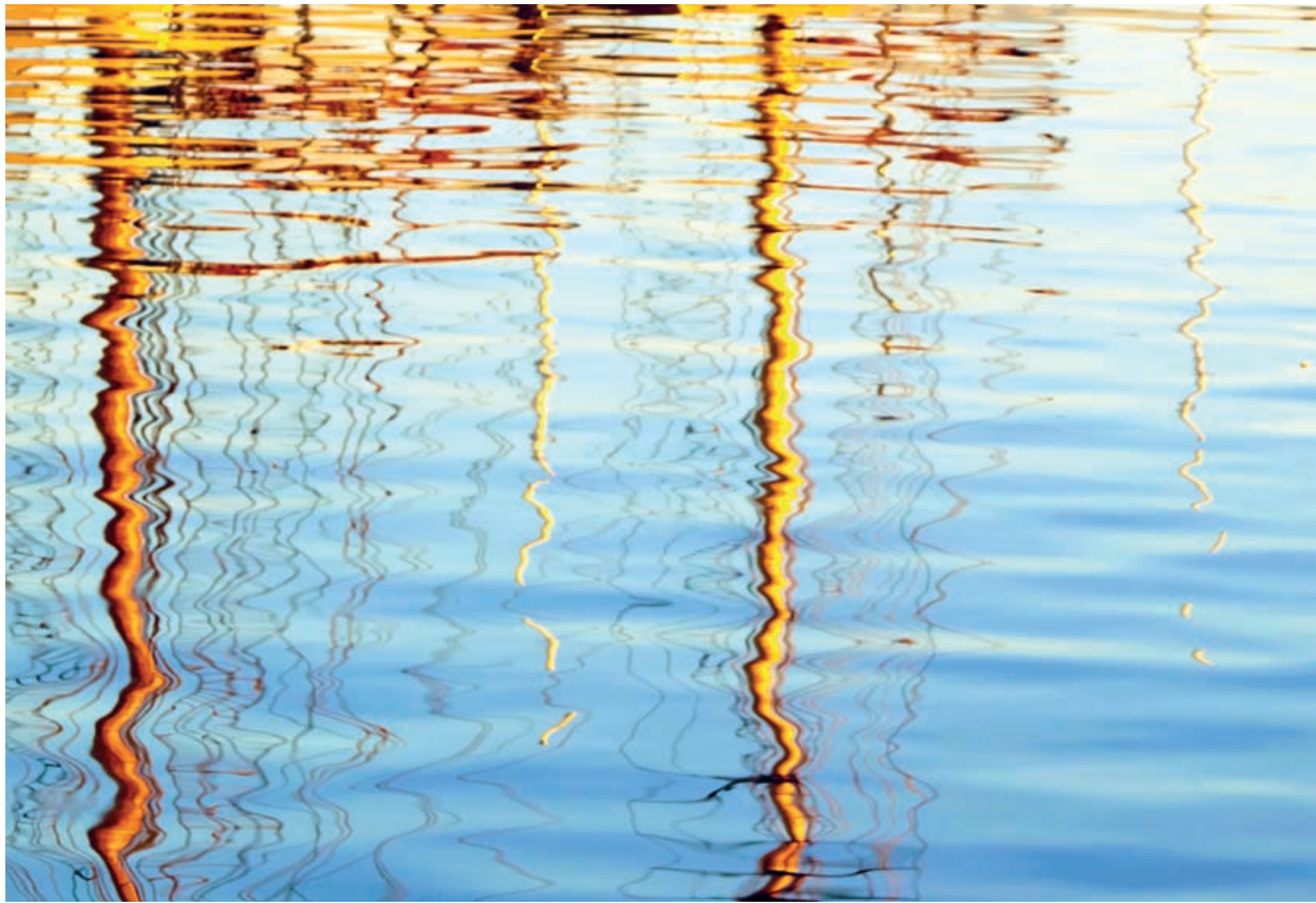


SUSTAINABLE
DEVELOPMENT
FRAMEWORK
2013_





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INTRODUCTION

The world we know is facing challenges on an unprecedented scale.

Climate change, the global financial crisis, energy security, resource depletion and scarcity, environmental degradation, species loss, water and food shortages, peak oil, extreme weather events and sea level rise all threaten the ability of the world's increasing population to exist peacefully and sustainably on the planet.

Around the world cities are leading the way in addressing many of these challenges through a transition towards green growth and low carbon economies. They recognise that action must be taken to ensure ecosystems are resilient and can continue to support life and lifestyles.

Waterfront Auckland is committed to achieving and showcasing sustainable development through the redevelopment of the waterfront. A goal of the Waterfront Plan is that the waterfront is the location of leading sustainable urban transformation and renewal in Auckland. Waterfront Auckland envisages that the transformation of the waterfront will demonstrate the benefits of sustainable development in environmental, social, cultural and economic terms. Pushing the boundaries of sustainable design and development will stimulate innovation and ensure the Auckland waterfront will be a vibrant, attractive and interesting place to live, work and visit.



PURPOSE AND STRUCTURE OF DOCUMENT

The purpose of this framework is to drive the sustainable development of the waterfront, to deliver the waterfront as New Zealand's leading location of sustainable urban transformation and renewal.

The Sustainable Development Framework (SDF) sets out Waterfront Auckland's sustainability aspirations and commitments. It establishes the development expectations and sustainability targets against which to measure the area's progress and success. Progress against these targets will be reported on an annual basis.

The Sustainable Development Framework is an implementation tool of the Waterfront Plan. It will guide the sustainable design, development and operation of the waterfront, in particular, the area to be redeveloped by Waterfront Auckland, on behalf of Auckland Council and the residents of Auckland. It articulates what sustainability means at the waterfront and gives confidence that Waterfront Auckland will deliver on the goals of the

Waterfront Plan, with the collaboration and coordinated actions and investment of key stakeholders, including other council organisations and development partners.

The SDF will be made available and promoted to stakeholders, including council, council-controlled organisations and other waterfront landowners who will be encouraged to support the approach and objectives for sustainable development.

The Sustainable Development Framework 2013 builds on earlier work and updates the objectives and targets for the environmental, social, cultural and economic outcomes for the land and water space for which Waterfront Auckland is responsible.

As the bar is always lifting, the intention is that new and continued engagements, research and analysis will lead to further actions and initiatives, which will be shared on Waterfront Auckland's website.

This document contains six sections:

- **Section 1** outlines the approach to sustainable development.
- **Section 2** provides the background and strategic context.
- **Section 3** introduces the sustainability vision, objectives and five key strategies of transformation or focus, being high performance buildings, renewable energy, sustainable transport and exemplar projects.
- **Section 4** discusses the broad range of sustainability issues relating to the development of the waterfront and sets development expectations for private and public projects on Waterfront Auckland land. It lists specific actions Waterfront Auckland will take to address the issues and support the delivery of the expectations.
- **Section 5** describes the range of implementation tools that will be used to implement this framework.
- **Section 6** sets out sustainability targets for the waterfront, and Wynyard Quarter precinct in particular, against which progress will be measured and monitored. Documenting how a particular project meets the sustainability expectations in the SDF is also a vital step in ensuring that Auckland's waterfront is developed in a sustainable way.



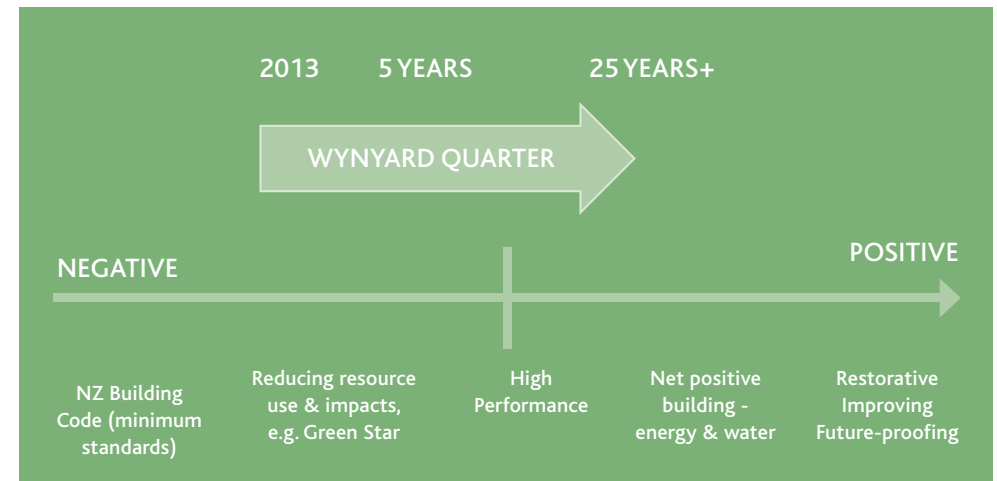


1 APPROACH TO SUSTAINABLE DEVELOPMENT

Waterfront Auckland's approach to sustainability

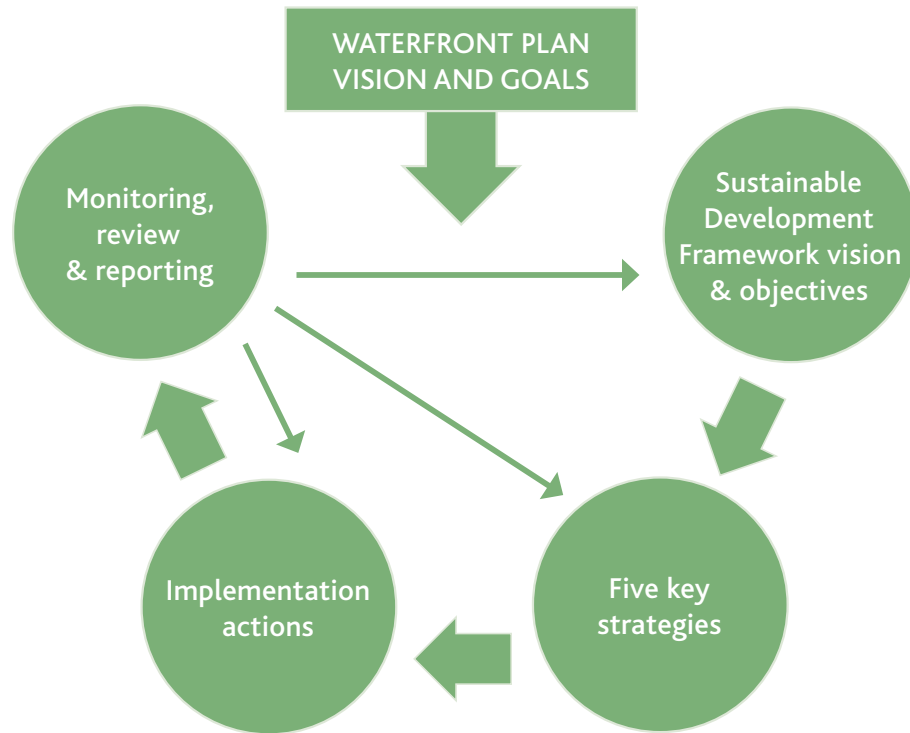
Sustainability is not business as usual. Sustainability is a journey from transition to transformation. It is intended that sustainability is not a prescriptive or constraining concept; rather, that it can stimulate creativity and innovative partnerships that result in dynamic, beautiful, sustainable communities. Waterfront Auckland has set clear overarching requirements for the Wynyard Quarter and has set minimum standards above business as usual, while recognising the capacity and capability of the market to deliver. Stretch targets are also set in priority areas.

Achieving international best practice by moving into the zero net energy/water/waste and restorative space is the expectation of future development phases at the waterfront.



Exemplar international developments include Barangaroo (refer page 19) and Hammarby (page 20), Baoding (page 26) and the Living Building Challenge certification scheme (page 31).

THE SUSTAINABLE DEVELOPMENT FRAMEWORK



The Waterfront Plan sets the context for Waterfront Auckland's ambitions and commitment to delivering sustainable development. Waterfront Auckland interprets sustainability as an approach to achieve the goals of the waterfront plan, which includes:

- Taking a long-term life cycle view
- Being smart, innovative, collaborative, creative and responsible
- Adopting systems thinking and looking for integrated solutions
- Improving outcomes across the four well-beings – social, economic, environmental and cultural
- Understanding risk and building resiliency of community, business, infrastructure and environment
- Embracing the importance and philosophy of kaitiakitanga
- Visionary leadership, and
- Community engagement.

Mana Whenua partnership

In delivering the sustainability outcomes sought by this document and through the regeneration of the waterfront, Waterfront Auckland will seek to acknowledge and celebrate the rich history of Māori settlement in the area. Mana Whenua are Māori with ancestral rights in respect of resources in Auckland and responsibilities as kaitiaki (guardians) to protect their tribal lands, waterways and other taonga (treasured things). Mana Whenua have been active participants in developing the future shape of the area and their continued participation is important to ensure a richer result. Waterfront Auckland has a good working relationship with Mana Whenua and will continue to foster this relationship.

