

15 August 2017

Memorandum

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<b>To:</b>	Environment and Community Committee
<b>Subject:</b>	Preparing for Climate Change: A summary of council activity
<b>From:</b>	John Mauro, Chief Sustainability Officer Sarah Anderson, Principal Specialist Climate Resilience and Sustainability

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**Purpose**

1. To provide an overview of current activity across council and wider council family in relation to preparing for the implications of climate change.

**Background**

- This summary of activities to prepare for climate change is a supporting document to the 8 August 2017 committee agenda item *Strategic Approach to Climate Change*. A copy of the presentation for that item has been placed on the official minutes and is available on the Auckland Council website as minutes' attachments.
- This summary is intended to provide a high level snapshot in time rather than a comprehensive analysis, which will be undertaken as part of a broader risk and vulnerabilities assessment to be carried out over the coming months.
- Future strategic direction for council and wider council family in relation to preparing for climate change is not incorporated here as this will be integrated into papers for the Environment and Community Committee over the coming months as discussed at committee on 8 August 2017.
- For an overview of activity in relation to climate change mitigation (i.e., reducing emissions in the region), a report on progress against Low Carbon Auckland will be provided in November.

## Preparing for climate change: A snapshot of current activity across council family

*This summary has been developed for the Environment and Community Committee to give an overview of current activity across Auckland Council and wider council family in preparing for the impacts of climate change. It is intended to provide a high level snapshot in time rather than a comprehensive analysis, which will be undertaken as part of a broader risk and vulnerabilities assessment to be carried out over the coming months (see section on cross-council activities). It is important to note that this report does not include future strategic direction for council and wider council family as this will be integrated into papers for the Environment and Community Committee over the coming months as discussed at committee on [8<sup>th</sup> August 2017](#).*

*For an overview of activity in relation to climate change mitigation (i.e., reducing emissions in the region), a report on progress against Low Carbon Auckland will be provided in November. In the interim, previous reports are available on [Auckland Council's website](#).*

### 1. Strategic context

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Auckland Council has statutory obligations to take climate change into account under a range of legislation and policy statements including (amongst others):

- Local Government Act 2002
- Resource Management Act 1991
- New Zealand Coastal Policy Statement 2010
- Civil Defence Management Act 2002
- Treaty of Waitangi Act 1975

There are three key strategic documents that link to these requirements: The Auckland Plan, the Auckland Unitary Plan and Resilient Auckland.

The current **Auckland Plan** sets out the strategic direction with regard to climate change adaptation as follows:

*“Auckland expects that we will work together to play our part in meeting the national goal of significantly reduced greenhouse gas emissions (mitigation), and that we will improve energy efficiency, resilience and security and our capacity to adapt to climate change (adaptation)”*

The Plan identifies a priority to ‘Adapt to a changing climate by increasing the resilience of Auckland’s communities, natural resources and built environments and their ability to adapt to the impacts of climate change. Take a cautious, risk based approach where there is uncertainty on the effects of climate change, and monitor and adapt to environmental change over time.’<sup>1</sup>

The Auckland Plan is currently being refreshed and climate change adaptation and mitigation will be integrated both as a cross-cutting issue and with specific directives in each of the themes currently in development. Climate change was identified as a key issue in early workshops with Councillors with an output that “a climate resilience approach may be needed, focussing on communities, ecosystems and businesses thriving and adapting to the impacts of climate change”.

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<sup>1</sup> <http://theplan.theaucklandplan.govt.nz/aucklands-response-to-climate-change/>

On 29 September 2016, Auckland Council resolved to make the **Auckland Unitary Plan** 'Operative in part'<sup>2</sup>. The plan includes climate change and natural hazards as chapters in the Regional Policy Statement and contains specific objectives, policies, rules and in some case maps designed to address these issues<sup>3</sup>. These range from addressing the potential impacts from coastal inundation and flooding through to increasing forest canopy and addressing water sensitive design to reduce flood risk, improve water availability and support community cohesion. Chapter B: Regional Policy Statement states:

*“Climate change is expected to increase the risk from natural hazards. Changes in the intensity of rainfall, increasing temperature variability and rising sea levels will mean that activities already at risk from natural hazards such as flooding, coastal inundation and land instability will be affected more often. Some activities in locations that are not currently affected by these hazards will be at an increased risk of adverse effects. It is essential that climate change projections are included in all natural hazards and risk assessments so risk can be appropriately managed or avoided.”*

*Working together to build a **Resilient Auckland**: Auckland Civil Defence and Emergency Management Group Plan 2016 - 2021* is a comprehensive plan, building on the 4Rs Framework (Reduction; Readiness; Response; Recovery) in the national CDEM strategy and adding a fifth, Resilience, to reflect and address Auckland’s unique challenges and vulnerabilities.

