

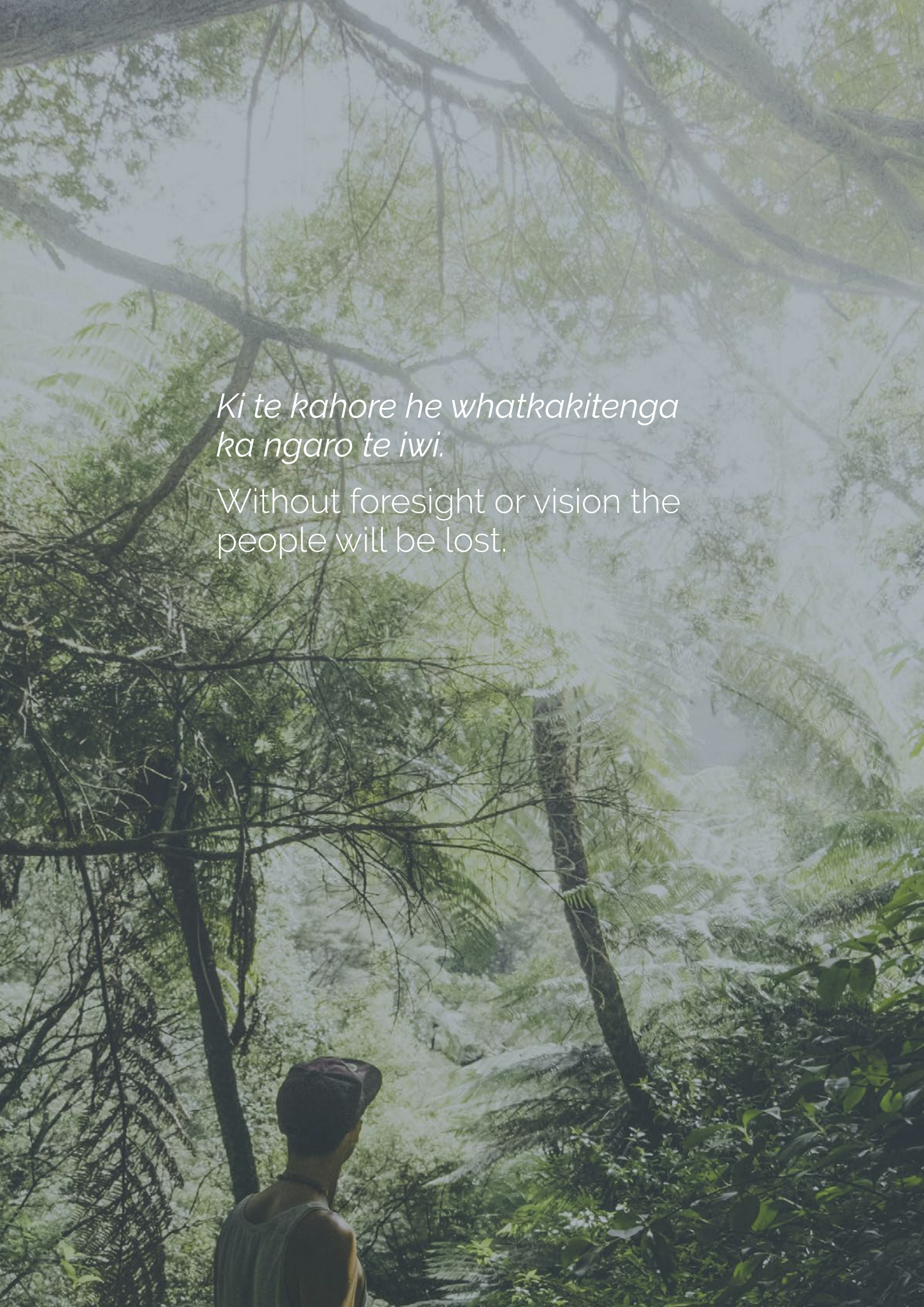


Navigating Critical 21st Century Transitions

Supporting the local government sector to lead fundamental change in their communities

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A person wearing a cap and a tank top is seen from behind, looking up at a dense forest of tall trees with many ferns. The scene is misty or foggy, with sunlight filtering through the canopy. The text is overlaid on the upper part of the image.

*Ki te kahore he whatkakitenga
ka ngaro te iwi.*

Without foresight or vision the
people will be lost.

Foreword

SOLGM provides leadership to its members in foresight and futures thinking to support them in their statutory responsibility to promote the well-being of their communities for the future, as well as the present. As part of this activity, we started out to create a product to support local government chief executives and senior managers to look forward. What has grown out of this intention is far more than a stand-alone product; it is the beginning of a journey.

The original concept for this report was a traditional scan of trends and change drivers to enable chief executives and senior managers to see at a glance what should be on their radar. In the process of commissioning this product, however, it became clear that something bolder and more definitive was needed.

The big change juggernauts have been on our radar for some time. For more than a decade we've all sat through presentations where we've been given information on the growing global population, risks of resource scarcity, increasing emissions, global warming and climate change, aging populations and the affordability challenge, and wave after wave of new technologies impacting the way we work, learn, share and exchange.

These change drivers are no longer abstract concepts. Together they create a perfect storm that has already started to confront our communities.

Trend-based analyses have made us better informed and spurred us to start to make responses in some areas, but they haven't helped us to understand the combined impacts of different drivers, grasp the scale of change that an integrated picture reveals or to act swiftly and collectively on those understandings.

We are facing 'era-scale' change. The change we have to make is as huge as the shift caused by the Industrial Revolution, when whole societies moved from being based on farming to being based on intensive manufacturing processes.

We need to move to different energy sources. We need to take much greater account of how we use land and other resources. We need to reduce waste and protect the environment that sustains us, whilst also facing the automation of all routine work. This means that everything will need to be done differently: where people live, how and where work happens, how people travel, how food is supplied, how learning happens.

We must be deliberate about putting equity at the forefront, as we go through these changes. Because we need to make change on every front, it opens up the opportunity to address the inequities that have been embedded in our current systems and to ensure that as we develop new systems they are designed to prevent inequity and to enhance wellbeing for all to the furthest extent possible.

At one level this is a global challenge, and it will require international action, taken in concert through the co-operation of all nations. This is also a national challenge. It will require action by nation states as central governments create the national-level incentives and powers to support the urgently needed change.

But, above all this is a community challenge. It is community by community, in how millions of us live, work and connect, day by day, week by week, where impacts will hit home and 'doing differently' will actually take place. This means local government has a pivotal role to play in the scale and speed at which we can make the critical transitions for the twenty-first century.

In this context, a product describing change drivers is not what is needed.

What is needed is a process to support local government officials in their statutory responsibility to lead their communities through 'era-scale' change in ways that protect and augment social, economic, environmental and cultural well-being and increase equity.

This document '*Navigating Critical 21st Century Transitions*' is intended to be the first step in that process. It sets us in the context of 'era-scale' change, describes five critical transitions we need to make together and proposes a Three Horizons approach (see pp. 8-9) as a common language to structure our thinking about how we make those transitions:

- **Transition to low emissions living**
- **Transition to living in a disrupted climate**
- **Transition to low waste society**
- **Transition to community interconnectedness**
- **Transition to learning-empowered communities**

These transitions are critical to our survival but at the moment none of us fully have the answers to how we are going to navigate them. We will have to learn our way forward together. The '*Navigating Critical 21st Century Transitions*' framework aims to provide clarity about the overall direction and destination in the transition landscape to help us keep on course as we work out the routes for our collective journey. In particular it will help us think in an integrated way about the changes we need to make. Our initiatives can and should contribute to several transitions at once (to ensure that we don't move forward on one transition to the detriment of another).

The framework should not be seen as an 'add-on' to the list of tasks facing local government chief executives and senior managers, rather it is intended as a way to reframe and integrate the many challenges we already face.

We know that across Aotearoa New Zealand councils have already started on different parts of their transition journeys. SOLGM will be working with the sector, gathering up and sharing examples of great practice, identifying 'next problems'

and supporting the process of innovating solutions. The '*Navigating Critical 21st Century Transitions*' process will be developed over time in response to the evolving support needs of local government managers.

As we get into the complex, messy business of working ourselves through the transitions, we hope this framework will continue to provide a common frame for making sense of where we have got to and what still needs to be achieved.

Above all we hope this framework will provide a sense of agency as we switch the focus from an emphasis on what is challenging us to applying our energy, attention and optimism to how we are going to move forward.

Mā tīni mā mano ka rapa te whai.

By many, by thousands, the work will be accomplished.



This work was commissioned by the New Zealand Society of Local Government Managers (SOLGM) from Dr Stephanie Pride of StratEDGY Strategic Foresight.

Introduction

An unprecedented combination of factors is requiring us to fundamentally change the ways we organise ourselves, our communities and our societies.

Collectively we have created a world where our emissions have destabilised the planet's climate and our waste has disrupted almost every ecosystem on the globe. Our communities are more diverse and mobile than they have ever been, but at a time when community interconnectedness has never been more crucial, a combination of factors is increasing the potential for disconnection, mistrust and hostility. At the same time, both new technologies and social shifts are fundamentally changing the structure and nature of work.

We are facing a confluence of change drivers that is pushing us into 'era-scale' change – change of the same magnitude as that caused by the Industrial Revolution. To protect and enhance well-being under these new conditions, we will need to do almost everything differently.