In delivering the Sustainable Development Framework, Waterfront Auckland will endeavour to:

- Engage with Mana Whenua at a high level and as a partnership (mana/rangatiratanga)
- Revive names and genealogical connections to ancestors and associated narratives (whakapapa)
- Acknowledge significant landmarks and their cultural connections (tohu)
- Explore opportunities for incorporation of natural landscape elements with cultural associations (taiao)
- Enhance environmental health/life essence in the wider site (mauri tū)
- Harness creative talent to inscribe iwi/hapu narratives into the built environment (mahi toi)
- Create opportunities for iwi/hapu to maintain a presence in the area through living, commercial, customary or cultural activities as part of a partnership (ahi kā).





Customary Māori sustainable management in Tāmaki Makaurau¹

Māori developed a sustainable system on the central isthmus by the 1800s, centred around two base winter camps and numerous coastal satellite fishing villages that were utilised over the summer months for harvesting and processing kaimoana (seafood).

Family units of the tribe changed settlement locations and moved across the isthmus at different times of the year to gather food. This system of management led to the saying, Te Pai me te Whai Rawa ō Tāmaki (The wealth and the luxury of Tāmaki!), as food was always plentiful.

¹ The Geography Department of the University of Auckland. The Maori economy of Tamaki 1820-1840, based on post-graduate research by Agnes Sullivan.



2

BACKGROUND AND STRATEGIC CONTEXT



Waterfront Auckland is a development agency with a mandate to lead delivery of the revitalisation of the city's waterfront.

Waterfront Auckland is responsible for around 45ha of waterfront property, including Wynyard Wharf and the land north of Pakenham Street at Wynyard Quarter, Westhaven Marina and Queens Wharf, on behalf of Auckland Council and the ratepayers and public of Auckland. The Waterfront Plan published in 2012 sets a vision and goals for future development across the waterfront.

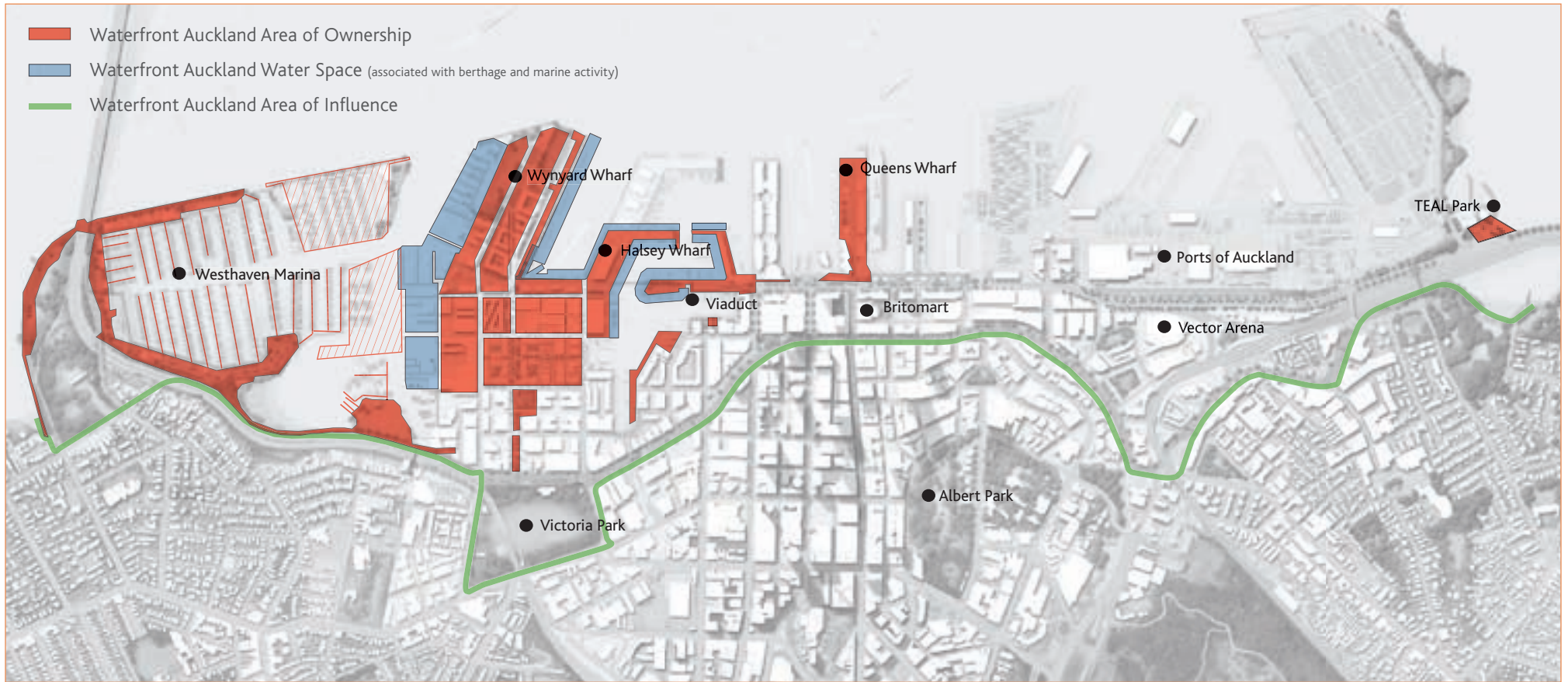
For many reasons, Auckland's waterfront represents the premier investment in the region. The redevelopment is projected to extend over 30 years, directly supporting 20,000 new full-time jobs and contributing towards a further 20,000 jobs across the region. With an additional \$285 million to be invested in public space and infrastructure, and aiming to attract around a billion dollars' worth of private investment, the waterfront is going to feature an exciting mix of residential, commercial and mixed use development. By 2040 the waterfront redevelopment is forecast to contribute \$4.29 billion to Auckland's economy.²

The Sustainable Development Framework (SDF) 2009 produced by Sea + City Projects Ltd set out the aspiration that the Wynyard Quarter would be New Zealand's premier example of environmentally responsible development and showcase world-class strategic and design responses to local and global environmental issues in a local context. The new SDF 2013 builds on this, responding to the strategic direction of the Waterfront Plan 2012 and the Auckland Plan 2012 and the continual advancement of sustainability technologies and strategies.

Sustainability has already been a core consideration in many public and private projects across the waterfront. These projects demonstrate some of the design solutions available and represent a commitment to high-quality infrastructure and buildings that use resources efficiently, reduce emissions and environmental impact, and are efficient to operate.³

² PricewaterhouseCoopers, (March 2013) Building the Waterfront Economy.

³ Some of these projects are described in the Waterfront Case Study boxes throughout this document.



New Zealand benefits from a clean, green image, a small population and a natural environment that by international standards is relatively pristine. However, New Zealand's greenhouse gas emissions continue to rise, the natural environment is under stress and environmental indicators largely show declining environmental quality and many species under threat. There are wide concerns that legislative changes will lower environmental standards and that in recent years New Zealand has lost its "environmental leader" position due to the lack of a coordinated response to climate change and limited support for alternative fuels, renewable energy and sustainable building.

However, a range of business, community, local government and non-government groups have been highlighting the need for green growth, alternative approaches and local responses, and are taking action.⁴ And some developers and investors have been leading the way with innovative and high performance buildings. There is an opportunity for the waterfront to lead New Zealand in the transformation to more sustainable urban environments and showcase the benefits, opportunities and efficiencies that arise from sustainable development.

Auckland Plan

The Auckland Plan sets a strategic direction for Auckland and its communities that integrates social, economic, environmental and cultural objectives. It estimates that Auckland's population could grow from 1.5 million to 2.5 million by 2040. Together, the Auckland Plan and Unitary Plan will provide the overall vision and direction for the future development of the whole Auckland region.

The Auckland Plan sets out an overarching vision for Auckland to be the world's most liveable city and sustainability is a key theme. The sustainability aspirations of Auckland Council include some clear direction and bold targets for reducing greenhouse gas emissions (40% by 2040 based on 1990 levels), significantly increasing passenger transport and transitioning Auckland to a sustainable eco-economy. Recognising sustainability imperatives and growth demands, the Auckland Plan seeks to deliver a compact city, with limited greenfield expansion and the majority of residential growth occurring through intensification.

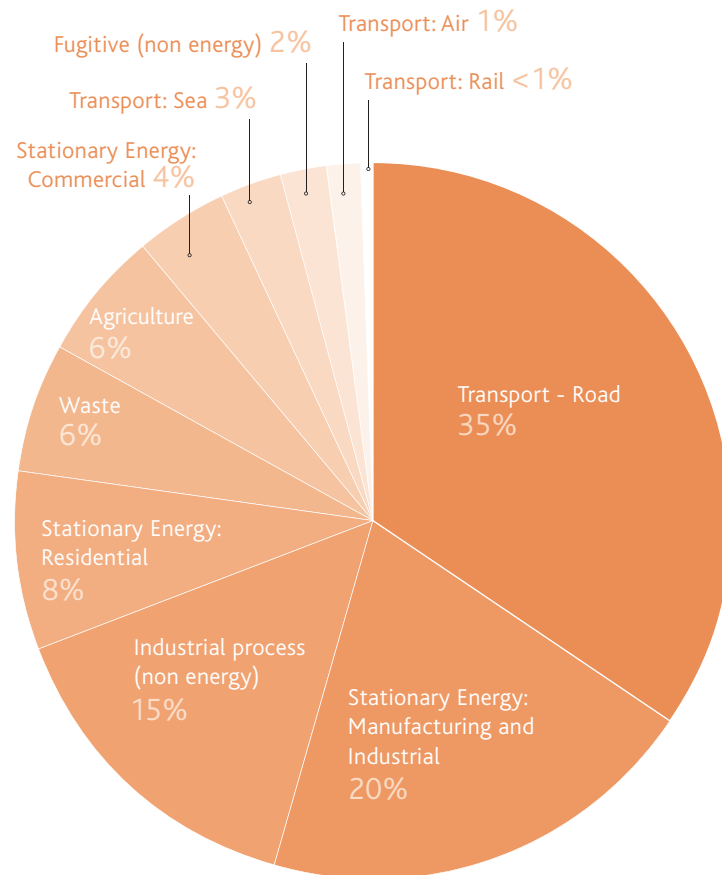
The Auckland Plan also sets targets for reducing water use, increasing energy efficiency and renewable energy, reducing air pollutants, improving coastal water quality and minimising waste, as well as outlining a directive to "acknowledge and account for ecosystem services when making decisions for Auckland".

Auckland Council is developing the Auckland Energy Resilience and Low Carbon Action Plan, which seeks a transformation from a fossil fuel-dependent, high energy-using, high-waste society to a more 'liveable city' based on:

- Sustainable resource use (including waste minimisation and recycling)
- A quality compact form
- An eco-economy and the pursuit of green growth
- Efficient transport and energy systems that maximise renewable resources and minimise reliance on fossil-based fuels

⁴ For example, Pure Advantage, the Sustainable Business Network, the New Zealand Green Building Council, the Sustainable Business Council (Business New Zealand), the Environmental Defence Society and environmental groups, Transition Towns, Element Magazine.

Auckland's emission's profile⁵



⁵ Auckland Council, (2012) The Auckland Plan.

Auckland Plan Environmental Principles⁶

Auckland's environment must be healthy and resilient in order to support life and lifestyles. To ensure this we must recognise that:

1. The environment supports us – the natural resources provided by our environment have limits, and must be protected and restored to ensure our future well-being.
2. We need to consider environmental values in all that we do – the interaction between the environment and people is understood and considered in our everyday behaviour and choices.
3. Everything is connected – human activities affect the air, sea, land and freshwater systems. Understanding the connections between environments in the way we manage them is critical.
4. Biodiversity is everywhere – our flora and fauna, and their habitats, occur on both public and private spaces, and in urban, rural and freshwater and coastal areas. To maintain biodiversity values we must all work together.
5. Natural hazards can affect our well-being – we need to ensure that Auckland and its people are resilient to the effects of natural hazards.
6. We are environmental stewards – future generations will depend on how well we manage the natural environment.

⁶ Auckland Council, (2012) The Auckland Plan.

Waterfront Plan Vision

The vision of the Waterfront Plan 2012 is “A world-class destination that excites the senses and celebrates our sea-loving Pacific culture and maritime history. It supports commercially successful and innovative businesses and is a place for all people, an area rich in character and activities that link people to the city and the sea”.

Waterfront Plan Goals

To achieve this vision and promote a balance of sustainability, resilience and productivity, Waterfront Auckland has set five goals for Auckland’s waterfront, to be advanced by bold leadership.

A public waterfront

A place for all Aucklanders and visitors to Auckland, a destination that is recognised for its outstanding design and architecture, natural environmental quality, public spaces, recreational opportunities, facilities and events; a place where we protect and express our cultural heritage and history, and celebrate our great achievements as a city and nation.



A smart working waterfront

Attracts high-value, innovative, creative and green businesses and investment to achieve a significant lift in productivity; a place for authentic and gritty waterfront activities: the marine and fishing industries, water transport and port activities.



A connected waterfront

A place that is highly accessible, easy to get to and to move around in, where people feel connected to the wider city and beyond by improved pedestrian and cycling linkages; fast, frequent and low-impact passenger transport; state-of-the-art telecommunications and through supportive community and business networks.



A blue-green waterfront

A resilient place where integrated systems and innovative approaches are taken to enhance the marine and natural eco-systems, conserve natural resources, minimise environmental impacts, reduce waste, build sustainably and respond to climate change.



