

# Future Implications Tauranga

Environmental Scan and Report

March 2020

**wsp** Future Ready®



*Tauranga City*

# Contents

## Executive Summary and Methodology

## Environmental Scan

- Separate pack

## Report and Insights

## Appendix

- Future Implications stakeholder workshop output data

# Executive Summary

To support Tauranga City Council's strategic review, WSP was commissioned to:

- Provide an **evidence based Environmental Scan** of Tauranga over the next 30-40 years based on global and national future trends relating to climate, society, technology and resources.
- Conduct ten **workshops to understand the different perspectives of (24) stakeholder groups** and what they believed were the most relevant, and highest priority future implications for Tauranga over the next 15 to 20 years.
- Produce a **Future Implications Report** based on the stakeholder workshop results, blind spots and opportunities.

The stakeholder workshops were conducted using **WSP's Future Ready® Methodology**. This methodology provided an evidence led approach to identifying future implications for Tauranga of key global, national and local trends based on primary and secondary research.

Based on the **stakeholder assessment of the most relevant and highest priority future implications for Tauranga**, the following themes have been identified:

## Critical and High Priorities:

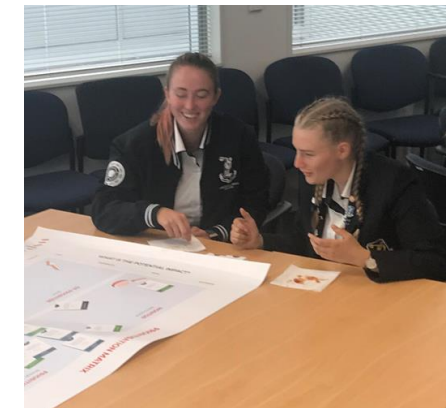
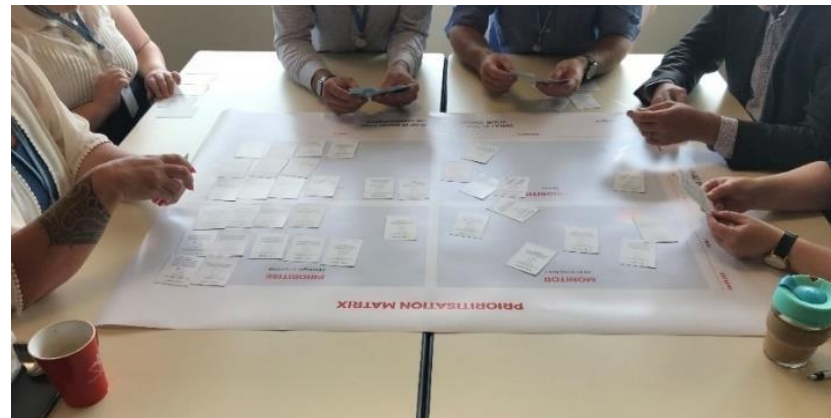
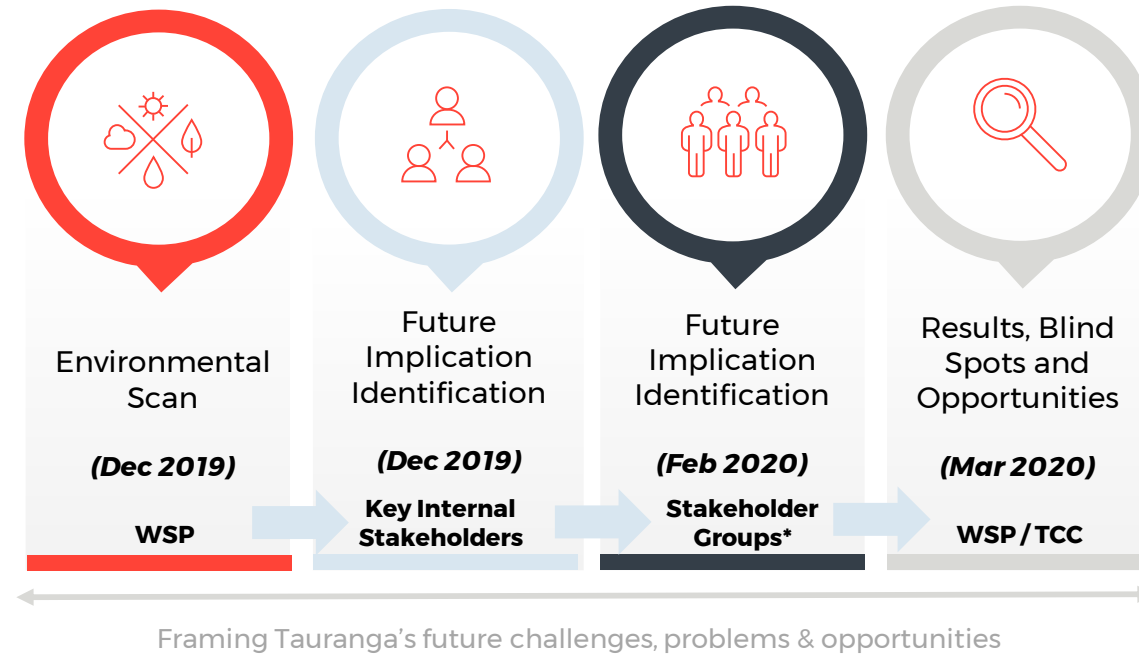
- **Resilience and reliability** of Tauranga (a city that will stand the test of time);
- **Connected communities** (ensuring the city is vibrant and inclusive);
- **Climate Risk and Hazard Management.**

## Observations, Blind spots and Opportunities:

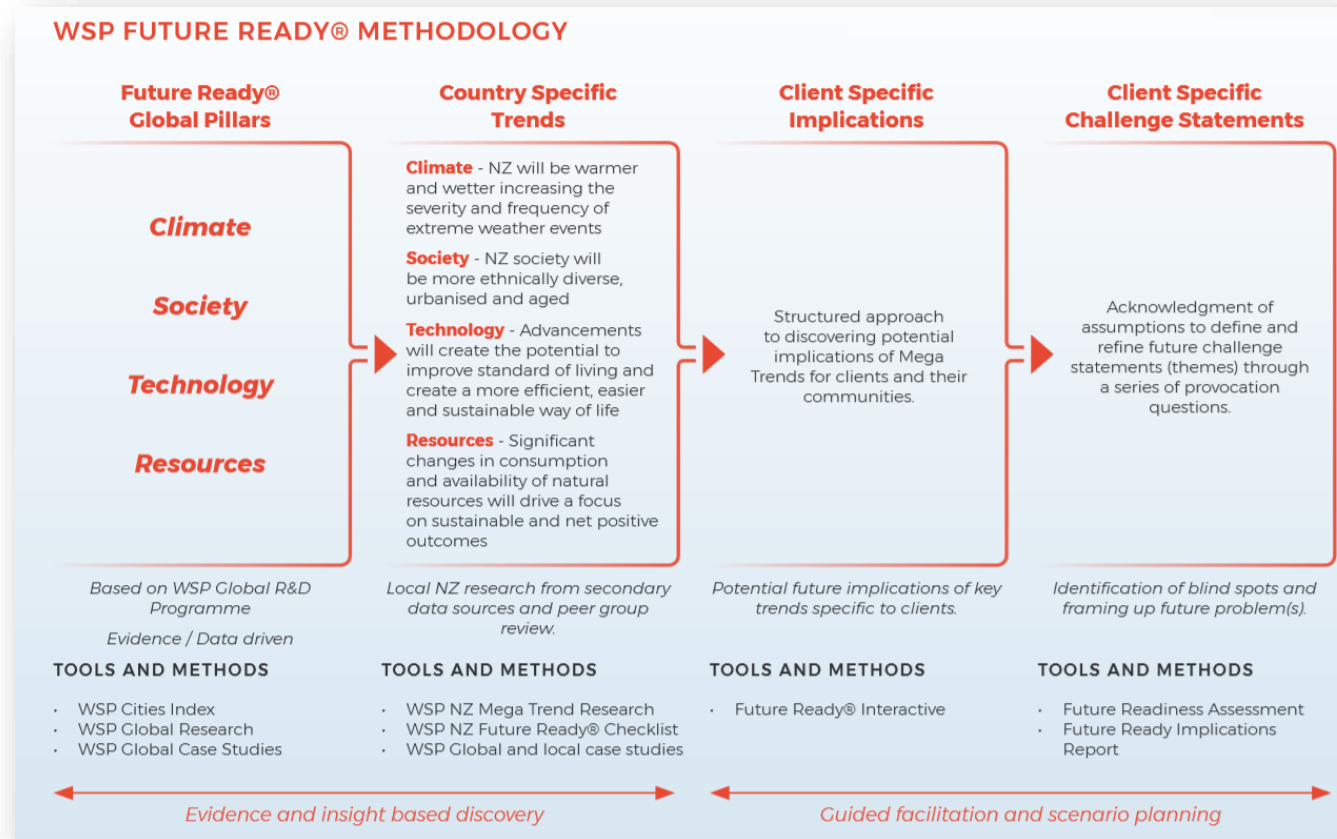
- Understandably stakeholders tended to prioritise Implications which were more immediate and apparent (for example the impact of climate change/extreme weather) over other Implications where the impact was probably less well understood (for example technology changes).
- Potential blind spots and opportunities include: leveraging **Carbon Zero** and **All Electric**; understanding **Generational Differences**; and impacts of an **Evolving Workforce**.
- The Elected Members were well aligned with other stakeholder groups in their assessment of Future Implications with the exception of the Youth Group (refer Appendix slide 32).

# WSP and Tauranga City Council Collaboration Journey

From December 2019, WSP and TCC partnered to identify Tauranga's highest priority future challenges and opportunities based on the evidence based Future Ready® Methodology.



