



Christchurch City Council

Smart Christchurch Strategy

2022–2025

**Share.
Connect.
Innovate.**



Christchurch City Council CE's foreword

Smart Christchurch Strategy

Ōtautahi-Christchurch is a city of opportunity for all... open to new ideas, new people and new ways of doing things – a city where anything is possible.

We established the Smart Christchurch programme in 2016 to deliver rapid proof of concepts to test innovative approaches and technologies that supports the Council's vision and goals for the city.

Over the past few years the programme has delivered a variety of initiatives for the city which has helped make our city a smarter, safer place to live, work and play. Collaboration has been key to the programme's success, working with both the private and public sector on city challenges.

We remain committed to ensuring that innovative approaches to our city's challenges are explored and embraced. Ōtautahi-Christchurch has one of the most exciting innovation and technology ecosystems in New Zealand, and one that we are proud to be part of and to support. Every year, the Smart Christchurch programme brings this ecosystem together at its Innovation Expo, now becoming one of the largest innovation and technology events in the country.

The programme also has a strong focus on driving decisions from data, which is one of the fundamentals for any city to be considered a Smart City. This has led to the development of our SmartView web app. SmartView provides citizens with real-time data that keeps them informed on how the city is operating and allows them to make informed decisions about their daily lives.

Over the next few years a key focus for the programme will be to help bring innovators together right across Canterbury to help tackle the biggest challenge of our time – climate change. The programme will play an important role in helping to deliver against the climate action programmes objectives, particularly in the economic transformation and innovation space.

Smart Christchurch is a connector, focusing on opportunities to collaborate across the region. By tapping into the collective genius around us, we can help to inform and accelerate our city's key strategies to support our community.



D. Baxendale

Dawn Baxendale
Chief Executive



The Smart Christchurch programme was established to **take action through innovative trials and co-creating solutions** to support the Council’s vision.

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Ōtautahi | Christchurch

Although Christchurch is New Zealand’s oldest chartered city, we are now New Zealand’s newest city. Since the 2010-11 earthquakes we have redefined ourselves as a ‘city of opportunity - open to new ideas, new people and new ways of doing things – a city where anything is possible’.

Ōtautahi-Christchurch is the second largest city in New Zealand and home to 392,100¹ people.

The Christchurch City Council’s community outcomes describe the kind of city we would like to see, and what we aim to achieve in meeting the current and future needs of the community.

We are committed to providing outstanding core services and these are clearly articulated in the four key community outcomes we aim to achieve:



Resilient communities



Liveable city



Healthy environment



Prosperous economy

The Smart Christchurch programme was established to take action through innovative trials and co-creating solutions to support this vision.

Strategic priorities

Our strategic priorities outline the areas of operational activity where elected members want to see more emphasis and/or a change in approach over the next three years and beyond.

The priorities provide us with a new way of focusing on particular aspects of our work programme and to clearly show the progress made in achieving the direction statements:

- Enabling active and connected communities to own their future
- Meeting the challenge of climate change through every means available
- Ensuring a high quality drinking water supply that is safe and sustainable
- Accelerating the momentum the city needs
- Ensuring rates are affordable and sustainable

Introduction | Smart Christchurch - Whakaraka Ōtautahi

The international emergence of smart cities is largely driven by four common goals:



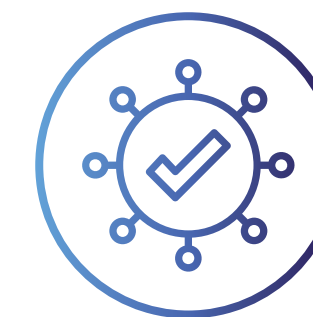
1.
Improving the efficiency of city operations



2.
Driving a strong local economy



3.
Increasing citizens’ participation in local government



4.
Improving quality of life for citizens

Smart Christchurch was established to deliver rapid proof of concepts that support the Council’s goals for the city. Through trials, we have provided a de-risked environment to test innovative approaches, to fail fast when needed, to learn, pivot, measure and then to hand over the successful trial to our Council business partners.

Smart Christchurch explores new technology and innovative trials that help make our city a smarter, safer place to live, work and play.

New smart technologies and sensors allow us to gather real-time data, so we can see how the city is functioning, and respond appropriately. Being a ‘smart city’ brings many benefits, such as better planning and decision-making, attracting international talent to the city, and creating new business opportunities.

The programme prides itself in delivering rapid prototypes and trials of innovative solutions, developed in collaboration with local innovators and our partners.

¹ Estimated June 2021

Introduction continued

Our three-year strategy is to continue to deliver innovative trials, ensure we use the technology and data to align with the Council's vision for a vibrant, prosperous and sustainable 21st century city, and that it supports a better quality of life for citizens. To do this we will trial new delivery models that will help support the Smart Christchurch programme's ability to move at pace and use a multi-faceted approach to funding so that, in time, we will be less reliant on rate payer funding.

Smart Christchurch is not only focused on traditional 'smart city' sensors, it is the Council's innovation enabler.

No one area owns innovation – it's in the fabric of everything the Council does. However, this programme provides the view beyond the here and now, by keeping up with emerging disruptive technology that can be trialled and quickly applied to the city's challenges.

Alongside trialling smart technologies we work on larger city-wide and regional strategies that support the wider innovation ecosystem. This attracts new business and investment into the city and demonstrates that Ōtautahi-Christchurch is a city that not only innovates but collaborates to support its community.

Smart Christchurch generates financial and non-financial benefits across a range of areas and will continue to focus on those areas where smart innovations can make the most impact, with particular emphasis on increased operational efficiencies, sustainability and climate change.

Smart Christchurch Strategy

This strategy reflects the next level of maturity within the programme and the direction the Smart Christchurch Programme means to take over the next three years. It reflects a global shift in which 'smart cities' are taking a citizen-centric approach and contributing to achieving community outcomes.

While the programme has successfully delivered over the past six years, the strategy will include changes to our approach, based on our learnings, past successes and failures and a desire to ensure it remains relevant and evolves with the needs of our community and the Council. The strategy will be revisited and revalidated annually.

The Smart Christchurch strategy has been conducted in consultation with our internal and wider city stakeholders and the innovation ecosystem. It highlights how the programme intends to implement the strategy and the main areas the programme will focus on.



Smart Christchurch | Vision and principles

Our vision

To promote Ōtautahi-Christchurch as an exemplar open and connected city, showcasing solutions that make life better and that are replicated by others.

The mission and values the programme was established and operates under to deliver rapid proof-of-concept projects that promote the power of:



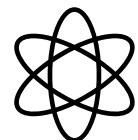
Open data, open platform, open city

- Foster Ōtautahi-Christchurch's reputation as one of the world's most connected cities
- Pursue a secure, open and accessible platform for city data
- Champion technology advances – making data available to all



Aggregating and visualising real-time data

- Combine existing and new sensor technology to build a wealth of detailed city data
- Use insights from aggregated data to plan more effectively, highlight opportunities for efficiency, and create a city that works better for people
- Position Ōtautahi-Christchurch as an international seismic centre of excellence, with a world-first array of sensors enabling defensible decision-making



Leveraging the collective genius around us

- Bring innovators together to collaborate on solving city challenges



Removing barriers to access

- Improve wayfinding and access to transport, by putting accessible, real-time information in people's pockets
- Provide free Wi-Fi in the CBD to give residents and visitors access to all the digital information they need, enriching their experience of Ōtautahi-Christchurch



Inspiring fresh thinking

- Spark peoples' imaginations and foster innovation in our city
- Increase networking and collaboration opportunities
- Demonstrate the effectiveness of 21st-century approaches such as crowd-sourcing data, participative democracy, and using sensors

Our guiding principles



Benefits without borders – we share our solutions with whomever can benefit from them.



