business owners need to be more accessible and well-coordinated, and enable the Māori business ecosystem to flourish.

Māori businesses have a Māori way of doing business with an emphasis on Māori values, joint ventures and enduring relationships.

They are commercially driven with well-defined long-term goals that promote a 'quadruple bottom line' and grow the Māori asset base, creating direct benefits back to iwi. This embeds a process that both empowers communities and cultivates an untapped part of the economy.

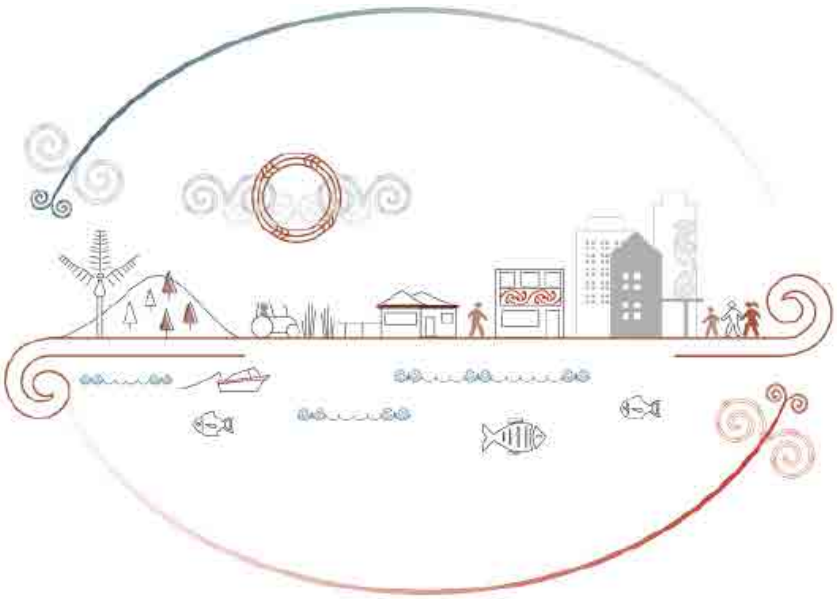
A visible thriving Māori economy creates unique opportunities for Auckland. Greater Māori economic success will have benefits for all Aucklanders and contribute to the further development of an internationally attractive Auckland economy. Globally, consumers are increasingly interested in sustainable and responsible business practices and products.

This interest aligns well with Māori values, and provides an opportunity for Māori to continue to apply a te ao Māori approach that is of growing value to the world.

How this can be done

Areas that could be looked at include:

- supporting Māori business development
- boosting rangatahi participation in education and training
- increasing Māori employment and wages
- supporting collaboration of iwi and Māori collectives to share lessons and maximise economic value
- supporting a te ao Māori approach to Māori enterprise development
- supporting Māori entrepreneurial initiatives
- continuing partnerships between council and iwi.



Leverage Auckland's position to support growth in exports

Auckland has an important role as New Zealand's main connection point for international and domestic markets. We need to use this role to increase exports.

Opportunities available in Auckland due to its scale, facilities and diverse population include:

- diverse and more specialised labour markets
- scope for specialised production, which increases trade between firms
- access to international markets which provides more scope for firms to benefit from scale economies
- opportunities to stimulate the development and spread of new ideas, technologies and ways of doing business
- business contacts in migrants' countries of origin
- a variety of specialised cultural and recreation opportunities.

Auckland however still has a primarily inwardly-focused economy driven by consumption, real estate, and domestically-focused services.

How this can be done

We need to move into creating and exporting a wide range of sustainably developed products, and more knowledge-intensive goods and services based on innovation and productivity growth.

Focusing on a broader mix of exports will mean a wider spread of innovation opportunities, and will require a wider range of skills.

There are a number of emerging and evolving economic sectors including:

- tourism, for more information read Destination AKL2025[231]
- food and beverage
- high technology
- marine
- screen and creative industries
- finance
- tertiary education and training.

Encouraging these export-linked new sectors will increase the resilience of Auckland's economy and also make New Zealand less vulnerable to fluctuations in commodity prices.

We also need to ensure the ongoing sustainable growth of sectors that are already internationally competitive, as described in The Tripartite Economic Alliance later in this section.

Figure 33 - The image below shows the top five New Zealand export markets in 2017.

Focus area 5:

Increase educational achievement, lifelong learning and training, with a focus on those most in need

Learning begins in the home. A solid foundation of early childhood learning and development that builds linguistic, social, emotional and physical skills is a prerequisite for success.

When followed by quality formal education and plentiful informal learning opportunities, this benefits people throughout their lives.

See Figure 34 - Highest qualifications for the 15 year and over usually resident population.

All our young people need the fundamental skills and creative thinking capabilities to develop the adaptability and resilience they will need in the future.

The Southern Initiative[232] is an example of a place-based initiative that aims to set children up for life with the best start and a pathway for further education and training.

For Auckland to succeed, attention needs to be focused not only on creating excellent learning opportunities for all our children and young people, but also on preparing everyone for a changing economic environment that will require continuous upskilling.

Whether in school, in the home, at work or within the community, it will be even more important to acquire knowledge, master methods of learning and build social skills.

These skills assist individuals to gain and keep good employment, to be personally fulfilled and to participate fully in the wider society.

Some Aucklanders are thriving but others are not - read Educational achievement of Auckland's children and young people for more information later in this section.

Particular focus is required to lift educational achievement and skill development of those most in need, which includes groups who consistently experience poorer education and employment outcomes.