# RECAP: WSP Future Ready® Methodology



## Future Ready® Implication Report

- Tauranga Environment Scan
- Workshop Results
- Opportunities
- Blind spots

## Future Ready® Implication Workshops

- Tauranga Environment Scan Summary
- 10x Stakeholder Group Workshops
- 24x Workshop Groups



# RECAP: Workshop Mindset / Participation Guidelines

## Workshop Tools



- **74 Future Implication Cards** (Evidence based implications for NZ using secondary research sources)



- **Priority Matrix** used by stakeholder groups to assess the likelihood of implications happening vs their potential impact on Tauranga

## Workshop Overview

- **24x** Stakeholder Groups\*
- **10x** 3-hour Workshops Delivered
- All participants were instructed to think like a vested member of the community and assess implications on a **15 – 20 year timeframe**.

## Future Ready® design principles

Critically thinking about the future in a way that stimulates meaningful action in the present

1. Never try to predict the future
2. Apply evidence based insights over intuition
3. Acknowledge your assumptions
4. Think long term so design is adaptive

## Workshop mindset

1. **Acknowledge your assumptions and be evidence led** (consider the research available to us)
2. **Wear your citizen hat first** (we're here because we care about our city)
3. **Apply 80/20 rule** (we're here to discern key priorities and themes)
4. **Long-term focus** (future of Tauranga 15-20 years from now)
5. **Be comfortable with ambiguity**

\*Stakeholder Groups were drawn from a broad cross section of the community and included: business groups, community groups, tangata whenua and youth groups. The participants also included the Mayor, Elected Members, and employees of Tauranga City Council.



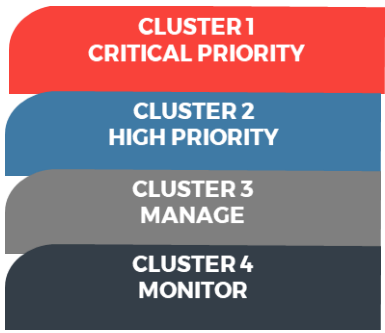
# Results and Insights

# Methodology to Collate Results and Generate Insights

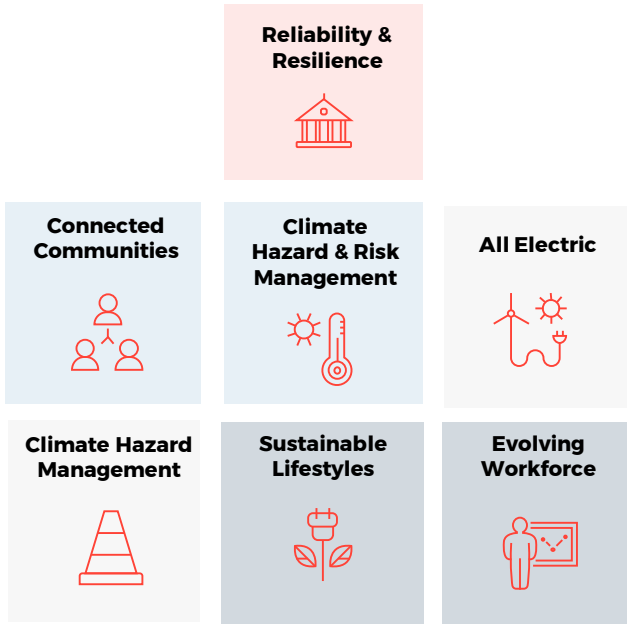


Implications where there was the greatest alignment across stakeholder groups about what was most important for Tauranga

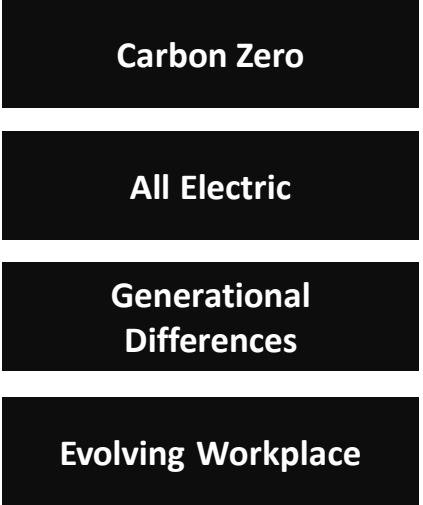
Clusters of similar or related Implications



Response Themes assigned based on clusters










Potential Blind Spots and Opportunities identified





# Seven Response Themes Emerged From the Stakeholder Groups, Driven by Four Cluster Groups



		Stakeholder Alignment						
		CLUSTER 1 CRITICAL PRIORITY	CLUSTER 2 HIGH PRIORITY	CLUSTER 3 MANAGE	CLUSTER 4 MONITOR			
		<i>~90% Groups Prioritised</i>  Unanimously agreed by all groups and can be considered non-negotiable.  These are the Implications that singularly require a immediate response	<i>~50 – 90% Groups Prioritised</i>  General consensus that these implications were somewhat of a priority  Varying levels on agreement of likelihood or impact of Implications	<i>&gt;75% Groups Prioritised &amp; Managed</i>  The groups felt these would likely happen but couldn't align on impact to prioritise them	<i>&gt;60% Groups Prioritised &amp; Monitored</i>  The groups felt these would be unlikely to happen but if they did, would have a big impact on Tauranga City			
Potential Response		<i>Strategic Response</i>	<i>Response with Community Engagement</i>	<i>Management Plan</i>	<i>Watching Brief</i>			
Potential Response Themes		<b>Reliability &amp; Resilience</b> 	<b>Connected Communities</b> 	<b>Climate Hazard &amp; Risk Management</b> 	<b>All Electric</b> 	<b>Climate Hazard Management</b> 	<b>Sustainable Lifestyles</b> 	<b>Evolving Workforce</b> 
What our community wants		A city that will stand the test of time	A city that's inclusive and vibrant	A city that's resilient to climate change	A city that supports a variety of transport options	A city that's responsive to extreme weather	A city that promotes a circular economy	A workforce that's resilient to changes