Technology moves too quickly to focus on perfect – **we get the job done.**



Collaboration is better than competition at both a local and national scale; we respect our colleagues and help them achieve their goals.



Think globally act locally – wherever possible we choose local partners to solve Christchurch problems.



We appreciate the value of both digital and intangible assets and look at the best ways to leverage these to the city's advantage.



Efficiency – right-size processes support rapid delivery and **accelerate innovation.**



Fail fast and fail well – salvage what we can and leverage from our learnings.



What gets recognised gets repeated; celebrating success encourages **high performance and motivation.**



People-centred Smart City

Globally, 'smart cities' are moving away from being technology driven to being more people-centred, using data and digital technologies to deliver more significant and meaningful results to citizens.

Smart Christchurch's strategy starts and ends with people; delivering community centred initiatives that benefit the city's residents, businesses and visitors. By putting the community at the heart of everything we do, we will deliver initiatives that the community will not only support, but will take ownership of.

Running parallel to the concept of a smart city is inclusion; that a city is better off if a wide range of people participate in how the economy, civic life, and urban design grow and evolve. A smart city and an inclusive city are not the same thing, and we need to bridge the gap between them so that Ōtautahi-Christchurch is a better place for everyone.

In 2019 the Department of Internal Affairs released the Government's vision for digital inclusion in the Digital Inclusion Blueprint. The Government's vision is: that all of us have what we need to participate in, contribute to, and benefit from a digital world.

Greater equity of access opens opportunities for economic and social growth to a wider range of a city's population.

An example of this has been the development of SmartView; a web-based app that provides open data to our community in a way that is meaningful, so that people are better informed and can make data-driven decisions about their lives.

The programme wanted to deliver an experience to the user that would allow them to access a range of useful datasets in one place and provide them in a way that is easier to understand and use.

Another example was the implementation of solar powered compacting rubbish bins that provide real-time fullness level information. Solar powered compacting rubbish bins have been used in New Zealand, and around the world for some time, but Ōtautahi-Christchurch was the first major city in New Zealand to trial these self-compacting bins. The trial resulted in a 93 percent reduction in bin emptying in the area we trialled and zero customer complaints post-implementation.

The bins have now been rolled out to public areas, including some parks, throughout Ōtautahi-Christchurch and Banks Peninsula.

The programme also runs the Innovation Expo, and supports the eSports event. These events are a great way to engage our community, share what the Council and the Smart Christchurch programme is working on, and to showcase Canterbury's innovation and tech community.

City-wide collaboration | Working on old and new challenges

Involving both the public and private innovation ecosystems, we work on opportunities to collaborate and co-create using smart principles and digital cleverness to solve community problems. Through trials, the programme can be used as a test bed for innovation providing a “de-risked” environment.

Smart Christchurch is an innovation enabler, bringing together parties which don’t normally collaborate, to help solve complex problems.

The public-private partnerships we have established have given us an opportunity to deliver solutions to some of the city’s challenges.

Ōtautahi-Christchurch is fortunate to have a well-established local tech and innovation sector. By involving both the private sector and partner agencies,

the city is supporting the local innovation community and is putting Ōtautahi-Christchurch in a good position to tackle some of its larger challenges, such as:

- Climate change, which brings increased extreme weather events, fires and the prospect of managed retreat
- Aging infrastructure network, which faces ever-increasing demands
- Public expectations of levels of service, which are higher than ever
- Global events, which result in massive economic and social disruption
- Disruptive and emerging technologies

Co-design – Smart Christchurch by design

Smart Christchurch takes a human-centred, iterative approach. The programme looks for co-design opportunities using multi-disciplinary teams to ensure the problem that needs to be addressed is properly understood in order to develop solutions.

Ōtautahi-Christchurch has embraced co-design labs and co-working facilities for collaboration and to accelerate innovation and change including facilities such as: Ministry of Awesome, Aronga Whanokē - Environmental Canterbury, Ara’s Te Ōhaka, Thinclab Canterbury, EPIC Innovation, Saltworks and HitLab.

Smart Christchurch has good relationships with local academic providers and there has been a range of initiatives, challenges and opportunities that we have supported. Some examples of how we have engaged are; GovHack, University of Canterbury MBA challenges and Ara Smart Christchurch Hackathon.

Some of our tertiary providers are also offering a Smart City course which the programme has been supporting by partaking in panel discussions, sharing information and providing use cases for course content. We see the relationship with the education sector important to the programme so that we can connect with their research and engage our future city innovators.

The programme will also look at ways to support and feed into partnerships such as Greater Christchurch 2050. This partnership describes the kind of place wanted for our future generations, and how that will be achieved over the next 30 years and has a strong focus on collaboration and innovation.

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The Smart Christchurch Programme comes with both an opportunity and responsibility to look beyond the immediate Council boundaries to develop smart innovations collaboratively to help solve challenges and improve liveability for our community. To support this, the linkages created for Smart Christchurch into the CCHL Group of commercial subsidiaries through their involvement as part of the CCHL Group Programme of Work and the CCHL Te Whāriki human capital collaboration platform pilot are key enablers that underpin the opportunity to positively leverage the Smart Christchurch investment that Council is making.

Marc Pringle – CCHL Group Programme Manager



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The Smart Cities initiative underpins our commitment as a city to driving sustainable economic growth through the use of smart technologies. ChristchurchNZ, the city’s economic development arm, is developing industry clusters in health technology, future food and fibre, and future transport and aerospace, strengthened through high-tech services and a city-wide commitment to sustainability. Smart Cities is critical to these ‘supernode’ clusters providing data and connectivity and a commitment to a smart, sustainable future.

Joanna Norris – Former CEO ChristchurchNZ

ChristchurchNZ™

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Replication | Great for Ōtautahi-Christchurch, great for New Zealand

Smart Christchurch is committed to creating sustainable innovation - at an organisational and city level - that can be replicated throughout New Zealand. One of the underpinning principles for Smart Christchurch is “Benefits without borders”- we share our solutions with whoever can benefit from them.