The role of local government

As suggested in the Foreword, navigating the 'era-scale' transitions in which we find ourselves is a global and a national challenge, as well as a local one. There are some aspects of system change that require international co-operation, others require legislative change to reset the rules and the system incentives.

Local government, however, will be instrumental in how system change translates into doing differently in practice, and has a statutory responsibility to promote the social, economic, environmental and cultural well-being of their communities as we make these transitions.

Climate disruption, waste pressures and automation of work are already threatening to undermine the well-being that currently exists. The changes facing us have the potential to drastically erode future well-being. We will need to take active steps to make these transitions in ways that deliberately protect and maximise well-being and promote equity. We need to do this by design, not by chance.

New assumptions for a new era

In designing and building the new systems, processes, laws and practices to support us doing things differently, we will need to start from a different set of assumptions.

The way we've been doing things has been based on the following default assumptions: *See Fig 1.*

Those assumptions are no longer fit for purpose. They do not fit with external realities, or what is needed to protect and enhance social, economic, environmental and cultural well-being. If those assumptions remain in play, either explicitly in our legislation and policy, or implicitly in our approaches, our practice and customs, then well-being will be undermined. We need to shift away from the underpinning assumptions from the previous era on which our thinking has been based. Part of the way forward will be updating our underlying assumptions so they are fit for purpose to guide us for the new era. *See Fig 2.*

If we are going to lead our communities through this transition in ways that protect well-being, we will need start from a new set of underlying assumptions.

Fundamental change is critical to our survival but at the moment none of us fully have the answers to how we are going to navigate it. In order to respond, we need to learn to do many things very differently. Leading 'era-scale' change in our communities will involve drawing on our collective knowledge, wisdom and imagination to work out how to build new systems based on these new underpinning assumptions.

Fig 1. Assumptions that characterised the previous era

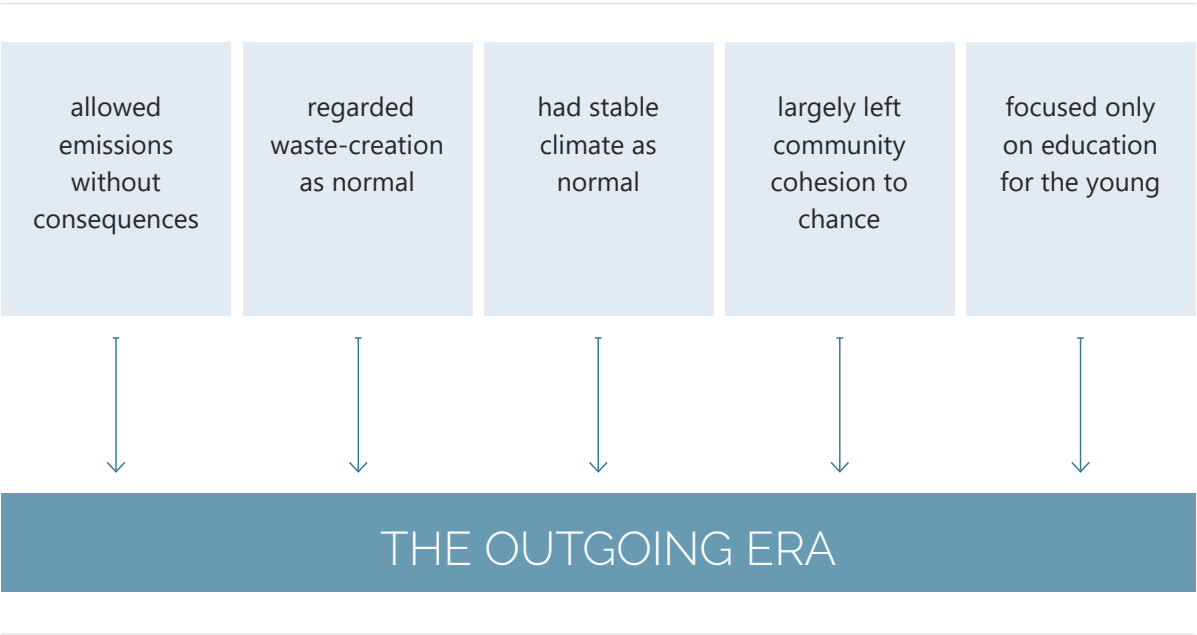
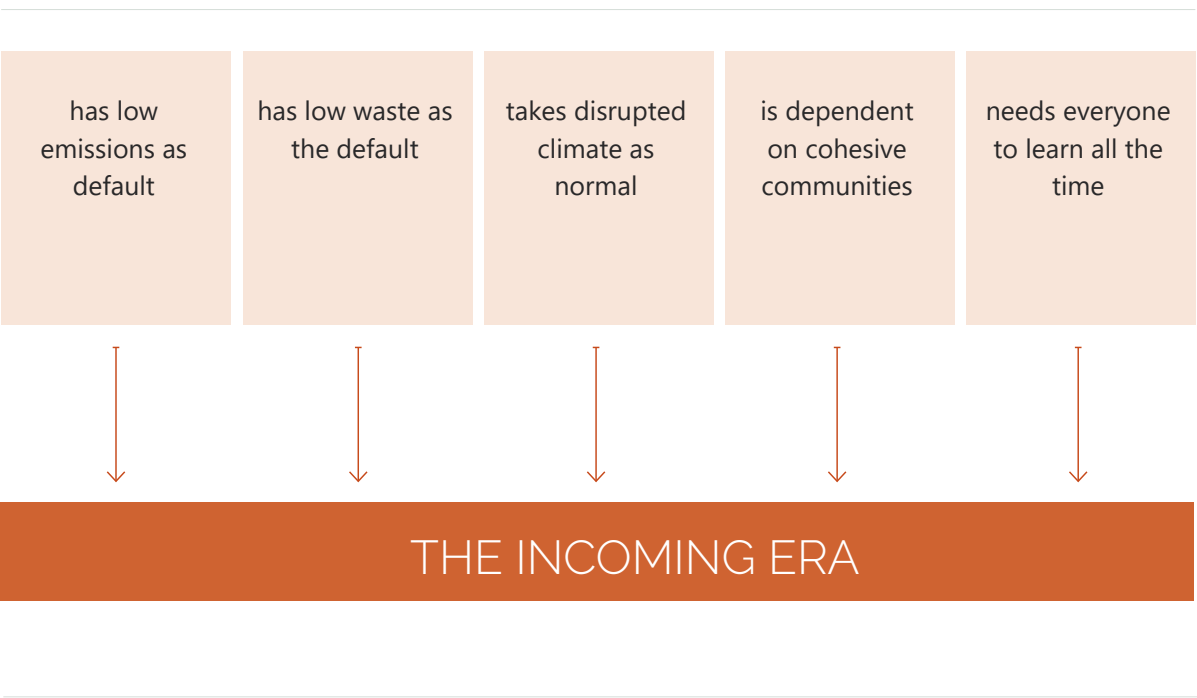


Fig 2. Assumptions that will characterise the coming era



Five transition areas

In this framework, we identify five key areas of transition, all of which have a direct bearing on well-being and require both urgent and ongoing focus.

- **Transition to low emissions living**
- **Transition to living in a disrupted climate**
- **Transition to a low waste society**
- **Transition to community interconnectedness**
- **Transition to learning-empowered communities**

We will need to think in an integrated way about the changes we have to make because there are interconnections across each of these transitions.

Thinking about these five areas in the context of 'era-scale' change creates the opportunity to radically reimagine how new systems can work together and be able to get the co-benefits across each area. Our initiatives can and should contribute to several transitions at once (to ensure that we don't move forward on one transition to the detriment of another).

Transition to low emissions living

Globally we need to halve our emission of 'greenhouse gases' (GHGs) by 2030 in order to have a chance of limiting global warming to 1.5°C according to the IPCC. This will require "rapid and far-reaching" transitions in land, energy, industry, buildings, transport, and cities.¹ We need to move to a society that has low emissions as a default, not as an add-on.

Transition to living in a disrupted climate

Our climate is already disrupted. Many communities in Aotearoa New Zealand are already dealing with the consequences. In the last five years we have already seen temperature and rainfall records broken, an upswing in heatwaves and extreme rainfalls, droughts,

tornadoes, wildfires and flooding. The widespread impacts of this climate disruption on human, economic and natural systems are already occurring and will worsen.

Transition to a low waste society

We have reached a tipping point with our waste. The way we have approached waste historically is no longer going to be feasible. We need to move from our current high waste society to a low waste society. This requires us to rethink every aspect of our approach. We need not only to recover resources at the end of their use rather than disposing of them, but also to only use resources in the first place in ways that will ensure they don't generate waste.

Transition to community interconnectedness

At a time when community interconnectedness has never been more crucial, both as a generator of well-being, and for making the other transitions described in this paper, a combination of factors is increasing the potential for disconnection, mistrust and hostility. Community interconnectedness and the trust it generates will be crucial for making the other transitions described in this paper. They depend on being able to harness innovation and action from everyone.

Transition to learning-empowered communities

We need to learn to survive and thrive under radically different conditions – conditions humans (and the ecosystems in which they live) have never before experienced. At the moment none of us fully have the answers to how we are going to make the transitions being forced upon us. In order to navigate them, we will need everyone's contributions as we learn our way forward together, and to do this everyone needs to be an empowered learner.