Climate change will result in increased frequency and severity of events that require Auckland Emergency Management interventions. Resilient Auckland is building Auckland’s resilience to eliminate, reduce or mitigate the impacts of these events on residents, businesses and service delivery into the future. All activities contained within Resilient Auckland will therefore support preparing for the severe weather events aligned to a changing climate.

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<sup>2</sup> <http://www.aucklandcouncil.govt.nz/EN/planspoliciesprojects/plansstrategies/unitaryplan/Pages/unitaryplanoperative.aspx>

<sup>3</sup> <https://geomapspublic.aucklandcouncil.govt.nz/viewer/index.html?extent=1757291.2027779354.1747468.5268825835.5952110.72474413.4.5946356.025734736> Maps on coastal inundation and flooding are available in the environment theme under 'emergency planning'.

## 2. Summary of Auckland Council activity

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### ***Engineering and Technical Services***

The Coast and Geotechnical team are undertaking a **Coastal Asset Data Review** project to refine and improve accuracy of our recording of coastal assets. This incorporates current state and long-term needs and supports the delivery of the **Coastal Management Framework**, which was adopted by the Environment and Community Committee on 8 August, 2017.

The aims and objectives of the Coastal Management Framework are to ensure:

- A long-term, balanced perspective to facilitate an environmentally and financially sustainable approach
- A sound understanding of coastal hazards, climate change and coastal assets to facilitate robust and defensible decisions
- Promotion of public understanding and an appreciation of coastal hazards and climate change
- The development of a decision making process that is clear and transparent, taking into account diverse Auckland Council and Council Controlled Organisation (CCO) drivers

The Framework establishes **Coastal Compartment Management Plans (CCMPs)**. These are non-statutory plans that articulate a shared vision for an area and identify the policies and actions required to deliver it. The aim is to improve integrated management and development of prioritised sections of coast within council, other agencies and the community. They provide a vehicle to review and gather technical information on local areas, providing a reference base for decision making, budgeting, education and research. CCMPs provide a distinction between areas requiring immediate or longer term responses and consider a range of management options.

A working example of a project being led by Engineering and Technical services is the progressive managed realignment response of a section at **Muriwai Beach**. The beach is in a high-energy environment, subject to both long period ocean swell as well as shorter period waves generated from the Tasman Sea. The surrounding area has experienced continued development with a population of around 2,500 but attracts approximately one million visitors per year. Since the 1960s the beach has experienced an erosion trend resulting in an average loss of up to 65m of land at the southern end, threatening regional park infrastructure, a stormwater outfall and impacting access and visual amenity.

A Coastal Hazards Management Strategy was commissioned that considered the viability of managed realignment and its role in climate change adaptation. This recommended the monitoring and establishment of trigger points to initiate managed realignment, which were subsequently reached in 2006 and 2007. Working with the local community to establish options, a staged process for management realignment was agreed. Stage 1 has led to a reshaping of the area, restoring and improving amenity and access and the provision of a new area of dry high-tide beach for recreation. This has also resulted in financial savings of around \$65k when compared to a structural response. Stage 2 has recently been completed with respect to dune restoration across 100m of dunes to increase resilience to storm events and protect from erosion. This has had the added advantage of improving the visual amenity in the area and enhancing native biodiversity.

**King Tides Auckland** is an initiative encouraging people from around the Auckland region to visit and photograph the highest tides (known as King Tides) that naturally occur along our coastline each year.<sup>4</sup> This citizen science initiative raises public awareness of the issues of sea level rise, whilst providing a living record of Auckland's changing coastlines and an insight into what our normal daily high tides may look like in 30 to 50 years' time with projected global sea level rise.

## **Healthy Waters**

To ensure consideration of climate change impacts (including sea level rise), Healthy Waters have developed a **Stormwater Climate Change Strategy**, informing the **Stormwater Asset Management Plan 2015-2045**<sup>5</sup>.