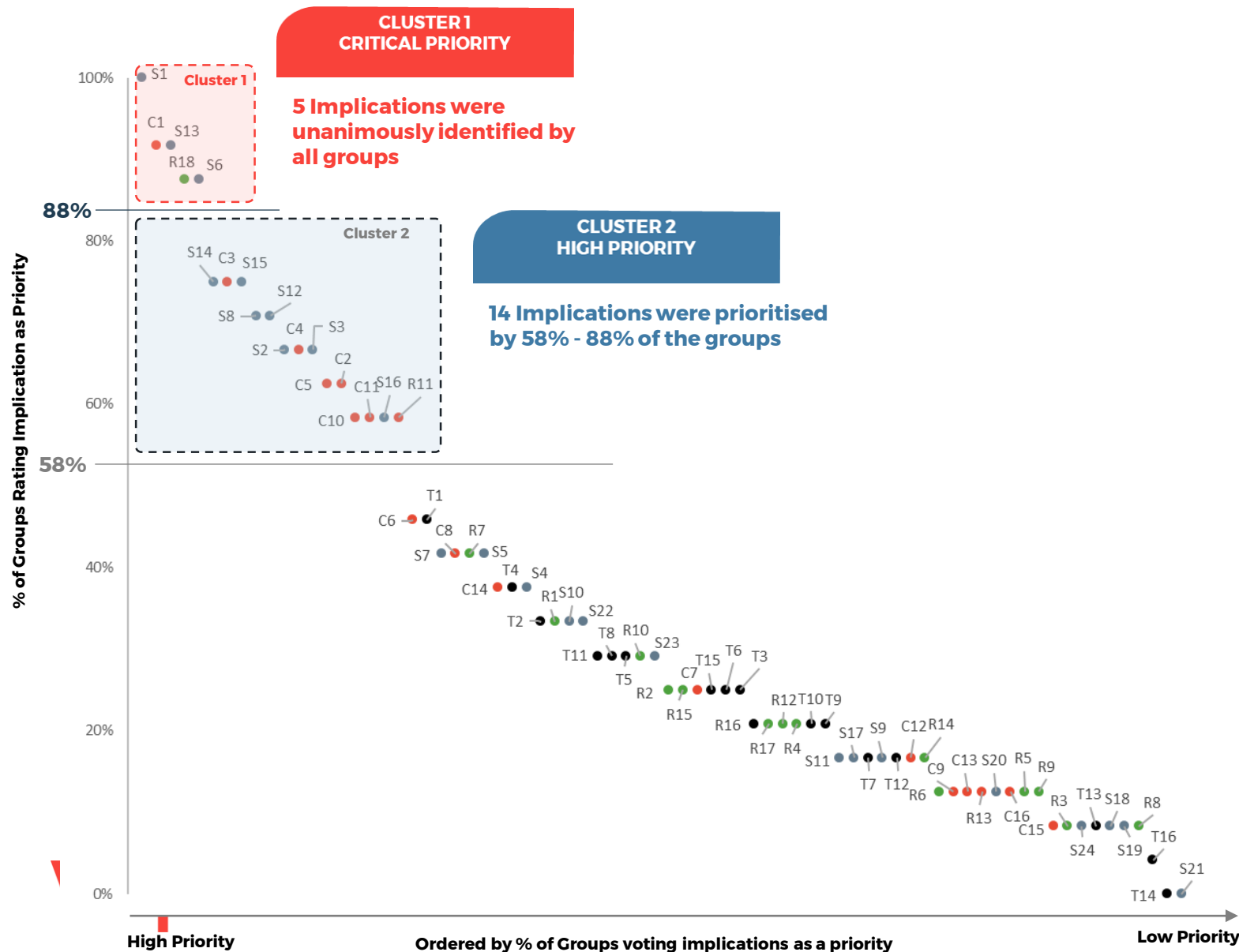


**CLUSTER 1  
CRITICAL PRIORITY**



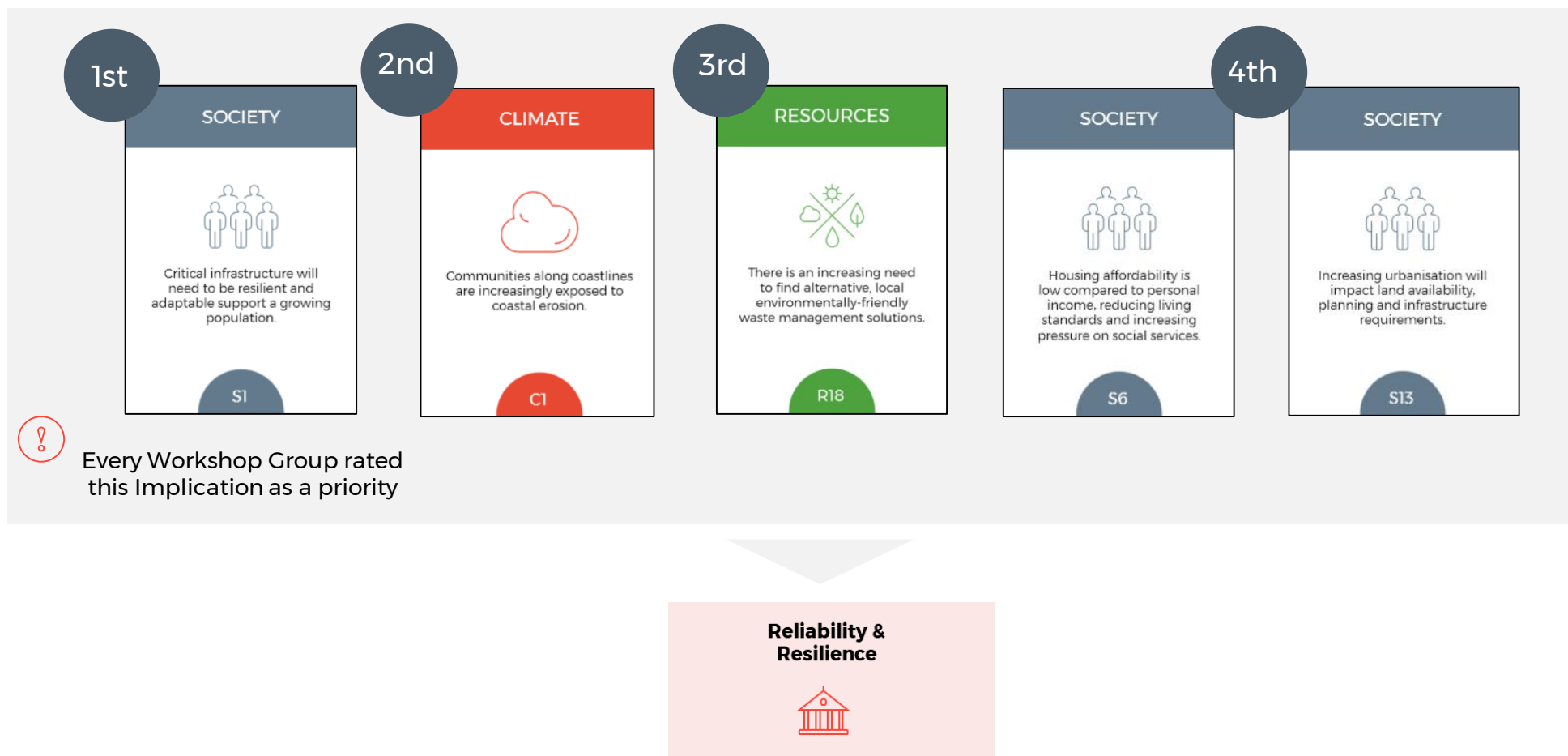
**CLUSTER 2  
HIGH PRIORITY**

# Across all Stakeholders, Five Implications were Identified as Critical Priorities for Tauranga



Key	Implication	Megatrend
S1	Critical infrastructure will need to be resilient and adaptable to support a growing population.	SOCIETY
C1	Communities along coastlines are increasingly exposed to coastal erosion.	CLIMATE
S13	Increasing urbanisation will impact land availability, planning and infrastructure requirements.	SOCIETY
S6	Housing affordability is low compared to personal income, reducing living standards and increasing pressure on social services.	SOCIETY
R18	There is an increasing need to find alternative, local environmentally-friendly waste management solutions.	RESOURCES
C3	A significant amount of residential development is currently in flood-prone areas.	CLIMATE
S14	Effective urban planning can promote healthier lifestyles - e.g. cycle lanes, green spaces, community exercise facilities.	SOCIETY
S15	City design can reduce inequality - e.g. connected public transport, mixed-tenure housing.	SOCIETY
S8	Social isolation and loneliness are contributing to increasing cases of mental health issues.	SOCIETY
S12	Community spaces and mixed-use developments are playing an increasing role in facilitating social interaction.	SOCIETY
S2	Residents are increasingly demanding safe, accessible and inclusive transport systems, housing and green public spaces.	SOCIETY
S3	An aging population will increase pressure on health services.	SOCIETY
C4	Carbon-zero policies will impact planning and development across all sectors.	CLIMATE
C2	New Zealand's main transport infrastructure (airports, rail and road) has been built in environmentally 'at-risk' areas.	CLIMATE
C5	New Zealand will experience more extreme weather events such as heavy rainfall, storm surges, droughts and high temperatures.	CLIMATE
S16	An increasing demand for community engagement is requiring greater transparency and accountability in policy making and service delivery.	SOCIETY
R11	New Zealand's challenge is managing storm water, waste water and potable water, rather than water supply.	RESOURCES
C10	Drier summers will increasingly cause droughts, resulting in ground shrinkage and pressure on water supply.	CLIMATE
C11	Increased flooding may exceed current defences, impacting communities, businesses and infrastructure.	CLIMATE

# The Top Five Implications were all Related to the Resilience and Reliability of the City



## Tauranga Environmental Scan Reference

1<sup>st</sup> – NIDEA/Stats NZ base projections predict that Tauranga's population will grow to 187,000 by 2050 – **Page 19**

2<sup>nd</sup> – Areas marked for infill/intensification like Kopurererua Stream, areas around Waimapu River and areas south of Mt Maunganui and surrounding Rangataua Bay are at risk of flooding. – **Page 11**

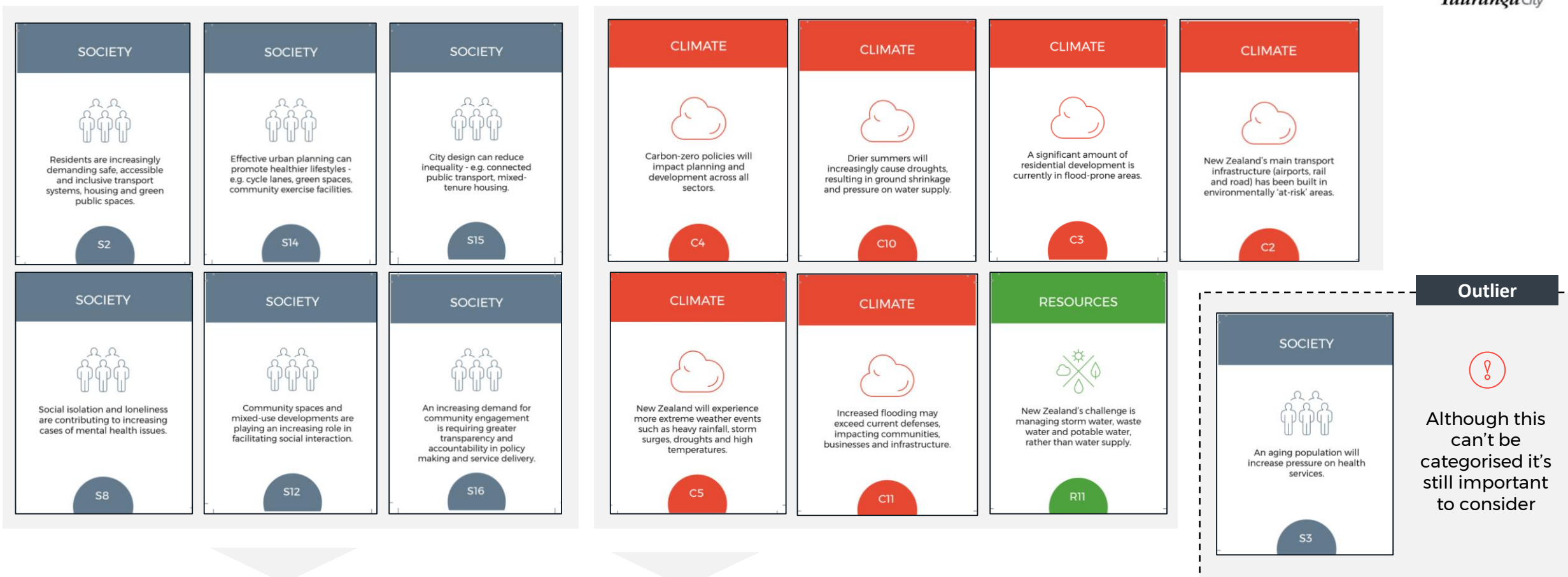
3<sup>rd</sup> – Tauranga's waste management plan forecasted that waste could increase as much as 1 tonne/person by 2026 – **Page 35**

4<sup>th</sup> – Tauranga City Council's long term plan showed median house prices rising 464% while household incomes only increased 128%. In addition to this they forecasted an additional 35,000 homes will be needed for their growing population by 2050 – **Page 19**

# Strategic Considerations for Cluster 1 to Ensure Tauranga is a Resilient and Reliable City



# Cluster 2 can be Categorised into Two Response Themes



**Connected Communities**



**Climate Hazard & Risk Management**



## Tauranga Environmental Scan Reference


**Connected Communities** - Mixed use and urban planning have been shown to help combat obesity and encourage mixed use between pedestrians, bikes and cars – **Page 21**.

**Climate Hazard and Risk Management** - Climate change is predicted to bring hotter temperatures, heavier rainfall and more extreme storms in the next few decades – **Pages 12 - 13**.

**Outlier** - Tauranga will be predicted to have 48,000 aged 65+ by 2043 – **Page 19**.



# Strategic Considerations when Addressing Response Themes for Cluster 2




**Implication:**  
An aging population will increase pressure on health services

**Strategic Consideration:**  
Is Tauranga's health care infrastructure investment plan adequately addressing its future needs?



**Response Theme:**  
Connected Communities

**Strategic Consideration:**  
Does Tauranga have an effective urban master plan which connects communities, improves social and economic well being?



**Response Theme:**  
Climate Hazard & Risk Management

**Strategic Consideration:**  
Does Tauranga have an effective plan for the impacts on climate change and flow on impacts to stormwater & water supply?