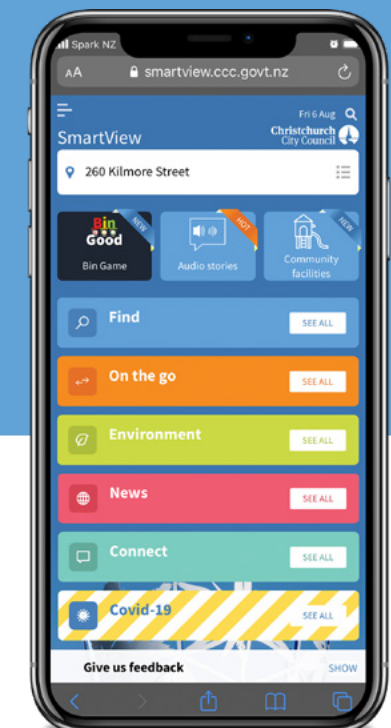
Although local authorities each have their unique challenges, there are many common problems that are experienced by all. There are great gains to be made by collaborating with other local authorities. By working in partnership, we can share the trials we have conducted and learn what has been a success for them. Through shared learnings we are able to bring the benefits back to the citizens of Ōtautahi-Christchurch and help us to springboard ahead, in turn saving money.

In conjunction with other councils we have been working to create an environment that supports shared learnings and in some cases technological solutions to help us all achieve our goals more quickly and efficiently. One approach we want to explore is a Smart Cities market place in New Zealand that will focus on supporting each local authority’s local tech and innovation communities whilst leveraging national procurement opportunities.

SmartView replication

Our replication strategy for our SmartView product is to work with other councils to extend SmartView into their region. Eventually this will feed into SmartView New Zealand which will allow a seamless and connected experience for our citizens and visitors to our country.

In return for creating SmartView there is the option for the recipient council to share a key project with us which would move us ahead with time and cost-saving benefits.

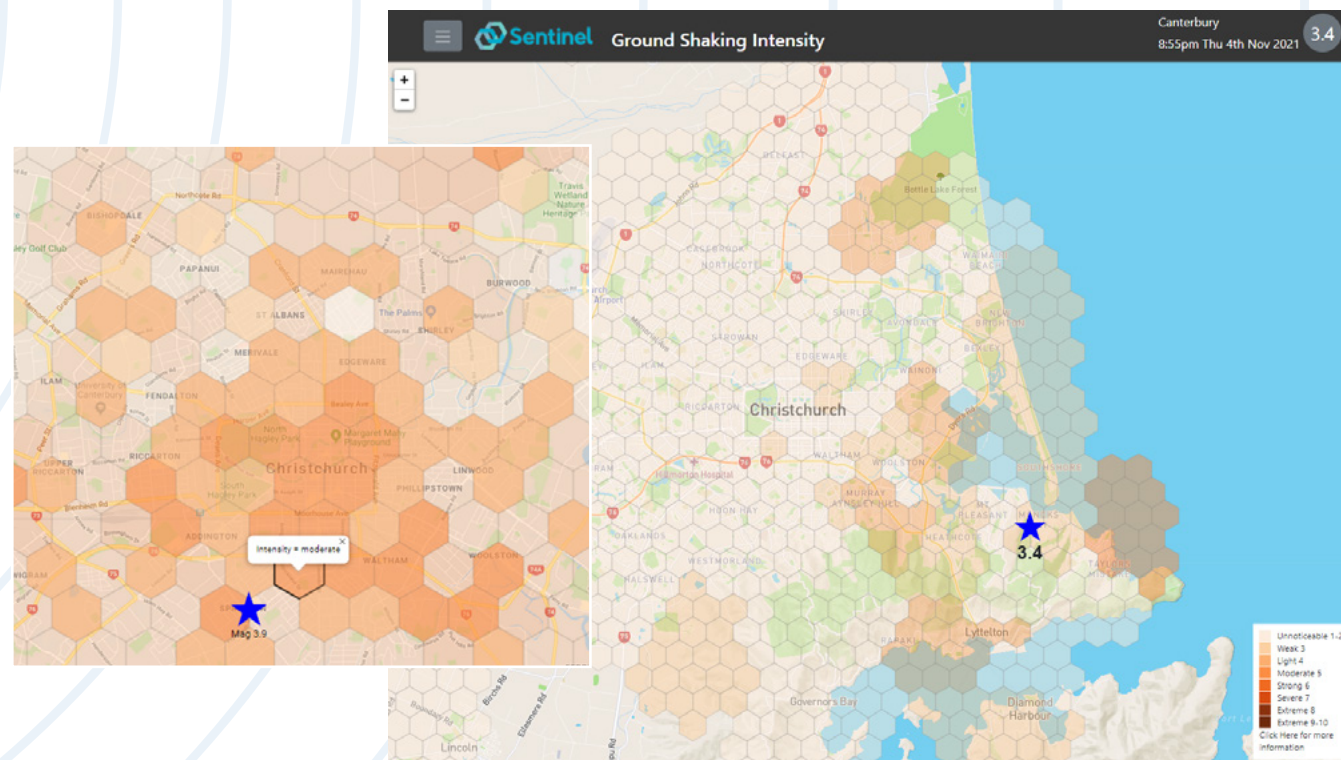


Sentinel Seismic Network

Sentinel, formerly named EQRNET, is a dense seismic network with more than 150 sensors across Ōtautahi-Christchurch, combined with best-practice engineering processes to manage our earthquake response in real-time, thereby safeguarding communities, employees, and our many assets above and below ground.

Sentinel is developed and operated by Canterbury Seismic Instruments Ltd (CSI). With Christchurch City Council as the anchor user of the network, CSI have created an affordable model that encourages uptake by lease holders, facility managers, engineers, building owners, Civil Defence and Emergency Management, homeowners, and the public to safeguard people and assets. It also provides a wealth of valuable data for industry development and academic research.

Through our connection with Wellington City Council, there is now a trial of approximately 100 sensors in Wellington using Canterbury Seismic Instruments Ltd.



The enabling environment

In delivering ‘smart city’ initiatives it helps to have the basic infrastructure in place. To be ‘smart,’ a city needs to be connected. Smart Christchurch takes a strategic approach, leveraging existing Council projects and creating the ‘smart’ infrastructure environment as we establish trials.

This approach has worked and we have been able to leverage substantial rebuild projects. Canterbury suffered significant damage during the devastating earthquakes of 2010 and 2011. However, they provided an opportunity to incorporate ‘smart’ technology in the rebuild of the city. We will continue to look for such opportunities as new projects are rolled out and identify opportunities to collaborate with our IT, project design and delivery teams to ensure the underlying ‘smart’ technology is considered.

As we deliver more ‘smart’ initiatives it will be important to support the development of the appropriate IoT platforms upon which all key ‘smart city’ infrastructure and related systems and services can sit. By doing this, the Council will ensure that it can provide and manage all relevant and connected devices within the Ōtautahi-Christchurch IoT space.

An IoT platform will be typically integrated with a Wi-Fi and data platform. This approach will enable sensors, edge devices and data to build ‘smart city’ uses in a modular way, connecting users throughout applications and services.