The asset management plan seeks to manage risks through:

- Educating the community to increase resilience because not all flooding and climate change impacts will be resolved
- Encouraging future development to locate above floodplains and low lying coastal land vulnerable to some of these hazards (in particular tidal storm surges, tsunamis and flooding associated with major rainfall events)
- Promoting the use of water sensitive design and source control, which moves away from relying heavily on traditional large communal hard infrastructure
- Increasing reliance on overland flow paths and natural assets rather than hard infrastructure, which is more susceptible to damage in disasters
- Preparing and adopting a *stormwater resilience strategy*, which will provide the unit with a framework for incorporating resilience in business decisions

The objective of the Stormwater Climate Change Strategy is to increase the resilience of Auckland's stormwater infrastructure, natural resources and built environment as a consideration when creating, upgrading, extending or improving stormwater infrastructure as part of Long Term Plan (LTP) works.

This will be achieved through the following actions:

- Using a risk-based approach to assess the climate change impacts on stormwater infrastructure projects. This may also apply to developments requiring the Stormwater Unit approval.
- Consideration of the following options for adapting to climate change and increasing resilience:
  - a) **Design** of infrastructure to minimise damage and maximise recovery from extreme events.
  - b) **Accommodate** the expected increase in frequency and intensity of rainfall by designing new stormwater systems, upgrades and renewals to accommodate. The potential increase in stream erosion and stream widening could be accommodated by providing sufficient riparian buffer zones where practical.
  - c) **Reduce** the effect of climate change by use of water sensitive development strategies, increasing green infrastructure and minimising impervious surfaces.
  - d) **Defend** coastal land from inundation through sea walls, flood control gates, etc.
  - e) **Retreat** (for example relocates buildings and infrastructure away from future flood plains and overland flow paths).
- Including climate change adaptation in cost-benefit assessment.

<sup>4</sup> <http://auckland.kingtides.org.nz/>

<sup>5</sup> <http://www.aucklandcouncil.govt.nz/EN/planspoliciesprojects/plansstrategies/Councilstrategies/Documents/stormwaterassetmplan.pdf>

- Incorporating climate change effects in flood plain and sea inundation hazard assessment.
- Providing advice to property owners, developers, other Auckland Council departments and CCOs on the stormwater related impacts of climate change.

Auckland Council supports **Water Sensitive Design** approach through the Unitary Plan. This aims to rely on natural components such as vegetation and soil media to cater for stormwater quality and enhance urban environments.

An example of the integration of water sensitive design into planning decisions is Long Bay, North Shore, where the inclusion of raingardens in the streets has allowed for treatment of the stormwater, whilst contributing to a pleasant streetscape and general amenity of the suburbs. The streets are designed as part of an *integrated treatment train*, beginning with stormwater runoff controls at source, followed by other complementary treatment devices throughout the catchment to collectively deliver stormwater quality and quantity objectives. The final step in the Long Bay treatment train is a stormwater wetland at the bottom of the catchment.

A further working example is in **Takanini**. The Takanini east urban intensification area is located in peat fields, predominantly flat and currently un-serviced by stormwater infrastructure. The urban area is currently within a predicted 1% AEP (annual exceedance probability) floodplain and is unable to be comprehensively developed until a stormwater solution is implemented.

Traditional piped systems, open channels and hybrid systems including attenuation were considered and evaluated and an open watercourse was selected as the most resilient solution and one that would also provide amenity and ecological benefits. The selection of channels over traditional pipes allows for much greater resilience to changes in flows relating to climate change whilst planting along the channel provides greater resilience to storm events and increases the amount of infiltration as opposed to traditional methods.

Auckland Council have started the planning and design of works that involve the construction of a major new stormwater channel formed as a natural stream system approximately 2.1 km long. The channel will meander along its length, include a number of weirs and will be surrounded by public open space that includes passive recreation areas. The channel will convey stormwater through the development area and discharge to the McLennan wetland via the Grove Road Box Culvert.

The McLennan wetland will attenuate peak discharges and provide treatment prior to being discharged to the receiving environment via the Artillery Road Tunnel. An area of public open space will be established next to the channel which will provide for flood flows in the largest storm events and when not in flood this will be available for active and passive recreation. Landscaping of the channel will include riparian planting, specimen trees and areas of lawn in the public open space.