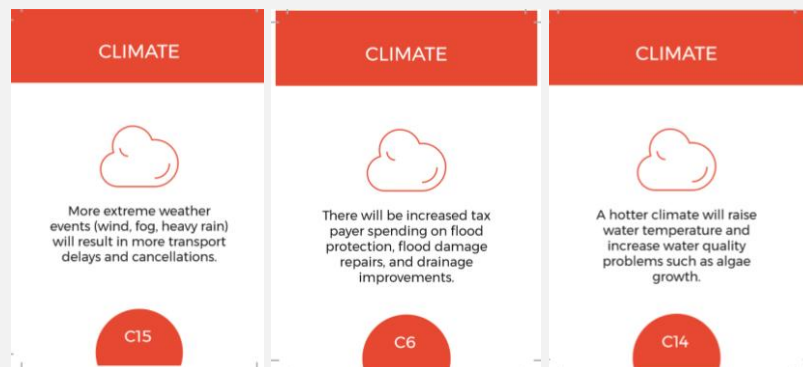


CLUSTER 3  
MANAGE

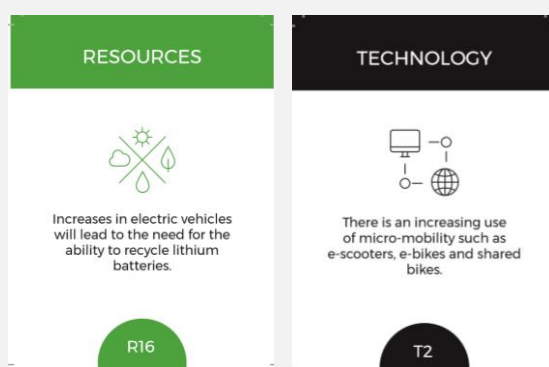


CLUSTER 4  
MONITOR

# Cluster 3 Implications were Identified as High Impact and Lower Likelihood with Two Response Themes



## Climate Hazard Management



## All Electric



### Tauranga Environmental Scan Reference

**Climate Hazard and Risk Management** – NIWA and LINZ analysis show that significant parts of Tauranga's infrastructure like roads, transmission lines and pipelines are in risky areas. – **Page 11**

**All Electric** – There is already 500 public charging sites across New Zealand for electric vehicles and this is continuing to grow. Electric vehicles are seeing double digit growth globally. – **Page 27**

# Cluster 4 Implications were Identified as High Likelihood and Lower Impact with Two Response Themes



Strong tilt towards sustainability



75% link to evolving workforce

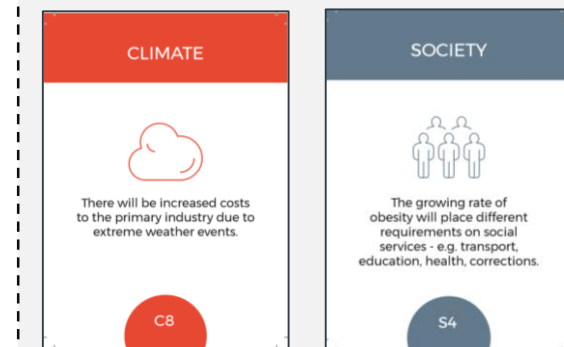
## Evolving Workforce



### Tauranga Environmental Scan Reference Evolving Workforce

- Technology is forecasted to create 12,000 new jobs for the Bay of Plenty area by 2030. - **page 29**
- By the mid 2030s McKinsey predicted that 24% of all jobs could be replaced by Automation. - **page 30**
- Outliers
- Obesity already affects 57,000 people in the Bay of Plenty placing extra demand on healthcare. - **page 21**
- Impacts of climate change have significant impacts on natural resources and the future of resources. - **page 32**

### Outliers



## Sustainable Lifestyles



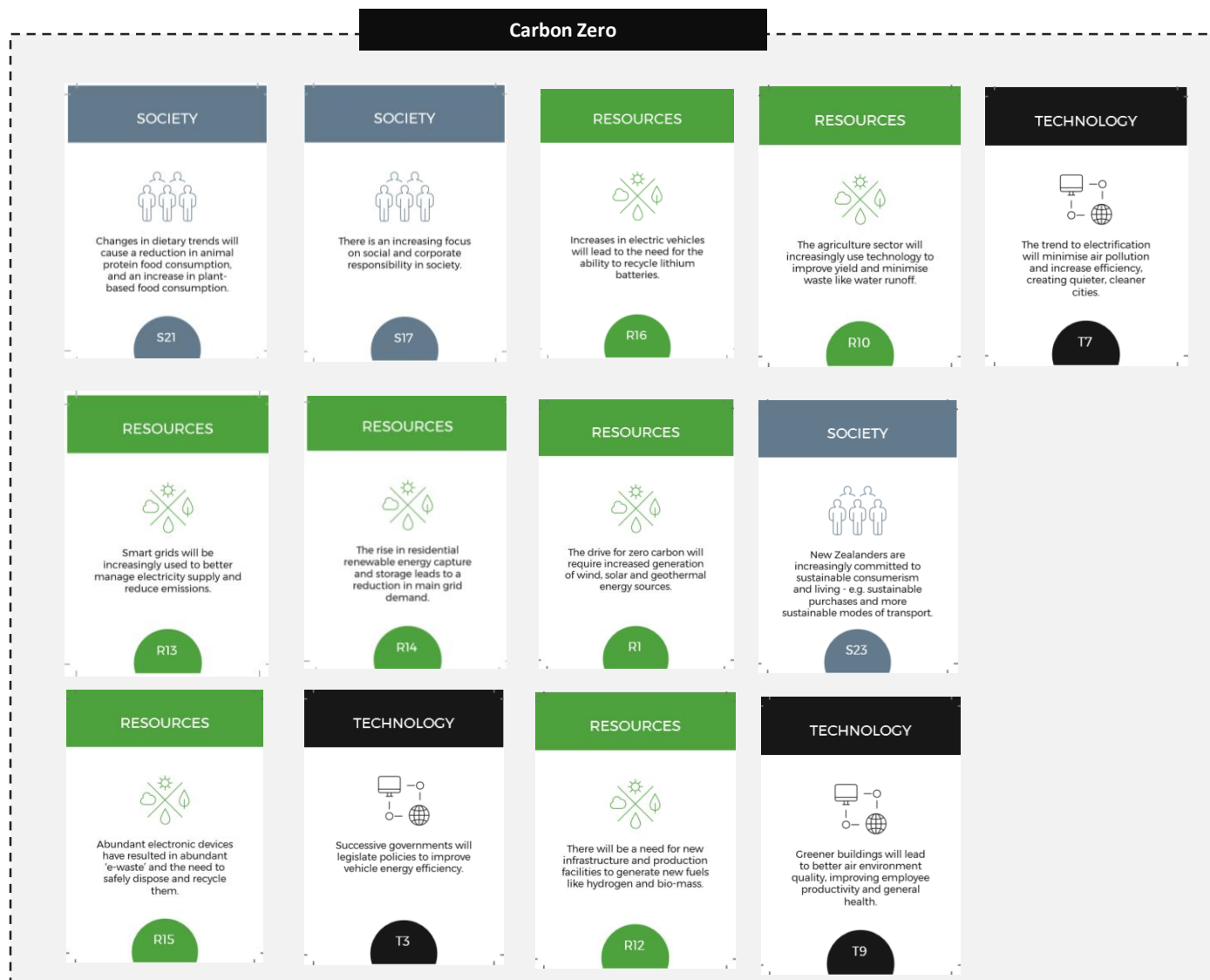
### Tauranga Environmental Scan Reference Sustainable lifestyles

- As urbanisation increases there will be less available land for farming and food production require new methods of farming e.g. vertical farming. - **page 32**
- There is a trend towards more sustainable and plant based diets in New Zealand. - **page 33**



# Blind Spots and Opportunities

# Thirteen Implications all Relating to Carbon Zero were Not Considered High Impact or Likely to Occur

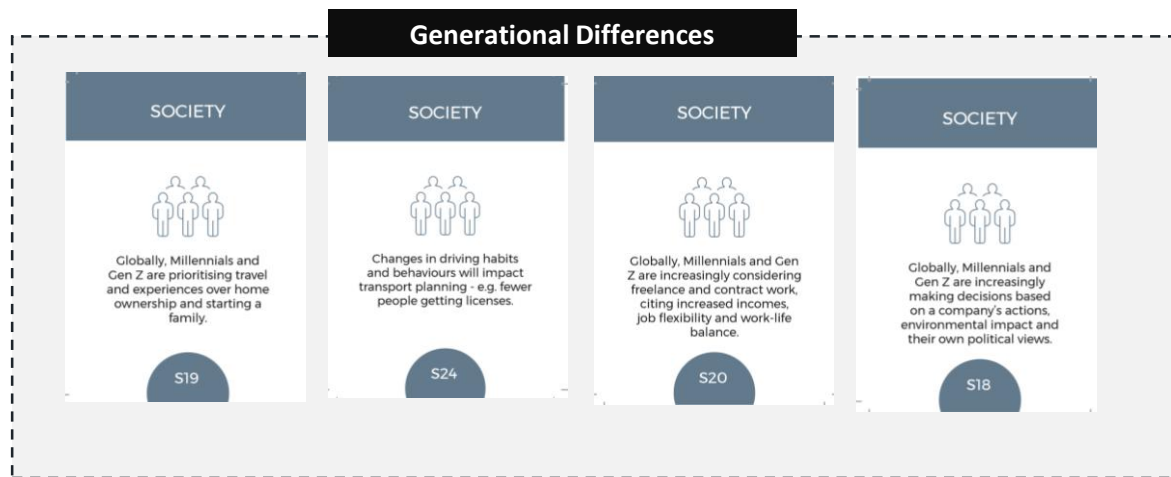


## Tauranga Environmental Scan considerations

- NZ has legislated reduction to zero carbon by 2050 or earlier. This will have an impact on Tauranga's own policies around carbon zero management. – **Page 32**
- Currently Tauranga will need to offset or reduce carbon production by approximately 760,000 tonnes of CO<sub>2</sub> in order to be carbon neutral. – **Page 35**
- NZ aims to be 100% renewable energy by 2035 relying on sources like hydro and solar instead of fossil fuels placing different demands on Tauranga's grid. Solar panel demand increased 20% in 2018 placing less demand on the main grid. – **Page 34**
- There is opportunity to convert some of Tauranga's waste into new fuels like bio-mass. – **Page 36**
- More electric vehicles and electrical devices due to the Internet of Things will lead to large amounts of 'e-waste' which will exacerbate Tauranga's waste management programme – **Page 6, 36**
- There is a trend towards more sustainable and plant based diets in New Zealand. – **Page 33**