¹ <https://www.ipcc.ch/2018/10/08/summary-for-policymakers-of-ipcc-special-report-on-global-warming-of-1-5c-approved-by-governments/>

Three Horizons approach: a shared framework to support our thinking about 'era-scale' change

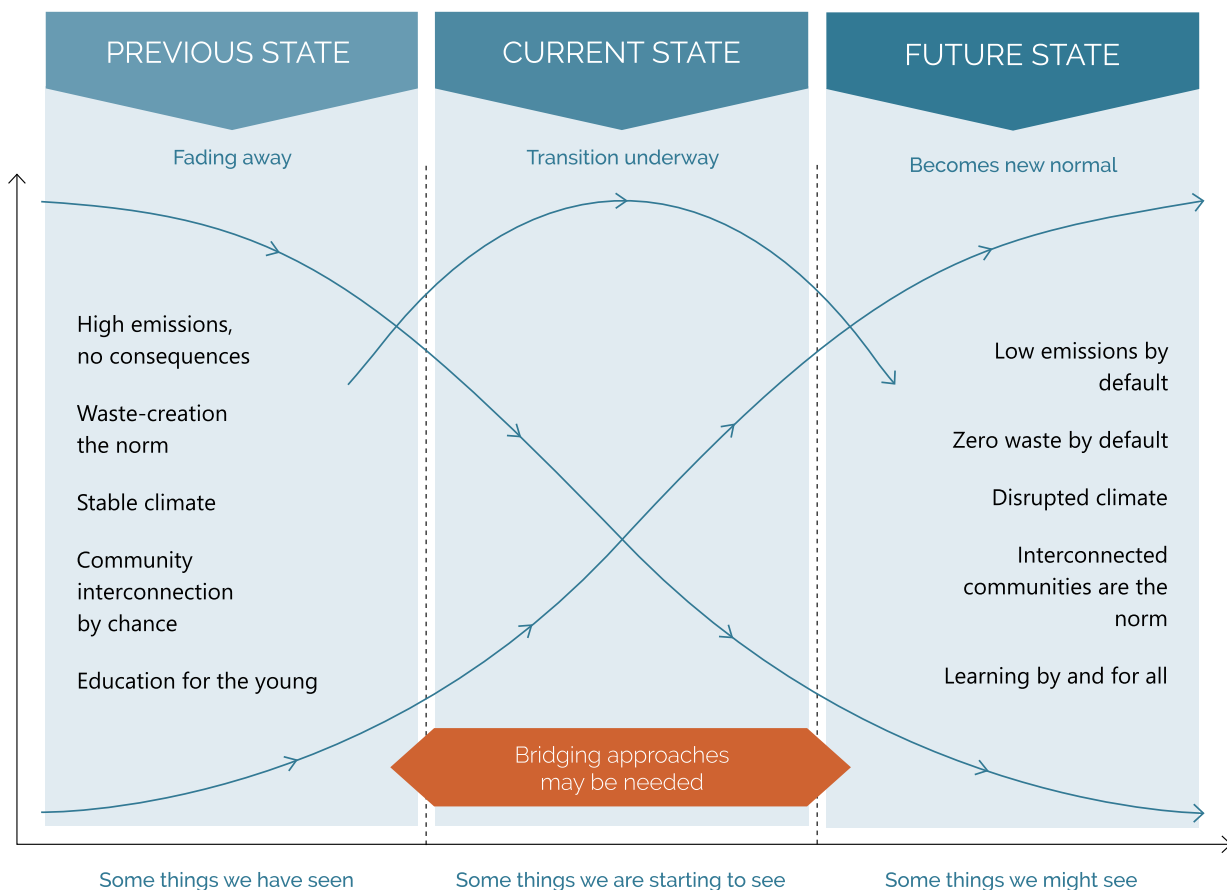
One challenge in leading change of this magnitude is that we are not used to thinking in terms of 'era-scale' change. Our brains are programmed for reacting to the immediate and for patterns that are repeated. Another challenge is that we need to start acting now (actions haven't been fast enough or comprehensive enough to date) but we need to act in relation to a future that is still forming, hasn't fully coalesced or is still to be imagined.

Thinking about 'era-scale' change using a three horizons approachⁱ helps us to deal with these challenges.

It allows us to name the ways we've been doing things - our 'business as usual' that has seemed so normal - as the 'previous state' an era that is fading away.

It allows us to identify the state we need to move to as 'the coming era' and, perhaps most importantly, it allows us to see ourselves in the middle space, in transition, in the process of

Fig 3 Using the Three Horizons framework for navigating 'era-scale' change



moving to the new era, but not yet there. In some parts of our lives, the old ways of thinking and doing dominate our social systems, and in others some of the new ways are gaining ground.

Using a Three Horizons approach:

- helps to provide clarity about the bigger picture of what we are changing from, and what we are changing towards by bringing shifts in assumptions and systems to the surface.
- clarifies the overall direction and destination, but at the same time, it doesn't assume there is only one path, or even that the best path is already known. It helps us all to head in the same direction, but it leaves space for new ways of getting to the destination to emerge.
- allows us to have explicit conversations about whether our strategies and actions are based on assumptions founded in the way we've been organising ourselves up to now, or whether they are based on the assumptions we need for the future.
- provides us with a frame for discussing how much effort and resource we should be putting into:
 - maintaining the status quo (the legacy of the previous state)
 - building infrastructure, services and processes to bring the preferred future into being
 - supporting the process of making the transitions. (In Aotearoa New Zealand, we have a long history of under-resourcing the practical, cognitive and social aspects of making big shifts)
 - enables discussions to focus on how we make the transition from previous to future ways of doing things.

Using a Three Horizons approach provides us with support for acting now in relation to a future that has not yet fully come into being. It allows us to change the narrative - for ourselves – and for our communities and to develop a shared language for paths to navigate change.

It may take decades for us to make the full transition, but over the next crucial decade we need to accelerate our progress towards the new states and that means going faster on building the tangible and intangible infrastructure we need to do so.

The next section describes each strand of the transition landscape individually, but it is important to remember that we need to think about how the new systems can work together to get the co-benefits across each area.

For each transition there is a high-level description of:

- the drivers or imperatives for this transition
- the state we are changing from and the state we need to change to, and
- the assumptions, system characteristics and some things we may see/have seen in each state.

These are **not** detailed roadmaps or blueprints. They provide a high-level overview of the nature of the shifts to be made in order to protect and promote well-being. They describe the broader landscape to support local government managers to think about system shifts in the context of 'era-scale' change. The task of working out what exactly needs to be put in place and what needs to be let go is the work that lies ahead.



Transition to low emissions living²

Globally we need to halve our emission of 'greenhouse gases' (GHGs) by 2030 in order to have a chance of limiting global warming to 1.5°C according to the IPCC. This will require "rapid and far-reaching" transitions in land, energy, industry, buildings, transport, and cities.^{3 4}



Emissions of GHGs caused by human activity are affecting the world's climate, atmosphere and oceans. GHG emissions have accelerated rapidly over the last 12 decades and the consensus of scientific opinion is that they are the key cause of global warming and the resultant climate disruption.⁵ Failure to reduce

emissions and therefore limit global warming will have serious consequences for our people, ecosystems, infrastructure and economy.

Globally, gross emissions of GHGs increased 51% between 1990 and 2013.⁶

New Zealand's gross GHG emissions increased 19.6% between 1990 and 2016.⁷

According to The Productivity Commission, New Zealand's GHG emissions are among the highest per person in the world (despite having an electricity system that is overwhelmingly powered by renewables). Nearly half of New Zealand's total emissions come from the agricultural sector, but the growth in New Zealand's emissions since 1990 is primarily a result of increased use of fossil fuels, particularly for road transport and industrial heat.^{8 ii}

We need to change our mental models, systems and incentives so that the default expectation of low emissions is the starting point for all activity. This goes across the range from macro-to-micro in our decisions about land-use, the type and location of energy generation, what buildings are made from and how they are designed, the type of transport infrastructure and the way we use and move around our towns and cities.

Living, working and leisure will need to be underpinned by low emissions and renewable energy as the default. With this transition we have to think not only at an 'all of community' scale, but also of speed – how much can we accelerate as many strands of this transition as possible?

² This transition focuses on reducing emissions to limit further warming in order to avoid increased climate disturbance and the subsequent increased harm to people and ecosystems. See '*Transition to Living Under Disrupted Climate*' for responses to the climate challenges that are already locked in.

³ <https://www.ipcc.ch/2018/10/08/summary-for-policymakers-of-ipcc-special-report-on-global-warming-of-1-5c-approved-by-governments/>

⁴ Moving to low emissions living will also contribute to moving towards a circular economy. One of the aims of a circular economy is to design out waste and pollution. For more information see <https://www.mfe.govt.nz/wastefreesummer/shop-smart/circular-economy-101> and <https://www.ellenmacarthurfoundation.org/circular-economy/concept>

⁵ 'Climate Change', SOLGM August 2015, p. 7.