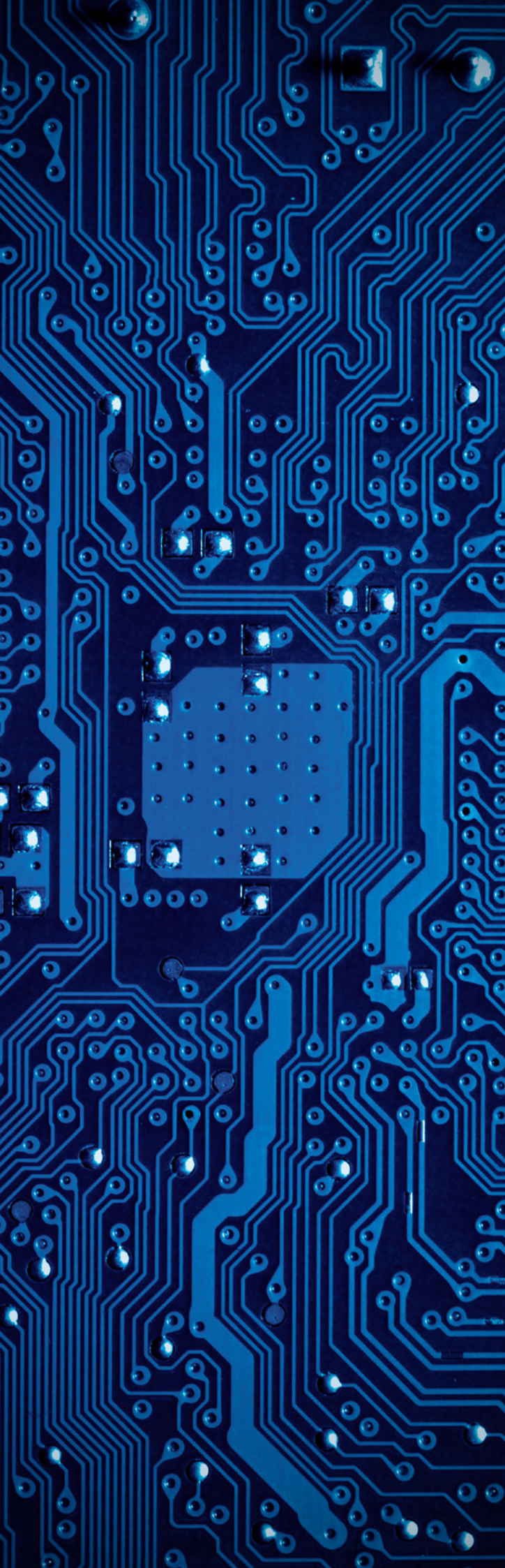
Where we are unable to leverage projects we will look to our technology investment partners for opportunities to accelerate the approach.



Harnessing the power of machine learning and AI

Machine learning and AI is developing at pace and is being adopted for many use cases globally, and this is certainly true in the ‘smart cities’ space. Over the past 12 months we have looked at how machine learning and AI can be harnessed to benefit our city. Opportunities we are exploring include:

- Trialling the use of machine learning and graffiti photos to identify repeat offenders and track their offending across the city
- Analysing aerial photography using machine learning to identify zinc roofs, the run off from which pollutes our waterways
- Using LIDAR, video and machine learning to automatically identify potholes
- Using AI to analyse community sentiment in real time and understand emerging issues



Areas of focus

Through our stakeholder engagement we have identified key focus areas for the programme. The areas listed highlight where our stakeholders feel that we can help support their strategies, provide insights on international trends, de-risk their environment by trialling new technologies and connect them to innovators and the tech sector.

While not an exhaustive list, these areas are where the programme will have a particular focus. Two overarching areas that the programme will focus on are Sustainability and Climate Change, given that these are major challenges facing all cities, and are a key focus for Council.

The Ōtautahi-Christchurch Climate Resilience Strategy states that climate change is the biggest challenge of our time. It is already affecting our climate, native ecosystems, customary practices, mahinga kai, food production, health, biosecurity, infrastructure, trade and tourism.

Smart Christchurch will play an increasingly active role in support of the strategy's Programme 6: Economic transformation and innovation.

Community engagement underpins these focus areas, as participation and active engagement contribute to prosperous high quality living and a place where people want to be. Meaningful outcomes are driven and owned by the community.

Climate change and sustainability

Christchurch City Council has taken a leadership role on climate change for many years and has called out meeting this challenge through every means available as one of its strategic priorities.



Air

Healthy Environment is one of the Council's key community outcomes. Maintaining air quality in and around our city is an important focus in Christchurch City Council's environmental commitments. Alongside Environment Canterbury (ECan), we aim to continue improving air quality to meet national environmental standards. While there has been a reduction in high pollution nights recorded over the past decade, there is still much to be improved. Using an air plan and other tools developed by ECan, members of our community can check air quality around them in areas where the most work is being done to improve air quality.

www.ecan.govt.nz/your-region/your-environment/air-quality



Water

Water supply, wastewater, storm water, surface water and groundwater are a fundamentally important aspect of Ōtautahi-Christchurch life. Christchurch City Council has a responsibility to ensure that its water services, infrastructure and water taonga are managed in a manner that supports the environmental, social, cultural and economic wellbeing of current and future generations.

www.ccc.govt.nz/the-council/plans-strategies-policies-and-bylaws/strategies/te-wai-ora-o-tane-integrated-water-strategy



Waste

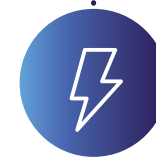
Ōtautahi-Christchurch is a sustainable city, working towards zero waste and a circular economy. Managing and minimising waste is a key council responsibility. We need to deliver an effective and efficient waste system, that maximises opportunities to reuse materials and benefits current and future generations. Our long-term vision is for a sustainable Ōtautahi-Christchurch, working towards zero waste and a circular economy. This will maximise the sustainable use of resources and support a strong response to climate change.

www.ccc.govt.nz/the-council/plans-strategies-policies-and-bylaws/plans/waste-management-and-minimisation-plan/



Mobility

Ōtautahi-Christchurch has an opportunity to be recognised as a world class destination for those who want good mobility. Enabling sustainable transport and mode of transport options by implementing applications that ease road congestion is critical, especially as Christchurch is a city where driving is dominant. Opportunities for real-time navigation alerts, smart parking apps, enhancements that promote active travel and providing data that supports promotion of active travel. Proactive engagement with the community, and capturing and understanding the data will lead to better mobility within and around our city.



Energy

The Sustainable Energy Strategy for Ōtautahi-Christchurch 2008-18 was agreed by the Christchurch City Council in 2008. In 2015 the Christchurch Energy Action Plan was developed to build on the Christchurch energy initiatives implemented to date and to respond to new opportunities available through the recovery and rebuild of the city. The Council's role is to facilitate and implement action on energy efficiency, renewable energy, transport energy efficiency and security of energy supply.



Economic development

The Smart Christchurch Programme works with the economic development and business attraction agency in Ōtautahi-Christchurch, ChristchurchNZ. This is part of our city-wide approach, to work on strategies to create high value work for the city by attracting national and international organisations to Christchurch. The programme supports the work that is being undertaken through the ChristchurchNZ Supernodes and has been actively engaged with initiatives such as; the Aerospace Challenge and supporting opportunities under the Food and Fibre Supernode.

www.christchurchnz.com

Engagement and communication

Participation and active engagement contribute to prosperous high quality living and a place where people want to be.

Implementing this strategy

Over the next three years, the programme will transition from not only being initiative-led, where there is a pressing need for us to solve a specific problem, to being strategy-led, working with business units and the community to provide future-focused solutions that deliver for citizens. This approach will help accelerate the delivery of key Council strategies and associated deliverables, and will identify potential operational cost savings through efficiencies.