A liveable waterfront

The location of leading sustainable urban transformation and renewal in Auckland; the most liveable New Zealand central city urban community; a vibrant mix of residents, workers, visitors and activities. A welcoming and resilient neighbourhood that is safe, diverse and attractive, with plentiful open space and access to local services and facilities.



⁷ OECD, (May 2011) Towards Green Growth: A summary for policy makers

Sustainable Development Framework Vision

The leading location of sustainable urban transformation and renewal in Auckland and across New Zealand.





3

VISION, OBJECTIVES AND KEY STRATEGIES

Objectives

- Reduce greenhouse gas (GHG) emissions and develop a low carbon precinct
- Increase resiliency of the built and natural environment and of the community
- Design and develop the waterfront public land according to sustainable design principles
- Identify opportunities to restore and enhance environmental quality
- Develop a diverse business and residential community
- Manage travel demand and prioritise and promote sustainable transport
- Create an authentic waterfront experience respecting cultural and heritage values.

Five key strategies to deliver the SDF objectives



Waterfront Auckland has reviewed many of the approaches and sustainability technologies being used internationally. As the basis for an exemplar sustainable development, the fundamentals of the Wynyard Quarter site are excellent:

- An urban regeneration of a former industrial site
- Excellent accessibility, with additional future public transport planned
- 2km from the city centre
- Sought-after waterfront location
- Planning for a compact, higher density, mixed use development
- Provision of 10ha of public open space and high-quality public realm
- Sustainable design features in early developments
- A clean electricity grid by global standards, comprising a high proportion of energy from renewable sources.

Auckland has a temperate climate with significantly lower heating and cooling demands than many other Western cities and a relatively clean energy supply.

This means that some of the most effective approaches for minimising emissions in other countries are not suitable here. Also, other factors – the nature of the building industry (scale, experience), investment market, legislative and planning framework – mean that it has been important to work through options for Auckland.

Quantitative modelling of the precinct's potential sustainability performance⁸ sought to identify both the costs and benefits of different supply and demand-side sustainability strategies and technologies. The modelling focused on resource use and greenhouse gas emissions.

Waterfront Auckland used the results of this analysis, its review of international approaches and input from a range of sustainability specialists to identify the five key strategies to drive the sustainable transformation of the waterfront.

High performance green buildings

Waterfront Auckland considers that high performance green buildings are critical to transforming the Wynyard Quarter into a low carbon precinct. A key focus of these buildings is the conservation of natural resources; they use significantly less energy and water than a conventional building. High performance green buildings have many quantified benefits, including reduced operating costs, increased energy and water efficiency, improved work productivity and health and well-being of workers and residents, improved energy security and increased marketability. Therefore, there is a strong business case for green buildings (refer page 21).

Waterfront Auckland has set a requirement for all buildings on its land to achieve 5 Green Star commercial and 7 Homestar residential accreditation as a minimum, to drive performance and provide quality assurance. The requirement to maximise credits in precinct priority areas (energy, water, waste and transport) has also been identified, and rainwater reuse for non-potable uses such as toilet flushing, laundry and irrigation is expected precinct-wide. Rainwater collection could reduce water consumption across the precinct by an estimated 13%.

Sustainable design has been a core consideration in many public and private projects across the waterfront to date. The Viaduct Events Centre, Jellicoe Street, North Wharf, Karanga Kiosk, Daldy Street and Shed 10 all demonstrate sustainable design features. Waterfront Auckland will monitor performance and share lessons with stakeholders and the public. A string of green buildings across the waterfront by the private sector (including Westpac, NZI and ASB) further showcase sustainable development.

⁸ Kinesis, (February 2013) Wynyard Quarter Precinct Report (www.kinesis.org)

Renewable energy

New Zealand's largest solar photovoltaic PV roof installation is proposed for Wynyard Central. This will be a point of difference for the Wynyard Quarter redevelopment and deliver substantial greenhouse gas emissions savings for the precinct. There are currently no solar systems of this scale elsewhere in New Zealand, so this will help position the Wynyard Quarter as a market leader in creating a low carbon community. The solar array will provide a visual demonstration of Waterfront Auckland's commitment to sustainability. If roof space coverage by solar is maximised, it has been estimated that 75% of the precinct's roof space could be covered by solar PV panels, which could generate around 30% of the precinct's electricity needs.

Sustainable transport

A target has been set of 70% of the trips to Wynyard Quarter at peak being by sustainable transport modes (walking, cycling and public transport). Located adjacent to the Auckland CBD, the Wynyard Quarter has a significant opportunity to become a low car-use precinct. Working with Auckland Transport to provide a low-impact, high-frequency passenger transport service between Wynyard Quarter and Britomart is critical.

Low parking rates, car share schemes, car pooling and travel planning will all be important mechanisms for

achieving the targeted modal split. Car share is relatively new to New Zealand but is gaining in popularity. It is estimated that there is the potential for around 9% of Wynyard Quarter residents to utilise car share vehicles and there is further opportunity to encourage local businesses to use car share for fleet vehicles. The provision of car share will provide a viable alternative for many households to having two cars. Car share itself does not necessarily reduce car use, but it is resource efficient and facilitates decreased parking provision. Car share schemes are successful in many cities worldwide and are increasingly offering a range of vehicle types to suit different uses, including small cars, SUVs and vans.

Exemplar projects

As a land development agency, on behalf of Auckland Council, Waterfront Auckland has the unique opportunity to demonstrate sustainable design, development and operation in all projects delivered on public land. In addition there are opportunities to take innovative approaches to community engagement, provision of community infrastructure, promoting sustainable behaviours, healthy lifestyles and building community cohesion. Community gardens, resource recovery centres, educational opportunities, public art projects and shared toolshed/workshop spaces will be explored as part of Waterfront Auckland's place making programme.



⁹ Office of the Prime Minister's Science Advisory Committee, (July 2013) New Zealand's changing climate and oceans: The impact of human activity and implications for the future

¹⁰ National Institute of Water and Atmospheric Research Ltd, (August 2011) Sea-level rise synthesis for Auckland



INTERNATIONAL EXEMPLAR:

Barangaroo, Sydney

Barangaroo's goal is to be the first precinct of its size in the world and the first CBD precinct in Australia to be climate positive. Barangaroo plans to generate more renewable energy than they use, recycle and export more water than they use and reuse, reduce and recycle more waste from the city than we generate. Barangaroo will be carbon neutral, water positive, generate zero waste and enhance the wellbeing of the community.

The following initiatives will help achieve these ambitious targets:

- A chilled water and harbour cooling system, recycled water service and waste recycling service
- Generating solar renewable energy on site, which will be enough to service the public areas
- Generating new renewable energy off site – including a solar farm in regional New South Wales, big enough to generate the amount of electricity required to power approximately 5,000 homes
- Providing recycled water from Barangaroo to the CBD
- Creating green travel options: strong public transport links, only 4% car use on site, walking and cycling networks, electric car power stations in car parks.

External agencies, contractors and organisations at the site will be required to manage their activities with a view to achieving these sustainability goals This will include:

- Manufacturing soil on site from sandstone and recycled waste
- Reducing waste to landfill by 97%, by sorting and separating waste and recycling or re-using during the construction phase
- Requiring tenants to have their air conditioning just 2 degrees warmer in summer and 2 degrees cooler in winter to save energy
- Planting 100% native plants in the headland park
- Using recycled water for flushing toilets, irrigation, fire sprinklers
- Ensuring 20% of construction work is given to apprentices or trainees
- Ensuring retailers and suppliers avoid packaging, reduce waste and offer healthy food choices from locally and sustainably produced food
- Including affordable retail and office space to encourage new enterprises
- Providing and promoting facilities for walking, cycling and passive and active recreation through design for active living and healthy lifestyles.

Adaptation to change

Minimising risk associated with climate change and natural hazards and ensuring resilience of the waterfront community is a critical element of sustainability. By the late 21st century New Zealand is expected to be at least 2°C warmer on average compared with 1990 and Auckland is expected to have an additional 40-60 days per year where temperatures exceed 25°C.⁹ Lower average rainfall patterns, more drought conditions, and more extreme weather events with more frequent heavy rainfall events and coastal storm inundation are predicted for Auckland. Recent research has recommended that long term planning should take account of accelerated sea level rise (for example, up to 1.5m by 2100 and 1.85 by 2115).¹⁰ A report of the Chief Science Advisor has recommended that "active and adaptive management is required".

Waterfront Auckland will undertake further analysis in relation to the risks of climate change and the higher projections of sea level rise and keep updated the guidance for public spaces, infrastructure and buildings at the waterfront. With the aim to minimise the potential harm to people and property from sea level rise and natural hazards, ongoing monitoring of the efficacy of adaptation methods will be important. Future projects, such as the development of the Headland Park and ongoing upgrades at Westhaven Marina, will provide opportunities to consider innovative approaches and demonstrate resilient design and future-proofing.

Compared to a business-as-usual scenario, the sustainable precinct modelling showed that these interventions across Waterfront Auckland land will contribute to achieving:

- 48% reduction in stationary energy greenhouse gas emissions
- 44% reduction in grid electricity consumption
- 62% reduction in peak electricity demand
- 54% reduction in water demand
- 42% reduction in stormwater discharge
- 81% reduction in private vehicle travel
- 54% reduction in household operating costs.

In addition to the direct quantified benefits from reduced resource use and the resulting reduced operating costs, wider benefits include:

- Making a contribution to the global need to severely reduce greenhouse gas emissions
- Contributing to the local and global need to reduce resource use, recognising that resource use efficiency will become increasingly required as the population increases
- Improving the precinct's energy security and reducing exposure to the risk of energy price increases
- Helping to support and grow the New Zealand green economy
- Being a showcase development for Aucklanders and New Zealanders to learn from and emulate
- Being a tourist attraction in its own right with an attractive information centre set up to describe the sustainable development features.



INTERNATIONAL EXEMPLAR:

Hammarby Sjöstad

Hammarby Sjöstad used to be a run-down old industrial area with grave pollution problems. In the early 1990s, in connection with an attempt to get the Olympic Games to Stockholm, all political parties in Stockholm's city council agreed to make the area an urban environmental role model. When completed, in 2018, it will house over 20,000 residents in around 11,000 apartments.

The goal of the entire environmental programme is to halve the total environmental impact in comparison with an area built in the early 1990s. One of the goals is to make the residents help to produce 50 percent of the power they need — by turning recycled wastewater and domestic waste into heating, cooling and electricity. New types of fuel cells, solar cells and solar panels are being tested in the area.

The goal for water use is to halve the consumption compared with the Swedish average of 180 litres a day. One of the ways to achieve this is via filters installed in all taps, mixing air into the water to reduce the volumes used.

All waste is separated and much of it reused or used to produce energy. The high-tech waste management company Envac has developed a system of underground pipes that use vacuum suction to transport the garbage. A local wastewater treatment plant has also been built, which uses new cleaning technology.

More than 10 years into the project, have the environmental goals been achieved? In a new report covering some major parts of Hammarby Sjöstad, it is concluded that these are 30–40% more environmentally friendly than normal housing areas.

THE BUSINESS CASE FOR GREEN BUILDINGS

New research from the World Green Building Council¹¹

Design and construction costs

Building green does not necessarily need to cost more, particularly when cost strategies, programme management and environmental strategies are integrated into the development process right from the start.

Asset value

As investors and occupants become more knowledgeable about and concerned with the environmental and social impacts of the built environment, buildings with better sustainability credentials enjoy increased marketability. Around the world there is a pattern of green buildings being able to more easily attract tenants and to command higher rents and sale prices.

Operating costs

Green buildings have been shown to save money through reduced energy and water use and lower long-term operations and maintenance costs. Energy savings in green buildings typically exceed any design and construction cost premiums within a reasonable payback period.

Workplace productivity and health

Green design attributes of buildings and indoor environments can improve worker productivity and occupant health and well-being, resulting in bottom line benefits for businesses.

Risk mitigation

Sustainability risk factors can significantly affect the rental income and the future value of real estate assets, in turn affecting their return on investment. Extreme weather events and systematic changes in weather patterns affect the insurability of real estate and lead to questions about the resilience of assets.

Scaling up from green buildings

By greening our built environment at the neighbourhood and city scale, we can deliver on large-scale economic priorities such as climate change mitigation, energy security, resource conservation and job creation, long-term resilience and quality of life.

International real estate firm Jones Lang LaSalle¹² advises that over the next decade, it is likely that capital and rental values will gradually reflect the respective energy and carbon intensity of buildings and their capacity to cope in different climatic stress conditions. There is a significant role that the residential sector can play

in reducing greenhouse gas emissions and Jones Lang LaSalle identifies key interventions for both mitigation and adaptation for investors and occupiers, throughout the building life cycle.

In New Zealand, the PCNZ/IPD Green Property Investment Index provides a measure of investment performance across office buildings that have been awarded a Green Star rating. The index, launched in November 2012 and sponsored by Goodman and CBRE, comprises data from 12 participants, representing approximately NZ\$1.3 billion of Green Star rated office buildings. The research found that office buildings with a Green Star rating returned 8.9% and outperformed non-rated buildings, which returned 6.4% in the year to September 2012. Return outperformance for Green Star rated buildings was driven by a positive capital growth component of 1.7%. Conversely, non-rated office buildings experienced a negative 1.4% capital decline. See the New Zealand Green Building Council (NZGBC) for further details or IPD.com.