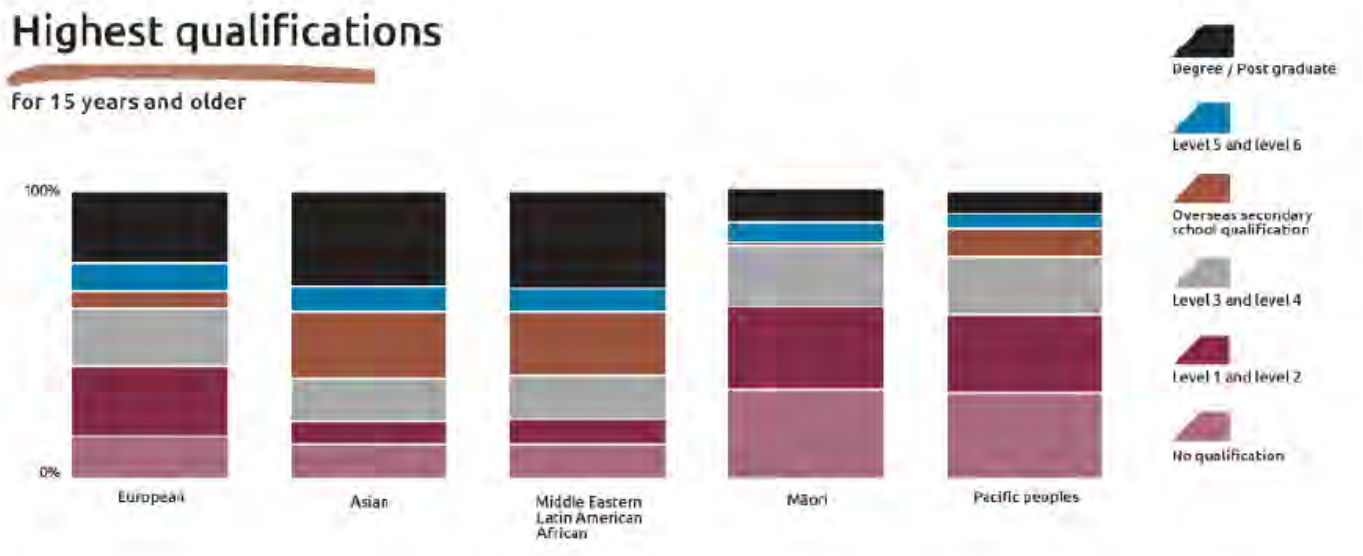
Trades training, apprenticeships and retraining options will continue to play an essential role in people getting the right skills to succeed. There needs to be a variety of development opportunities, that will reduce barriers to achieving meaningful employment and high wage jobs, at every stage of life.

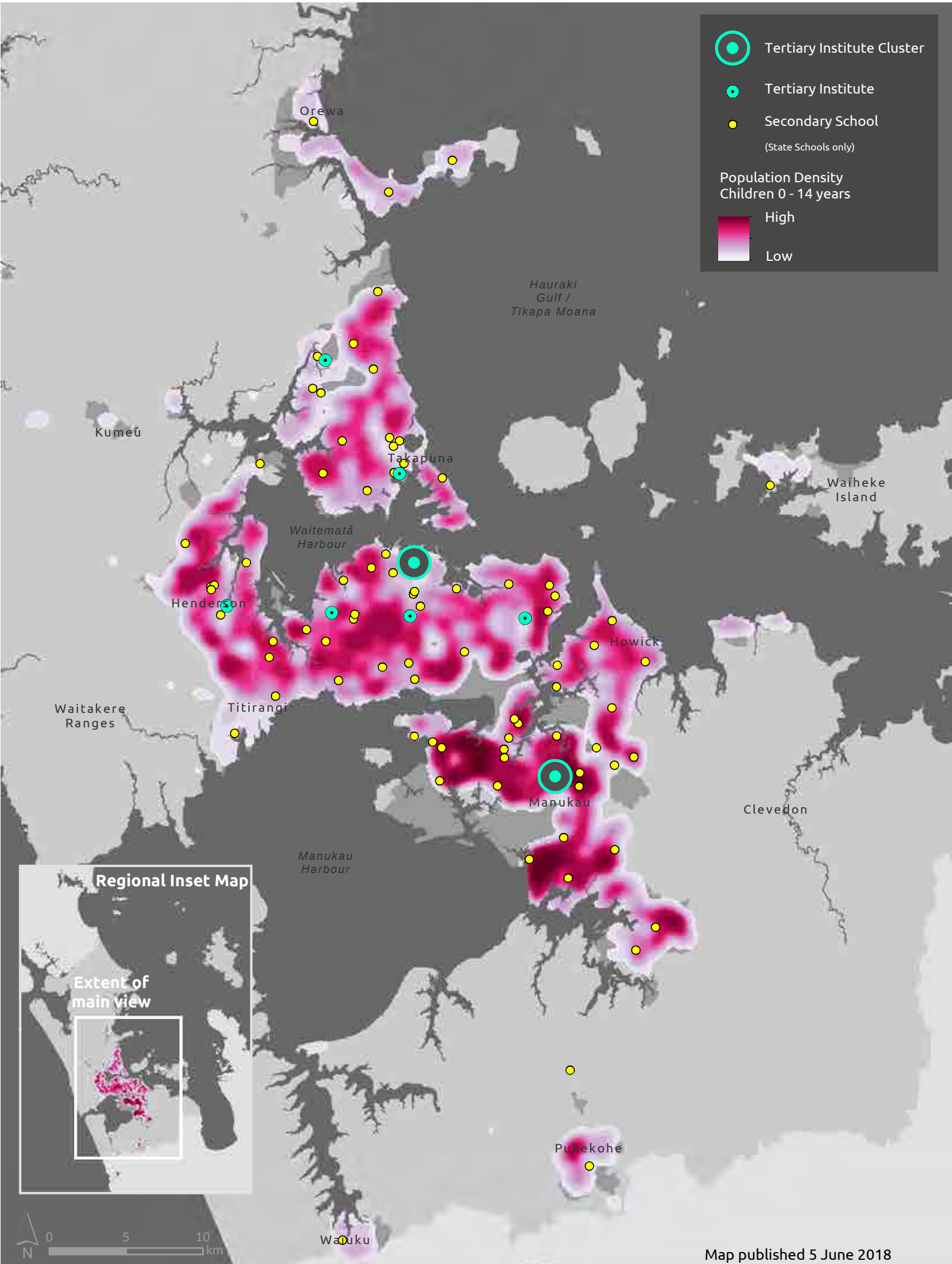
All Aucklanders deserve the chance to achieve great things.