Active engagement with our Council units to share key Smart Christchurch concepts along with working on public and private sector partner collaborations are key to implementing this strategy. New initiatives we explore are generally funnelled from a range of starting points, and assessed on how they will support our objectives and strategic priorities.

Most commonly, research on what is happening in cities around the world informs the ideas we begin with for initiatives, which we then apply to our local community. Along with this, we work with our Council business partners to understand their needs, conceptualise ideas which helps generate ways to support them. We also have Tertiary Education providers, vendors, including local start-ups and innovators, approach us with ideas to address issues in the city. Reflecting on past policies and initiatives throughout the community and repurposing them into a new, more effective initiatives is another starting point for some Smart Christchurch initiatives. Collaboration is at the centre of these processes.

The programme has developed a triage model that will provide the assurance that what we are working on will help us to deliver our objectives. The initiatives will be assessed on how it meets the following:

- Does the initiative provide community benefits?
- Does the initiative support Council's vision:
 - Ōtautahi - Christchurch is a city of opportunity for all... open to new ideas, new people and new ways of doing things – a city where anything is possible.
- Does the initiative align with the Smart Christchurch mission?

- Is the initiative ambitious enough in its innovation?
- Are there opportunities to collaborate with other strategic and regional partners?

Tapping into the collective genius around us helps make Smart Christchurch the Council's innovation enabler, and focuses our initiatives on a variety of technology and solutions. This helps us to address many different challenges, as well as support the wider innovation ecosystem. Moving forward with this model, we are also aiming to incorporate more community engagement into our initiatives. This will include getting input from citizens on what they would like to see in their communities, and how best we can see that through.

The adoption of the Smart Christchurch Strategy will provide a framework for the programme and shows the commitment from Council in exploring innovative approaches.

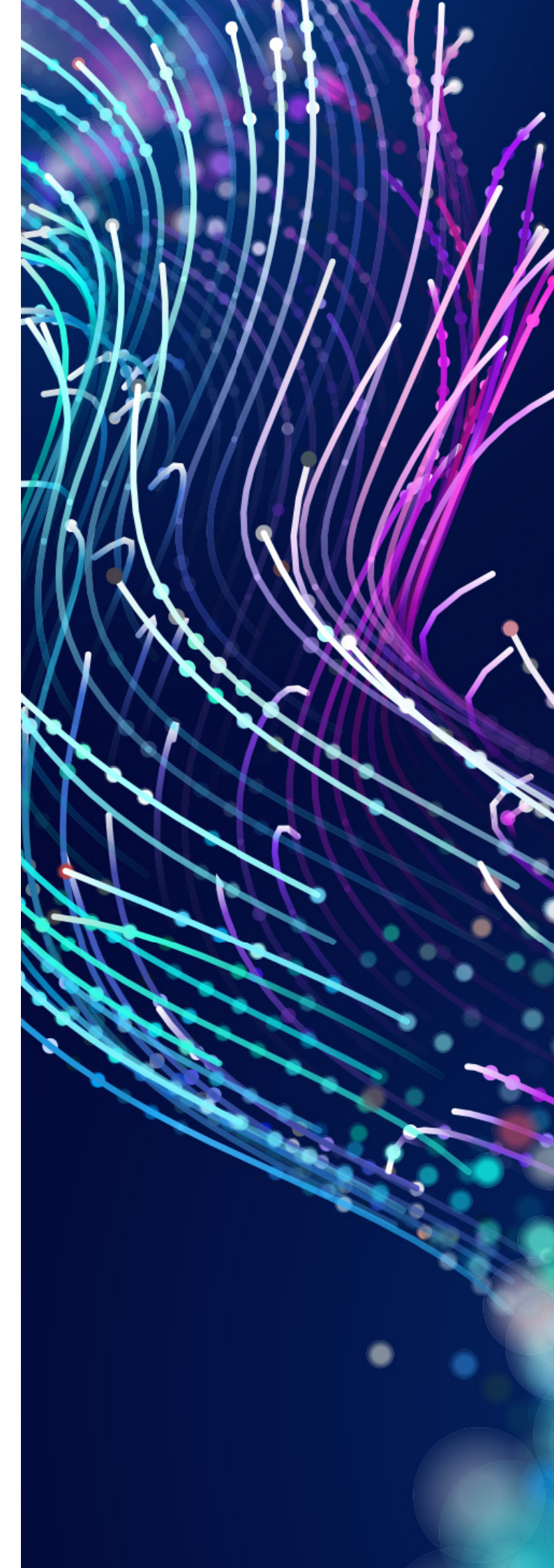
Measuring success

The programme will know it has been successful when we see, as a direct result of the Smart Christchurch initiatives:

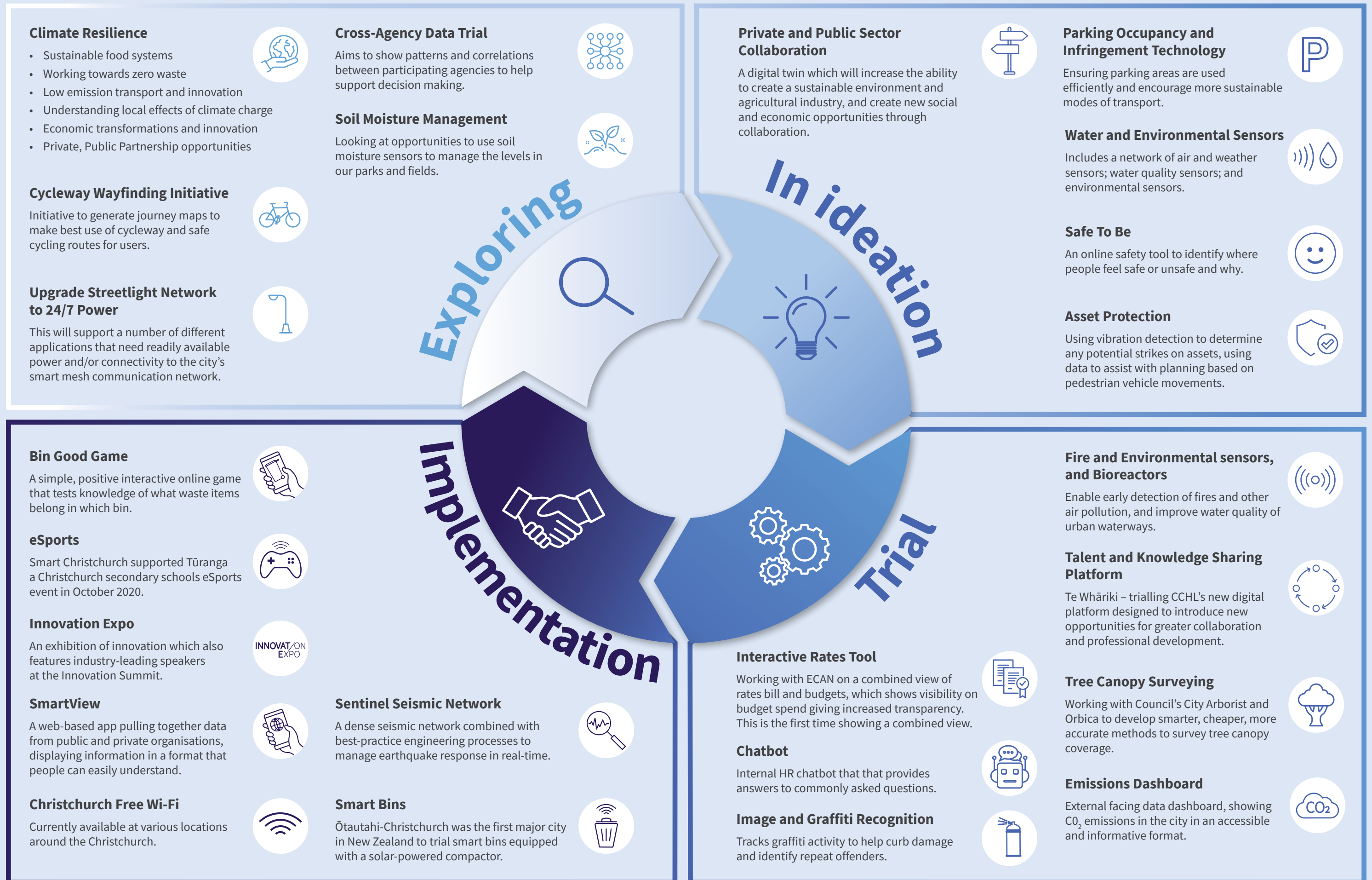
- Positive change in citizen's lives
- Operational efficiency gains for Council
- Accelerated momentum in key Council strategies
- Innovation and smart technology woven into solutions and included in Council's operating models.