In relation to residential consumers, research has found that 9 out of 10 people believe there is an opportunity for a price premium on properties that can demonstrate energy, water and heating efficiency.¹³

¹¹ www.worldgbc.org/business-case

¹² Jones Lang LaSalle, (January 2010) From Sandbags to Solar Panels: Future-proofing UK real estate for climate change resilience

¹³ NZGBC Sustainable Housing Summit, (2012) Market insights: Selling sustainable homes and how to get it right



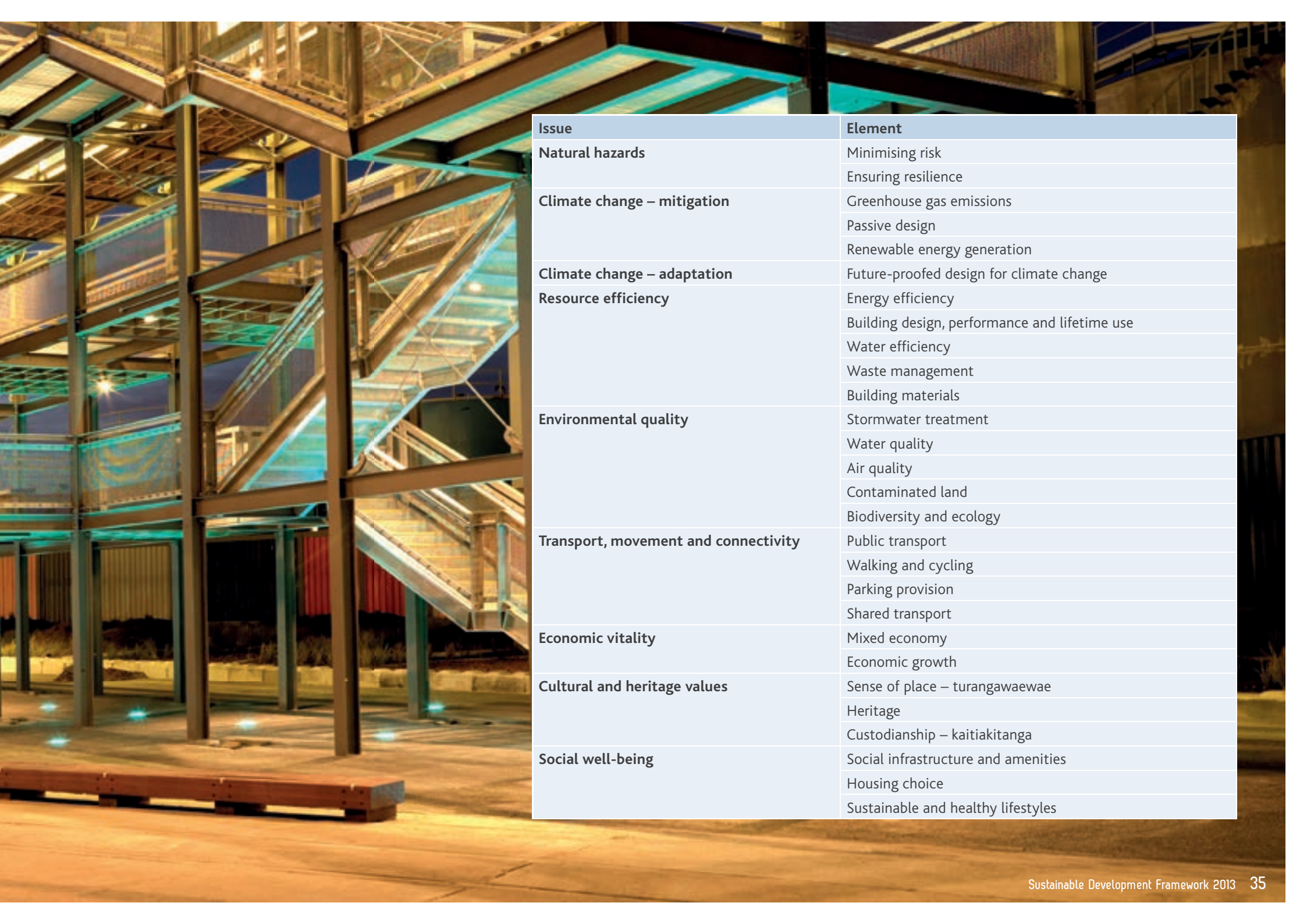




4 ISSUES, DEVELOPMENT EXPECTATIONS AND ACTIONS

Responsiveness to challenges that face Auckland and the waterfront in particular is critical to achieving urban transformation. In this section the broad range of sustainability issues relating to the waterfront is discussed. Development expectations for private and public projects on Waterfront Auckland land are set out in tables, covering the following issues and elements. An action list is also noted under each issue. These are actions Waterfront Auckland will take to advance the implementation of this framework.





Issue	Element
Natural hazards	Minimising risk
	Ensuring resilience
Climate change – mitigation	Greenhouse gas emissions
	Passive design
	Renewable energy generation
Climate change – adaptation	Future-proofed design for climate change
Resource efficiency	Energy efficiency
	Building design, performance and lifetime use
	Water efficiency
	Waste management
	Building materials
Environmental quality	Stormwater treatment
	Water quality
	Air quality
	Contaminated land
	Biodiversity and ecology
Transport, movement and connectivity	Public transport
	Walking and cycling
	Parking provision
	Shared transport
Economic vitality	Mixed economy
	Economic growth
Cultural and heritage values	Sense of place – turangawaewae
	Heritage
	Custodianship – kaitiakitanga
Social well-being	Social infrastructure and amenities
	Housing choice
	Sustainable and healthy lifestyles

NATURAL HAZARDS

Auckland's physical setting and large metropolitan area means it is exposed to a wide range of natural hazards that occur with varying severity and frequency.

Natural hazards in Auckland can be broadly categorised as: geological, including earthquakes and volcanic eruptions; climatic, including cyclones, floods, rain-induced landslides, droughts and tornadoes; and coastal, including beach and cliff erosion, coastal flooding and tsunami. A number of these hazards are likely to be magnified under climate change conditions (see also Climate change, page 25).

Auckland's waterfront is at risk from some of these natural hazards. The risk to the waterfront is not just a result of the frequency and magnitude of the hazard but also the exposure and vulnerability of the elements at risk (e.g. people, buildings and infrastructure).

The low-lying land of Auckland's waterfront adjacent to the coast exposes people and development to coastal inundation and tsunami hazards. Coastal inundation occurs when high tides, storm surge and/or large waves occur at the same time.

Coastal inundation events along the Auckland waterfront could create large waves that overtop barriers, overwhelm stormwater and drainage networks, damage property and impact on business productivity, resulting in economic losses.

Tsunamis occur less frequently, however, the consequences can be much more significant depending on the magnitude of the event. Although the Auckland waterfront is not located in a floodplain, the area is still susceptible to flooding from heavy or prolonged rainfall events. Surface flooding along the Auckland waterfront can cause damage to buildings and property, social disruption and economic losses.

Future changes in climate could have an effect on the environmental processes that cause natural hazard events. Based on current projections Auckland could experience more extreme variability in its climate, increasing the frequency and magnitude of extreme storm events. This would mean an increased frequency and intensity of flooding and coastal inundation events.

Projections of sea level rise due to climate change will also impact on the frequency and intensity of coastal hazards. With rising sea level and more intense storms, low-lying land that is only inundated occasionally is likely to be inundated much more frequently in the future. (See Climate change, page 25).

To ensure Auckland's waterfront is resilient and people are kept safe, it is important that hazard risks are identified and assessed, and measures put in place to reduce the risk to acceptable levels. Risk from hazards can be avoided by not placing development in areas susceptible to natural hazards, but if this is not an option then any adverse effects should be mitigated without generating significant adverse effects to the environment. Future development of the waterfront should ensure that: people remain safe during a natural hazard event; buildings are engineered to withstand external shocks and avoid economic losses; critical services can be restored within acceptable timeframes to avoid lengthy social disruption and economic impacts; and businesses can continue to operate following a natural hazard event.

Issue: Natural Hazards

Element	Waterfront Auckland's development expectation
Minimising risk	All developments (including infrastructure) are designed and built to reduce risk from natural hazards. Design responses to minimise risk could include higher floor levels and water sensitive design approaches for flooding events and safe egress/access out of the area in the event of a natural hazard.
Ensuring resilience	Placement of critical infrastructure in areas susceptible to coastal inundation is avoided.
	Stormwater systems are designed to accommodate the effects of extreme weather events – flooding and coastal inundation.
	Businesses at the waterfront have continuity plans in place to deal with disturbances from natural hazard events.

Action

Work with Auckland Council in the development and implementation of the Natural Hazard Risk Management Action Plan and undertake further waterfront-specific investigations, if necessary, and recommend appropriate response options.

CLIMATE CHANGE

The world's climate is changing due to increased levels of gases such as carbon dioxide in the atmosphere.

Human activities such as the burning of fossil fuels (oil, gas and coal) and deforestation are resulting in rising concentrations of greenhouse gases (GHGs) in the atmosphere. This makes the natural greenhouse effect more pronounced, trapping more of the sun's heat and resulting in a rise in the earth's temperature.

Even the slight change in temperature to date has been accompanied by more extreme weather events, which scientists consider are occurring as a consequence of the rise in temperature. Further temperature rises are projected to bring an increase in the frequency and severity of extreme weather events, which would have potentially catastrophic impacts worldwide. Waterfront precincts are at significant risk from these impacts.

Whatever measures are taken to reduce GHG emissions, the levels already in the atmosphere are expected to continue to affect and change the climate over the next few decades. Therefore, in order to address the issue of climate change, it is necessary to address mitigation and adaptation:

- Mitigation involves seeking to limit and slow down future climate change by reducing the emissions of greenhouse gases into the atmosphere.
- Adaptation involves taking steps to ensure that we are able to adapt to the changes to the climate already occurring and projected to occur.

Based on current knowledge, Auckland could experience more extreme variability in its local climate in the short, medium and long term. Auckland is likely to see hotter average temperatures, changes in wind and rainfall patterns, more frequent extreme weather events such as droughts and floods, and rising sea levels, with higher storm surge and waves.¹⁴ This will create risks and uncertainties for the natural environment, biodiversity, the built environment, the economy, public health, and lifestyles.

There are uncertainties associated with projections for sea level rise due to the variability of the principal contributing factors: thermal expansion, melting of glaciers and polar ice caps, ice loss from Greenland and West Antarctica. Data collected over the past century indicates that the Global Mean Sea Level has risen by 10–20cm. However, sea level rise is accelerating, with the annual rate of rise over the past 20 years being roughly twice the average speed of the preceding 80 years.¹⁵

¹⁴ National Institute of Water and Atmospheric Research Ltd, (August 2011) Sea-level rise synthesis for Auckland

¹⁵ <http://ocean.nationalgeographic.com/ocean/critical-issues-sea-level-rise/>



Impacts for Auckland

Based on current knowledge and under moderate projections, it is likely over the next century that Auckland could experience.¹⁶

- Hotter average temperatures, increasing between 0.2° and 2.5° by 2040 and 0.6° and 5.8° by 2090 (this compares to a temperature increase in New Zealand during the last century of about 0.7°C)
- An additional 40–60 days per year where maximum temperatures exceed 25°C, and more evaporation
- Lower average rainfall patterns (decreasing between -1% and -3% by 2040, to -3% and -5% by 2090)
- More drought conditions: By 2080, drought with a severity that is currently only encountered on average every 20 years, could occur as often as every five years¹⁷
- More extreme weather events with more frequent heavy rainfall events, westerly winds and coastal storm inundation
- More frequent storm inundation and higher storm surge and waves
- Sea level rise – Auckland is presently tracking towards a rise in sea level of 80cm by the 2090s or 1 metre by 2115, but it could be lower or higher: 0.7 m or 1.85 m by 2115 – depending on ice-sheets.¹⁸

¹⁶ New Zealand Climate Change Office, (2008), Climate Change Effects and Impacts Assessment: A guidance manual for local government in New Zealand (2nd edition)

¹⁷ Auckland Regional Council, (2009) Issues and Options: Climate Change

¹⁸ National Institute of Water and Atmospheric Research Ltd, (August 2011) Sea-level rise synthesis for Auckland

INTERNATIONAL EXEMPLAR: Baoding, China – the world's first carbon positive city

A city of one million people about 100 miles southwest of Beijing, Baoding has ascended rapidly as a working urban model of China's transition to a clean energy economy. The city is considered to be the first carbon positive city in the world, largely due to local efforts along with additional national and international support.

Baoding has undergone a transformation from a traditionally dirty textile and automobile manufacturing city to a central hub for renewable energy production and deployment. Over 200 producers of wind, photovoltaic and thermal mass solar, biomass and energy efficiency technologies now call Baoding home, resulting in the creation of over 20,000 additional jobs and the generation of more than \$1 billion in fiscal revenues in 2009. Baoding's companies combined to manufacture and sell 500 megawatts (MW) of solar products and 5089 MW of wind power products in 2008 alone. Baoding's immense economic success in recent years has attracted partners such as the World Wildlife Fund



(WWF) as well as the Chinese national government.