## ***Community Facilities***

### **Green Building Pilots**

There is strategic direction and targets around carbon and climate change, however council know that this is not consistently applied to the way we manage assets (i.e. new builds, renewals and operation). To ameliorate this, a number of pilots to apply green building standards, incorporating both climate mitigation and adaptation, are being undertaken across community facilities with a

view for the principles to be applied across all asset management activities.

Community Facilities have started with three large new builds as pilot projects, which include a new mixed-use facility (Arts, Libraries, Community) in Flat Bush, the proposed Civic Annex in Manukau, and the proposed Central Community Recycling Centre at Western Springs. In parallel we are developing tools and guidelines for smaller projects to mainstream sustainable practices, including climate resilience planning and principles.

As an example, for the new mixed-use facility in Flat Bush, the following principles and project-specific targets were established:

### **1. Principles**

- a. carbon neutral growth, net zero water, net zero energy
- b. facilitated integrated design process incorporating Council's strategic direction
- c. lifecycle assessment of design
- d. selection and application of a green building framework that fits strategic drivers for the project (in this case the Living Building Challenge)

### **2. Project-specific performance targets:**

- a. Energy - 60kWh / m<sup>2</sup> (i.e. 60% less than BAU)
- b. Embedded energy generation – 100% solar offset of energy use
- c. Water - 0.2kL / m<sup>2</sup> (i.e. 65% less than BAU)
- d. Water – 100% offset of potable water (rainwater and greywater harvest)
- e. Wastewater – One of three toilets composting
- f. Waste – zero waste to landfill
- g. Construction and demolition waste – 90% diversion from landfill
- h. Must adhere to Living Building Challenge imperatives for education, community, biodiversity, transport, supply chain and embodied carbon to ensure alignment with other Council's strategic direction

The end result has been a design that is aligned with current council strategy and green building principles. Though climate change adaptation is not currently fully integrated into Community Facilities new building processes, this pilot forms initial steps to embed resilience principles into a department-wide best practice standard, which will be built on over the coming months.

### **Operational Impact Reductions**

Several initiatives have been implemented to decrease resource consumption of everyday operations in community facilities, including (among others):

- Better use of utility consumption to inform decision making and reduce energy, water and waste footprints
- Integration of waste minimisation tools to decrease materials to landfill, especially construction and demolition waste
- Empowering community lessees of Council land to contribute to sustainable outcomes, connecting them with resources to develop power, water and waste minimisation
- Integrating environmental outcomes and carbon emission reduction KPIs and specifications into contracts for maintaining Community Facilities-managed assets

All initiatives are grounded in Council strategic direction to contribute toward an aligned collaboration towards a more resilient network of community facilities.

### ***Parks, Sport and Recreation***

Climate change adaptation actions are closely linked to Green Infrastructure e.g. floodplain restoration, counter-acting the urban heat island effect, provision of shading and improving air quality amongst many others benefits.

To support this, the Parks, Sport and Recreation department partnered with Opus International Consultants to develop a green infrastructure guidance document that provides best practice research, guiding principles and actions. The key driver for both the department and Opus was to develop a guidance document that staff and other local government organisations could use as a tool to consider alternative options to current practice.

As such, the key priorities of the guidance document were to provide:

- Green infrastructure guiding principles
- Green infrastructure guiding actions, and
- National and international case studies.

The following green infrastructure guiding actions were developed to support the implementation of green infrastructure during the phases of planning, development and redevelopment.

- Embed the principles of green infrastructure during project planning, design and construction
- Establish baseline data, and model and map the potential for green infrastructure across sport parks
- Understand the benefits of green and grey infrastructure lifecycles through detailed business cases and whole-of-life cost analysis, and
- Encourage use of green infrastructure and green engineering principles through trialling, innovating and implementing new technologies and solutions.

### ***Auckland Emergency Management***

Auckland Emergency Management, through **Resilient Auckland** (see strategic context) are building Auckland's resilience to eliminate, reduce or mitigate the impacts of severe weather events on residents, businesses and service delivery now and into the future. The Group are working to integrate resilience into wider strategy and policy (e.g., Auckland Plan, Unitary Plan and Infrastructure Strategy), strengthen partnerships, build evidence and understanding of the risks (both short term and long-term in relation to climate change), and are undertaking widespread engagement activities across businesses and communities to understand local context, raise awareness and empower action.