Success will be based on the quality of the solution multiplied by the volume of acceptance from citizens and stakeholders. Our programme is focused on outcomes, with all initiatives set for measured and tangible results.

Through our involvement in city-wide initiatives in the wider ecosystem we will see Ōtautahi-Christchurch's reputation build, so that when people "think innovation, they think Christchurch" - a city where anything is possible.



Smart Christchurch Initiatives | In collaboration with our council and private sector partners



Climate Resilience

- Sustainable food systems
- Working towards zero waste
- Low emission transport and innovation
- Understanding local effects of climate change
- Economic transformations and innovation
- Private, Public Partnership opportunities



Cross-Agency Data Trial

Aims to show patterns and correlations between participating agencies to help support decision making.



Soil Moisture Management

Looking at opportunities to use soil moisture sensors to manage the levels in our parks and fields.



Cycleway Wayfinding Initiative

Initiative to generate journey maps to make best use of cycleway and safe cycling routes for users.



Upgrade Streetlight Network to 24/7 Power

This will support a number of different applications that need readily available power and/or connectivity to the city's smart mesh communication network.



Private and Public Sector Collaboration

A digital twin which will increase the ability to create a sustainable environment and agricultural industry, and create new social and economic opportunities through collaboration.



Parking Occupancy and Infringement Technology

Ensuring parking areas are used efficiently and encourage more sustainable modes of transport.



Water and Environmental Sensors

Includes a network of air and weather sensors; water quality sensors; and environmental sensors.



Safe To Be

An online safety tool to identify where people feel safe or unsafe and why.



Asset Protection

Using vibration detection to determine any potential strikes on assets, using data to assist with planning based on pedestrian vehicle movements.



Bin Good Game

A simple, positive interactive online game that tests knowledge of what waste items belong in which bin.



eSports

Smart Christchurch supported Tūranga a Christchurch secondary schools eSports event in October 2020.



Innovation Expo

An exhibition of innovation which also features industry-leading speakers at the Innovation Summit.



SmartView

A web-based app pulling together data from public and private organisations, displaying information in a format that people can easily understand.



Sentinel Seismic Network

A dense seismic network combined with best-practice engineering processes to manage earthquake response in real-time.



Christchurch Free Wi-Fi

Currently available at various locations around the Christchurch.



Smart Bins

Ōtautahi-Christchurch was the first major city in New Zealand to trial smart bins equipped with a solar-powered compactor.



In ideation



Exploring



Implementation



Trial



Interactive Rates Tool

Working with ECAN on a combined view of rates bill and budgets, which shows visibility on budget spend giving increased transparency. This is the first time showing a combined view.



Chatbot

Internal HR chatbot that provides answers to commonly asked questions.



Image and Graffiti Recognition

Tracks graffiti activity to help curb damage and identify repeat offenders.



Fire and Environmental sensors, and Bioreactors

Enable early detection of fires and other air pollution, and improve water quality of urban waterways.



Talent and Knowledge Sharing Platform

Te Whāriki – trialling CCHL's new digital platform designed to introduce new opportunities for greater collaboration and professional development.



Tree Canopy Surveying

Working with Council's City Arborist and Orbica to develop smarter, cheaper, more accurate methods to survey tree canopy coverage.



Emissions Dashboard

External facing data dashboard, showing CO₂ emissions in the city in an accessible and informative format.