However, the city's clean energy industry growth was not initially spurred on by the Chinese government. Instead, it was initially reportedly the result of the mayor's interest in developing a new economy after lakes in the area experienced fish die-offs that were attributed to water pollution from a local industry. After the national government designated Baoding as a High-Tech Development Zone, Mayor Yu Qin began researching clean energy technologies by visiting nations with early-stage renewable industries in Europe. After securing low-interest loans from the national government, Baoding began its transition to what Mayor Yu Qin calls 'power valley' emulating the industrial cluster model of California's Silicon Valley.

Recent research undertaken by NIWA suggests that long-term planning will need to take into consideration accelerated sea level rise (for example up to 1.5m by 2100 and 1.85m by 2115), due to factors such as global ice sheet melt.¹⁹

Auckland Council is carrying out some updated modelling in relation to sea level rise and storm surge events and the 5th Intergovernmental Panel on Climate Change (IPCC) report is due to be published in 2014. Waterfront Auckland will undertake further analysis in relation to the risks of climate change and the higher projections of potential sea level rise and keep updated the guidance for public spaces, infrastructure and buildings at the waterfront.

Waterfront Auckland will also monitor international design responses to climate change and sea level rise. Given the extent of low-lying waterfront cities around the world, there will be new technology developing and innovative solutions found, which Auckland can benefit from and also potentially be a leader in.

Adaptation will be dealt with through the design of marine edges, landscapes, infrastructure and buildings to be resilient to sea level rise, potential flooding and future-proofed to cope with a climate that is hotter, more extreme and more volatile. It will also be important to ensure the proper functioning and protection of storm

¹⁹ National Institute of Water and Atmospheric Research Ltd, (August 2011) Sea-level rise synthesis for Auckland

water systems, basement dewatering systems, overland flow paths and emergency relief points.

Climate change may also have impacts on biodiversity and on public health due to heatwaves and diseases that flourish in a different climate.

At the Wynyard Quarter mitigation is being addressed through creating a low carbon precinct where greenhouse gas emissions are minimised. A zero carbon goal remains an aspiration but is difficult to deliver at high densities. Through the projects already implemented, Waterfront Auckland has delivered buildings and public spaces that are energy and water efficient and incorporate renewable energy. The Wynyard Quarter redevelopment will build on these developments and raise the bar higher, with high performance green buildings and large scale solar arrays delivering on-site renewable energy.

Around the world, the leading low carbon developments feature on-site renewable energy, often linked by a smart grid. Examples include Bo01 Malmö (Sweden), Baoding (China) and Treasure Island (USA). Best practice projects target on-site renewable energy generation of up to 20% of the total energy consumed. Waterfront Auckland's target of 30% renewable energy generation within 30 years would position the development as a global leader.



WATERFRONT CASE STUDY: Karanga Kiosk

A green roof has been installed on the information kiosk in Karanga Plaza. The roof is made from a range of native tussocks and grasses and is designed to reduce the amount of rainwater that flows off the roof and into the stormwater system by up to 75%. The roof provides insulation, thereby saving energy, and will help to promote biodiversity in Wynyard Quarter by attracting bird and insect life.



Issue: Climate Change – Mitigation

Element	Waterfront Auckland's development expectations
Greenhouse gas emissions	All developments will be low carbon. This will primarily be achieved through being energy efficient, incorporating renewable energy, promoting sustainable transport modes and minimising waste to landfill.
Precinct passive design	Designs of new developments will maximise microclimate, solar access, natural ventilation and natural light to minimise the need for heating, cooling and artificial lighting.
Precinct renewable energy generation	Building design optimises the roof space available for solar and makes this space available for installation of solar panels to maximise the provision of on-site renewable energy.

Actions

- Undertake further analysis in relation to the risks of climate change and sea level rise, and update guidance for public spaces, infrastructure and buildings at the waterfront, if required.
- Maintain a watching brief on sea level rise, extreme weather events and flooding, and continually evaluate the waterfront's resilience and effectiveness of adaptation responses.

Issue: Climate Change – Adaptation

Element	Waterfront Auckland's development expectations
Designing for future climate – flooding/sea level rise/storm surge/extreme weather events	Developments will adopt resilient design principles and be adaptable to predicted climate effects, including more severe and frequent weather events and predicted sea level rise and associated potential rise in water table. This will involve considering risk and resilience to flooding and drought. Particular care will be taken with basements.
	Design of residential and non-residential buildings will ensure the comfort of occupants in a future climate that may be warmer.
	Developments will adopt a Water Sensitive Design (WSD) approach.
	Designs for the public realm incorporate shade, shelter and green space.
	Stormwater systems designed to accommodate extreme weather and flooding events.

RESOURCE EFFICIENCY

The world's population is continually growing and resource depletion and scarcity is a significant challenge.

It is estimated that the developed world is currently consuming resources at a rate that would require three planets to sustain us. Population growth and the increasing prosperity and resultant increase in consumption of the emerging middle classes in some developing nations will only increase the problem.

Recognition of the scale of the problem has led to an international drive towards improving resource use efficiency, with a goal to return to 'one planet' living. The consumption of resources such as fossil fuels and deforestation are also having serious consequences through their contribution to climate change.

Making more efficient use of resources will ensure that we do not compromise the ability of future generations to meet their needs. In the short term, improved resource efficiency will have economic as well as environmental benefits.

Auckland has historically seen a pattern of development that is land and energy consumptive and car-focused. The Auckland Plan signals a move towards a compact city which promotes more efficient use of land and resources, and facilitates and encourages the use of sustainable transport.

The redevelopment of the waterfront is an opportunity to leverage the inherent sustainability benefits of a central city, brownfield site and demonstrate the low carbon, sustainable development that the Auckland Plan seeks to promote. In delivering the waterfront redevelopment Waterfront Auckland will look to address resource efficiency by focusing on the design of buildings to ensure they are low carbon, energy and water efficient and have carefully selected materials. Developments will be encouraged to take opportunities to showcase sustainable New Zealand building products and systems, e.g. laminated timber products, and locally sourced materials.

All waterfront developments will be required to take water efficiency measures such as using 5 star appliances and tapware. Rainwater reuse for toilet, laundry and irrigation could reduce water demand by 13% and is expected. While grey water use has more of an impact on peak water demand and reduces the load on sewerage systems and cost of treatment, it is more complex in a high-density urban situation and there are regulatory barriers.

Waterfront Auckland has set an expectation that office buildings will be of a minimum standard of a 5 star Green Star rating and residential developments will achieve a minimum 7 star Homestar rating, and has set specific energy and water use standards for new development (refer the Homestar and Green Star boxes on this page). The use of independent building rating schemes is well established in sustainable urban developments around the world, including Songdo International Business District (South Korea), Barangaroo (Australia, refer page 19) and Toronto Waterfront (Canada). Rating schemes provide a mechanism for independent verification and marketing of sustainability performance.

Waterfront Auckland will work with the New Zealand Green Building Council to facilitate an efficient and effective accreditation process for developments at the waterfront. Waterfront Auckland will seek to pre-negotiate points for sustainability features such as solar PV, car share and secure bike storage with electric charging points, and will provide simple spec sheets for a generic 7 Homestar apartment.

Homestar²⁰

Homestar is a voluntary environmental rating system for New Zealand Homes. Homestar assesses a home based on performance in the following categories: energy, health and comfort, water, waste, home management and house site. Star ratings are given from 1-10 stars based on the performance of the home. The New Zealand Green Building Council has recently developed a multi-unit Homestar tool so that attached dwellings such as apartments and terrace houses can be given a Homestar rating.

Green Star²¹

Green Star is a comprehensive, national, voluntary environmental rating scheme that evaluates the environmental attributes of buildings using a suite of rating toolkits developed to be applicable to different building types and function.

The tools are developed by the New Zealand Green Building Council (NZGBC) in partnership with the building industry to:

- Establish a common language and standard of measurement for green buildings
- Promote integrated, whole-building design
- Raise awareness of green building benefits
- Recognise environmental leadership
- Reduce the environmental impact of development.

The Green Star suite of rating tools was designed to match the key phases in a building life cycle from design to build. The tools address the needs of specific building types, such as office buildings, industrial buildings and education buildings, in the design phase and following construction, in the built phase.

The current tools assess the environmental impact that is a direct consequence of a building's site selection, design, construction and maintenance. The framework has eight separate environmental impact categories plus an innovation category. The categories are management, indoor environmental quality, energy, transport, water, materials, ecology and emissions.

Credits are awarded within each of the categories based on the building's environmental merits in a range of areas and they take into consideration the unique development requirements and impacts of each sector. Points are then weighted and an overall score is calculated, determining the project's Green Star rating.

- 4 Star Green Star Certified Rating (score 45-59) signifies 'Best Practice'
- 5 Star Green Star Certified Rating (score 60-74) signifies 'New Zealand Excellence'
- 6 Star Green Star Certified Rating (score 75-100) signifies 'World Leadership'

Internationally, groundbreaking development has now moved beyond carbon neutral and into carbon positive or restorative developments, such as the Clinton Climate Positive Developments and the City of Baoding in China (refer page 26). This is consistent with the Māori resource management principle of kaitiakitanga, as the Māori world view requires a strong reciprocal relationship where more is given back to the environment than taken. Waterfront Auckland appreciates the difficulty of delivering restorative developments and zero energy, waste and water buildings at the scale of development proposed at the waterfront, so it has realistic expectations in this regard. However, Waterfront Auckland will support any endeavours to achieve or get close to these targets and having a Living Building on the waterfront is an aspiration.

Auckland Council has set an aspirational target of zero waste by 2040 and improving resource efficiency will be critical in moving towards this target. Key focus areas for the council in delivering this target are establishing a network of resource recovery centres and dealing with organic matter, which currently makes up around 50% of the waste that goes to landfill. Waterfront Auckland recognises the challenges of reducing waste and seeks to develop innovative solutions for dealing with waste through the Wynyard Quarter redevelopment. Examples of innovative approaches used elsewhere are on-site composting (e.g. Toronto Waterfront, Canada), anaerobic digestion (San Jose, USA), smart bins (New York, USA), waste trucks powered on biogas (City of Surrey, Canada) and automated waste collection (Wembley City, UK).

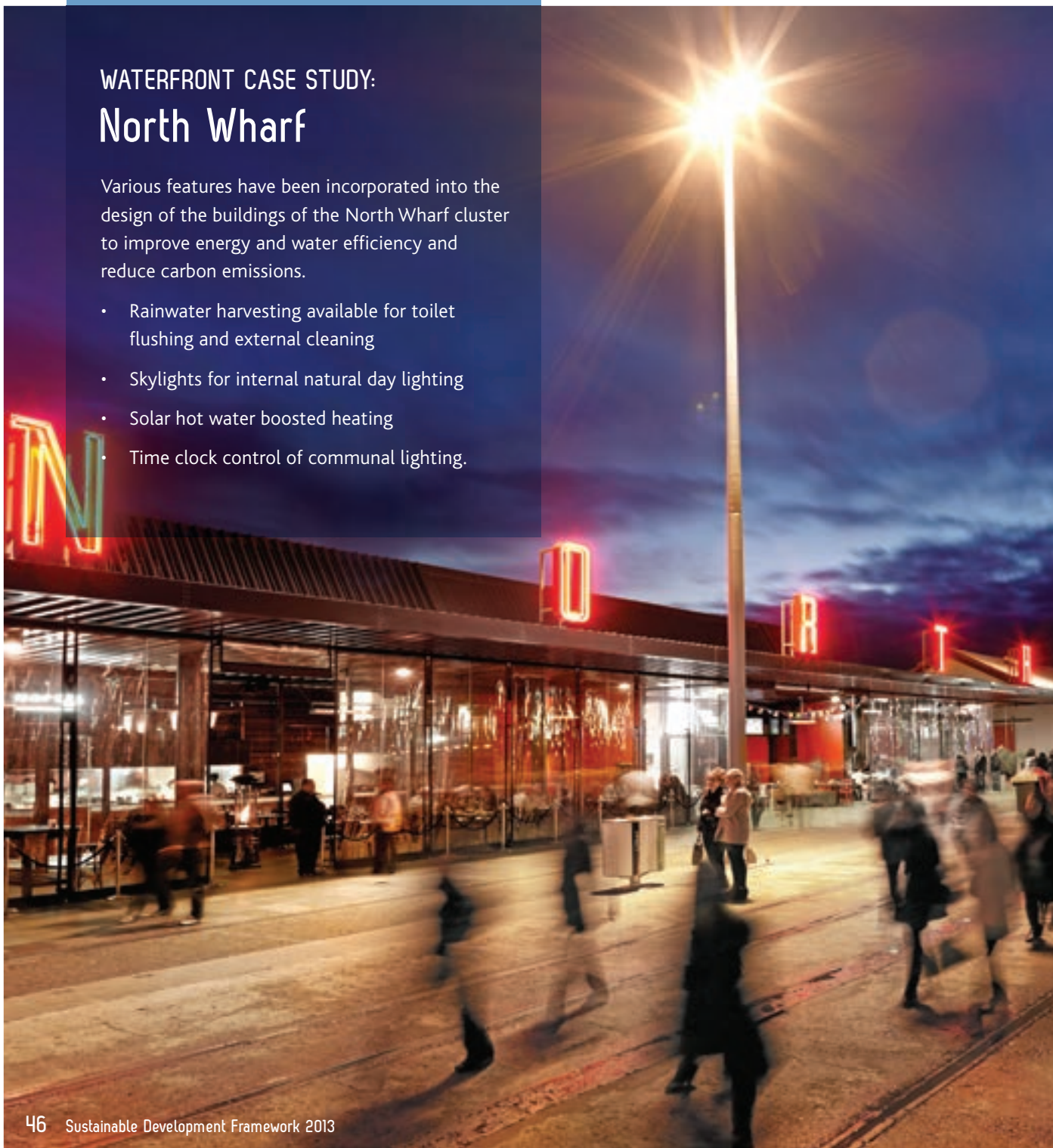
²⁰ www.homestar.org.nz

²¹ www.nzgbc.org.nz

WATERFRONT CASE STUDY: North Wharf

Various features have been incorporated into the design of the buildings of the North Wharf cluster to improve energy and water efficiency and reduce carbon emissions.