Auckland Emergency Management are also implementing the Auckland Council's **Natural Hazard Management Action Plan**. This links to the Auckland Plan and Resilient Auckland and looks to address:

- Auckland's natural hazards and the risks they present
- The role and responsibilities of Auckland Council and other organisations in managing the

risks of natural hazards

- The actions Auckland Council will undertake or facilitate over the next 10 years to reduce risk from natural hazards and increase resilience

## **Environmental Services**

### **Impacts of Climate Change on Biodiversity**

A 2011 report for the Department of Conservation on impacts of climate change on terrestrial biodiversity noted that “*The best defences against biodiversity loss as a consequence of climate change are exactly those actions that we are undertaking right now to prevent biodiversity loss due to ongoing pressures of pests, weeds, and land use change*”<sup>6</sup>

The same assessment equally relate to Auckland Council’s activities in this area. Therefore, the protections for native habitat provided under the Unitary Plan and the pest control undertaken by Council (both funded by the Governing Body and Local Boards) are helping to make Auckland’s biodiversity more resilient to climate change.

### **Regional Pest Management Plan (RPMP)**

Auckland Council’s Regional Pest Management Plan (RPMP) is currently under review and undergoing consultation to replace the former Auckland Regional Pest Management Strategy (2007-2012). In summary the plan looks to include the management of a range of new and emergent pest species whose biosecurity risks and impacts will increase under climate change and thus threaten Auckland’s environmental, economic, social and cultural values. The RPMP is a 10 year plan and will proactively incorporate pest management programmes to future proof against increased threats and pressures under climate change scenarios.

### **Regional Pest Management (Biosecurity)**

Current pest control programmes are underway to reduce the establishment, spread and impact of current pests (as declared in Auckland’s Regional Pest Management Strategy) or unwanted organisms (as declared under the Biosecurity Act 1993) throughout the Auckland Region. These programmes ensure environmental, economic, social, cultural values as well as human health are not further degraded or reduced by a range of significant pests that are expected to increase their fecundity (reproductive rates), rates of spread rates and invasive ranges under future climate change scenarios. For example kauri dieback (*Phytophthora agathidicida*) has an optimum growth and activity temperature of 21oC so its severity and virulence is expected to increase with rises in soil temperatures and changes in wet-dry weather patterns. Therefore management of kauri dieback is an important activity to ensure survival of kauri ecosystems in the Auckland Region under climate change.

Prioritised research objectives, as outlined in Auckland Council’s Biosecurity Research Implementation Plan, has been ongoing since 2011 to evaluate biosecurity threat of emerging and novel pest species using future climate change models to complete a robust risk assessment that will inform all current pest control programmes. This has led to proactive operational control of species, such as red eared slider turtles (*Trachemys scripta elegans*), which are expected to significantly benefit under future climate change scenarios in the Auckland Region.

<sup>6</sup> McGlone, M & Walker, S. (2011). Potential effects of climate change on New Zealand’s terrestrial biodiversity and policy recommendations for mitigation, adaptation and research. *Science for Conservation 312*. Department of Conservation Technical Publication.

## ***Sustainability Initiatives***

The role of Sustainability initiatives in responding to climate change is focussed on empowering Auckland households, schools and communities to reduce the carbon emissions that result from their everyday lives. In addition, the team work with CDEM to ensure input with regards to building community resilience. Aligning closely with the climate change goals for Auckland, and infrastructure changes in response to climate change, Sustainability Initiatives is in the unique position to promote behaviour change as a key way to improve environmental outcomes for Aucklanders. Using approaches such as Community Based Social Marketing to engage and empower Aucklanders, the Sustainability Initiatives teams are able to start conversations, raise awareness, and give individuals, households, schools and communities the actions and tools needed to be conscious of climate change, and act on this knowledge to reduce their impact on the environment.

This work is increasingly centred around the development of a behaviour change programme based on a top ten list of Climate Action Themes targeting high impact activities that Aucklanders can take to reduce their carbon footprint and raise awareness of the impacts of climate change. This programme will act as an umbrella identity for new and existing sustainability initiatives from across council, CCO's and the community and will work to support and amplify community initiatives, allowing community groups to build capacity and gain traction. The programme will provide Aucklanders with the tools necessary to make positive choices in their everyday lives, changing their behaviour and benefitting from this change through health benefits and financial savings, as well as lowering their carbon footprint and building resilience.