We must ensure that all of our people have the tools they need to build a bright future, through a mix of informal learning options, paired with quality formal education and general personal development.

See Map 7 - Proximity to Education

Figure 34 - Highest qualifications for the 15 year and over usually resident population. Source: Census 2013.





Map published 5 June 2018

How this can be done

We can do this through:

- training and education initiatives focused on those most in need
- encouraging a culture and practice of lifelong learning and skill development
- supporting early childhood learning
- enabling opportunities to build soft skills
- supporting education-to-work pathways, apprenticeship and internship programmes
- providing appropriate education infrastructure
- retraining opportunities and digital literacy programmes.

Implementing the Opportunity and Prosperity outcome

Implementation partners

Auckland's businesses are the backbone of Auckland's economic future.

Central government sets the legislative framework for businesses to operate in and provides leadership through its different policy settings.

Auckland Council has set a strategic vision for Auckland's economy through Auckland's Economic Development Strategy. Auckland Tourism, Events and Economic Development (ATEED), a council-controlled organisation, works with partners to deliver multiple objectives, from growing Auckland's innovation culture and key economic sectors to attracting foreign direct investment, international events and visitors from around the world.

Through the supply of adequate infrastructure, central and local government help create the physical environment within which enterprise can thrive.

Several partners collaborate to create the learning environment of the future, including education and training agencies and organisations, research institutes, and COMET Auckland (a community education charitable trust).

Auckland Council will develop an implementation approach for this outcome working alongside our key partners and stakeholders. This will be built on existing programmes and ensure all new elements introduced in the Auckland Plan 2050 are planned for.

Mechanisms used to work together

Auckland businesses are represented by a range of national and regional advocacy groups and professional bodies, each with specific priorities and work programmes.

Businesses engage with central government through these groups, and with each other through a range of networks.

Business and the education sector will need to work collaboratively for their mutual benefit, to create opportunities for individuals to develop the right skills and potentially to deliver innovative commercial products.

There is an ongoing need for stakeholders involved in the creation of positive learning environments in schools, tertiary institutes, and in the workplace to work together in order to deliver coherent actions on the ground. This may involve Auckland-wide strategic approaches that align planning and monitoring and define collaborative action.

Advanced industries are critical to the future of Auckland's economy as they rely on innovation and add high value through bringing capital and jobs into New Zealand.

Auckland has a multi-agency approach to grow advanced industries that involves: attracting investment, research and development activities, providing supporting infrastructure, addressing skills shortages to secure a talent pipeline, and supporting the growth of international trading relationships to increase export revenues.

Supporting strategies and plans

Auckland's Economic Development Strategy

The strategic vision for Auckland's economy that sets out the tangible steps to make Auckland an internationally competitive, prosperous economy where all Aucklanders can benefit.

Learn more about Auckland Economic Development Strategy.[233]

Learning environment

Government agencies such as the Ministry of Education and the Tertiary Education Commission have a range of strategies and plans that will contribute to creating a high quality learning environment in Auckland. Some of the key strategies include:

- Ka Hikitia – Accelerating Success[234]
- Pasifika Operational Strategy 2017–2020[235]
- International student wellbeing strategy[236]
- Tertiary Education Strategy 2014–2019[237]
- Auckland Innovation Plan[238] - The Auckland Innovation Plan outlines the priorities and actions identified by ATEED to build a culture of innovation and entrepreneurship in Auckland

- Toi Whītiki - Arts and Culture Strategic Action Plan[239]- The plan's overall goal is to enable arts and culture to be integrated into our everyday lives, and create a culturally rich and creative Auckland. One of its six goals is to build a flourishing creative economy. It is a ten-year plan, delivered by Auckland Council in partnership with the creative sector.
- I Am Auckland - the Children and Young People's Strategic Action Plan[240] - This plan sets out the strategic direction for Auckland Council to help children and young people reach their full potential. It contains seven key strategic goals, including opportunities to access learning, development and pathways to employment.

Auckland Council's strategies, policies and plans have acted as an important input in the development of Auckland Plan 2050. With the adoption of the plan, the council will assess these documents to ensure they remain fit for purpose.

How to get involved

- Information about Auckland's Jobs and Skills Hubs –
  - City centre,[241]
  - Tāmaki[242] and
  - Ara[243] at the airport.
- ATEED has more information about building young talent on the ATEED website.[244]
- Find out about activities as champions and connectors within the Auckland education and skills system on COMET Auckland's website.[245]
- Information about grants and help for new businesses is available on the business.govt.nz[246] website.

Supporting information

Information about the initiatives that ATEED delivers across business growth and innovation, business attraction and investment, tourism, international education, film and major events can be found on the ATEED website.

Supporting Information

The Fourth Industrial Revolution

Impact of new technology

The Tripartite Economic Alliance

The importance of soft skills

Educational achievement of Auckland's children and young people

Why lifting productivity is important

Groups that experience poor education and employment outcomes

Māori and Pasifika Trades Training programme

The Fourth Industrial Revolution

Technology disruption is predicted to be of a scale so great that it is described as the fourth industrial revolution.

The following is taken from World Economic Forum, The Global Competitiveness Report, 2016-2017, Geneva, 2016.[247] It was adapted from Klaus Schwab's 2016 book titled The Fourth Industrial Revolution. Find out more on the World Economic Forum website.[248]

"We are at the beginning of a global transformation that is characterized by the convergence of digital, physical, and biological technologies in ways that are changing both the world around us and our very idea of what it means to be human. The changes are historic in terms of their size, speed, and scope.