⁶ http://archive.stats.govt.nz/browse_for_stats/environment/environmental-reporting-series/environmental-indicators/Home/Atmosphere-and-climate.aspx

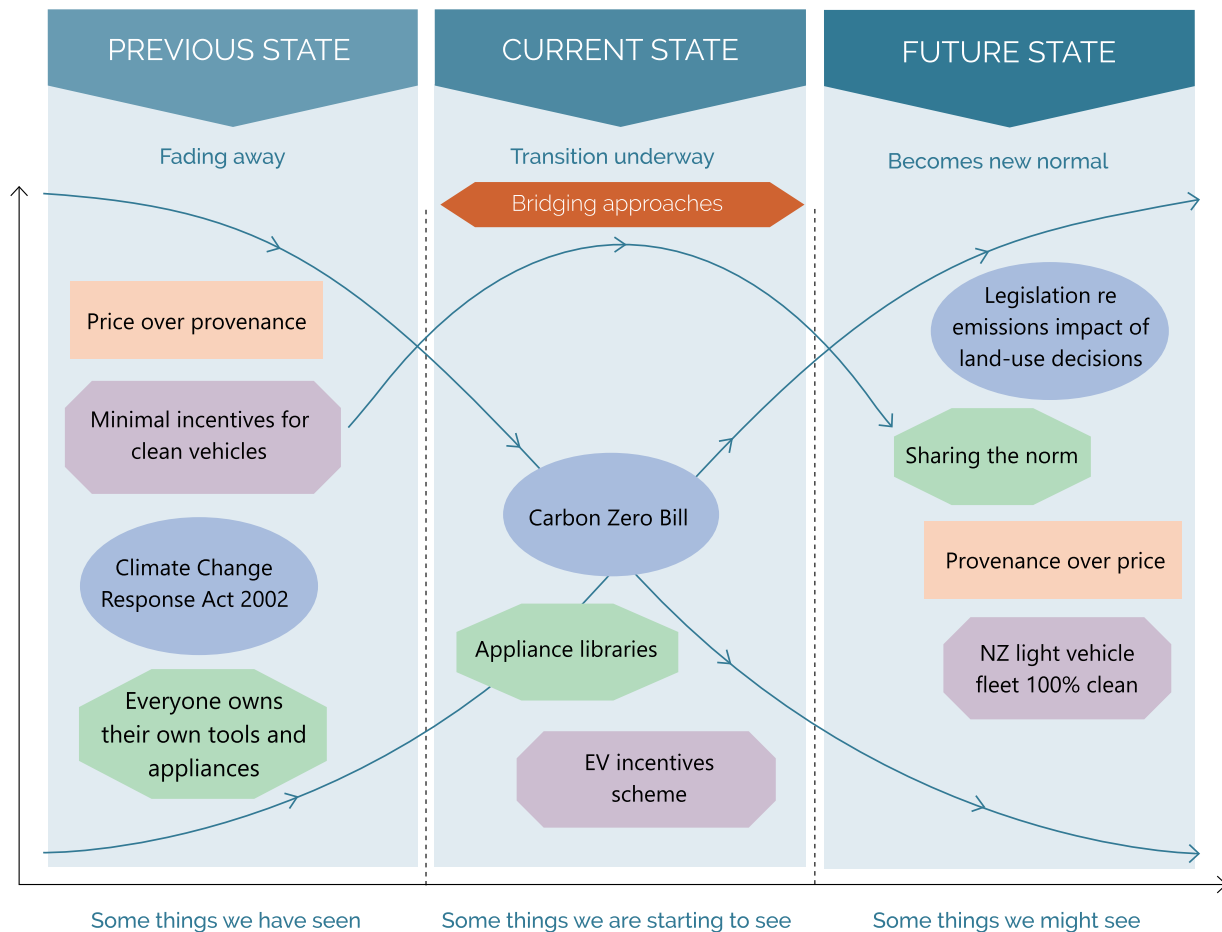
⁷ <https://www.stats.govt.nz/indicators/new-zealands-greenhouse-gas-emissions>

⁸ New Zealand Productivity Commission. (2018). Low-emissions economy: Final report. Available from <https://www.productivity.govt.nz/inquiries/lowemissions/> p. 21.

Changing our underlying assumptions, system settings and the way we do things - transition to low emissions living

	PREVIOUS STATE		FUTURE STATE	
Default assumptions	<ul style="list-style-type: none"> Emissions are harmless Emissions from human activities are externalities and producers have no responsibility for them Emissions do not have to be factored in (or only at a low price and only for some sectors of the economy) The public are more concerned about the price of goods and services than the emissions created in producing them For a majority of the workforce, work happens at a workplace during the daytime on weekdays (industrial, pre-digital model), even if this increases emissions (travel to work and congestion). 		<ul style="list-style-type: none"> Emissions from human activities have serious negative impacts on people and ecosystems both for Aotearoa New Zealand and globally Everyone is responsible for their contribution to emissions Emissions are always factored in The public are concerned about both price and emissions when choosing goods and services For a majority of the workforce, work can happen anywhere at anytime, with respect to the best balance between productivity and emissions. 	Default assumptions
Characteristics of the system	<ul style="list-style-type: none"> The legislative or regulatory incentives to reduce, limit or stop emissions are weak (price has been relatively low) and only cover some activities Systems to track and measure emissions have been nascent or non-existent No system connections (legislative, regulatory, procedural, or Generally Accepted Practice) drawn between land-use decisions and emissions levels No strong incentives for building and transport systems to be designed in ways that reduce or limit future emissions. 		<ul style="list-style-type: none"> There are strong legislative and regulatory incentives to reduce, limit or stop emissions Systems to track and measure emissions are sophisticated and pervasive The frameworks determining land-use decisions put impact on emissions at the front of the decision-making process Ensuring low emissions is a starting point and central consideration for the design of building and transport systems. 	Characteristics of the system
Some things we have seen	<ul style="list-style-type: none"> The negative impact of emissions on well-being was up for debate Aotearoa New Zealand's economy and particular communities dependent on high emissions activities Many businesses and communities unaware of, and/or unconcerned about their emissions profile People and households unaware of their emissions profile Everyone owns their own household tools and appliances (even though they may only use them once a year) Increasing deforestation, as land is converted for housing, industrial buildings, farming. 		<ul style="list-style-type: none"> The negative impact of emissions on well-being is documented and beyond debate High emissions goods and services are no longer part of our economy Low emissions is a key part of marketing and a source of pride for businesses and communities People and households actively track and manage down their emissions Almost all communities have appliance banks or are in exchange networks Intensive reforestation in rural areas and preservation and reintegration of trees in provincial and urban areas. 	Some things we may see

Transition to low emissions living



(The examples in this graphic are illustrative only - a more detailed and comprehensive picture will be built with the sector in the next stage of the Critical C21 Transitions work.)

Transition Underway! Solar farm on council building

Palmerston North City Council has set a target of a 25% reduction in CO2 emissions by 2028. As part of the work towards achieving that goal 400 panels of 100kW solar farm were installed on the roof of the Civic Administration Building and Convention Centre in 2014.

Transition to living in a disrupted climate⁹

Our climate is already disrupted. Global temperatures are already more than 1°C warmer than pre-Industrial Revolution levels.¹⁰ Many communities in Aotearoa New Zealand are already dealing with the consequences.

Last year (2018) was part of a larger warming trend, with four of the past six years in the top five hottest years on record in New Zealand.¹¹ We have also seen an upswing in extreme rainfall, drought, tornadoes, wildfires and flooding. The widespread impacts of this climate disruption on human, economic and natural systems are already occurring and will worsen.

We have been used to regarding severe weather events as the exception. Accepting that we are living under disrupted climate means taking frequent severe weather events as the norm and anticipating what we need to respond and endure.

Aspects that will become the new normal in this transition include, but are not limited to:

- changed land-use patterns, including retreat from flood prone areas, new uses for flood prone or unstable areas that have been retreated from, e.g.
 - wetland crops
 - new waterways and rewilded areas that may give rise to new recreational and economic activity
 - developments to capture energy and water from flood-level water flows etc.
- updated building codes, new building standards and restrictions (including wind tolerance) possibly new designs and modes of production for built infrastructure
- much higher levels of community preparedness for, and resilience in the face of climate-related disasters, including

- much more localised energy generation, water collection and food production – especially for small and remote settlements
- different ways of working and learning that don't rely solely on physical proximity
- much higher level of first aid skills, basic medical training and emergency response know how across all communities.¹²

As already disadvantaged groups are more vulnerable to the impacts of climate change (as a result of limited resources and therefore lower adaptive capacity), we will also need to be deliberate about addressing these inequities in the way we support our communities to transition to living under disrupted climate as the new normal.¹³



⁹ This transition is about living and surviving under an already disrupted climate – so starting off with a focus on coping with the physical environmental phenomena that global warming will create. (There will be social and cultural impacts of this but they aren't the transition in and of itself.)