Work with schools recognises that Auckland's youth have a vital role in achieving sustainability outcomes as future leaders, early adopters and influencers within their communities. Sustainable Schools works in partnerships with Auckland schools (early childhood, kura, wharekura, primary, secondary, home-schoolers and tertiary institutions) and their wider communities to achieve sustainability outcomes through education for sustainability.

## ***Cross-Council Initiatives***

***Providing regional climate projections for Auckland*** (Chief Sustainability Office, Parks, Sport and Recreation, Research and Evaluation, Healthy Waters, Infrastructure and Environmental Services, Auckland Transport, Watercare, Panuku, District Health Boards)

Partners across council, CCOs and DHBs are working with NIWA to provide regionalised climate projections for Auckland, supporting decision making and refining understanding of risks, opportunities and vulnerabilities. These projections will be widely communicated at multiple levels through a video and summary for policymakers as well as mapping and a technical report for more detailed analyses. The outputs will be utilised to review current council strategy, policy and processes and will underpin a full risk and vulnerabilities assessment for the region across multiple sectors.

### ***Structure Planning***

Council's structure planning is always informed by a team of experts, which would include stormwater engineers and scientists, coastal engineers and Watercare water supply engineers. Each of these incorporate climate change considerations into their assessments.

An example of this is the Whenuapai development, which is designed to mitigate the effects of climate change and coastal hazards. A priority of the development is that communities, development and infrastructure take an adaptive approach to respond to the effects of climate change and coastal hazards. In order to achieve the objectives of the New Zealand Coastal Policy Statement, the Whenuapai structure plan proposes to maintain setbacks from the coast and a water-sensitive design approach to stormwater management, which will help to address potential coastal hazard risks and water quality issues.

The Whenuapai Stormwater Management Plan (WSMP) was prepared to support and promote the sustainable long-term urban development of Whenuapai based on water sensitive design principles. The catchment has a significant number of permanent and intermittent watercourses throughout and also has existing natural wetland features. The stormwater management methods in the WSMP seek to protect and promote the enhancement of streams and the harbour to mitigate the potential negative effects of development. The recommended stormwater management infrastructure approach includes the provision of decentralised at source (or close to source) bio-retention devices (e.g. rain gardens, swales and green roofs) to service the built environment and minimise adverse effects on the receiving environment through WSD processes.

Consultants are currently undertaking further work to inform the Whenuapai Plan change process in the coastal areas. They will identify the most likely rate of erosion along the plan change area based on a range of parameters such as historic erosion, sea-level, cliff heights, and geomorphology.

***Scott Point Sustainable Park*** [Community Facilities and Parks Services]

A new park in Hobsonville is currently in design that will cater for a wide range of recreational outcomes as well as protecting and enhancing endangered native biodiversity. The park is intended to be a model and exemplar of sustainability and resilience, incorporating green infrastructure and delivering an energy and water efficient, low carbon development.

***Urban Forest Working Group*** [Chief Sustainability Office, Natural Environment Strategy, Parks Services and Auckland Transport]

Increasing our urban forest has the potential to reduce the impacts of increased rainfall, higher temperatures, air quality problems, and levels of UV that are expected as the climate changes. However, the most recent LIDAR analysis shows a deficit in tree cover <15% in the south and west and along the new urban growth corridors permitted in the Unitary Plan. Urban tree cover is being geospatially mapped, by council and its contractors, across the region to give a clearer picture of the type size, age mix, and health of trees. This research will also help us to develop management systems for disease control and monitoring of species specific threats such as Myrtle Rust. Pest and diseases are expected to become more problematic as the climate changes, and council needs to have developed plans to address the potential future changes to the types of trees that are found across the region.

The working group are using this evidence base to establish a long-term strategic approach to maintain and grow the urban forest, addressing inequality across the region.

***Virtual Resilience Department*** (Led by Civil Defence and Emergency Management)

An integrated, cross-council, collaborative and coordinated approach to driving resilience across the organisation is currently being established through a *virtual resilience department*. This group will work to ensure that resilience is fully embedded in Auckland Council strategies, plans, work programmes and budgets.

### 3. Summary of Council Controlled Organisation (CCO) activity

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#### PANUKU DEVELOPMENT AUCKLAND

Panuku Development Auckland actively considers climate change impacts in its planning and development in Transform locations, including more specifically:

1. **Wynyard Quarter** Transform location:

In February 2015 the Board of Waterfront Auckland [now Panuku] adopted a climate change adaptation pathway that covered the Waterfront Auckland area of influence, including Westhaven Marina.