# Eight Implications Relating to Generational Differences, All Electric and Evolving Workforce were also not Considered High Impact or Likely to Occur



## Tauranga Environmental Scan Reference

### All Electric

Globally sales for battery electric vehicles (BEV) and plug in hybrid electric vehicles (PHEV) have been experiencing double digit growth in the last few years. At the end of 2018 there were over 5 million electric cars on the road with nearly half of them in China. – **page 27**

Electricity demand as a percentage of total delivered energy demand is estimated to increase from 25% to 61% by 2050 leading to a need to connect 10GW of additional generation capacity. – **page 34**

New Zealand aims to be 100% renewable energy by 2035 through a mix of off-grid marine, solar, wind, geothermal and hydro. – **page 34**

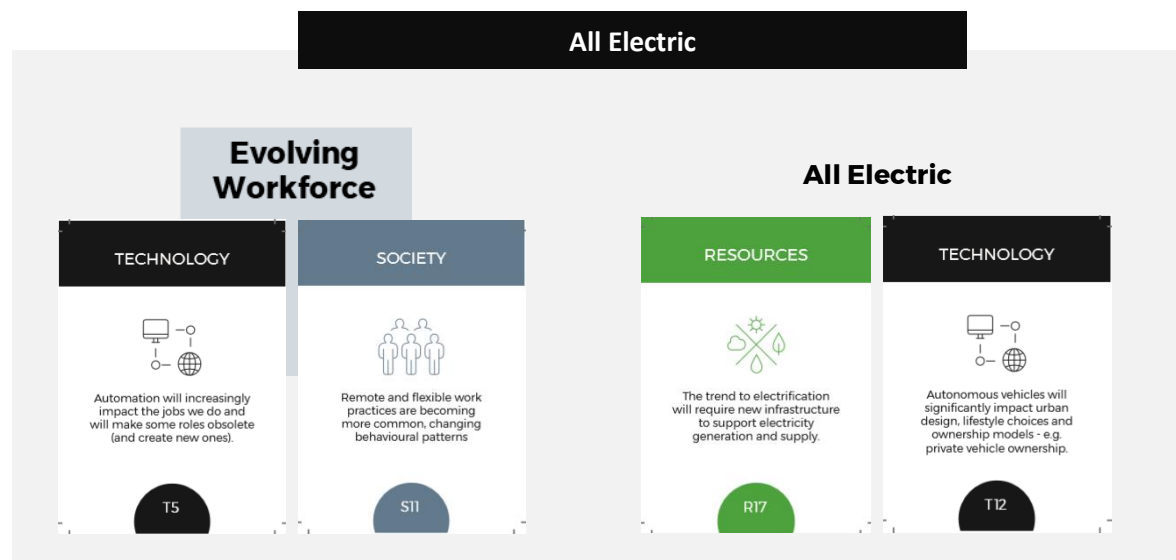
The rise of energy prosumers has lead to a ~20% increase of solar panel installations in 2018. – **page 34**

**Evolving Workforce - as per references on slide 18**

## Tauranga Environmental Scan Reference

### Generational Differences

- One of the key drivers of why Millennials and Gen Z do not prioritise home ownership is the increasing unaffordability of homes, between 1991 and 2017, Tauranga median house prices increased by 464% while household incomes only increased by 128%. – **page 3**
- Statistics NZ predicts that over the next few decades to 2068 shows a gradual decline in the birth rate leading to higher proportions of people aged 65+ in NZ – **page 16**
- Tauranga is predicted to show a 8 point decrease in 2 parent families by 2050 as a result of fewer people living together and starting a family. – **page 19**
- Vehicle travel has been trending downwards over time in New Zealand. Tauranga is the only exception – **page 22**



# Blind Spots and Opportunities

Blind spots may be due to personal bias, a lack of understanding or expertise in an area. Overall future implications relating to **Resources** and **Technology** were **not consistently identified** by the stakeholder groups as being **high impact** or **high likelihood** to happen. These potential blind spots may also provide an important opportunity. For example changing generational attitudes and technology are powerful enablers to solving climate and societal issues which most stakeholders identified as priorities for Tauranga.

## Carbon Zero



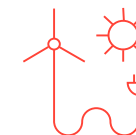
Carbon Zero is a global mega trend with many countries setting goals to reduce carbon emissions to zero over the next two decades as part of their response to managing the impacts of climate change. Examples include Norway by 2035 and Sweden by 2045..

Likewise countries are also focusing on the reduction of carbon emissions through legislation such as banning the sale of internal combustion engine cars which Norway has done by 2025. Similarly, cities globally are starting to set specific targets, the most ambitions of which is Copenhagen's to be Carbon Zero by 2025.

In 2019, New Zealand passed legislation to become Carbon Zero by 2050. Prior to this and increasingly as a result, public and private sector organisations are setting science based targets to achieve Carbon Zero by 2050 or earlier. At the same time rapidly changing consumer behavior, and the ability to identify the carbon footprint of goods and services, necessitates all organisations and individuals to reduce their carbon footprint.

**Consideration:** Does Tauranga City Council as an organization, and on behalf of the City, have a Zero Carbon plan which it is actively implementing across all aspects of its organizational activities and the future development of the City?

## All Electric



All Electric is a global mega trend to remove reliance on fossil fuels as part of reducing the impact of climate change, combined with improvements in battery storage and life. All Electric encompasses renewable forms of electricity generation (such as solar, wind and marine power), and the trend to all electric vehicles.

Likewise the trend to Carbon Zero is only increasing government and consumer behavior towards all electric power generation and electric transport. In Australia the uptake of residential solar power has been so successful that consumers are now net providers back to the power generation grid.

New Zealanders have been a relatively fast adopter of electric vehicles for personal usage, and since Councils such as Auckland, Wellington and Christchurch have commenced initiatives to convert public transport bus fleets to all electric.

**Consideration:** Does Tauranga have adequate initiatives to support the transition to electric vehicles, and is it actively working with Power Generation companies to assess the expected increase in residential and commercial electricity demand based on this trend and overall forecasted population growth?

# Blind Spots and Opportunities

Blind spots may be due to personal bias, a lack of understanding or expertise in an area. Overall future implications relating to **Resources** and **Technology** were **not consistently identified** by the stakeholder groups as being **high impact** or **high likelihood** to happen. These potential blind spots may also provide an important opportunity. For example changing generational attitudes and technology are powerful enablers to solving climate and societal issues which most stakeholders identified as priorities for Tauranga.

## Generational Differences



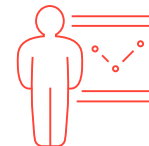
Global and national research indicates that Millennials and Gen Z hold significant different attitudes to other generations in regards to what they believe is important, how they want to live their lives and what they expect from public and private sector organisations.

Future Implications relating to the different attitudes of Millennials and Gen Z were consistently ranked in the bottom 10% of all implications by stakeholder groups with the exception of the Youth Group (Year 12 and 13 students). This may reflect the fact that most stakeholders who participated were either Gen X and or Baby Boomers.

However, given Millennials and Gen Z will become an increasing contributors and the future leaders of local workforce and community within Tauranga, this is a potential blind spot and may result in Council policies and/or city development not meeting these generations future needs.

**Consideration:** How does Tauranga ensure that it's strategy, long-term plan and policies reflect the different requirements of future generations?

## Evolving Workforce



City design during 20<sup>th</sup> century was largely predicated on people travelling from suburbs into a central business district to work in typically office based jobs, most of which remained largely unchanged during the last 50+ years.

However, during the next two decades significant workforce changes are forecast to be driven by changing behavior and expectations towards flexible, non-office based work and occupations. This is combined with a trend towards automation which will re-shape the type of employment available within 10 to 15 years. In Tauranga 42,000 existing jobs are forecast to disappear with automation by mid 2030's, replaced 54,000 new jobs.

These trends will shape future infrastructure demands and city design particularly in transport, residential and commercial buildings.

**Consideration:** Does Tauranga have a urban master plan, supported initiatives to re-skill impacted employees, which reflects the significant changes likely in employment practices and employment types?