This transformation – the Fourth Industrial Revolution – is not defined by any particular set of emerging technologies themselves, but rather by the transition to new systems that are built on the infrastructure of the digital revolution. As these individual technologies become ubiquitous, they will fundamentally alter the way we produce, consume, communicate, move, generate energy, and interact with one another.

And given the new powers in genetic engineering and neurotechnologies, they may directly impact who we are and how we think and behave. The fundamental and global nature of the revolution also poses new threats related to the disruptions it may cause – affecting labour markets and geopolitical security as well as social value systems and ethical frameworks."

Impact of new technology

Disruptive changes to business models will have a profound impact on the employment landscape over the coming years. Many of the major drivers of transformation currently affecting global industries are expected to have a significant impact on jobs, ranging from significant job creation to job displacement, and from heightened labour productivity to widening skills gaps. In many industries and countries, the most in-demand occupations or specialties did not exist 10 or even five years ago, and the pace of change is set to accelerate.[249]

We are on the cusp of a new 'automation age'. In a study of the scale of change that could be expected from recent developments in robotics, artificial intelligence, and machine learning, the McKinsey Global Institute developed a template for estimating the automation potential across 2000 work activities and more than 800 occupations within the United States.

Results are shown below. This summarises the potential impact of automation across the global economy.

Information for the chart below was sourced from McKinsey Global Institute (January 2017) A future that works: Automation, Employment, and Productivity – Executive Summary.

The X axis (horizontal) represents 820 (100 per cent) occupations, expressed as an overall percentage.

Those occupations have been broken down into a number of distinct activities based on a list of 2000 activities.

An occupation can share a number of common activities.

For example, data analysis is an activity undertaken by an economist, or a market researcher or a scientist, among others.

The Y axis (vertical) represents the proportion of each occupation that could be automated, based on the activities that make up that role. In other words, its technical automation potential.

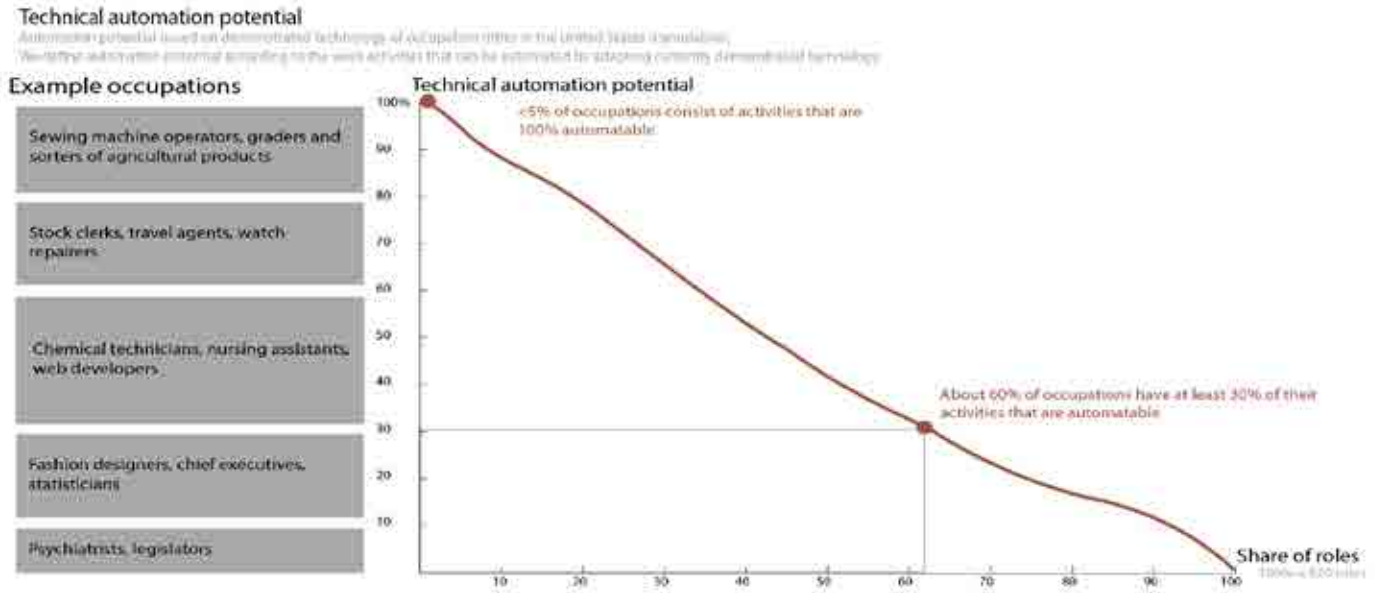
As the chart shows, the McKinsey Global Institute study found that while less than five per cent of occupations are fully automatable, 60 per cent of all occupations have at least 30 per cent technically automatable activities.[250]

The study also looked at possible technology adoption scenarios. The modelling produced significantly different results.

In the earliest scenario, automation could account for more than 50 per cent of working hours in two-thirds of countries within just 20 years. In the latest scenario, more than half of all countries will have 50 per cent automation or more within 50 years.

These findings reflect uncertainty about the speed of take up of automation technologies across activities and sectors.

Regardless of the speed of adoption, the study concluded that the greatest impact will be experienced in a few advanced economies, especially Germany, Japan, and the United States. These countries have both high wages and industries with high potential for activities to be automated.



In all economies, including New Zealand, the decision when to automate will depend on the costs of integrating technology in the workplace relative to wages.

Other factors which will determine the speed of take up are the impact on production and service quality, and customer acceptance.

The Tripartite Economic Alliance

In 2014, the Tripartite Economic Alliance between Auckland, Guangzhou (GZ, China) and Los Angeles (LA, U.S.A.) was signed for a three year period.