- Rainwater harvesting available for toilet flushing and external cleaning
- Skylights for internal natural day lighting
- Solar hot water boosted heating
- Time clock control of communal lighting.



Pushing boundaries – the Living Building Challenge²²

The Living Building Challenge (LBC) is the built environment's most rigorous performance standard. It calls for the creation of building projects at all scales that operate as cleanly, beautifully and efficiently as nature's architecture.

The LBC is a green building certification programme that defines the most advanced measure of sustainability in the built environment possible today and acts to diminish the gap between current limits and ideal solutions. Projects that achieve this level of performance can claim to be the 'greenest' anywhere and will serve as role models for others that follow.

To be certified under the Challenge, projects must meet a series of ambitious performance requirements, including net zero energy, waste and water, over a minimum of 12 months of continuous occupancy. The Challenge comprises seven performance areas, or 'Petals': Site, Water, Energy, Health, Materials, Equity and Beauty. Petals are subdivided into a total of 20 Imperatives, each of which focuses on a specific sphere of influence.

To date six buildings have been certified around the world and New Zealand's first, the Tuhoe Living Building, Te Wharehou o Tuhoe, will be completed in 2013. Waterfront Auckland explored the LBC and was privileged to host a workshop with Executive Director Jason McLennan. Waterfront Auckland aspires to achieve a Living Building.

²² <http://living-future.org/>

Issue: Resource Efficiency

Element	Waterfront Auckland's development expectations
Energy efficiency	All developments will have a high level of energy efficiency and have energy efficient lighting and appliances.
Building design, performance and lifetime use	All buildings will be low carbon, energy and water efficient and designed to meet set performance standards.
	Office buildings will be of a minimum standard of a 5 star Green Star rating. Residential developments will achieve a minimum 7 star Homestar rating.
	Energy and water use will be monitored to ensure that they perform as designed and to allow tuning of building systems to improve performance.
	Data collected will inform targeting of reductions and awareness and behaviour change campaigns.
	Tools such as NABERS NZ may be used to monitor ongoing performance.
Water efficiency	Water efficient fixtures and appliances to be used in all new buildings and refurbishments.
	Rainwater collection and reuse for toilet flushing, laundry and irrigation for all new buildings (and in refurbishments where practical).
	Landscaping to be low-water demand or to use drip irrigation systems.
Waste management	Waste to landfill will be minimised.
	Developments will maximise the recycling and reuse of construction and de-construction waste.
	Developments will make provision for the on-site storage of clean recyclables and non-landfill disposal of organic kitchen waste.
Building materials	Developments will take opportunities to showcase sustainable New Zealand building products and systems, e.g. laminated timber products, locally sourced materials, and demonstrate support for environmentally friendly materials, equipment and environmental labelling schemes (e.g. ECNZ, FSC, Energy Star, MEPS etc).
	Materials used will be durable and suitable for the marine environment of the site.

Actions

- Explore options for innovative precinct-wide waste management solutions and rainwater harvesting options.
- Undertake feasibility work and analysis of options for delivery of the Wynyard Quarter solar installation.
- Work with the NZGBC to facilitate an efficient and effective accreditation process for developments at the waterfront.

ENVIRONMENTAL QUALITY

Environmental quality is hugely important for Aucklanders who value the natural environment and expect clean air and water.

Development puts pressure on land and water resources and impacts on air quality. It results in additional waste that must be managed and minimised. We must manage, maintain and restore the quality of our natural resources for the long-term health, well-being and prosperity of Aucklanders.

For the waterfront, environmental priorities are to improve water quality, deal with land contamination issues and stormwater, promote biodiversity and ecological values and maintain or improve local air quality.

Water quality is a particular challenge for the waterfront. There is a host of activities contributing to the deterioration of water quality, many of which Waterfront Auckland has limited control over (such as runoff from roads and wastewater overflows). Therefore, Waterfront Auckland sees its role as addressing the aspects within its control and engaging with partners to help facilitate improvements to address the other aspects.

Watercare is undertaking projects to reduce wastewater overflows across the Auckland region. It is envisaged that these projects will have significant impacts on water quality. A future project that has been identified is a waterfront interceptor pipe, which would reduce spills from the 50 overflow points in Grey Lynn and the waterfront suburbs from Coxs Bay to Freemans Bay.

The land at the Wynyard Quarter is contaminated, due to the land's historical industrial uses and as a storage site for chemical and fuel products. Significant budget has been set aside for remediation and as individual sites in the precinct are developed, any contaminated land will be dealt with. There is a range of options for dealing with contaminated sites and the most suitable option varies according to the proposed land use, proposed building design and construction and the level and type of contamination present. Waterfront Auckland

has undertaken a considerable amount of research into best practice remediation, and development to date has required both containment and removal of contaminated materials. Waterfront Auckland will review international best practice in regard to the multiple remediation options available, as each site is developed, to ensure there is minimal impact on the environment and no danger to human health.

One area where it is possible to make a significant difference is in the treatment of stormwater and this has been a focus of the projects delivered on the waterfront to date. Waterfront Auckland has adopted a low impact design approach and has made extensive use of swales and rain gardens to filter stormwater before it reaches the sea, such as in Jellicoe Street. Waterfront Auckland has a target of removing 80% of total suspended sediment from stormwater.

In addition to the design approach and stormwater treatment, Waterfront Auckland has been investigating other innovative approaches used around the world for improving water quality to establish if they can be usefully incorporated here. Internationally, bioremediation techniques have been used to purify and filter water, such as the use of constructed wetlands, algae and oyster farms.

Auckland Transport has been taking measures to reduce the level of pollutants entering the water from roads in the CBD. Prior to the world triathlon event, 150 tetratrap traps that reduce levels of gross pollutants through filtration were installed in the CBD. Auckland Transport also identifies locations of high litter drop and road contaminant discharge and installs filter systems in street drains in these locations.

Consideration is being given to the opportunities for improving environmental quality and building resilience to climate change in the future development of Westhaven Marina. The aim is to restore damaged ecologies and remediate water pollution levels, while simultaneously ensuring the development is adaptive and resilient to the unpredictability of the future. Some innovative coastal protection and ecological remediation techniques are being considered such as the softening of hard coastal edges through minor reclamations to reduce storm surge and create habitat opportunities, the use of restored or constructed wetlands as natural filters, and oysters (in suspended cages and baskets) as natural purifiers for improving water quality.

Although the Auckland waterfront is a highly modified environment, and the focus is on developing an intensive, vibrant, urban mixed use precinct, there are opportunities to enhance ecological values, support biodiversity and recreate habitat through the development projects. Consideration will be given to opportunities that promote bird and marine life, improve water quality, promote biodiversity and provide for food production. Urban farming and community gardens have been increasing in popularity in many cities around the world, with the objectives to produce fresh and affordable produce for local communities, reduce 'food miles' and add greenery to cities, reducing runoff and increasing shading. Urban farms and gardens have been developed on rooftops and patios, in public parks and squares, and along streets and railway lines.

Helping improve the Waitemata – Water Sensitive Design (WSD)²³

Water Sensitive Design (WSD) is an approach which works with nature, using design features such as rain gardens and green roofs to reduce pollutants entering urban streams and harbours, while creating green spaces for New Zealand plants and animals to live in and green spaces for people to enjoy.

WSD is based on avoiding or minimising impervious surfaces (surfaces that water can't seep through, like concrete), minimising earthworks in construction, using vegetation to trap sediment and pollutants and minimising energy, material use and waste in urban development.

WSD is about learning how natural systems regulate water flows and surface temperatures so that through designing-in natural features, cities can reduce flooding, filter pollutants and keep buildings cooler in summer without expensive air conditioning. As the climate changes, with more heatwaves and heavy rain events predicted in many parts of New Zealand, cities will need to adapt and WSD is a sustainable way to do this.

²³ <http://www.ourfuture.net.nz/Collections/13>

WATERFRONT CASE STUDY:

Jellicoe Street rain gardens

Over 600m² of purpose-built rain gardens to treat stormwater and provide passive irrigation. Rain from over 9000m² of the surrounding roads and surfaces flows into the rain gardens. The rain gardens serve important sustainability functions such as minimising stormwater peaks, reducing contaminant and sediment discharge to the sea and providing irrigation for street vegetation..

Issue: Resource Efficiency

Issue	Element	Waterfront Auckland's development expectations
Environmental quality	Water quality – precinct stormwater treatment	Exemplary level of stormwater treatment. Developments will take available initiatives to improve harbour water quality.
	Air quality	Local air quality impacts will be minimised through a high use of sustainable transport modes and use of the Best Practicable Option (BPO) in dealing with any discharges to air.
	Contaminated land	BPO to be used in dealing with contaminated land, to be assessed on a site by site basis. Impact on the environment is minimised and there is no danger to, or harm to, human health.
	Biodiversity and ecology	Developments to support biodiversity through landscaping and to complement existing and planned areas such as Jellicoe Street and Daldy Street linear park. Ecological corridors will link Victoria Park to the Headland Park and waterfront. Opportunities for open space, shade, community gardens and food growing spaces in residential developments to be considered. Support for use of threatened native plant species and species that provide a year-round food source for native birds such as tui.

Actions

- Investigate options for improving harbour water quality in collaboration with relevant partners.
- Explore opportunities for promotion of biodiversity and ecological values through the redevelopment of the waterfront.

TRANSPORT, MOVEMENT AND CONNECTIVITY

Transport is the leading source of greenhouse gas emissions in Auckland, comprising 40% of Auckland's carbon footprint.

Much of this is due to emissions from car usage. A shift towards sustainable transport modes is key to addressing issues such as climate change, environmental quality, public health and amenity.

For the waterfront, particularly the Wynyard Quarter, a high level of car use for commuting would have adverse effects on environmental quality, productivity and most noticeably amenity. Providing alternatives to the private car and encouraging Aucklanders to shift to other modes of transport will be vital for the liveability and functionality of the precinct.

The Wynyard Quarter Transport Plan (part of the District Plan) has a target of 70% of the trips to the Wynyard Quarter at peak hours being by sustainable transport modes (walking, cycling and public transport). This is comparable to the modal split of New York City, where 76% of people commute to work using sustainable transport. This modal share would represent a significant departure from current commuting patterns in the Auckland central city, therefore a package of measures will need to be employed to help effect this change. A key mechanism for encouraging this is provision of low levels of car parking coupled with improvements to sustainable transport infrastructure.

Through the course of the development continual investments will be made to walking and cycling infrastructure and expanded public transport services, which will be necessary to achieve the desired modal shift. The existing street network will also be transformed into a finer grained system, enhancing the permeability of the blocks and improving connectivity for pedestrians and cyclists. In addition to the parking provided in residential and commercial developments, cycle parking will be provided throughout the public realm for visitors to the area.

The Wynyard Quarter Transport Management Association (TMA) has been established to promote travel initiatives that encourage alternatives to car travel to improve accessibility into and around the area. Improved accessibility through changing travel habits will help encourage the economic and business potential of the area and also contribute to a more pleasant residential and entertainment setting, with significant environmental and sustainability benefits. Auckland Transport has led the establishment of the TMA through a steering group of representatives from Auckland Council, Waterfront Auckland, Auckland Transport, Viaduct Harbour Holdings Ltd and the NZ Transport Agency, and has published travel information.²⁴ A working group of local businesses has also commenced.

As the area develops, the TMA will become an independent organisation providing a forum for local businesses and neighbourhood associations to work together to promote Travel Demand Management and sustainable transport initiatives. A key TMA focus will also be promoting and assisting the delivery of business and residential travel planning, as well as awareness raising and behaviour change campaigns.

²⁴ <http://www.aucklandtransport.govt.nz/improving-transport/wynyard-quarter-tma/Documents/wynyard-quarter-map.pdf>

Waterfront Auckland is committed to the provision of a modern, low-impact, frequent, high-volume transit service between Wynyard Quarter and Britomart. Further work is underway to update the passenger transport business case for the Wynyard Quarter and to identify the role that trams or modern light rail could play in the future, as part of the wider passenger transport network.

Previous studies have indicated that the waterfront is difficult to access, especially for pedestrians, and that it is cut off from the city centre and neighbouring suburbs largely by major roads and intersections with poor street amenity and safety. Waterfront Auckland will work with Auckland Council on the Harbour Edge project to improve linkages between the waterfront and the city centre. Some improved wayfinding and signage would also help to improve the connectivity and accessibility of the waterfront to the rest of the city and this will be considered in development projects.