# Appendix

# Stack Rank of Future Implications assessed as 'Prioritise' by Stakeholder Groups (1/3)

Implication Statement	Mega Trend	Coding	Prioritise
Critical infrastructure will need to be resilient and adaptable support a growing population.	SOCIETY	S1	100%
Communities along coastlines are increasingly exposed to coastal erosion.	CLIMATE	C1	92%
Increasing urbanisation will impact land availability, planning and infrastructure requirements.	SOCIETY	S13	92%
There is an increasing need to find alternative, local environmentally-friendly waste management solutions.	RESOURCES	R18	88%
Housing affordability is low compared to personal income, reducing living standards and increasing pressure on social services.	SOCIETY	S6	88%
Effective urban planning can promote healthier lifestyles - e.g. cycle lanes, green spaces, community exercise facilities.	SOCIETY	S14	75%
A significant amount of residential development is currently in flood-prone areas.	CLIMATE	C3	75%
City design can reduce inequality - e.g. connected public transport, mixed-tenure housing.	SOCIETY	S15	75%
Social isolation and loneliness are contributing to increasing cases of mental health issues.	SOCIETY	S8	71%
Community spaces and mixed-use developments are playing an increasing role in facilitating social interaction.	SOCIETY	S12	71%
Residents are increasingly demanding safe, accessible and inclusive transport systems, housing and green public spaces.	SOCIETY	S2	67%
Carbon-zero policies will impact planning and development across all sectors.	CLIMATE	C4	67%
An aging population will increase pressure on health services.	SOCIETY	S3	67%
New Zealand will experience more extreme weather events such as heavy rainfall, storm surges, droughts and high temperatures.	CLIMATE	C5	63%
New Zealand's main transport infrastructure (airports, rail and road) has been built in environmentally 'at-risk' areas.	CLIMATE	C2	63%
Drier summers will increasingly cause droughts, resulting in ground shrinkage and pressure on water supply.	CLIMATE	C10	58%
Increased flooding may exceed current defenses, impacting communities, businesses and infrastructure.	CLIMATE	C11	58%
An increasing demand for community engagement is requiring greater transparency and accountability in policy making and service delivery.	SOCIETY	S16	58%
New Zealand's challenge is managing storm water, wastewater and potable water, rather than water supply.	RESOURCES	R11	58%

# Stack Rank of Future Implications assessed as 'Prioritise' by Stakeholder Groups (2/3)

Implication Statement	Mega Trend	Coding	Prioritise
There will be increased taxpayer spending on flood protection, flood damage repairs, and drainage improvements.	CLIMATE	C6	46%
Transport will change with the introduction of networked vehicles, autonomous vehicles, high speed rail and multi-purpose vehicles.	TECHNOLOGY	T1	46%
There is resistance by residents to urban intensification in our cities.	SOCIETY	S7	42%
There will be increased costs to the primary industry due to extreme weather events.	CLIMATE	C8	42%
There is increasing potential for energy generation and recovery from water catchments and wastewater treatment systems.	RESOURCES	R7	42%
A lack of available labour will impact future work programmes.	SOCIETY	S5	42%
A hotter climate will raise water temperature and increase water quality problems such as algae growth.	CLIMATE	C14	38%
The demand for digital skills and innovative thinking will increase as manual tasks are displaced by automation.	TECHNOLOGY	T4	38%
The growing rate of obesity will place different requirements on social services - e.g. transport, education, health, corrections.	SOCIETY	S4	38%
There is an increasing use of micro-mobility such as e-scooters, e-bikes and shared bikes.	TECHNOLOGY	T2	33%
The drive for zero carbon will require increased generation of wind, solar and geothermal energy sources.	RESOURCES	R1	33%
There is increasing focus on inclusion and equality, placing new and different demands on services and infrastructure.	SOCIETY	S10	33%
Consumer behaviour is shifting towards a circular economy where goods are increasingly re-used or repurposed.	SOCIETY	S22	33%
There will be increasing demand for cybersecurity and Artificial Intelligence as more data and information becomes available online.	TECHNOLOGY	T11	29%
The availability of big data, intelligent systems and the Internet of Things (IOT) will lead to optimised asset management, improved forecasting and operational intelligence.	TECHNOLOGY	T8	29%
Automation will increasingly impact the jobs we do and will make some roles obsolete (and create new ones).	TECHNOLOGY	T5	29%
The agriculture sector will increasingly use technology to improve yield and minimise waste like water runoff.	RESOURCES	R10	29%
New Zealanders are increasingly committed to sustainable consumerism and living - e.g. sustainable purchases and more sustainable modes of transport.	SOCIETY	S23	29%
There will be a greater emphasis and demand on more sustainable building materials.	RESOURCES	R2	25%
Abundant electronic devices have resulted in abundant 'e-waste' and the need to safely dispose and recycle them.	RESOURCES	R15	25%
There will be increased costs to businesses due to more extreme weather events (e.g. insurance costs, loss in productivity).	CLIMATE	C7	25%
Workplace demand for physical and manual skills will decline in the future e.g. labourers, machine operators, admin and clerical work.	TECHNOLOGY	T6	25%
Successive governments will legislate policies to improve vehicle energy efficiency.	TECHNOLOGY	T3	25%
Increases in electric vehicles will lead to the need for the ability to recycle lithium batteries.	RESOURCES	R16	21%
The trend to electrification will require new infrastructure to support electricity generation and supply.	RESOURCES	R17	21%
There will be a need for new infrastructure and production facilities to generate new fuels like hydrogen and bio-mass.	RESOURCES	R12	21%
Increased capacity and efficiency of batteries will allow buildings and infrastructure to be decoupled from centralised energy systems.	RESOURCES	R4	21%
Smart buildings will become more common and will improve efficiency, occupancy productivity, sustainability and security.	TECHNOLOGY	T10	21%
Greener buildings will lead to better air environment quality, improving employee productivity and general health.	TECHNOLOGY	T9	21%



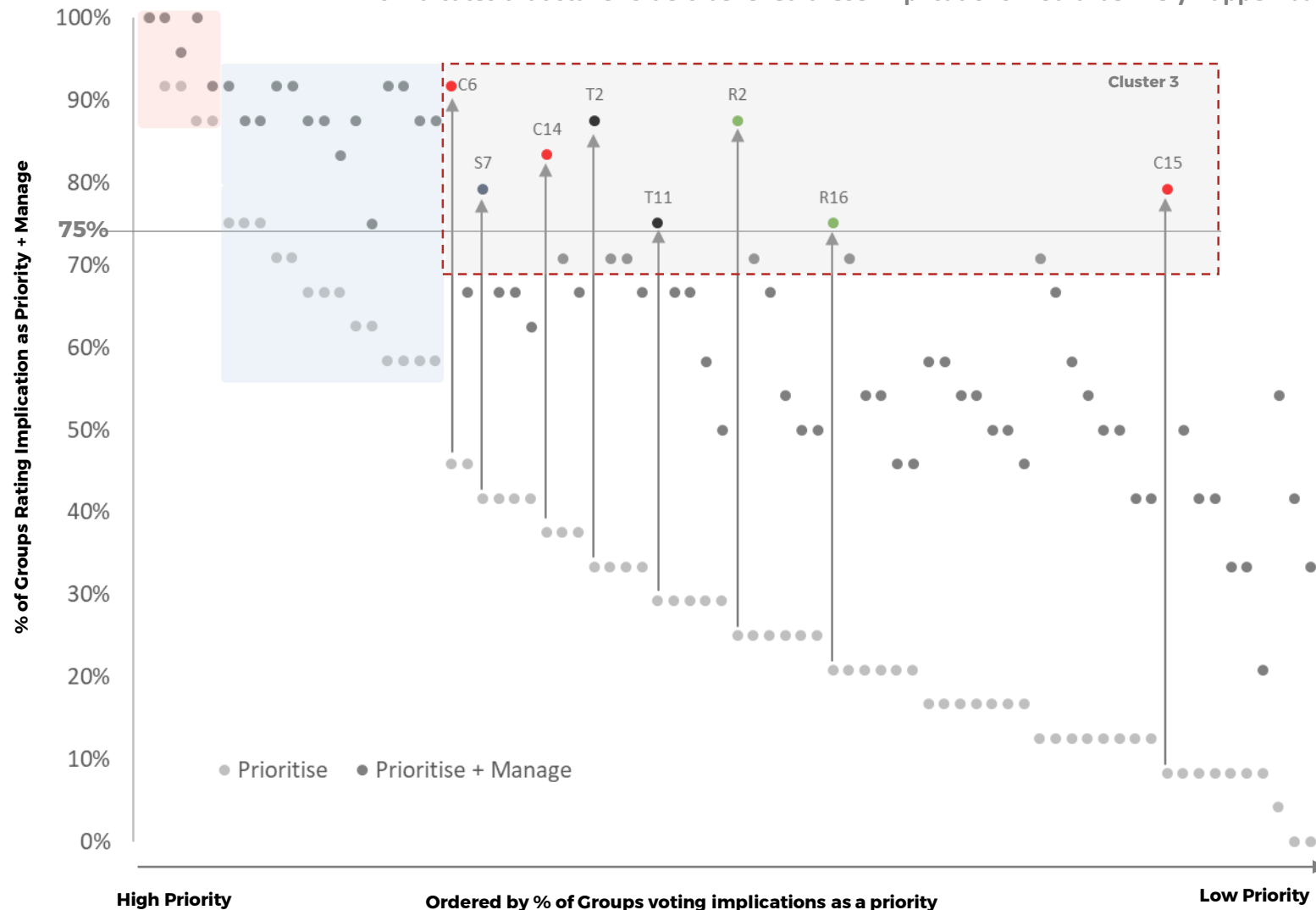


# Stack Rank of Future Implications assessed as 'Prioritise' by stakeholder groups (3/3)

Implication Statement	Mega Trend	Coding	Prioritise
Remote and flexible work practices are becoming more common, changing behavioural patterns	SOCIETY	S11	17%
There is an increasing focus on social and corporate responsibility in society.	SOCIETY	S17	17%
The trend to electrification will minimise air pollution and increase efficiency, creating quieter, cleaner cities.	TECHNOLOGY	T7	17%
Increasing ethnic diversity is placing new and different demands on services and infrastructure.	SOCIETY	S9	17%
Autonomous vehicles will significantly impact urban design, lifestyle choices and ownership models - e.g. private vehicle ownership.	TECHNOLOGY	T12	17%
More frequent extreme hot days will impact health and productivity, e.g. heat stress, subtropical diseases, and discomfort.	CLIMATE	C12	17%
The rise in residential renewable energy capture and storage leads to a reduction in main grid demand.	RESOURCES	R14	17%
In a circular economy, end-of-life buildings and infrastructure may no longer be seen as waste.	RESOURCES	R6	13%
Increased intensity of rain, wind and heat will reduce driving safety and deteriorate road conditions.	CLIMATE	C9	13%
An increase in the number of extreme hot days will damage transport infrastructure, e.g. buckled railway lines and damaged roads.	CLIMATE	C13	13%
Smart grids will be increasingly used to better manage electricity supply and reduce emissions.	RESOURCES	R13	13%
Globally, Millennials and Gen Z are increasingly considering freelance and contract work, citing increased incomes, job flexibility and work-life balance.	SOCIETY	S20	13%
Globally, Millennials and Gen Z are more concerned about climate change action than addressing other issues such as unemployment or income disparity.	CLIMATE	C16	13%
Smart systems and buildings allow new technologies to capture data on more efficient use of resources.	RESOURCES	R5	13%
Meeting global demand for food will require more reliance on alternative protein sources like lab-grown meat, insects and mycoprotein.	RESOURCES	R9	13%
More extreme weather events (wind, fog, heavy rain) will result in more transport delays and cancellations.	CLIMATE	C15	8%
The taxation of carbon will increase as environmental impacts of fossil fuel use rises and costs are realised.	RESOURCES	R3	8%
Changes in driving habits and behaviours will impact transport planning - e.g. fewer people getting licenses.	SOCIETY	S24	8%
Drones will be increasingly used in the public and private sectors - e.g. firefighting, asset and crop inspection and package delivery.	TECHNOLOGY	T13	8%
Globally, Millennials and Gen Z are increasingly making decisions based on a company's actions, environmental impact and their own political views.	SOCIETY	S18	8%
Globally, Millennials and Gen Z are prioritising travel and experiences over home ownership and starting a family.	SOCIETY	S19	8%
Vertical farming can provide out-of-season food sustainably due to lower distribution costs and better management of water use and runoff.	RESOURCES	R8	8%
Globally, Millennials and Gen Z will increasingly choose who they do business with based on how that company collect and secure their data.	TECHNOLOGY	T16	4%
3D printing will become more common as machine printing speeds increase and printable materials expand.	TECHNOLOGY	T14	0%
Changes in dietary trends will cause a reduction in animal protein food consumption, and an increase in plant-based food consumption.	SOCIETY	S21	0%