The alliance is based on strong previous sister-city relationships. It focuses on increasing trade and investment between the three cities and their surrounding areas, and deepening political and civic engagement.

This is the first trilateral economic international agreement between cities, and sets a new benchmark for city engagement and collaboration. Under the alliance, there have been annual Tripartite Economic Summits. The intention is to implement specific tri-party initiatives and a work programme to meet the shared objective of increasing trade and economic engagement.

The Tripartite Economic Alliance creates a 'platform' and opens doors to meaningful and substantive economic, trade and investment opportunities for Auckland-based businesses, entrepreneurs, and investors. It also allows the parties to get increased benefits from existing people and cultural- focused relationships.

Progress since signing of the tripartite agreement

The tripartite has been a successful collaboration to date, deepening Auckland's connections and visibility with two important international partners and gaining national and international recognition.

Auckland Tourism Events and Economic Development (ATEED), a council-controlled organisation, estimates that opportunities from the Auckland summit have generated a number of potential deals for local companies. Given the time required for business deals to conclude, the commercial results from the LA and Auckland summits will continue to be tracked.

Other initiatives facilitated under the Tripartite Economic Alliance include substantive memoranda of understanding and strategic alliances between business and research institutions that cover ports, design and innovation.

Auckland, LA and Guangzhou have experienced significant interest in the model from cities around the world. It is therefore serving as a potential model for other international city relationships.

Collaboration between Auckland Council organisations and central government has also strengthened under this alliance. This collaboration was formalised through the signing of a memorandum of understanding to future-proof Auckland's working relationship with central government on global engagement.

The Tripartite Economic Alliance was extended by a further three years in November 2017 at the summit held in Guangzhou.

The importance of soft skills

The term 'soft skills' describes a range of personality traits, non-cognitive skills and abilities, character traits and socio-emotional skills.[251] People are not born with a fixed set of abilities and many of these skills are developed over their lifetime.

Soft skills include:

- critical thinking and problem solving
- creativity and curiosity
- communication and collaboration
- agreeableness
- conscientiousness
- persistence and self-motivation
- adaptability
- leadership
- social and cultural awareness
- enthusiasm.

These skills are important for individual development, academic performance and participation in society. They are also highly valued in the workplace.

Investment in children's soft skills

Early investment in developing children's social and emotional skills helps to:

- establish healthy brain architecture as the brain forms
- create a strong foundation on which higher-level skills can be built
- provide ongoing benefits throughout life[252]

Building these skills early can have a positive impact on all children, especially those in disadvantaged groups.

A recent longitudinal study in nine countries conducted by the Organisation for Economic Cooperation and Development has shown a balanced set of cognitive, social and emotional skills play a crucial role in improving children's economic and social outcomes later in life.[253]

The study found that in New Zealand, the impact of raising the social and emotional skills of an eight year old reduces self-reported behaviour problems (e.g. drinking, smoking, violence, fights) at 16 years old by 15 percentage points, while the impact of raising cognitive skills is statistically insignificant.

Soft skills for work

As our work environments evolve, soft skills are becoming increasingly important in a variety of workplaces.

The growing automation and globalisation of markets has seen:

- a decrease in the proportion of middle-skilled jobs
- an increase in the proportion of low-skilled jobs
- more demand for highly-skilled workers[254]

Employers are seeking people with a range of soft skills in both highly-skilled and low-skilled roles.

Figure 35 - Jobs in the US from 1980 – 2012 requiring social skills and math skills . Data for this chart was sourced from The World Economic Forum (2016). New vision for education: fostering social and emotional learning through technology[255]

Research has shown that the bulk of job growth in the United States from 1980 to 2012 was in occupations that require high social skills such as managers, teachers, nurses, therapists, physicians and lawyers.

It has also been found that higher-paying jobs increasingly require social skills.[256]

Further to this, the United States Bureau of Labour Statistics projected employment to grow fastest in occupations that are difficult to automate, specifically within healthcare, construction, and science, technology, engineering and mathematics (STEM) occupations.[257]

There will be increasing demand for workers who have a comparative skills advantage. Even in highly technical roles a strong set of soft skills will provide that advantage.

There are skills gaps in many OECD countries that include technology and basic literacy skills. There is also a significant lack of soft skills.

Auckland employers surveyed in 2012 stated that soft skills (or non-cognitive skills) are becoming increasingly important when hiring[258] and expressed difficulties finding employees with adequate soft skills.

That study also found that some infrastructure firms reported that they could increase revenues and improve productivity more through enhanced non-cognitive skills amongst their engineers than through advances in technical skills.[259]

In 2017 a large number of business organisations, including Xero, ASB, Noel Leeming, Vector and Sky City, published an open letter[260] stating their intent to hire people without tertiary qualifications.

Their hiring process would instead focus on assessment of the necessary skills, attitudes, motivation and adaptability to join their organisations, in conjunction with previous experiences in and out of the workforce.

The possibilities that technology brings are being pushed further and further every day.

There are new occupations in fields that only recently would have been taken for science fiction, for example:

- cybersecurity
- cloud technologies
- robotics
- 'app' development
- social media management
- meta-data mining.

There is no certainty about the skills that will be required in this rapid changing environment. However, soft skills, particularly adaptability, creativity and critical thinking will be more advantageous as the world of work evolves.

For further information:

The World Economic Forum report on the new vision for education[261]

The Economist Intelligence Unit report on the learning curve[262]

The European Political Strategy Centre report on the future of work skills and resilience for a world of change[263]

Educational achievement of Auckland's children and young people

Auckland's child and youth population will continue to increase

Children and young people (aged 0 to 24 years old) represent over a third of Auckland's population (36 per cent in 2013).

Statistics New Zealand population projections (medium series) suggest that over the next 20 years, the number of children and young people in Auckland will continue to increase, possibly by another 26 per cent.

Population ageing will mean however that the proportion of Aucklanders who are children and young people will decrease.