WATERFRONT CASE STUDY:

Daldy Street

Design incorporates a number of sustainability features and careful materials selection, including recycled concrete and aggregates; a low impact stormwater design strategy which treats runoff from the street, park and adjacent development sites; native planting; new energy efficient LED street lighting and best practice lighting control systems; the reuse of industrial archaeology recovered from the site; sustainably sourced timber and low embodied energy materials.

The linear park is a green corridor for the precinct, which provides for and facilitates walking and cycling through and within the Wynyard Quarter. Daldy Street will form a linkage with Victoria Park and the future Headland Park, providing open space that contributes to amenity but is also for passive and active recreational use.



Issue: Transport, movement and connectivity

Element	Waterfront Auckland's development expectations
Public transport	Developments will be designed to facilitate and support a high use of public transport. Enabling modern rapid transport is a priority for Waterfront Auckland.
Walking and cycling	All developments will provide appropriate cycling and pedestrian infrastructure, e.g. showers, lockers, secure bike parking and electric bike charging points.
Parking provision	On-site parking provision to be below District Plan maximums where possible.
Shared transport	Developments will facilitate and support shared transport options, including car pool and car share schemes. Car share schemes and car pooling by commuters will make a significant contribution to achieving the modal share target and reducing congestion and parking supply issues.

Actions

- Work with partners to implement a car share scheme for the Wynyard Quarter.
- Provide cycle parking facilities in the public realm.
- Support the activities of the TMA, travel planning initiatives and behaviour change programmes.
- Continue to advocate to Auckland Transport for increasing transport services, including buses and ferries.
- Work with partners to enable the provision of a modern, low-impact, frequent, high-volume transit service between Wynyard Quarter and Britomart.

ECONOMIC VITALITY

A successful waterfront will have a strong, distinct and diverse employment base that adds to the city and region's economic vitality.

The waterfront is expected to be a major driver of Auckland's economic future, with a mix of business services, retail, food and beverage, marine and fishing, cruise industry, tourism and events, and construction contributing to the mixed economy.

Today the waterfront provides nearly 7000 full-time equivalent (FTE) jobs and generates \$710 million in direct Gross Domestic Product (GDP). Over the five years to 2018, this impact is expected to rise to nearly 11,000 direct FTEs and \$1.2 billion in direct annual GDP. Once upstream and downstream impacts are included, these figures more than double, supporting jobs and economic production across Auckland.

By 2040 the waterfront will generate nearly \$2 billion in direct annual GDP, while it will directly support nearly 19,200 ongoing FTEs through the key components of waterfront-based employment, cruise industry, waterfront-linked events and waterfront tourism. Once upstream and downstream impacts are included, the Waterfront will support 39,400 FTEs producing \$4.12 billion in GDP on an ongoing basis by 2040. This \$4.12 billion equates to around 5.4% of Auckland's total GDP in 2012, supporting the equivalent of 5.6% of Auckland's present-day employment.²⁵

Two priority areas for economic growth in the waterfront area are the continued growth of the marine and fishing industries and the establishment of an innovation precinct in the Wynyard Quarter.

The further development of the fishing industry at Wynyard Quarter will help enhance the character and tradition of a working waterfront, and create activities and income in the business and tourism sectors. The fishing industry contributed 262 direct full-time employment positions in 2010, which is expected to increase to 541 in 2040. Enabling fishing vessels to continue to berth in close proximity to fish processing facilities is critical, as well as sheltered berthage for the smaller fishing vessels in the Auckland-based fishing fleet. The marine cluster contributed approximately 15% (or \$350 million) of New Zealand industry turnover in 2005. Growth in the superyacht sector has been supported by ongoing expansion of the superyacht refit facility.

²⁵ PricewaterhouseCoopers, (March 2013) Building the Waterfront Economy.

The strategic development of the innovation precinct at Wynyard Central is sponsored by Waterfront Auckland and Auckland Tourism, Events and Economic Development, and supported by Auckland Council and the Ministry for Business, Innovation and Employment. The aim is to locate a mix of firms from the ICT, digital media, R&D and business incubation sectors in prime high performance office space. Three thousand workers will be occupying a 14-16,000m² site, which will include the adaptive reuse of some character buildings. There is considered to be a good synergy between sustainability and innovation and it is anticipated that green growth and further sustainability opportunities will emerge.

While these areas will be a focus, economic diversity will be promoted. Diversity of industry types and diversity in the number and size of businesses helps contribute to a sustainable economy, reducing the risk of boom and bust cycles. Diversity also provides a variety of job types and skill sets, attracting a wide range of workers. Additionally, it reduces reliance on a limited range of resources or economic conditions, increasing the resilience of the economy.



WATERFRONT CASE STUDY:

ASB building

The building is 5 Green Star rated and incorporates various sustainability features:

- A light reflector tunnel assists natural light into the heart of the building, reducing lighting demands.
- The windows open manually, exposing occupants to the sea air and reducing air conditioning demands.
- The seaward side has metallic sunscreens in the shape of leaves, and vertical fins on the other side shade the facade, reducing glare and heat build-up in internal spaces.
- A rainwater harvesting system supplies water for toilet flushing and landscape irrigation, catering for approximately 70% of the building's water requirements. This will both reduce water use and minimise stormwater runoff.





Issue: Economic vitality

Element	Waterfront Auckland's development expectations
Mixed economy	Development will support the retention of the marine and fishing industries.
	Varied plot sizes and building typologies will attract a diversity of business.
	Urban and building design will facilitate networking and address potential reverse sensitivity issues between activities, including residential.
Economic growth	12-15,000 jobs in the Wynyard Quarter.

Actions

- Provide, in partnership with the private sector, infrastructure and space to grow particular industries such as marine, fishing and tourism, e.g. multi-purpose cruise terminal, fishing water space, superyacht refit facility, hotel accommodation.
- Establish an innovation precinct in Wynyard Quarter.
- Sustainably manage waterfront commercial operations owned by Auckland Council, e.g. Westhaven Marina.
- Create new business and development opportunities along the length of the waterfront, e.g. opportunities linked to the waterfront walkway and cycleway, Wynyard Quarter and Quay Park.
- Improve accessibility for employees and visitors, such as new pedestrian bridges, the waterfront walkway, improved access to public transport and pedestrian access between the waterfront and city centre.
- Improve amenity and provide new spaces to attract new business, events and visitors, e.g. public investment in parks, walkways, streetscapes and infrastructure.

SOCIAL WELL-BEING

A goal of the Waterfront Plan is to create New Zealand's most liveable central city urban community in Wynyard Quarter – a vibrant mix of residents, workers, visitors and activities.

Creating a sense of place and identity that is uniquely Auckland, as well as an accessible, welcoming and resilient neighbourhood that is safe, diverse and attractive with access to local services and facilities, is a focus for Waterfront Auckland.

In order to achieve this, it is necessary to ensure there are appropriate social infrastructure and housing choices available for residents.

A community infrastructure and housing policy will drive the delivery of appropriate housing and social infrastructure.

An important aspect of the waterfront's social sustainability will be ensuring there is a suitable balance of residents and workers. This will be vital to ensure there is a 24/7 economy that will support entertainment amenities such as bars and restaurants as well as essential local services such as dairies, chemists and banks. It will also be critical to ensure the provision of a variety of tenancy options to enable the operation of a diverse range of businesses. To promote diversity, Waterfront Auckland will play a proactive role to ensure there is an interesting and useful mix of shops and services in the Wynyard Quarter.

Ensuring the waterfront is accessible to all will be important in creating a diverse and inclusive community. Waterfront Auckland has worked with the Be Accessible organisation to understand the accessibility issues and opportunities relating to the Wynyard Quarter and will continue to work to ensure future developments meet the needs of all ages and abilities.

The approach to housing in Wynyard Central is to provide a diverse range of housing typologies and sizes, and therefore price points. The gap in the housing market in the city centre is 3+ bedroom units. In Wynyard Central there will be 600-800 apartments over 10 years and the intention is to attract a higher proportion of families and owner occupiers than is current market practice. Urban design guidelines and sustainability standards will ensure they are exemplars of high-density residential design and

sustainable building. Priority community infrastructure has been identified to be delivered in Wynyard Central, including crèche and early child care education, medical services, superette and a community facility.

Placemaking activities will be used as a tool to develop community cohesion, as well as to provide an attractor for visitors to promote the vitality of the waterfront and economic growth. Waterfront Auckland will aim to achieve an appropriate balance between regionally focused events and meeting the needs of residents to be involved in smaller, locally focused activities.

There are many exciting opportunities for developing synergies between the provision of social amenities, promoting sustainable behaviours and building community cohesion. Examples gaining popularity both here and internationally are facilities based around sharing resources and collective consumerism – community gardens, resource recovery centres, shared toolshed/workshop spaces. Waterfront Auckland will look for and support opportunities through the Wynyard Quarter redevelopment that achieve these co-benefits.

Green buildings don't necessarily have green tenants, therefore Waterfront Auckland recognises that education and awareness-raising campaigns will need to be undertaken to enable and encourage residents, visitors and workers to adopt sustainable behaviours.

Design and development that promotes the health and well-being of residents, visitors and workers is an important consideration in terms of social sustainability. Development should promote healthy and active lifestyles by providing for walking, cycling and recreational opportunities, facilitating food growing and taking opportunities to minimise exposure to toxins and pollutants through the design and construction process and choice of materials. The Garden to Table project in the Wynyard Quarter will showcase urban food production opportunities and provide a valuable educational resource and demonstration project for the local community, schools and visitors alike.



WATERFRONT CASE STUDY:

Garden to Table

The Garden to Table Trust runs a programme with schools where children can learn to grow, harvest, prepare and share food. Students learn to build and maintain a garden according to organic principles, and to grow and harvest a wide variety of vegetables, fruits and herbs.

The creation and care of the garden teaches students about the natural world, its wonders and beauty and how to cultivate and care for it. In the kitchen, students prepare a range of delicious dishes from the seasonal produce they've grown. The shared meal is a time for students, specialists, teachers and volunteers to enjoy the fruits of their labour, and each other's company and conversation.

On site in Wynyard Quarter the trust is creating an edible garden to educate children from some local schools. The area will be used to further the trust's vision of teaching all children how to grow, harvest, prepare and share fresh, seasonal food.





Issue: Social well-being

Element	Waterfront Auckland's development expectations
Social infrastructure and amenities	There will be a range of social infrastructure and amenities (such as childcare, medical facilities, community centre, personal services and convenience retail) provided to support the identified needs of the community and contribute to liveability.
	Development partners will contribute to the provision of community infrastructure and to creating a sense of place and identity that is uniquely Auckland.
Housing choice	There will be a range of housing options available to allow for diversity of residents and lifestyles.
Sustainable and healthy lifestyles	Local businesses, residents and bodies corporate will engage in and promote sustainable behaviours.
	Design and development will facilitate sustainable and healthy lifestyles by: <ul style="list-style-type: none"> • Providing for walking, cycling and recreational opportunities • Providing opportunities for food growing • Minimising exposure to toxins and pollutants through the design and construction process and choice of materials.

Action

Deliver community facilities and amenities through the development agreements and work with Auckland Council and stakeholders, and the private sector.

CULTURAL AND HERITAGE VALUES

The waterfront is where the city of Auckland began and it has a diverse and interesting cultural history, boasting a number of important Māori, colonial and natural heritage sites and features. It was an important area for Māori, containing numerous pa sites due to its strategic location with hilltop vantage points and the waters of the Waitemata Harbour. Māori utilised the waterfront for fish and shellfish gathering, harvesting of crops and as a hub for trade.

Since the 1880s the waterfront has been a bustling commercial area supporting a wide range of infrastructure and industries such as flour mills, boat building, rope making, warehousing, sawmills, gas works and railways as well as numerous taverns. In more recent times the waterfront has become a hub for the marine and fishing industries, and today this provides an authentic and distinctive character, setting it apart from other locations.

A goal of the Waterfront Plan is that the waterfront is a place where we can express our cultural heritage and history. In order to do this it is important to protect and enhance the heritage, cultural values and character of the waterfront through the development process.

Development should allow people to celebrate their own cultural heritage and enable occupants, residents and visitors to share a sense of place and community. In delivering this outcome Waterfront Auckland is committed to working with iwi and has an iwi liaison group that is engaged with the development and delivery of waterfront projects.

Culture can be expressed through a wide variety of mechanisms such as place names (whakapapa), public art, landscape markers (tohu), heritage buildings and vernacular architecture (taiao), narrative and storytelling (mahi toi), significant landmarks and historical locations. Māori also express the Māori landscape principles of enduring presence (ahi kā) and environmental health (mauri tū) that could underpin bold responses in the urban environment.²⁶

A Māori design toolkit is under development, which may assist Waterfront Auckland in future projects.²⁷

The celebration of cultural heritage is a fundamental strength of the waterfront development. More than other showcase precincts around the world, the waterfront highlights the importance of culture to sustainability.

²⁶ Design Tribe.

²⁷ Ibid.





WATERFRONT CASE STUDY:

Shed 10

Adaptive reuse of a heritage building – designed to optimise natural light and ventilation, and incorporates energy generation using photovoltaics and rainwater harvesting for water reuse.