¹⁰ New Zealand Productivity Commission. (2018). Low-emissions economy: Final report. Available from <https://www.productivity.govt.nz/inquiries/lowemissions/> p. 21

¹¹ NIWA Annual Climate Summary, 2018. https://www.niwa.co.nz/files/2018_Annual_Climate_Summary-NIWA.pdf

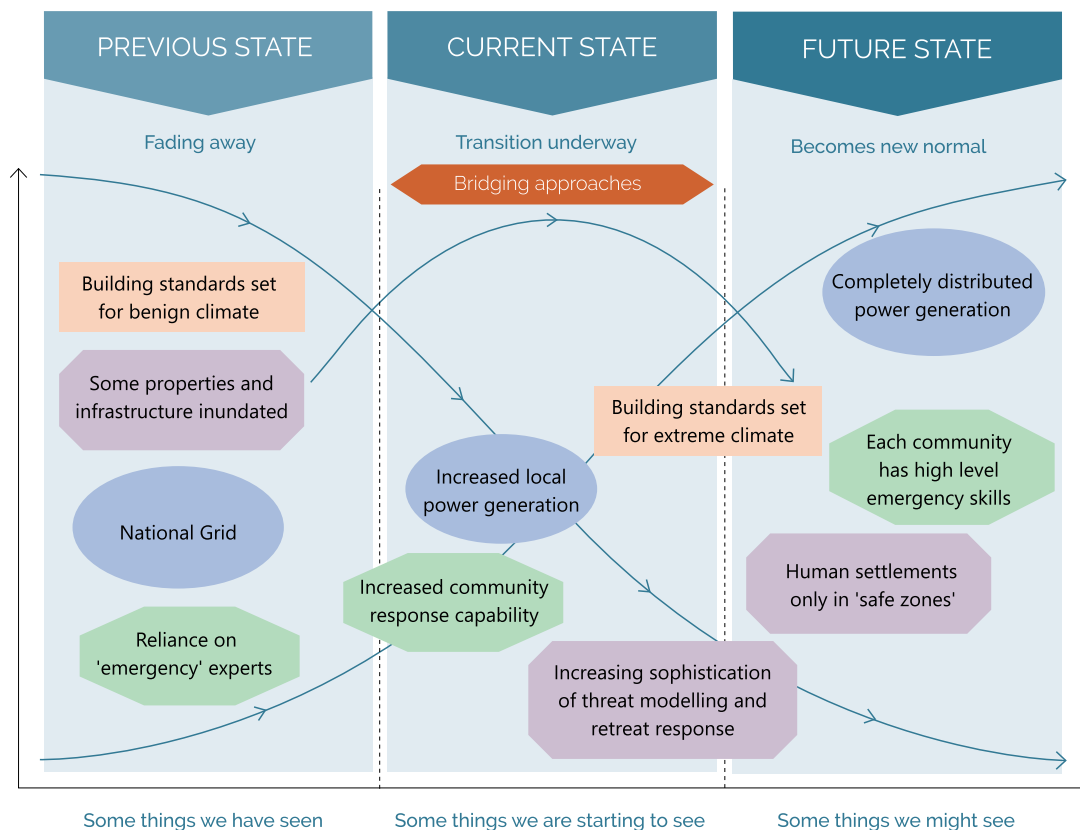
¹² Advances in medical AI have already created robots that can train doctors, and can support doctors to carry out their roles and that can diagnose as accurately as human doctors. In 5-10 years, such technologies may be able to help community-based responders to manage all but the most severe and complex medical issues. (e.g. <https://futurism.com/first-time-robot-passed-medical-licensing-exam>)

¹³ *Overview of Impacts, Adaptation, and Vulnerability to Climate Change* Schneider & Sarukhan, IPCC, p.80

Changing our underlying assumptions, system settings and the way we do things - transition to living in a disrupted climate

	PREVIOUS STATE		FUTURE STATE	
Default assumptions	<ul style="list-style-type: none"> • Extreme weather events are rare • We can protect existing infrastructure • Current settlements will remain viable • Traditional civil defence and emergency management responses will be sufficient • Power is supplied by a national power grid • Power, water and road access can be restored relatively quickly • Restoring power, water and road access is feasible and affordable (i.e. travel in and out of all settlements will remain possible) • We can and must travel for work and learning • Serious medical conditions are not treated in a community setting. 		<ul style="list-style-type: none"> • Extreme weather events are frequent • Land-use takes into account frequent, extreme weather events • Built environment design takes account of frequent, extreme weather events • Built infrastructure is moveable, responsive to changing landforms due to extreme weather • Settlements and suburbs generate their own power • Settlements and suburbs can supply their own water and food for frequent, severe weather emergencies • Settlements can maintain their own connectivity to the internet • Most learning and work can happen without travel • All but the most extreme medical conditions can be treated in a community setting. 	Default assumptions
Characteristics of the system	<ul style="list-style-type: none"> • Building standards set for benign, stable climate • Urban design set for benign, stable climate • Responsibility ceded to experts. 		<ul style="list-style-type: none"> • Building standards set for extreme winds, extreme rainfall, extreme heat • Urban design set for extreme winds, extreme rainfall, extreme heat • Everyone in a community sees themselves as having responsibility for enabling community well-being under disrupted climate • Active monitoring of evolving extreme weather incidents and proactive community planning/response <ul style="list-style-type: none"> - Widely shared understandings of responses needed. 	Characteristics of the system
Some things we have seen	<ul style="list-style-type: none"> • Relatively loose control over where developments can be built. 		<ul style="list-style-type: none"> • Safety first principle integrated into land use legislation and regulation • Rewilding of slip and flood-prone areas, repurposing of salinated land • All settlements are in 'safe zones' (<i>intensification, even in small settlements</i>) • Some settlements completely relocated/abandoned • Shared social responses to extreme weather (<i>in the same way that some communities elsewhere know how to prepare for typhoons/hurricanes now</i>) • Everyone has first aid skills, basic medical training and emergency response know how (<i>in the same way that almost everyone can read, write and drive now, but 100 years ago, many people could do none of these</i>). 	Some things we may see

Transition to living in a disrupted climate



(The examples in this graphic are illustrative only - a more detailed and comprehensive picture will be built with the sector in the next stage of the Critical C21 Transitions work.)

Transition underway! The Clifton to Tangoio Coastal Hazards Strategy 2120

The Clifton to Tangoio Coastal Hazards Strategy 2120 is a joined-up approach to coastal hazards impact management between Hawke's Bay Regional Council, Napier City Council, Hastings District Council and iwi groups Mana Ahuriri, He Toa Takitini and Maungaharuru-Tangitū Trust. It has a focus on long-term workable solutions in order to develop resilient communities out to 2120. Starting in 2014, it has had, at its core, a fully transparent, consultative approach ensuring that stakeholder engagement is comprehensive and consistent throughout the process. Based on high quality data, adaptive pathways for 16 'cells' have been developed, with trigger points for moving to next actions. The OECD has praised the proactive, locally led approach to coastal hazards in the face of climate change and sea level rise and other councils as adopting elements of the Hawke's Bay model.

More information: <https://www.hbcoast.co.nz/strategy-development/>

Transition to a low waste society

We have reached a tipping point with our waste. The way we have approached waste historically is no longer going to be feasible. We need to move from our current high waste society to a low waste society. This requires us to rethink every aspect of our approach.



We need not just to recover resources at the end of their use rather than disposing of them, but also to only use resources in the first place in ways that will ensure they don't generate waste.¹⁴

Aotearoa New Zealand has always had a high waste per capita output, but most people haven't been aware of this. Managing

waste has been out of sight for most communities. Our 'high waste' society has been masked on the one hand by our low population to landmass (until recently it has been relatively easy to find more places to bury our rubbish), and on the other hand by the ability to send our recycling off-shore - particularly the waste that is dirty to recycle or dispose of.

As products have become cheaper to replace than repair, and packaging has grown in status to become an integral part of a product's identity, our waste per capita has grown. Our waste increased from 562.7kg per person in 2012 to 739.7kg per person in 2017 and we're now the third highest per capita waste producer in the OECD.¹⁵ As a society, we don't currently factor in the full cost of waste. These include the costs and consequences of resource depletion, the environmental impacts of resource extraction, and the pollution caused by waste.

With China no longer accepting our recycling, we can no longer put it out of sight. There is increasing pressure on land use, making it harder and more expensive to find places to use for landfills. Increasingly extreme rainfall and flooding is accelerating leaching of toxins from old dumps and threatening to uncover and spread existing landfill across the environment. We are also facing increasing resource scarcity, so we can no longer afford to throw away resources than can be recovered. Our high waste system is generating increasing costs and environmental harm.

We need to change our mental models, systems and incentives so we minimise waste creation in our production and distribution processes, have high public awareness of waste choices and have clear responsibilities for end of use recovery and treatment activities (and associated costs), and low-waste pathways that are easy for the public to access.