Auckland will require more formal and informal learning environments, as well as services and infrastructure required for children and young people.

This includes:

- schools
- early childhood centres
- playgrounds and recreational opportunities
- health services.

Relatively high rates of participation in early childhood education

There is consistent evidence linking good quality education, especially early childhood education (ECE), with improved skills development and employment prospects.[264]

Participation in high quality ECE builds the foundation for children's lifelong learning.

The Ministry of Education reports that there have been steady rises in ECE participation rates in Auckland and across New Zealand since 2000.

In addition, the time that children spend in ECE per week has been increasing.[265]

In 2015, 95 per cent of children in Auckland took part in ECE. Although the rates for Pacific (90 per cent) and Māori (92 per cent) children are lower than for other groups, this is a significant improvement from 2012 participation rates.

In part, this may reflect the impact of programmes introduced to target specific local areas where ECE participation is low.[266]

The national ECE Participation Programme[267] was set up in 2010. It is made up of various initiatives that aim to support Māori, Pasifika, and low-income families to enrol their children in ECE.

Gradual increase in levels of formal educational achievement

A formal school qualification gives young adults the basic prerequisite to go on to higher education, training and many entry-level jobs.

The main qualification available to secondary school students is the National Certificate of Educational Achievement (NCEA), which encompasses a wide range of learning. Future educational and job prospects will be limited for those who leave school without Level 2 NCEA.

In 2014, of the total young people who left school in Auckland, 81.6 per cent had achieved NCEA Level 2 (or equivalent) or above – up 2.1 per cent from the previous year. Almost half (46.2 per cent) had attained University Entrance standard.

There has also been a gradual increase overall in the numbers and proportions of young people leaving school in Auckland with Level 3 or higher qualifications, including University Entrance.

Education has an intergenerational impact

In New Zealand, educational achievement persists between generations.

In 2012, the OECD noted that the chance that a young person whose parents have not attained an upper secondary education will attend higher education is limited, and they reported that tertiary students in New Zealand were more likely to have highly educated parents than in any other OECD country.[268]

Evidence shows very strong links between education and the transfer of income and other inequality across generations. For children in New Zealand, education is the main way to break the transmission of low incomes across generations.[269]

Socio-economic deprivation has a negative effect on educational achievement

Educational achievement is associated with socio-economic background.

The link between a parent's socio-economic status and a child's educational outcome is very high in New Zealand when compared internationally.[270]

Children whose parents do not have school qualifications and who live in a socio-economically deprived area have a higher probability of poor educational outcomes than other children in Auckland.

Auckland has a larger number of low decile schools.

Auckland has a disproportionate number of low decile schools, for example those rated 1, 2 or 3.

A third (32 per cent) of all decile 1 schools in New Zealand are found in Auckland, while only 21 per cent of New Zealand's schools are in Auckland.

The southern part of Auckland has a substantial concentration of decile 1, 2 or 3 secondary schools.

Māori and Pacific children are more likely than others to attend low-decile schools. As at 1 July 2015, approximately 71 per cent of Auckland's Pacific students and 50 per cent of Māori students attended decile 1, 2 or 3 primary and secondary schools, compared to only six per cent of European/Pākehā students.[271]

Read more about school deciles on the EDUCATION.govt.nz website.[272]

Some improvement in educational outcomes in The Southern Initiative area

Significant proportions of Auckland's Māori and Pacific school leavers are from schools in The Southern Initiative.

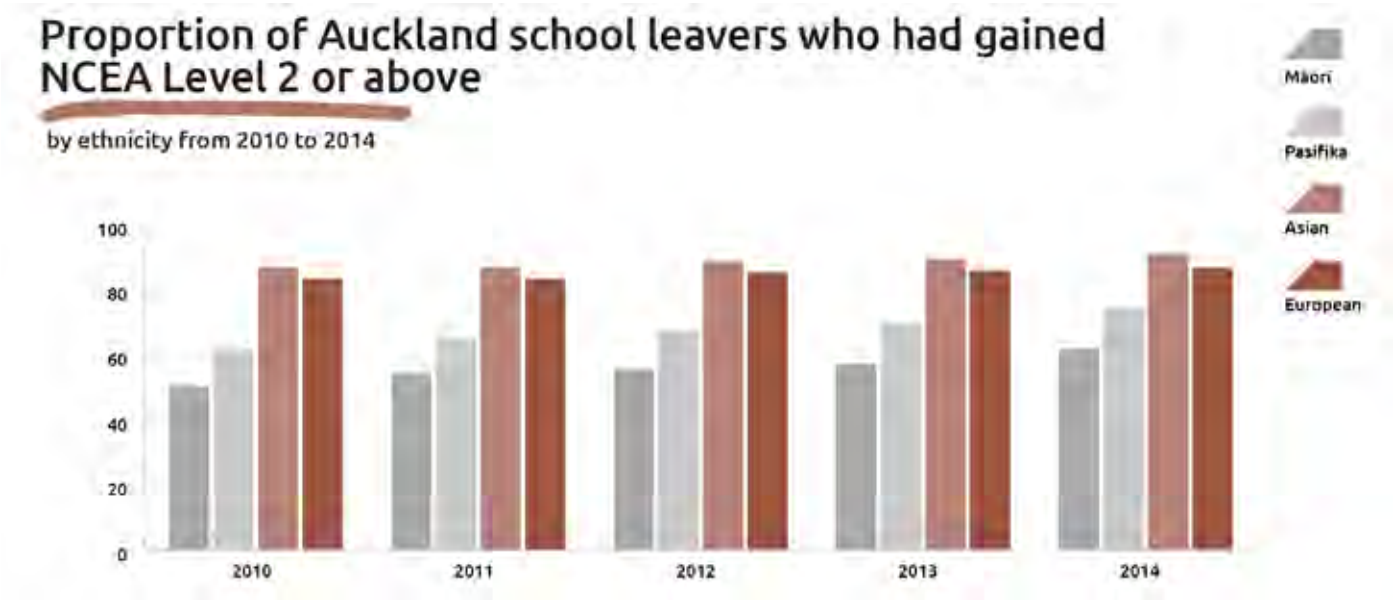
In 2014, over a third (38 per cent) of all Māori school leavers and almost half (47 per cent) of all Pacific school leavers (overall, 21 per cent of school leavers) were from schools in this area.