Issue: Cultural and heritage values

Element	Waterfront Auckland's development expectations
Sense of place – turangawaewae	Design will be high quality, interesting and will contribute to a sense of place.
	Developments will contribute to the cost of art in the public realm.
	Opportunities will be taken for the incorporation of Māori urban design principles in development projects.
Heritage	Character buildings will be restored where possible and new buildings will be attractive and varied.
Custodianship – kaitiakitanga	Opportunities for promotion of cultural values will be considered in development proposals.

Actions

- Work with iwi on expressing kaitiakitanga.
- Work with Auckland Council and iwi to implement the Māori Responsiveness Framework for waterfront projects and explore the potential of a Māori Design Toolkit for Waterfront Auckland.
- Explore with Pacific and other communities ways to express their culture and better recognise their presence in Auckland's waterfront.



5

IMPLEMENTATION APPROACHES



IMPLEMENTATION APPROACHES

Tool	Purpose
Sustainability standards in development agreements	Site-specific sustainability standards must be achieved by developers at Wynyard Central. Examples are shown in the following table, page 48.
Development partners	In evaluating potential investor and development partners, Waterfront Auckland will look for companies that have experience in and can demonstrate a high level of commitment to sustainable design and development. Waterfront Auckland will look for 'like-minded' partners who look to go beyond minimum performance and use this as an opportunity to showcase and innovate.
NZGBC accreditation	Green Star accreditation will be required for developments over 2000m ² in Wynyard Central to provide quality assurance that the sustainability standards can be met. It will also allow Waterfront Auckland to market the development as meeting a 5 star standard. Homestar certification will be required for all residential developments. Waterfront Auckland reserves the right to change performance levels and accreditation requirements in future phases of development of the Wynyard Quarter.
Green leases	Waterfront Auckland will use tools such as green leases and precinct rules to ensure that green buildings continue to be operated to achieve the design performance and to encourage occupants to adopt sustainable behaviours.
Sustainability monitoring and reporting	Smart metering, building audits or continuous commissioning are required to ensure that buildings achieve the design performance promised. Other tools may be introduced to measure, monitor and report on the performance of occupied buildings, e.g. NABERS NZ.
Sustainability targets (precinct)	Waterfront Auckland has developed the targets in this document and will monitor and communicate the sustainability performance of the waterfront.
Exemplar projects	Waterfront Auckland will incorporate sustainable design and innovation in all public projects in order to demonstrate the benefits, trial innovative approaches, support the development of new markets and share the lessons with the public, stakeholders and development sector.

Tool	Purpose
Urban design guidelines	A design-led approach to waterfront development will be supported by urban design guidelines, which underpin the implementation of the Waterfront Plan vision and goals and sustainability objectives outlined in this framework.
Infrastructure requirements	Waterfront Auckland will work with infrastructure providers to facilitate the sustainable development expectations in this document.
Development of policies, strategies and plans	The development of further policies and strategies will guide the sustainable development of the waterfront. For example, the Westhaven Plan will incorporate a range of projects to implement the principles, development expectations and targets in this framework.
Advocacy and partnerships	There are some outcomes in this SDF over which Waterfront Auckland has limited control, for example in terms of air and water quality. Waterfront Auckland will advocate and look for opportunities to partner with relevant agencies to achieve these outcomes.
Research and feasibility studies	Additional research and feasibility analysis will support the implementation of the development expectations in this framework. Internships and research opportunities for students will be supported, where practicable.
Education, communication and events	All sustainability-related documents will be made available on the Waterfront Auckland website. Sustainability successes, innovative approaches and lessons will be shared through a wide range of communication channels to educate and inspire local residents and businesses, future tenants and residents, stakeholders and the wider public. A variety of events and activities will provide information about sustainable development and encourage sustainable behaviours.
International benchmarking and relationship building	International advances in sustainable design and building, sustainability reporting and tools (such as the Living Building Challenge) provide inspiration. The development of relationships with public and private organisations that are leaders in sustainability enables quicker uptake and adaptation of ideas and technologies.

WYNYARD CENTRAL SUSTAINABILITY STANDARDS

Specific sustainability standards have been developed for Wynyard Central which is the next stage of development of Council land in Wynyard Quarter to be completed by private sector development partners over the period 2015-2020. Selected examples are set out below.

Rating scheme targets

All commercial buildings will be required to be a minimum 5 Green Star accredited, and residential developments 7 Homestar accredited, using the new NZGBC Homestar multi-unit tool.

Renewable energy

A precinct-wide solar farm with the installation of photovoltaic cells on all roofs to produce renewable energy is planned. Buildings are required to be 'PV ready' and the panels will be installed by a third party. This will contribute 30% energy demand and will be the largest PV installation in New Zealand.

Performance targets

Buildings will be required to meet high levels of performance in terms of energy efficiency, renewable energy, water reuse and sustainable transport, as these have been identified as priority areas for the Wynyard Quarter.

Selected examples of the standards include:

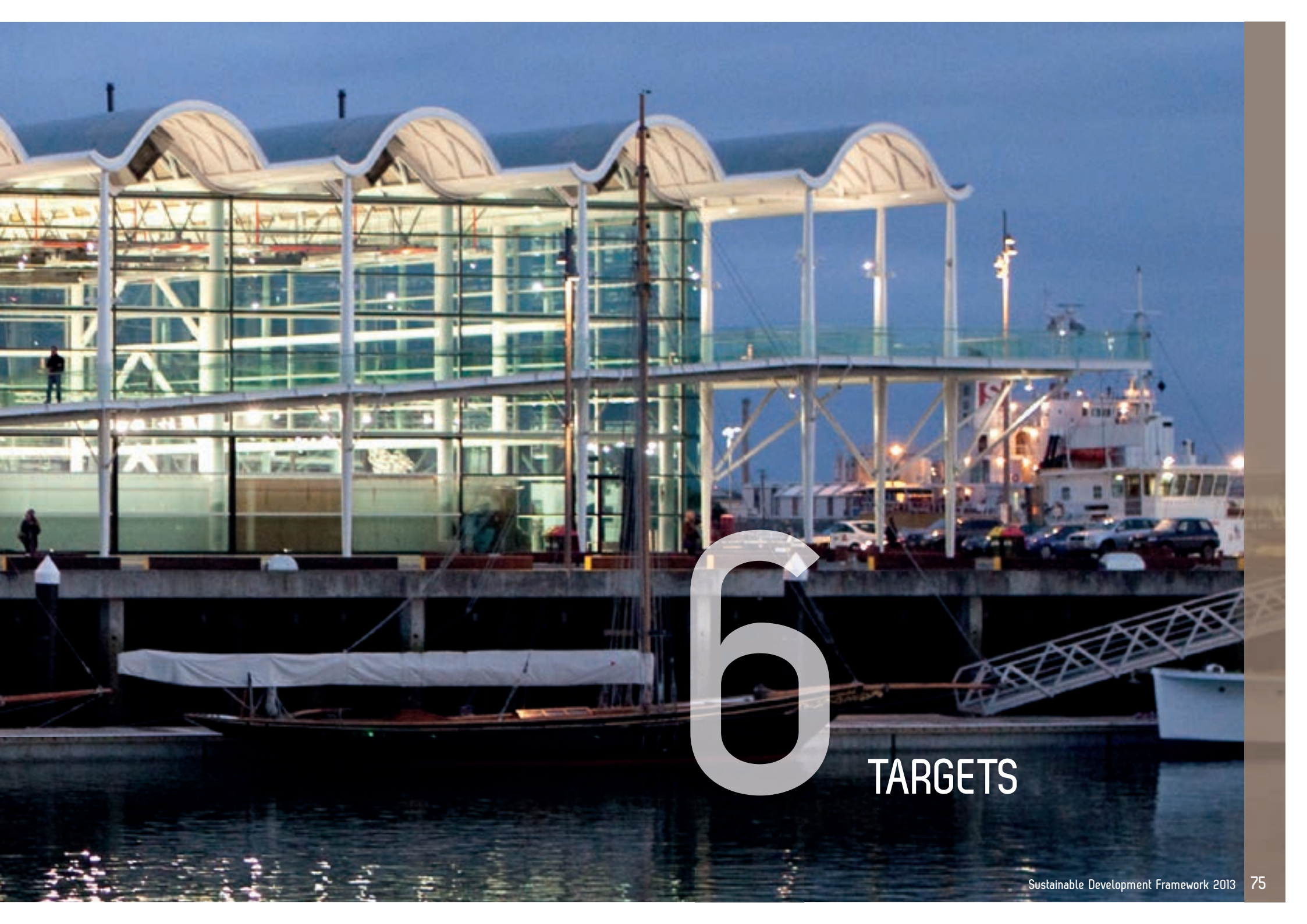
- 45% reduction in GHG emissions
- Passive solar design, natural ventilation for apartments and mixed mode ventilation for commercial buildings
- Energy consumption below: Office - 80kWh/m²/year; Residential - 40kWh/m²/year
- Water and energy efficient fixtures and fittings
- Smart metering, monitoring and continuous commissioning
- Water consumption below: Office - 0.35kL/m²/year; Residential - 50m³/person/year
- Rainwater collection and reuse for toilet flushing, laundry and irrigation for all new buildings
- 85% of construction waste to be reused or recycled

- Provision to be made for on-site storage and collection of organic kitchen waste and recyclables. Precinct-wide composting. Commercial waste target: – 30kg/person/year; Residential waste target – 50kg/person/year; longer term target is zero waste.

Sustainability standards for future development phases will be developed to take account of changes in policy, technology, community expectations and the climate.







6

TARGETS

The following indicators and targets have been prepared to monitor progress towards implementation of the Sustainable Development Framework objectives.

		Key indicators	Targets
Climate change	1	HEADLINE TARGET Renewable energy generation	Initial – on-site sources 5% 10-year target – on-site sources 10% 30-year target – on-site sources 30%
	2	Greenhouse gas emissions	45% reduction in CO2 emissions
Resource efficiency	3	HEADLINE TARGET High performance buildings	100% commercial buildings will be minimum 5 Green Star ²⁸ and residential buildings 7 Homestar in Wynyard Central At build-out 10% of commercial buildings at Wynyard Quarter are 6 Green Star Minimum one Living Building (highest international green building standard) ²⁹
	4	Building energy efficiency	Office/commercial – 80kWh/m ² /year Multi-unit residential – 40kWh/m ² /year
	5	Public space energy efficiency	40% reduction in energy use (compared to baseline)
	6	Water efficiency	Office – 0.35kL/m ² /year Residential – 120 litres/person/day
	7	Construction waste management	90% of construction waste for new build projects to be reused or recycled 80% of demolition waste to be reused or recycled (excluding any contaminated land or hazardous material)
	8	Waste to landfill	Commercial – 30kg/person/year Residential – 50kg/person/year Long-term target – zero waste to landfill
Environmental quality	9	HEADLINE TARGET Open space	10ha of publicly accessible open space in the Wynyard Quarter by 2030
	10	Water quality	Water quality at city centre waterfront improves
	11	Stormwater treatment	80% of total suspended solids removed from stormwater precinct-wide
	12	Air quality	Air quality in city centre improves
	13	Remediation of contaminated land	Minimal harm to the environment and no danger or harm to human health

²⁸ Applies to buildings over 2000m².

²⁹ <http://living-future.org/>

	Key indicators	Targets
Connectedness	14 HEADLINE TARGET Sustainable transport	70% of peak period trips to and from the Wynyard Quarter is by walking, cycling and passenger transport
	15 Permeability of street network	Two intersections per hectare
	16 Shared transport	10% of Wynyard Quarter residents and 25% of businesses utilise car share vehicles
	17 Parking provision	50% of new developments provide less than the permitted maximum car parking ratio
Sense of place	18 HEADLINE TARGET Sense of pride	90% of residents agree or agree strongly to a sense of pride in the way their local area looks and feels
	19 Marine and fishing activity	Marine and fishing employment opportunities are maintained or increased
	20 References to culture and heritage	5% annual increase in cultural and heritage references.
	21 Diverse events	Percentage of Aucklanders who indicate satisfaction with the good variety of appealing events Initial target – 60% locals, 50% other Aucklanders 25-year target – 70% locals, 60% other Aucklanders
Community	22 HEADLINE TARGET Housing diversity	The mix of apartment typologies and sizes are more diverse than the city centre Target – 20-25% 3+ bedroom apartments
	23 Community	Percentage of residents agree or agree strongly to a 'sense of community' in their local neighbourhood Initial target – 55%, 25-year target – 70%
	24 Safety	Percentage of locals who consider the waterfront is a safe place to go at night (38%, 2012) Initial target – 45%, 25-year target – 70%
Economic vitality	25 HEADLINE TARGET Business and employment growth	Number of workers in Wynyard Quarter (est. 3360, 2012) Three-year target – 6100 (2015/16) 25-year target – 12,000-15,000 (Waterfront Plan)
	26 Visitor numbers	4 million visitors per annum by 2030
	27 Vacancy rate	Percentage of vacant floorspace: Retail – 1% annual average vacant floorspace Commercial – 5% annual average

Sources: SDF 2009, Waterfront Plan, Waterfront Auckland Statement of Intent, Kinesis modeling, expert advice (eCubed), Auckland Council monitoring. Excludes sustainable design standards for buildings that are specified separately (Wynyard Central Sustainability Standards).