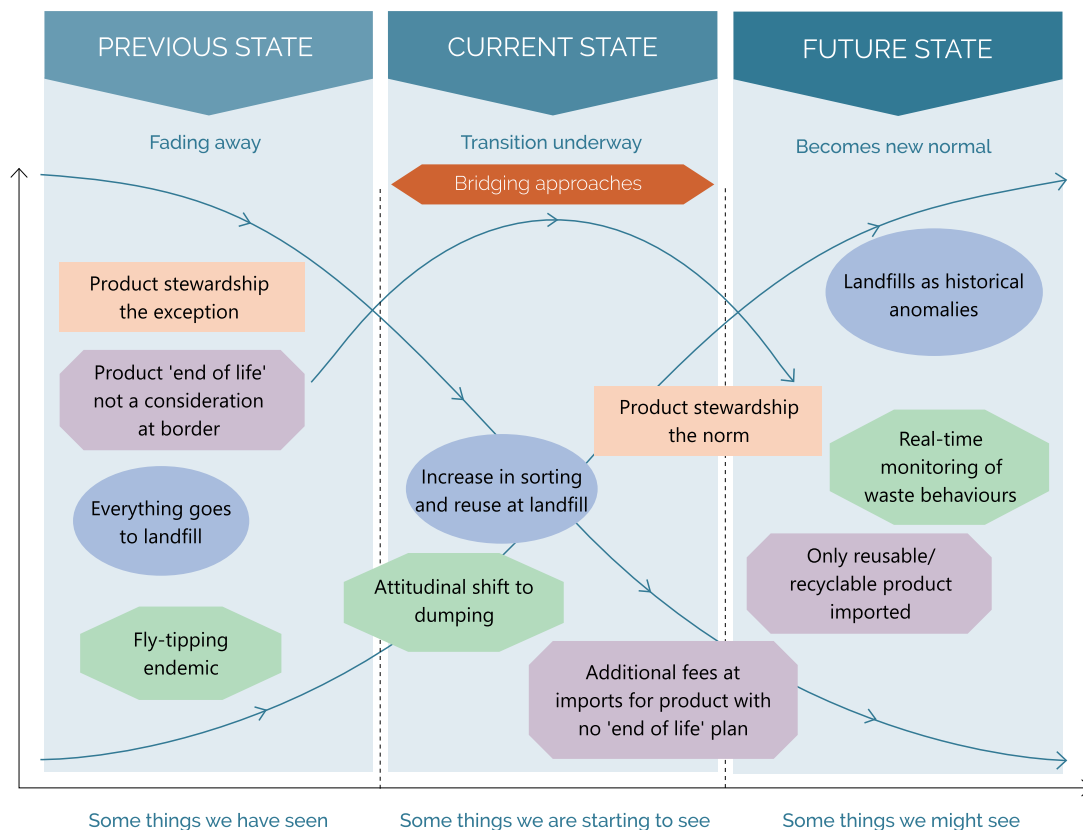
¹⁴ Moving to a low waste society will also contribute to moving towards a circular economy. Two of the aims of a circular economy are to design out waste and pollution, and to keep products and materials in use. For more information see <https://www.mfe.govt.nz/wastefreesummer/shop-smart/circular-economy-101> and <https://www.ellenmacarthurfoundation.org/circular-economy/concept>

¹⁵ OECD Indicators: Municipal Waste. The only higher waste producers than New Zealand in the OECD are the USA and Denmark. Over this period, most other countries waste per capita production has dropped or remained static. In this period, the UK's waste per capita dropped from 473.4kg to 46.7kg. <https://data.oecd.org/waste/municipal-waste.htm>

Changing our underlying assumptions, system settings and the way we do things - transition to a low waste society

	PREVIOUS STATE		FUTURE STATE	
Default assumptions	<ul style="list-style-type: none"> Producers have no responsibilities for waste generated by their product post point of sale Waste doesn't matter as it 'disappears' My waste is not my problem Disposal is socially acceptable Some things can't be recycled/aren't worth recycling. 		<ul style="list-style-type: none"> Producers are responsible for the full life-cycle of what they produce Waste is an unnecessary burden for all of us and the environment I am responsible for my waste Disposal is regarded as antisocial Everything can and should be recycled. 	Default assumptions
Characteristics of the system	<ul style="list-style-type: none"> No incentives and systems for product stewardship No or low costs of disposal for public Limited capacity to monitor waste behaviours Limited powers to enforce waste behaviours. 		<ul style="list-style-type: none"> Product stewardship the norm Recycling is free or remunerative Unnecessary disposal -where recycling is possible - is costly Technology-supported monitoring of waste behaviours Powers to enforce waste behaviours commensurate with impact of waste. 	Characteristics of the system
Some things we have seen	<ul style="list-style-type: none"> Space and cost-pressure on landfill operations Consumer choices driven by price, convenience & quality Packaging as a fundamental form of branding No checks on imports in relation to 'waste impacts'. 		<ul style="list-style-type: none"> Landfills no longer exist – nothing to put in them Consumer choices driven by waste considerations first, then price, quality and convenience The decoupling of branding and packaging Everything that enters the country has to have a sustainable path for its life-cycle as a condition of its entry. 	Some things we may see

Transition to a low waste society



(The examples in this graphic are illustrative only - a more detailed and comprehensive picture will be built with the sector in the next stage of the Critical C21 Transitions work.)

Transition Underway! Information and support for zero waste living

The Rubbish Trip is a not-for-profit zero waste roadshow offering free presentations and workshops to community groups and schools across Aotearoa New Zealand about how and why individuals can reduce their waste footprint. As well as presentations, the team have tips, tricks and Regional Zero Waste Shopping Guides.

More information: <https://therubbishtrip.co.nz/media-and-resources/the-rubbish-trip-resources/>

Transition to community interconnectedness

At a time when community interconnectedness has never been more crucial, both as a generator of well-being, and for making the other transitions described in this paper, a combination of factors is increasing the potential for disconnection, mistrust and hostility.

Globally people are more mobile than ever before and almost all populations have become more culturally and linguistically diverse, some significantly more so. Auckland is now one of the most ethnically diverse cities in the world.¹⁶

Increased diversity has been shown to be beneficial in a range of ways. Diversity has positive correlations with rates of innovation, economic performance, and vibrancy of culture and the well-being of individuals and society as a whole is improved in diverse communities.^{17 iii} The benefits of diversity are, however, only created when inequality is low, and there are strong formal and informal connections across diverse groups. Interconnected communities generate social capital, and social capital contributes to increased resilience.¹⁸

Where increased diversity is combined with inequality of income or opportunity between people of different ethnicities, it can create de facto segregation and have a detrimental impact on trust, participation, community cohesion, social capital and inter-ethnic relations.

Not only have our communities been changing^{19 iv} but, as the other transitions indicate, we are also facing unprecedented change in the external context in which our communities are embedded. Where communities are not already interconnected, the stress of rapid change can increase divisions. Over the next decade we need to deal with fundamental changes in the way we use resources and power our lives, and cope with adverse weather. We are also seeing rapid changes in the nature of work and the economy that are increasing a sense of economic insecurity for many people.

These changes are happening alongside a media and technological environment that can be used to connect or to divide some groups within societies from each other. Manipulative use of some media is actively being used by some to sow distrust and hatred between different social groups. We've already seen this contribute to an upsurge in factionalism and extremism in other countries.

Strengthening connections within and across communities is vital. The trust it generates will be crucial for making the other transitions in ways that enhance equity and increase well-being for all, harness innovation and action from everyone.



¹⁶ <http://worldpopulationreview.com/world-cities/auckland-population/>

¹⁷ See endnote for sources

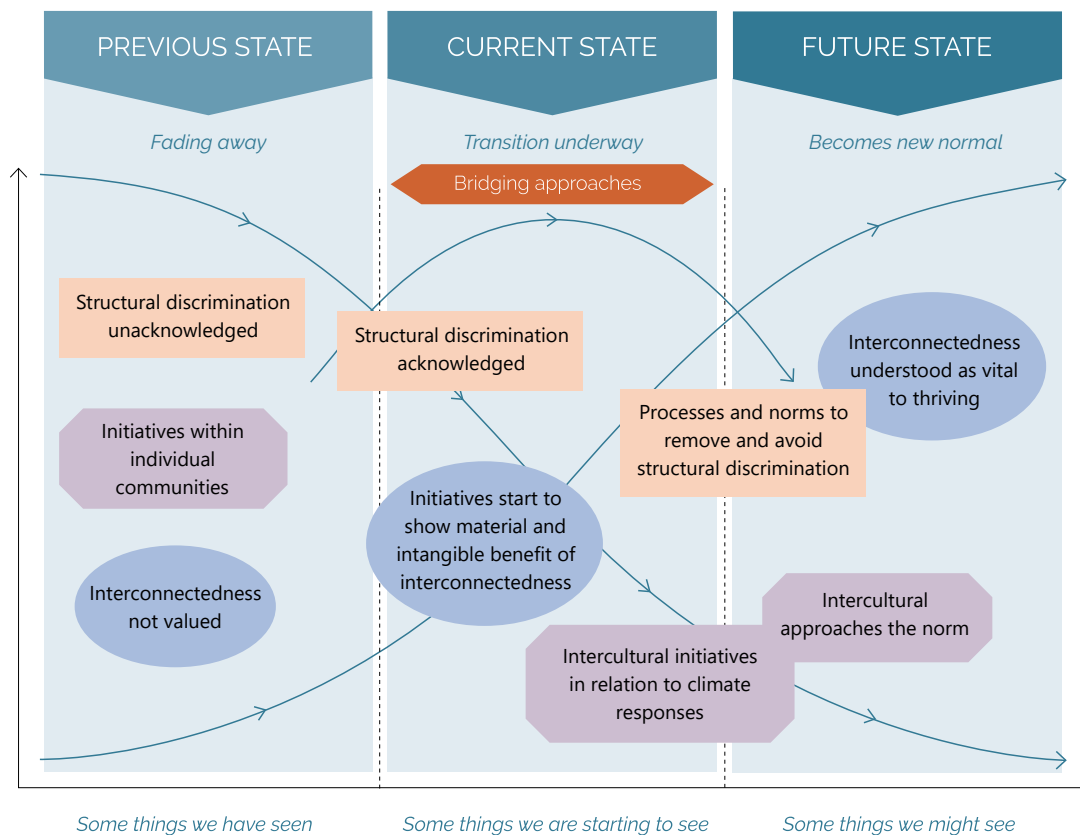
¹⁸ Building Community Resilience Dr Roger Blakely, SOLGM 2016, pp. 9-11.

¹⁹ Changes in workforce participation over the last few decades mean that many people who previously contributed time and energy in activities which connected communities are in paid workforce. See endnote for more detail.