# Cluster 3 identifies Future Implications that 75% of the groups rated as either Priority or Manage

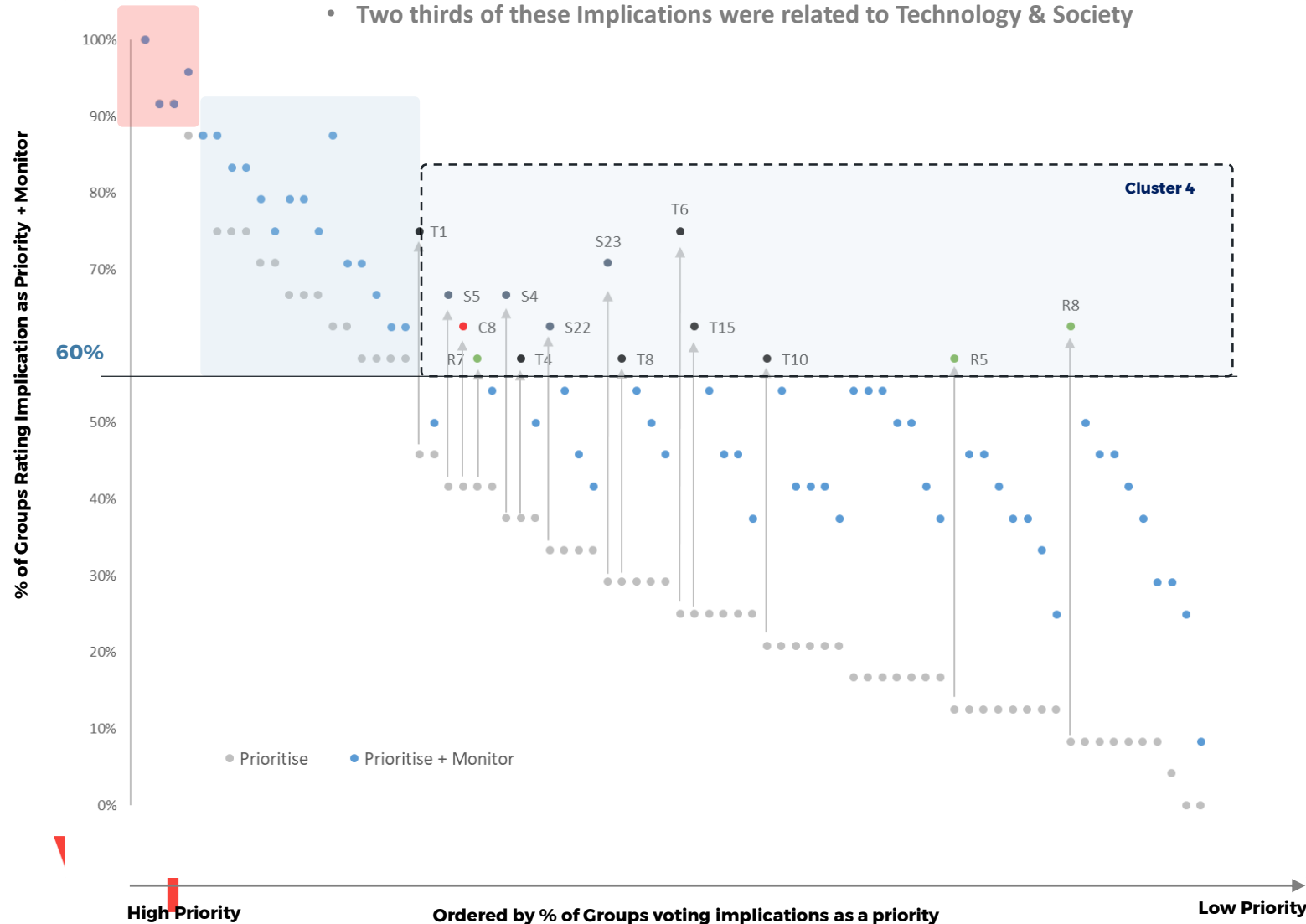
- This cluster was created by looking at stakeholder groups who either put an Implication as a 'Priority' or 'Manage'
- This indicates that stakeholders believed these Implications would be likely happen but couldn't align on the impact to prioritise them higher



Key	Implication	Prioritise & Monitor	Megatrend
C8	There will be increased tax payer spending on flood protection, flood damage repairs, and drainage improvements.	92%	CLIMATE
T2	There is an increasing use of micro-mobility such as e-scooters, e-bikes and shared bikes.	88%	TECHNOLOGY
R2	There will be a greater emphasis and demand on more sustainable building materials.	88%	RESOURCES
C14	A hotter climate will raise water temperature and increase water quality problems such as algae growth.	83%	CLIMATE
S7	There is resistance by residents to urban intensification in our cities.	79%	SOCIETY
C15	More extreme weather events (wind, fog, heavy rain) will result in more transport delays and cancellations.	79%	CLIMATE
T11	There will be increasing demand for cybersecurity and Artificial Intelligence as more data and information becomes available online.	75%	TECHNOLOGY
R16	Increases in electric vehicles will lead to the need for the ability to recycle lithium batteries.	75%	RESOURCES

# Cluster 4 identifies Future Implications that ~60% groups rated as a 'Priority' or 'Monitor'

- This cluster was created by looking at stakeholder groups who either put an Implication as a 'Priority' or 'Maintain'
- This indicates that stakeholders believed the Implication would be high impact but couldn't align on the likelihood to prioritise them
- Two thirds of these Implications were related to Technology & Society