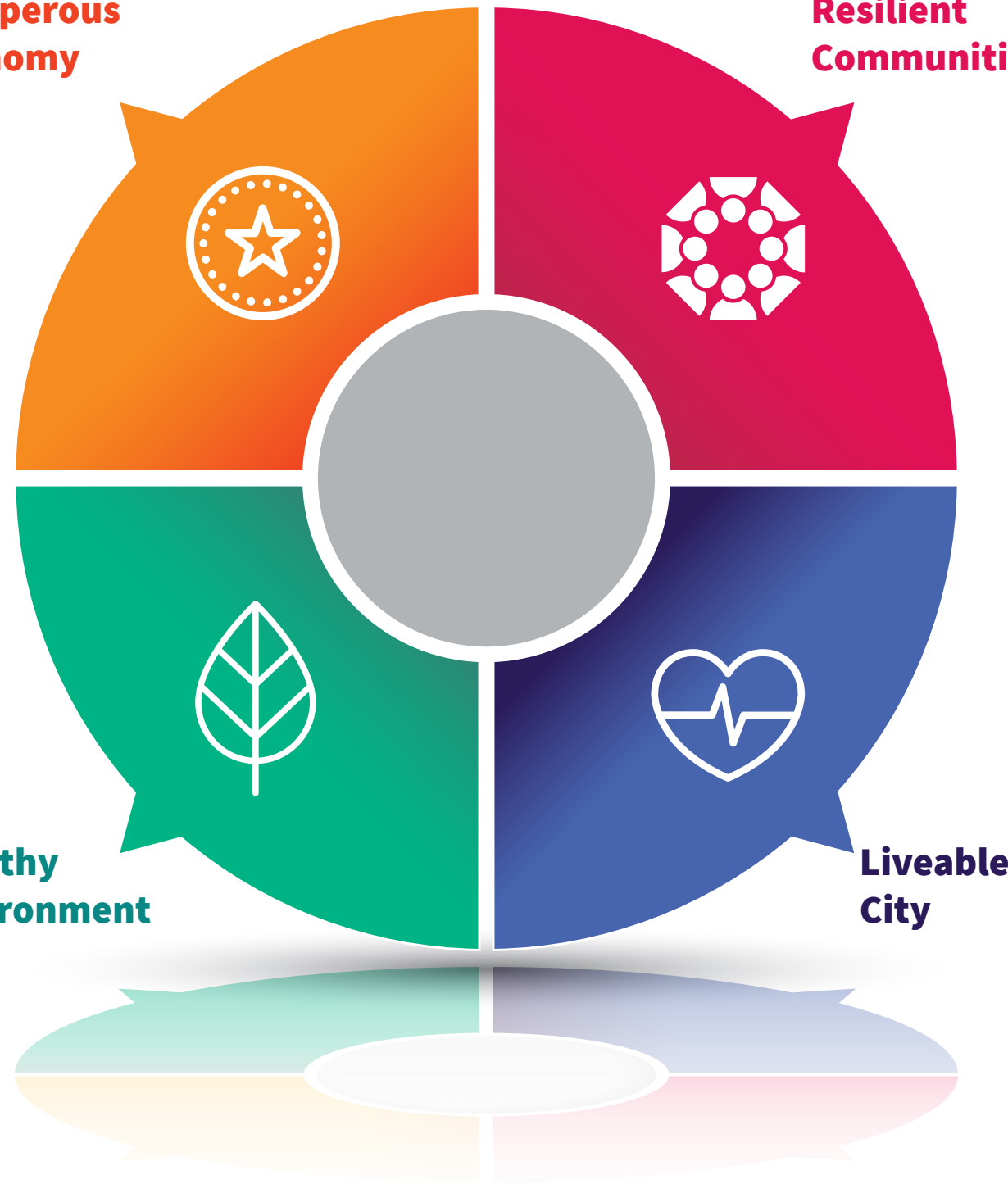
Community Outcomes

Prosperous Economy

Resilient Communities

Healthy Environment

Liveable City



Smart Christchurch Initiatives | In collaboration with our council and private sector partners

Sentinel Seismic Network Resilient Communities Liveable City

Recent earthquakes in Canterbury, Marlborough, and Wellington have not only caused major loss of life, but also economic losses measuring well over \$50 billion. This, and the growing prevalence of risk-based insurance premiums, means local and central government agencies, and emergency response teams, must capture more high-quality information for defensible decision-making.

Sentinel is a network of sensors developed and operated by Canterbury Seismic Instruments Ltd (CSI). With Christchurch City Council as the anchor user of the network, CSI have created an affordable model that encourages uptake by lease holders, facility managers, engineers, building owners, Civil Defence and Emergency Management, homeowners, and the public to safeguard people and assets – and the ability to provide a wealth of valuable data for industry development and academic research.

Progress: Over 150 sensors across Ōtautahi-Christchurch have been rolled out, providing real-time response and safe guarding communities, employees, residents and our many assets above and below ground. Winner: SOLGM – Local Government Excellence Awards – Innovation in Asset and Infrastructure Management.

Impact: Increased community safety, resilience of infrastructure, defensible decision making.

Status: Implementation

Work programme: Smart city infrastructure | Replication strategy | People-centred Smart City

Christchurch Free Wi-Fi Resilient Communities Liveable City

Christchurch Free Wi-Fi is currently available in Cathedral Square, in Akaroa, at the New Brighton Promenade, and at Council libraries. A partnership with Enable will see the expansion of free public Wi-Fi in areas of the CBD. Greater equity of access opens opportunities for economic and social growth to a wider range of the city's population. The expansion helps support digital inclusion and will provide us with a network that we can leverage for other digital solutions and provides us with a channel to deliver community messages.

Progress: Christchurch Free Wi-Fi is offered in Council Libraries and at various locations in public spaces in the Ōtautahi-Christchurch CBD, Akaroa and New Brighton.

Impact: Open access to digital networks for residents and visitors to our city. Positive impact on digital inclusion.

Status: Implementation

Work programme: Smart city infrastructure | City-wide collaborations | People-centred smart city

Smart bins Resilient Communities Liveable City Healthy Environment

Ōtautahi-Christchurch was the first major city in New Zealand to trial these compacting bins. Each Smart bin is equipped with a solar-powered compactor. A sensor inside the bin activates the compactor when the rubbish gets to a certain level. Crushing the contents enables a Smart bin to hold up to 10 times more waste than a standard rubbish bin. The bin sends real-time level data to a dashboard that lets contractors and city operational leaders know how full the bin is, and when it needs emptying. They can also use historical data to manage the waste management assets and process more efficiently. The Council has also been trialling Wi-Fi enabled bins in Akaroa.

Progress: The initial trial saw a 93 percent reduction in bin emptying, and zero customer complaints after trial implementation. We have now rolled out 100 bins throughout Ōtautahi-Christchurch.

Impact: Operational efficiencies, positive environment effects and improved community satisfaction.

Status: Implementation

Work programme: Smart city infrastructure | People-centred smart city

Smart Christchurch Initiatives |

In collaboration with our council and private sector partners

Water and environmental sensors



Water and environmental sensors bring a host of smart possibilities to our community, ranging from real-time leak detection in our potable water network to detecting the early stages of forest fires. Projects in this category include gifting a network of air and weather sensors to schools throughout Ōtautahi-Christchurch to gain insights into air quality across the city; deploying water quality sensors along the length of the Ōtakaro-Avon River; installing five fire detection and environmental sensor arrays in Bottletake Forest and trialling two bio reactors that remove key contaminants such as nitrates and E. coli from rivers and wetlands, developed by a local start-up.

Progress: Ōtautahi-Christchurch is the first New Zealand city to trial using thermal imagery and particulate detection sensors to identify the early stages of forest fires and to automatically notify fire and emergency services, forest management staff and park rangers.

Impact: Real time insights, pin point issues, educate community.

Status: In ideation/Trial

Work programme: Smart city infrastructure | City-wide collaborations

Digital Twin Resilient Communities Liveable City Prosperous Economy

A digital twin is a digital representation of the physical world. It is a virtual representation of a physical object or system using real-time data and other sources. After successfully building a Ōtautahi-Christchurch City digital twin proof of concept (POC) on an external specialist platform, the Smart Christchurch programme is now working with the Council's GIS Team to create this model and associated datasets within our core GIS enterprise software. The programme is also working with other cities and central government on developing a national digital twin strategy.

Progress: The initial Ōtautahi-Christchurch Twin digital twin POC included above-ground and underground infrastructure, 3D building and feature imagery and Building Information Modelling (BIM) digital representations of key rebuild projects such as Tūranga, the new central library. The programme is looking at a range of use cases with an aim to facilitate the development of a Digital Twin strategy for the city.

Impact: Increased community engagement, better decision making, climate resilience.

Status: In ideation/Implementation

Work programme: Smart city infrastructure | Replication strategy | People-centred Smart City

SmartView Resilient Communities Liveable City

SmartView is a web-based app pulling together data from public and private organisations, displaying information in a format that people can easily understand. Our replication strategy for our SmartView product is to work with other councils to extend SmartView into their regions, eventually feeding into SmartView New Zealand, allowing a seamless and connected experience for our citizens and visitors.