Changing our underlying assumptions, system settings and the way we do things - transition to community interconnectedness

	PREVIOUS STATE		FUTURE STATE	
Default assumptions	<ul style="list-style-type: none"> • Systems seen as neutral – inherent bias not well understood • Almost everyone has a 'fair go' • It's okay for the systems to be designed primarily for and by dominant groups • Community interconnectedness is a fluffy 'nice-to-have' that has no real world impact • Some voices rarely or never heard in mainstream discussions. 		<ul style="list-style-type: none"> • Mechanisms of structural discrimination well understood • Making sure everyone has a 'fair go' requires monitoring for inequality and working to rectify it • There are lots of different people and the systems need to be designed for all of us • Community interconnectedness has a real world impact on our well-being and our resilience • All voices heard. 	Default assumptions
Characteristics of the system	<ul style="list-style-type: none"> • The value in having interconnected communities is not understood or acted on • Inequality, separation and extremism can develop under the radar • Few deliberate processes to build connections across communities • Civic spaces not explicitly designed to foster connections across communities. 		<ul style="list-style-type: none"> • The value in having interconnected communities is well understood by all • Structural discrimination is well understood and the design of systems, processes and projects constantly adjusted to counter it • Processes are designed so that they provide a safe way to bring people together around common goals that transcend differences. 	Characteristics of the system
Some things we have seen	<ul style="list-style-type: none"> • It's easy for people to live without positive encounters with people who have some differences from them • The stories of discriminated groups not heard, or not listened to • Amplifying of negative stereotypes on social media • People more aware of differences than what we have in common. 		<ul style="list-style-type: none"> • Discriminated groups are supported to have a voice and an equal part of the conversation • Everyone knows people who have some differences from them • Everyone sees what they have in common with people who are different from them • Different cultures and traditions are valued because of the different wisdom that they bring. 	Some things we may see

Transition to community interconnectedness



(The examples in this graphic are illustrative only - a more detailed and comprehensive picture will be built with the sector in the next stage of the Critical C21 Transitions work.)

Transition underway! Connecting communities for better emergency preparedness

Many local councils support and participate in Neighbours Day, a not for profit campaign encouraging you to connect with your neighbours and celebrate your neighbourhood. All nine councils in the Wellington region fund the Wellington Region Emergency Management Office and its activities. This year, for the 10th anniversary of Neighbours Day, Wellington Region Emergency Management Office (WREMO), which is funded by all nine Wellington councils, organised eight Community Emergency Hub exercises where people met their neighbours and practiced how their community can respond to an emergency.

More information: <https://wremo.nz/about-us/news/get-to-know-your-neighbours-before-an-emergency-happens/>

<https://neighboursday.org.nz/about/>

Transition to learning-empowered communities

There are two ways in which transitioning to learning-empowered communities is critical for our future. The first is because no-one has ready-made solutions to the new challenges we face so we will need to learn the way forward together. Councils will need to put a learning approach at the forefront of how they work with communities to develop responses. This is because we'll need to draw on all knowledges and all experiences to find solutions to how we live under a disrupted climate - how we halve our emissions, how we connect our communities, and how we change our systems to design out waste. To do this, everyone will need to be empowered to learn and the ability to learn together will become a vital community competency.

The thriving communities of the future will be communities of people who are confident they can learn. In the past, learning has

been associated with formal and compulsory education, which happened for most people at the beginning of their lives, and it may be many decades since they have thought of themselves as learners. For many people, their confidence in themselves as learners is low or non-existent, so to fully engage people, councils will need to use approaches that rebuild people's confidence – and enjoyment – in their capacity to learn.

The extent to which communities can bring a learning approach to making the transitions that face us will determine the extent to which well-being is enhanced or eroded as we move into situations we've never encountered.²⁰

The second way in which transitioning to learning-empowered communities is critical for our future is related to the way in which automation is changing the nature of work. All routine work, both manual and cognitive, is being automated and jobs that consist only of routine work will disappear.²¹ The work for humans will be the work that requires finding innovative solutions for never-before-encountered challenges, so the capacity to learn will become critical.

The impacts of automation on work will not be distributed evenly²² and some communities and some groups within communities will be hit harder than others.²³ Because of this, ensuring ongoing access to learning opportunities - of all kinds - will need to be a much more significant part of council's social, cultural, environmental and economic development strategies. This is not to suggest that local government has the sole responsibility in this area, but that working with others to ensure communities have access to the learning they need, will become a much more prominent part of ensuring equity and well-being.²⁴



²⁰ Miller, Riel 'Learning, the Future, and Complexity: An Essay on the Emergence of Futures Literacy' European Journal of Education https://www.researchgate.net/publication/285051882_Learning_the_Future_and_Complexity_An_Essay_on_the_Emergence_of_Futures_Literacy

²¹ 'Automation and the future of work: understanding the numbers', Prof. Michael Osborne, Oxford Martin School, 13 April 2018 <https://www.oxfordmartin.ox.ac.uk/blog/automation-and-the-future-of-work-understanding-the-numbers>

²² 'The impacts of job-displacement on workers by education level', Dean Hyslop, Motu Economic and Public Policy Research, August 2019 https://www.productivity.govt.nz/assets/Documents/6fda36e50d/Motu-Aug-2019_The-impacts-of-job-displacement-on-workers-by-education-level.pdf

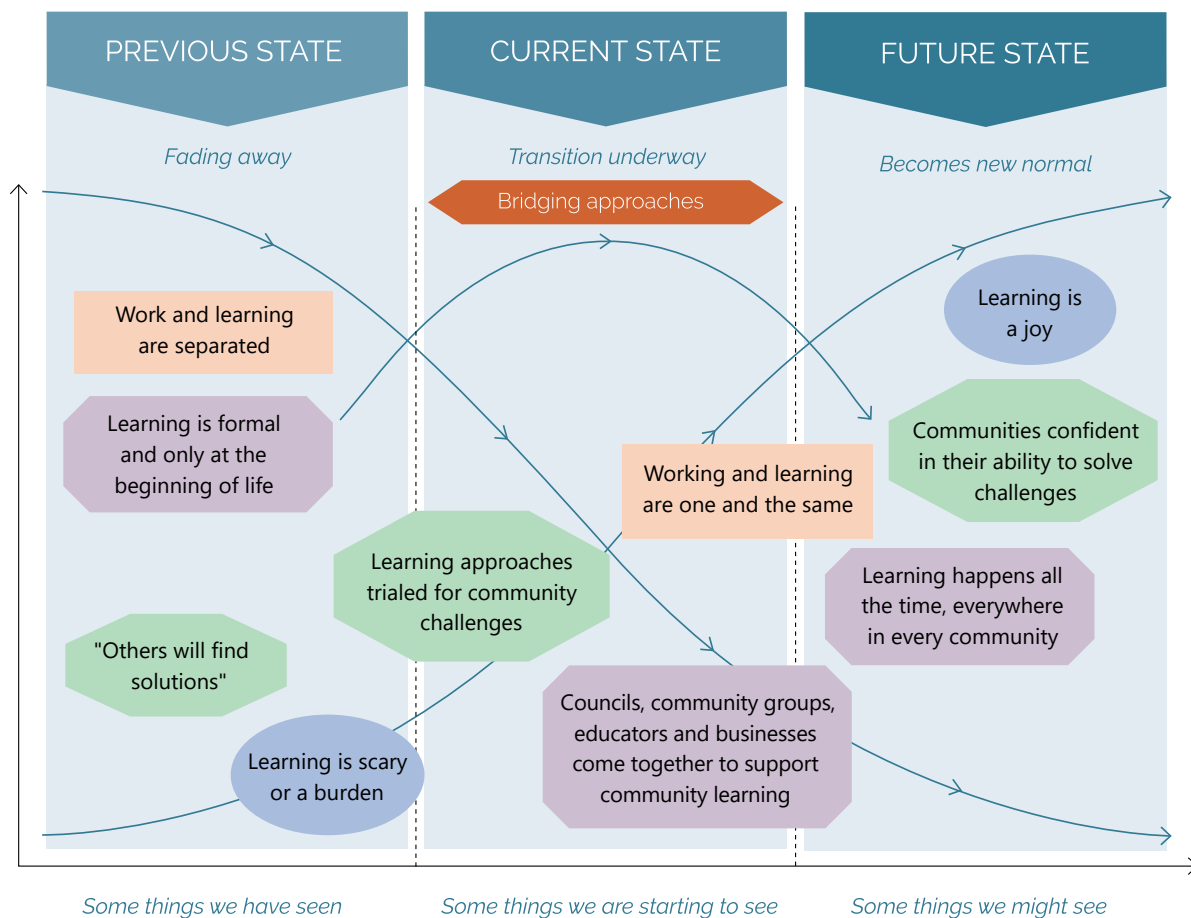
²³ E.g. <https://www.stuff.co.nz/southland-times/news/105058851/southland-at-risk-of-losing-high-percentage-of-jobs-to-automation-in-next-20-years?rm=a>

²⁴ At the moment, learning new skills in order to be able to do different work is seen as the responsibility of individuals, but with our current structures, in many communities it is simply not feasible for individuals alone to bridge the learning gap. A community-level response is also needed.