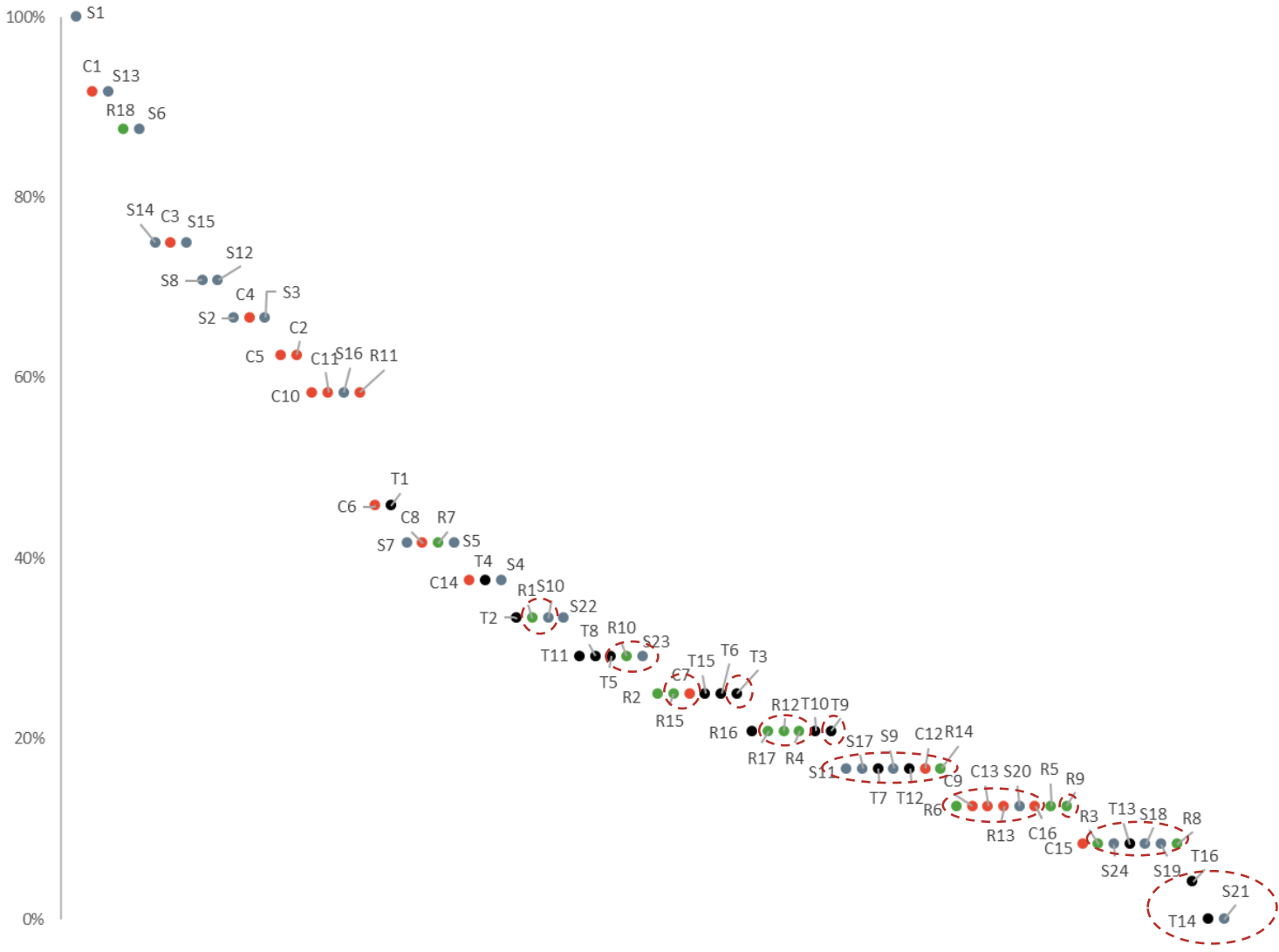


Key	Implication	Prioritise & Monitor	Megatrend
T1	Transport will change with the introduction of networked vehicles, autonomous vehicles, high speed rail and multi-purpose vehicles.	75%	TECHNOLOGY
T6	Workplace demand for physical and manual skills will decline in the future e.g. labourers, machine operators, admin and clerical work.	75%	TECHNOLOGY
S23	New Zealanders are increasingly committed to sustainable consumerism and living - e.g. sustainable purchases and more sustainable modes of transport.	71%	SOCIETY
S5	A lack of available labour will impact future work programmes.	67%	SOCIETY
S4	The growing rate of obesity will place different requirements on social services - e.g. transport, education, health, corrections.	67%	SOCIETY
C8	There will be increased costs to the primary industry due to extreme weather events.	63%	CLIMATE
S22	Consumer behaviour is shifting towards a circular economy where goods are increasingly re-used or repurposed.	63%	SOCIETY
T15	New materials will allow new ways of building and maintaining the built environment.	63%	TECHNOLOGY
R8	Vertical farming can provide out-of-season food sustainably due to lower distribution costs and better management of water use and run-off	63%	RESOURCES
R7	There is increasing potential for energy generation and recovery from water catchments and wastewater treatment systems.	58%	RESOURCES
T4	The demand for digital skills and innovative thinking will increase as manual tasks are displaced by automation.	58%	TECHNOLOGY
T8	The availability of big data, intelligent systems and the Internet of Things (IOT) will lead to optimised asset management, improved forecasting and operational intelligence.	58%	TECHNOLOGY
T10	Smart buildings will become more common and will improve efficiency, occupancy productivity, sustainability and security.	58%	TECHNOLOGY
R5	Smart systems and buildings allow new technologies to capture data on more efficient use of resources.	58%	RESOURCES

# Future Implications were identified as potential blind spots where stakeholders couldn't align on impact or likelihood



Blind spots may be due to personal bias, a lack of understanding or expertise in an area. Overall future implications relating to Resources and Technology were not consistently identified by the stakeholder groups as being high impact or high likelihood to happen.



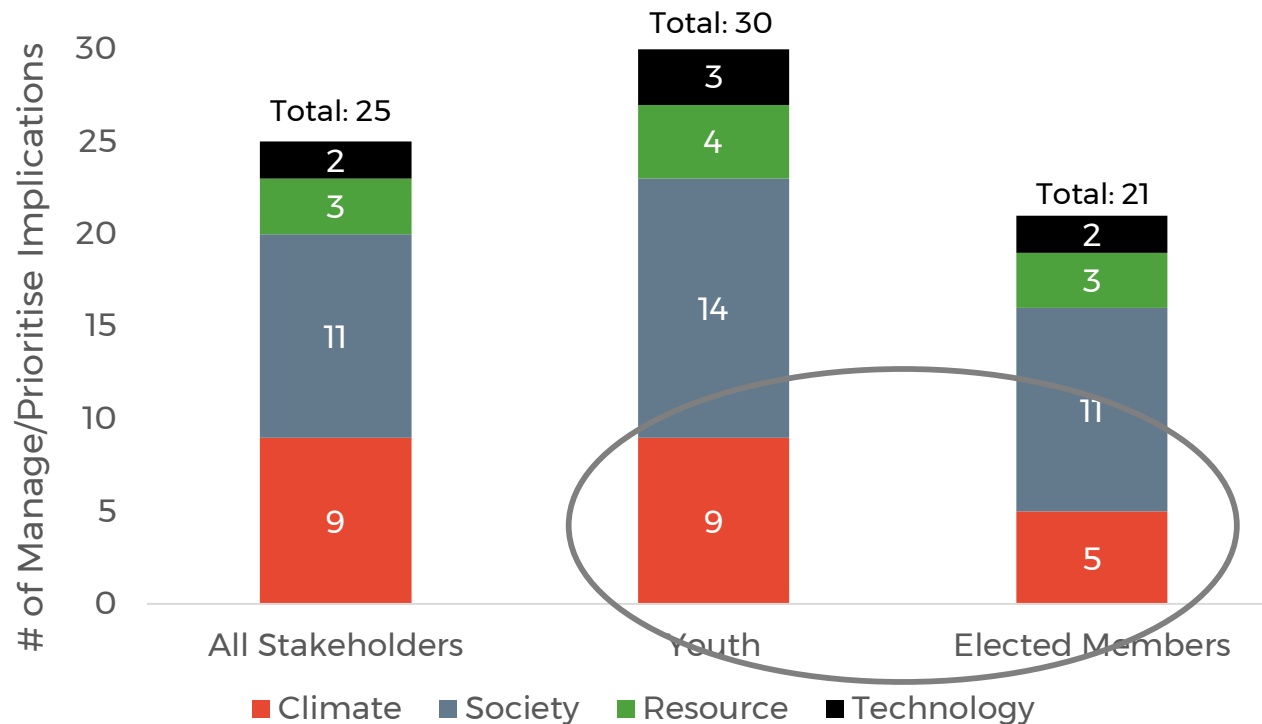
Coding	Implication Statement	Megatrend
R1	The drive for zero carbon will require increased generation of wind, solar and geothermal energy sources.	RESOURCES
S10	There is increasing focus on inclusion and equality, placing new and different demands on services and infrastructure.	SOCIETY
T5	Automation will increasingly impact the jobs we do and will make some roles obsolete (and create new ones).	TECHNOLOGY
R10	The agriculture sector will increasingly use technology to improve yield and minimise waste like water runoff.	RESOURCES
S23	New Zealanders are increasingly committed to sustainable consumerism and living - e.g. sustainable purchases and more sustainable modes of transport.	SOCIETY
R15	Abundant electronic devices have resulted in abundant 'e-waste' and the need to safely dispose and recycle them.	RESOURCES
C7	There will be increased costs to businesses due to more extreme weather events (e.g. insurance costs, loss in productivity).	CLIMATE
T3	Successive governments will legislate policies to improve vehicle energy efficiency.	TECHNOLOGY
R17	The trend to electrification will require new infrastructure to support electricity generation and supply.	RESOURCES
R12	There will be a need for new infrastructure and production facilities to generate new fuels like hydrogen and bio-mass.	RESOURCES
R4	Increased capacity and efficiency of batteries will allow buildings and infrastructure to be decoupled from centralised energy systems.	RESOURCES
T9	Greener buildings will lead to better air environment quality, improving employee productivity and general health.	TECHNOLOGY
S11	Remote and flexible work practices are becoming more common, changing behavioural patterns.	SOCIETY
S17	There is an increasing focus on social and corporate responsibility in society.	SOCIETY
T7	The trend to electrification will minimise air pollution and increase efficiency, creating quieter, cleaner cities.	TECHNOLOGY
S9	Increasing ethnic diversity is placing new and different demands on services and infrastructure.	SOCIETY
T12	Autonomous vehicles will significantly impact urban design, lifestyle choices and ownership models - e.g. private vehicle ownership.	TECHNOLOGY
C12	More frequent extreme hot days will impact health and productivity, e.g. heat stress, subtropical diseases and discomfort.	CLIMATE
R14	The rise in residential renewable energy capture and storage leads to a reduction in main grid demand.	RESOURCES
R6	In a circular economy, end-of-life buildings and infrastructure may no longer be seen as waste.	RESOURCES
C9	Increased intensity of rain, wind and heat will reduce driving safety and deteriorate road conditions.	CLIMATE
C13	An increase in the number of extreme hot days will damage transport infrastructure, e.g. buckled railway lines and damaged roads.	CLIMATE
R13	Smart grids will be increasingly used to better manage electricity supply and reduce emissions.	RESOURCES
S20	Globally, Millennials and Gen Z are increasingly considering freelance and contract work, citing increased incomes, job flexibility and work-life balance.	SOCIETY
C16	Globally, Millennials and Gen Z are more concerned about climate change action than addressing other issues such as unemployment or income disparity.	CLIMATE
R9	Meeting global demand for food will require more reliance on alternative protein sources like lab-grown meat, insects and mycoprotein.	RESOURCES
R3	The taxation of carbon will increase as environmental impacts of fossil fuel use rises and costs are realised.	RESOURCES
S24	Changes in driving habits and behaviours will impact transport planning - e.g. fewer people getting licenses.	SOCIETY
T13	Drones will be increasingly used in the public and private sectors - e.g. firefighting, asset and crop inspection and package delivery.	TECHNOLOGY
S18	Globally, Millennials and Gen Z are increasingly making decisions based on a company's actions, environmental impact and their own political views.	SOCIETY
S19	Globally, Millennials and Gen Z are prioritising travel and experiences over home ownership and starting a family.	SOCIETY
R8	Vertical farming can provide out-of-season food sustainably due to lower distribution costs and better management of water use and runoff.	RESOURCES
T16	Globally, Millennials and Gen Z will increasingly choose who they do business with based on how that company collect and secure their data.	TECHNOLOGY
T14	3D printing will become more common as machine printing speeds increase and printable materials expand.	TECHNOLOGY
S21	Changes in dietary trends will cause a reduction in animal protein food consumption, and an increase in plant-based food consumption.	SOCIETY

Ten Implications not Considered High Impact or Likely to Occur were not able to be categorised, however these may still be potential blind spots



# Overall, the Elected Members' assessment of Future Implications were aligned to other stakeholders with the exception of the Youth Group

Priority & Manage Implications by Workshop Groups



Compared with Elected Members the Youth Group prioritised almost double the amount of Climate Implications and prioritised a broader range implications notably:

- Increased Temperature
- More Extreme Weather and Rainfall
- Droughts