Relatively large proportions of Māori and Pacific young people in the Southern Initiative area are leaving school with low, or no, qualifications, when compared with other ethnic groups, and compared to school leavers from other areas. For example, in 2014, a third (33 per cent) of Māori school leavers left school without NCEA Level 1, as did 19 per cent of Pacific students.

These figures are however an improvement on previous years, particularly among Māori school leavers.

Figure 36 - Proportion of Auckland school leavers who had gained NCEA Level 2 or above, by ethnicity (2010 to 2014)
Source: Ministry of Education, School leaver data

Note: Students could belong to more than one ethnic group so percentages may total more than 100.



School leaver attainment among school leavers from schools in the Southern Initiative area, by ethnicity (2014)

	Below NCEA Level 1 (%)	Level 1 and working towards Level 2 (%)	NCEA Level 2 or above (%)
Māori	33	17	50
Pacific	19	12	69
Other ethnicities	11	10	79
Total	19	12	69

School leaver attainment among school leavers from schools in the rest of Auckland, by ethnicity (2014)

	Below NCEA Level 1 (%)	Level 1 and working towards Level 2 (%)	NCEA Level 2 or above (%)
Māori	20	13	67
Pacific	13	9	77
Other ethnicities	6	6	88
Total	8	7	85

Source: Wilson, Reid & Bishop (2016) using Ministry of Education data.[273]

Note: Students could belong to more than one ethnic group.

Māori and Pacific young people have poorer educational outcomes

Māori and Pacific young people make up more than a third of Auckland's young people and continue to experience higher levels of disparity in education outcomes than others.

The 2013 OECD economic survey of New Zealand reports that:

"Among the population lacking school qualifications, Māori have nearly double the incidence of people lacking school qualifications as Pakeha/Europeans and quadruple those of Asians, and conversely Māori show much lower rates of tertiary attainment."[274]

Although trends are improving across Auckland, there are significant educational disparities for Māori and Pacific children and young people.

Māori and Pacific young people's tertiary attainment rates, NCEA attainment and early childhood education participation rates have been rising, but they are not catching up to those of other ethnicities.[275]

There needs to be increased focus in these areas on creating positive outcomes for Māori and Pacific young people.

Focusing on equitable education outcomes

Auckland can create equitable outcomes for all its children and young people. To bring all Auckland's children and young people along on the journey of educational achievement, these indicators of inequitable education outcomes need to improve swiftly.

There needs to be focus in geographic areas with low levels of educational achievement, lower socio-economic areas and higher levels of Māori and Pacific young people.

A strong education system that focuses on creating positive outcomes for all, not just some of its learners, will benefit everyone.

Why lifting productivity is important

There are three main ways to achieve higher incomes:

- increase the number of people working
- increase the number of hours worked
- increase productivity.

New Zealand has traditionally relied on the first and second methods to boost national income, which has resulted in more people working longer hours and low real wage growth.

The Organisation for Economic Co-operation and Development (OECD) has highlighted that productivity in New Zealand remains well below that of leading OECD countries.[276]

Productivity is calculated as the ratio of the volume of outputs to the volume of inputs.

High productivity means that a large amount of output is produced with little input. Find out more about productivity on the Stats NZ website.[277]

Lifting productivity is an important goal as it has the greatest potential to improve quality of life and create broader more sustainable benefits. These include a more highly skilled workforce, higher wages, more efficient use of resources, and innovative and more resilient businesses.

Since 2000, the knowledge intensive service sector in Auckland has grown at an average annual rate of 3.9 per cent.[278]

This sector:

- covers firms providing finance, professional, scientific and technical services
- is supported by a highly skilled and knowledge-enabled labour force and is highly productive.

While Auckland seeks growth in those sectors that are highly productive it is also important to improve productivity across all businesses.

Innovation through new technologies and automation can drive the change required to lift productivity within firms and reshape existing business models.

Firms can lift productivity by:

- increasing research and development
- encouraging collaboration between industry and research institutions
- attracting skilled migrants
- improving infrastructure and land use settings that enable mass benefits.

Groups that experience poor education and employment outcomes

Over-representation in some groups

In Auckland some groups are over-represented among those with poor education and employment outcomes, including:

- young people (aged 15-24)
- Māori
- Pacific people
- disabled people
- women[279]
- long-term unemployed
- underemployed[280]
- those with low formal educational attainment.

Groups with lowest levels of participation in employment in New Zealand in 2015[281]

Group	Employment participation
Women	Higher rates of unemployment and underemployment
	Lower rates of labour force participation than men
Young Māori women aged 15 to 24	Unemployment rate of 24 per cent
Young Pacific women aged 15 to 24	Unemployment rate of 31 per cent
Māori	High unemployment rate at 13 per cent (compared to 6 per cent of all people)
	Lower rates of labour force participation at 66 per cent (compared to 68 per cent of all people)
Pacific people	High unemployment rate at 13 per cent
	Lowest labour force participation rate of all ethnicities at 61 per cent
Disabled women	46 per cent participation in the labour force (compared with 54 per cent of disabled men)

Youth unemployment

The unemployment rate of young people in Auckland has been higher than that of other age groups for some time.

In 2015, the employment situation for youth was beginning to improve from the peak of unemployment rates after the Global Financial Crisis, but these rates have not yet recovered as much as for other age groups.