Changing our underlying assumptions, system settings and the way we do things - transition to learning-empowered communities

	PREVIOUS STATE	FUTURE STATE	
Default assumptions	<ul style="list-style-type: none"> Life is front-ended with education Working comes after learning Work (both manual and cognitive) is primarily routine. 	<ul style="list-style-type: none"> Learning is needed at all stages of life Almost all routine work has been automated Working involves learning as an integral part of work We are deliberate about using 'learning mode' to solve problems. 	Default assumptions
Characteristics of the system	<ul style="list-style-type: none"> Learning funded and supported primarily in youth Learning separated from the rest of life Systems redesign was the preserve of experts Mismatch between national education arrangements and local learning needs. 	<ul style="list-style-type: none"> Everyone is supported to learn Learning pervades everything Everyone contributes to systems redesign Seamless integrated 'learning system' that meets local learning needs. 	Characteristics of the system
Some things we have seen	<ul style="list-style-type: none"> Only certain people get to be involved in innovation Learning regarded as a task/burden by many. 	<ul style="list-style-type: none"> Communities able and empowered to learn the things they need to ensure well-being Using everyone's capacity for ideas and innovation Learning as a site of joy and excitement Communities connected through learning endeavours Community learning compacts: community determines what the community needs to learn (to be more climate-resilient, or reduce waste etc) and pools resources to make it happen. 	Some things we may see

Transition to learning-empowered communities



(The examples in this graphic are illustrative only - a more detailed and comprehensive picture will be built with the sector in the next stage of the Critical C21 Transitions work.)

Transition underway! Community-owned clean energy delivered through empowering and upskilling communities

Awel Aman Tawe (AAT) provides an example of working to reduce emissions in ways that engage, empower and upskill local communities.

AAT is a Welsh community energy project founded in 1998 with the purpose of addressing climate change at a local level by developing community renewable energy schemes. AAT is embedded in the community - its small staff and active volunteer group live in the area, and it is committed to protecting the outstanding natural environment of the neighbourhood. It works to raise awareness of the importance of clean energy in the fight against the threat of climate change through a sustained programme of information, communication and consultation and, more recently, through an innovative range of arts activities related to climate change that often reach people at a deeper level and empower communities. The quality of its work has been recognised nationally and internationally.

It has made a difference to the lives of people at the top of the Swansea and Amman Valleys by bringing clean electricity, jobs and regeneration to the villages near the Mynydd y Gwrhyd. Among other projects it has built a two-turbine community wind farm high up on the Gwrhyd, a £6million asset that has brought in low carbon energy and construction contracts to the area, together with an annual income stream from the sale of electricity of around £200,000 that helps to fund local projects. It has also created energy efficiency training and jobs for local people in energy surveys, insulation and other improvement work. It has initiated and delivered many local projects, and supported projects developed by other communities.

More information: <http://awel.coop/>

Transition underway! The Southern Initiative's Employment and Skills programmes

Auckland Council set up The Southern Initiative (TSI) to champion, stimulate and enable social and community innovation in South Auckland. Because TSI takes a systems view, it recognises that for the community to transform, and be ahead of the curve in an increasingly globalised and technological world, its people must have skills and access to meaningful and high value employment opportunities. Working with businesses and training providers, two of the programmes it offers are free trades training to Māori and Pasifika people, focusing on courses connected to council activities, such as infrastructure and construction, and Youthful, a free digital job opportunity and micro skills training platform targeting employers willing to accept applicants based on attitude and potential.

More information: <https://www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/place-based-plans/Pages/southern-initiative.aspx>

Selection criteria for the transitions

The transition to the incoming era will be multi-faceted because 'era-scale' change involves changing almost everything about what we do and how we do it. One of the challenges in developing this work has been to articulate the transitions at a level that is inherently useful, i.e. a level at which people can use them both to build shared understandings of the big picture, and as a starting point for making change on the ground.

Each transition needed to be expressed at a high enough level to signal a fundamental shift from one state and set of assumptions to a new state and a new set of underpinning assumptions

Each transition needed to be distinct enough from the other transitions so that what was under discussion in each area was really clear to people.

Each transition needed to be both relevant to, and urgent for the work of the local government sector.

The following criteria were used to select a group of transition areas at an appropriate level of granularity:

- The transition requires urgent action
- The transition requires action at scale
- The transition is sufficiently high level (i.e. not a sub-set of a more significant transition)
- The transition clearly overlaps with local government's existing statutory responsibilities
- The transition is directly relevant to, and will impact on local government's current activities
- Non- or late engagement with the transition is likely to increase costs for local government
- Lack of engagement with the transition may undermine social well-being
- Lack of engagement with the transition may undermine cultural well-being
- Lack of engagement with the transition may undermine environmental well-being
- Lack of engagement with the transition may undermine economic well-being
- Active engagement with the transition creates the opportunity to enhance social well-being
- Active engagement with the transition creates the opportunity to enhance cultural well-being
- Active engagement with the transition creates the opportunity to enhance environmental well-being
- Active engagement with the transition creates the opportunity to enhance economic well-being.



Provenance

This work was commissioned by the New Zealand Society of Local Government Managers (SOLGM) from Dr Stephanie Pride of StratEDGY Strategic Foresight, a New Zealand-based futures consultancy (www.stratedgy.co.nz).

In developing this report, Dr Pride has drawn on two decades of futuring experience where she has worked with local government, central government, the not-for profit sector and academia in Aotearoa New Zealand.



Dr Stephanie Pride

Endnotes

ⁱ The Three Horizons model was first developed in foresight by Bill Sharpe et al (for more information see e.g. Sharpe, B., A. Hodgson, G. Leicester, A. Lyon, and I. Fazey. 2016. Three horizons: a pathways practice for transformation. *Ecology and Society* 21(2):47. <http://dx.doi.org/10.5751/ES-08388-210247>). It has been further developed by Andrew Curry et al. (for more information see e.g. *Seeing in Multiple Horizons: Connecting Futures to Strategy* Andrew Curry, Henley Centre Headlight Vision United Kingdom, Anthony Hodgson Decision Integrity United Kingdom, *Journal of Futures Studies*, August 2008, 13(1): 1 – 20). The Sharpe/Curry approach to Three Horizons is a powerful way of framing change. (It is not to be confused with the McKinsey's adaptation of the 'Three Horizons' approach, which is more much more limited.)

ⁱⁱ The Productivity Commission report goes on to say "While per person emissions are high, New Zealand's total emissions make up less than 0.2% of global emissions. Actions in New Zealand will not make an appreciable difference to the global climate-change trend. This exemplifies the public policy challenge of climate change. It is a classic example of the "tragedy of the commons", in which individuals acting in their own interests damage resources belonging to the wider community. The "commons" in this case is a truly global resource – the shared atmosphere upon which life depends – and its limited ability to absorb GHG emissions without giving rise to climate disruptions. So, while it is small, New Zealand's size does not justify inaction – despite the incentives to free-ride. Indeed, quite the opposite. Around a quarter of global emissions come from small emitters (countries with emissions less than 1% of global total). Collectively, small emitters do matter and a global, concerted effort is needed."

p.21 <https://www.productivity.govt.nz/inquiries/lowemissions/>

ⁱⁱⁱ The material in the community interconnectedness transition was drawn from a wide number of sources, including the following:

Global Terrorism Index 2016 "Unlike home-grown groups, education and employment opportunities seem to influence membership of international terrorist groups. Recruits to ISIL generally have higher levels of education and lower income status. . . There is speculation that this disconnect between education and opportunity may have been a motivating factor for recruits joining ISIL out of a sense of frustration"

<http://economicsandpeace.org/wp-content/uploads/2016/11/Global-Terrorism-Index-2016.2.pdf>

Caught in the Net: The Impact of "Extremist" Speech Regulations on Human Rights Content <https://www.eff.org/wp/caught-net-impact-extremist-speech-regulations-human-rights-content>

"Strong social connections are fundamental to physical and mental well-being. But recent research shows that the negative health consequences of chronic isolation and loneliness, while harmful at any age, are especially so for older adults. According to a study published last year in Perspectives on Psychological Science, the health effects of prolonged isolation are equivalent to smoking 15 cigarettes a day. An earlier report found that subjective feelings of loneliness can increase the risk of death by anywhere from 26 percent to 45 percent." "Foundation-Draws-Attention-to-Social-Isolation-with-the-Launch-of-Connect2Affect", *Aspen Institute*

<https://press.aarp.org/2016-12-07-AARP-Foundation-Draws-Attention-to-Social-Isolation-with-the-Launch-of-Connect2Affect>

The Start of a Conversation on the Value of New Zealand's Social Capital Dr Margreet Frieling Office of the Chief Economic Adviser Living Standards Series: Discussion Paper 18/04

<https://treasury.govt.nz/sites/default/files/2018-02/dp18-04.pdf>

"If you could do one thing..." 10 local actions to promote social integration.

<https://www.thebritishacademy.ac.uk/sites/default/files/British%20Academy%20IYCDOT%20Essays.pdf?ga=2.107907525.656054774.1566356834-426109548.1566356834>

^{iv} Workforce participation by women doubled between 1977 and 2017 (<https://ourworldindata.org/female-labor-supply>) Within the OECD New Zealand recorded the second highest employment rate of people aged 55-64 years. By 2030 it is projected that 30 percent of people aged 65 and over in New Zealand will still be in the workforce. Up from 19 percent in 2011 (<https://partnersinchange.co.nz/workforce-ageing/>)

Almost all sectors are being reshaped by technology: from agriculture to law, routine tasks are being automated. Changing climate and a focus on emissions is also challenging both individual businesses and whole sectors. Some sectors are booming whilst others are struggling. There is also the emergence of a two tier labour market, with a widening gap between the remuneration for skilled and unskilled workers.