Progress: 70 datasets visualised; 189,000 users; 437,507 minutes looking at city data; 1,186,000 page views. Finalist in the IDC Smart City Awards 2021 – Civic Engagement.

Impact: Engaged and connected community that can make informed decisions about their daily lives.

Status: Implementation

Work programme: People-centred smart city | Replication strategy | Driving value through data

Smart Christchurch Initiatives |

In collaboration with our council and private sector partners

Bin Good game Resilient Communities Liveable City Healthy Environment

High volumes of recyclable material is being contaminated, requiring it to be sent to landfill and resulting in high costs to the Council. Contamination of recyclable material is not new as people are often confused and lack confidence in deciding what goes in which bin. The Bin Good Game is another tactic to engage our community to learn about putting their waste in the right bin.

The game was developed in house by the Smart Christchurch programme in conjunction with the Marketing, Design, IT and Resource Recovery teams. It is a simple, positive interactive online game that tests knowledge of what waste items belong in which bin.

Progress: 16,000 users, 29,000 user sessions, 876,000 bin drops (events).

Impact: Educating citizens on waste management.

Status: Implementation

Work programme: People-centred smart city | Replication strategy | Driving value through data

Image and graffiti recognition Resilient Communities Liveable City

The graffiti recognition app tracks graffiti activity using data from the public and contractors to help curb damage and identify repeat offenders. We analyse each photo using the newly developed graffiti recognition software and capture key data from the images to help identify and map the activities of recidivist offenders. The data collected and visualised by the solution is used by Council staff, community groups and NZ Police to inform decision-making that will reduce graffiti incidents.

Progress: Shortlisted for 2021 LGNZ Excellence awards in the Social Wellbeing category.

Impact: Increased ability to track recidivist offenders, intervene appropriately, reduce numbers of graffiti.

Status: Trial

Work programme: People-centred smart city | Replication strategy | Driving value through data

Talent and Knowledge Sharing Platform – Internally referred to as Te Whāriki



Christchurch City Holdings Limited (CCHL) has been piloting Te Whāriki to better utilise the skills of the group's 3000-plus workforce – leveraging skills across the group, increasing employee engagement and preparing for the future of work. This platform has been successful in increasing collaboration on challenges and opportunities across the group. Smart Christchurch has been trialling the platform through that pilot and is now expanding this trial to include Council staff.

Progress: There have been more than a 1000 employees join the platform, with 300+ listings posted, including projects, tasks and development opportunities.

Impact: Increased collaboration and engaged workforce.

Status: Trial

Work programme: People-centred smart city | Replication strategy | Driving value through data

Smart Christchurch Initiatives |

In collaboration with our council and private sector partners

eSports  **Resilient Communities**  **Liveable City**  **Prosperous Economy**

Smart Christchurch supported Tūranga, the new central library, with the delivery of the inaugural eSports event which was held with eight Ōtautahi-Christchurch secondary schools in October 2020. The Smart Christchurch programme is working with libraries, the Ministry of Education and the local gaming industry to organise regional and national competitions, with one aim being to attract bigger e-Sports events to the city in future.

Progress: The inaugural event at Tūranga attracted 500 people in person and 2000 people online.

Impact: Improved Digital Inclusion, opening career paths, growing local talent, making public facilities relevant to our youth.

Status: Implementation

Work programme: People-centred smart city | City-wide collaborations

Innovation Expo  **Resilient Communities**  **Liveable City**  **Prosperous Economy**

An exhibition of innovative solutions and approaches, also featuring leading industry speakers as part of an Innovation Summit. It showcases the city's innovators and lets the public experience tomorrow's technology and explore new possibilities.

Progress: The 2019 event had 2500 visitors, 45 exhibitors and 10 speaking sessions. The 2023 event will be showcased at Te Pae, the new convention centre, and we are expecting approximately 100 exhibitors and over 10,000 visitors. (Recent events could not go ahead because of the COVID-19 pandemic).

Impact: Awareness of up and coming technological solutions; community engagement; fosters collaboration among innovators.

Status: Implementation

Work programme: People-centred smart city | City-wide collaborations

Cross-agency data trial

 **Resilient Communities**  **Liveable City**  **Prosperous Economy**  **Healthy Environment**

Data-driven decision making by people and agencies in Ōtautahi-Christchurch often happens in isolation. This gives us only part of the picture when it comes to making current and future decisions about what is important to citizens and minimises our ability to react to emerging issues in real time.

For good data-driven decision making to occur we need to have a greater view of datasets outside our own Council. The cross-agency data sharing trial aims to show patterns and correlations between participating agencies that will help support decision making and identify and analyse trends of use to decision-makers.

Key to this trial is treating privacy rights and considerations for safe data-use not as a roadblock, but rather as an opportunity to ensure responsible and safe data use.

Progress: Early stage discussions

Impact: Connected joined up view providing better insights for decision making.

Status: Exploring

Work programme: People-centred smart city | Driving value through data | City-wide collaborations



Whiria ngā whenu o ngā papa, honoa ki te maurua tāukiuki

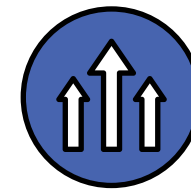
Bind together the strands of each
mat and join together with the
seams of respect and reciprocity

Share. Connect. Innovate.



Alignment with central government priorities

Plan for a modern New Zealand we can all be proud of: A better New Zealand for this generation – and the next.



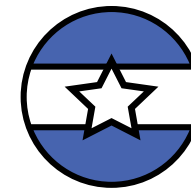
An economy that is growing and working for all of us

- Grow and share NZ's prosperity more fairly
 - Support thriving, sustainable regions
 - Govern responsibly
 - Transition to a clean, green carbon-neutral NZ
-



Improving the wellbeing of New Zealanders and their families

- Ensure everyone who is able to, is earning, learning, caring or volunteering
 - Support healthier, safer and more connect communities
 - Ensure everyone has a warm, dry home
 - Make New Zealand the best place in the world to be a child
-



Making New Zealand proud

- Deliver open, transformative and compassionate government
 - Build closer partnerships with Māori
 - Value who we are as a country
 - Create an international reputation we can be proud of
-

Sources and references

1. Christchurch City Council Strategy
2. ChristchurchNZ – Review of Innovation Ecosystem
3. Christchurch City Council – Sustainable Energy Strategy
4. Christchurch City Council – Integrated Water Plan
5. Christchurch City Council – Minimise Waste Plan
6. Christchurch City Council – Otautahi Christchurch Climate Change Strategy
7. Greater Christchurch Partnership – Greater Christchurch 2050
8. Deloitte – Inclusive Smart Cities
9. McKinsey Global Institute – Smart Cities: Digital Solutions for a more liveable future
10. ChristchurchNZ – Economic Insights
11. ChristchurchNZ – Supernodes
12. Smart Cities Council – Australia and New Zealand
13. Smart Cities Council – Readiness Tool kit
14. Gartners – Market Trends
15. BBC World – Business Daily Series, Smart Cities
16. PWC – Creating the smart cities of the future



Smart Christchurch Strategy

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2022–2025

**Share.
Connect.
Innovate.**