The pathway:

- Identified the risks to assets as they were understood at the time and the adaptation measures already in place
- Set out the approach by which the organisation will seek to manage assets and future projects in the dynamic and continuously evolving environment that characterises climate change
- Identified the range of opportunities from operating in a coastal context into the future
- Enabled the organisation to implement appropriate adaptation measures over time. At Wynyard Quarter (the most advanced Transform location), comprehensive Sustainability Standards for Wynyard Central were developed which include specific measures for climate change adaptation. This comprises adopting resilient design principles for buildings, infrastructure and the public realm. Developments all take a Low Impact Urban Design and Development (LIUDD) approach to minimise the risk of flooding and storm inundation damage, as well as adaptability to fluctuating temperatures.

2. **Onehunga and Manukau** Transform locations:

Panuku commissioned NIWA to produce a report outlining the coastal hazard and sea-level rise inundation exposure for Onehunga, Mangere and Manukau. Recommendations from this will be built into development requirements, to ensure vulnerable areas' exposure to climate risk is minimised.

Additionally, Panuku is in the process of reviewing its processes against the Green Star Communities tool, and mapping specific policies or practice that will strengthen sustainable outcomes. One of the recommendations to emerge from this work is that Panuku could formalise its approach to climate adaptation, and ensure informed planning is carried out for every project area. This will be built into the 2017/18 corporate responsibility work programme.

#### WATERCARE

In relation to planning for resiliency for existing infrastructure and services, Watercare has (and is) carrying out a number of large project-based initiatives. For water supply, resilience is afforded by

providing headroom in dam storage, treatment and reservoir capacity. Many additional water conveyance projects are planned that will further improve resiliency in water supply. In relation to wastewater conveyance, the CANOPY project is assessing the separation of stormwater from wastewater assets in the Central Auckland combined systems. This will help increase the resilience of the existing network to accommodate the impacts of climate change effects with respect to system capacity and overflows to the environment.

Watercare is continuously reviewing its water and wastewater engineering standards. These standards are consistent with the Auckland Unitary Plan (Operative in Part) and NZS 4404:2010 – Land development and subdivision infrastructure, but they also set minimum standards for material types. These water and wastewater engineering standards are becoming increasingly performance based.

As a specific example of how the impacts of climate change have been incorporated into planned infrastructure, the Central Interceptor project has adopted a design storm commensurate with stormwater systems design, with allowance for climate change and an associated allowance of 25% increase in impervious area. The design considers rainfall intensity changes, depth of rainfall events and the effect of sea level rise. These have been factored into the hydraulic models used to develop the sizing of the wastewater tunnel and related elements of the project.

Watercare continues to progress a work programme to better understand its vulnerabilities to the potential impacts of climate change. From these more detailed understandings, and then prioritising them, Watercare will develop more refined adaptation responses to the impacts of climate change.

## AUCKLAND TRANSPORT

It is important to note that a full assessment of the impacts of the range of predicted effects has not yet been undertaken across the full the range of AT activity. The actions taken so far serve as a basis from which to embed consideration of the predicted effects of climate change into the planning, design, operation and management of the transport network. They also highlight the importance of the broader assessment and deliberation of the impacts to the adjacent and surrounding land-use and assets.

AT has to date:

1. Undertaken a high-level assessment of AT assets at risk from future sea level rise
2. Undertaken an assessment of sea level risk for individual capital projects (e.g. Tāmaki Drive)
3. Provided feedback and review of development proposals for potential risk
4. Provided feedback on the development of central government guidance for local government on Climate Change adaptation

Each of these is briefly outlined below.

### **1. High-level assessment of AT assets at risk from future sea level rise**

AT screened its transport infrastructure against the coastal inundation layers detailed of Auckland Council's Unitary Plan i.e. 1m sea level rise (SLR) + 100 ARI and 2m SLR + 100 ARI.

This analysis was conducted by exporting all the assets classes from our RAMM road asset database and our SPM database for PT and parking assets for analysis within AT GIS. The analysis was isolated

to assets within AT's asset register, not wider public or private assets or property. The assets (for the road assets) were valued at the renewals rate used in AT's asset renewal programme.