Auckland youth with the highest unemployment rates in 2013

Group	Unemployment status[282]
Māori youth aged 20 to 24	23 per cent (compared with 15.2 per cent unemployment rate overall)
Pacific youth aged 20 to 24	25 per cent (compared with 15.2 per cent unemployment rate overall)

Note: Data on youth unemployment and NEET taken from a report into children and young people prepared by Auckland Council on the Knowledge Auckland website.[283]

Auckland youth who are not in education, employment or training (NEET)

For young people, unemployment is only a part of their story. Young people aged 15 to 19 tend to be completing secondary school qualifications and beginning tertiary study or training. Those who are seeking work at this age are unlikely to have qualifications, skills or much work experience, contributing to these relatively high unemployment levels and low labour force participation rates.[284]

Therefore, to better understand young people's employment outcomes, data is collected on young people who are not in education, employment or training (NEET).

The NEET rate is designed to capture a wider understanding of the proportion of young people who are excluded and/or disengaged from both work and education, than standard measures for adults such as unemployment. Young people aged 15-24 who are NEET tend to take a longer time to find employment and have difficulty maintaining employment.

Auckland youth with the highest not in education, employment or training (NEET) rates in 2015

Group	NEET status
Māori youth aged 20 to 24	26 per cent (compared to 13.4 per cent overall)
Pacific youth aged 20 to 24	27 per cent (compared to 13.4 per cent overall)

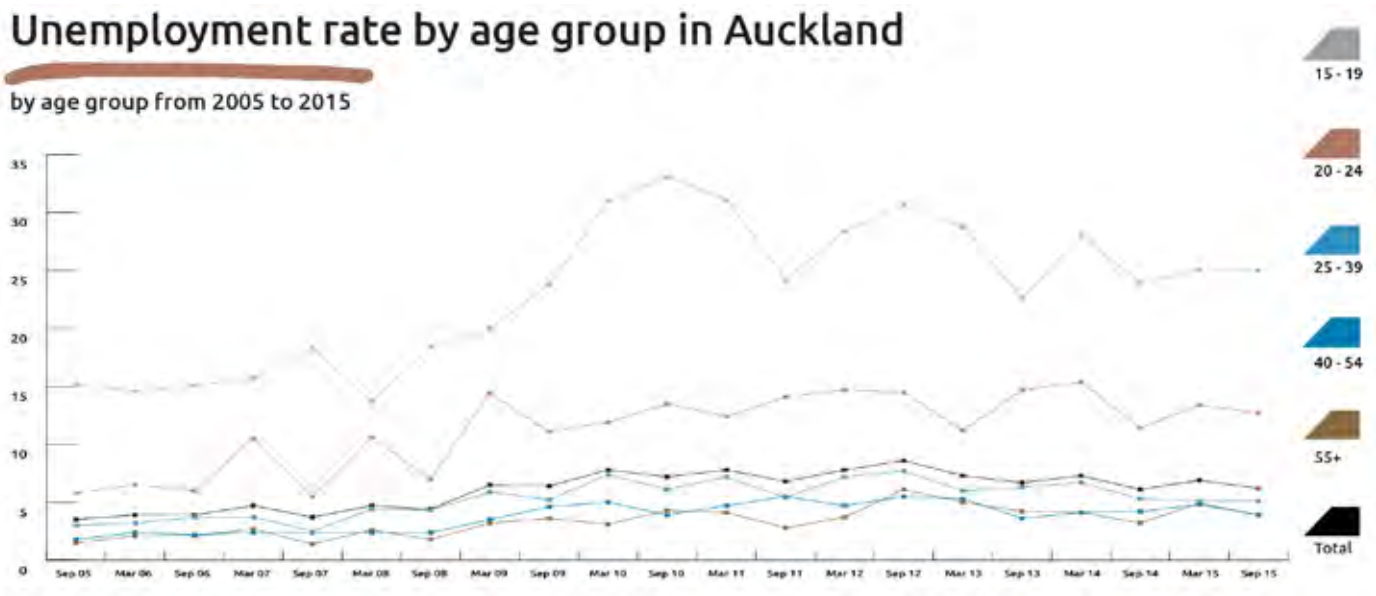
Data source: Stats NZ, Household Labour Force Survey.

Note: These figures need to be read with caution as there is a relatively high sampling error associated with estimating NEET rates by ethnicity and age, due to small sample sizes.

Further reading

A report on young people not in education, employment or training on the Scottish Government website.[285]

Figure 37 - Unemployment rate by age group in Auckland (September 2005 to 2015). Source: Stats NZ, Household Labour Force Survey



Māori and Pasifika Trades Training programme

Auckland is currently experiencing a demand for skilled tradespeople and that demand is expected to grow.

The Southern Initiative identified young Māori and Pasifika training and employment as a critical priority. To address this, it delivers the Māori and Pasifika Trades Training programme.

The programme is a central government initiative to assist Māori and Pasifika, aged 16 to 40, to:

- gain qualifications through training and apprenticeships
- secure sustainable employment with opportunities for progression.

The programme is based on close collaboration with an employer consortium and training providers to ensure trainees meet the needs and requirements of the industry.

The Southern Initiative coordinates training providers to deliver courses and recruit Māori and Pasifika people to take up trade training.

There is a focus on recruiting vulnerable young people not in education, training or employment, who are often challenging to reach.

Participants are recruited through Work and Income, community organisations, iwi and prisons.

Young people, who often have limited exposure to work, benefit particularly from the soft skills training that the programme provides. Moreover, young people enter into the programme with confidence that a clear path to sustainable employment is part of the programme.

Following the training participants receive assistance to find a job. They and their employer receive post-employment support to ensure that any challenges are managed.

In 2015, a majority of participants were offered full-time employment or apprenticeships following their training.

Employers are positive about the programme and value the contribution of the participants to their businesses.

Māori and Pasifika Trades Training is an example of organisations working together to empower young people and improve outcomes for some of Auckland's most vulnerable people.