At this higher level this identifies approximately \$1B worth of assets at a level of 1m SLR + 100ARI. (AT has \$16B worth of assets)

Outside of this, AT is also reviewing coastal reserve land currently vested as roads.

## **2. Assessment of sea level risk for individual capital projects (e.g. Tāmaki Drive)**

Sea level rise risk / Coastal inundation was considered as part of the early design process of the Tāmaki Drive Ngāpipi intersection improvement project. It was a known consideration for the project (particularly to the west of the bridge), would be raised in the resource consent process, and was also raised by one of the stakeholders – the Tamaki Drive Protection Society.

The intersection design provided a widened footprint which allows for future raising of the road however addressing the wider inundation risks outside the project boundaries would have to be considered as part of a wider Tamaki Driver corridor approach. The commissioners agreed with this approach in their decision following hearings in December 2016.

Consideration or assessment has also been done on other projects e.g. a concept study for a boardwalk on Tāmaki Drive, and AT also reviewed the levels of the north western cycleway as part of NZTA's upgrade and lifting of the causeway.

## **3. Feedback and review of development proposals for potential risk**

AT beyond its own capital programme, also inherits vested assets created within subdivisions undertaken by a developer upon completion. In this case, AT provides advice to Auckland Council consents team.

One example is Fordyce road in Parakai where in March 2015 the Council's Hearing Panel of Independent Commissioners declined a subdivision consent on the basis of coastal inundation on roads, footpaths and reserves (the habitable floor levels of the houses were adequate). This issue was subsequently addressed without the need to go to the Environment Court by way of a Memorandum between the parties in August 2015 outlining the raising of the roads and footpaths.

We note that the Unitary Plan commissioners rejected the 2m SLR + 100 ARI threshold for greenfield growth areas. In the absence of this, AT has had approaches regarding subdivisions in greenfield areas and early conversations on locations of assets AT would inherit. We note the guidance set to be released by Ministry for the Environment includes reference to 1.9m for Coastal greenfield development.

## **4. Feedback on the development of central government reports and guidance on Climate Change adaptation**

AT has reviewed and provided commentary on into Government reports as part of wider council family feedback processes. AT reviewed draft chapters of the Parliamentary Commissioner for the Environment (PCE) report Preparing New Zealand: Certainty and Uncertainty (late 2015). This included comparing the assessment of length of roads identified at risk in Auckland identified under the national study with AT's own assessment and providing feedback to ensure caveats and in the national study on reasons for divergence from local figures. AT also reviewed and provided feedback on the Ministry for the Environment's Guidance on Coastal Hazards (2016 but not yet released to the public) particularly with a focus to aligning government policy direction and recommendations to tailor guidance to the particular decision making functions of council. Reviewing these reports and guidance also highlighted issues e.g. a road controlling authority's legal requirement to provide road

access.

AT also provided feedback to (and saw value) in the work to bring a systemic assessment and prioritisation of council funds to addressing coastal hazards – Coastal Management Strategy. The last reference we have seen within council - December 2015.

#### *Gap Analysis*

As noted, the above does not address the full range of predicted effects for the transport network. The following are potential areas of work and next steps for AT and partners:

- Assessing the impacts of climate change predictions and natural hazards against all of transport network
- Contributing to revised set of climate change predictions for Auckland based on NIWA's latest guidance and projections produced for MFE.
- Contribute to and review of guidance for Auckland council entities based on revised climate change predictions for Auckland.
- Reviewing and assessing coastal inundation risks at finer resolution for AT assets, including Identify specific sites for further investigation.
- Assessing of the coastal impacts on the rail network in conjunction with Kiwirail.
- Developing a coordinated approach as part of wider council family to particular areas of Auckland's coast.
- Developing of design standards based on future climate change predictions for inclusion in AT or council-family wide design guidance / code of practice.
- Developing of prioritised programme to address impacts to the transport network, including discussions with NZTA on subsidy of projects to enhance resilience of the network.

## **CITY RAIL LINK**

City Rail Link considers climate change and will continue to assess its design in relation to growing knowledge of the issue. With increasing storm events in Auckland and nationwide, particularly evident this year such as Cyclone Debbie, recent flooding in New Lynn, Hunua Ranges and Edgecumbe etc, the CRL team is aware the project is equally susceptible to the effects of a changing climate. With the need to design infrastructure for the next 100 years, CRL is focussed on creating a resilient design whilst staying connected with others working on climate change resilience in Auckland.