

# Sustainability Assessment

## Warkworth Structure Plan

June 2019



Prepared by:

Matthew Blaikie (Senior Sustainability & Resilience Advisor)

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# 1 Executive Summary

The Warkworth Structure Plan presents a significant opportunity to influence sustainability outcomes and support a low carbon development model for the area. The scale and predominantly undeveloped nature of the structure plan area provides opportunities to plan for broader sustainability outcomes from the outset.

This report is the outcome of an iterative process whereby the structure plan has been amended to address sustainability issues raised.

*'Sustainability and natural heritage'* is one of the seven planning principles for the Plan. Under this principle it states, *'Plan to enable development of the Future Urban zone to be sustainable, including having a compact urban form, providing local employment options, enabling extensive active and public transport routes, and minimising discharges to air and water bodies'*. In addition, under this principle it states, *'Design the Future Urban zone to be able to adapt to the effects of climate change'*.

Although not explicitly referenced as *'Sustainability and natural heritage'*, most of the planning principles also contribute towards the delivery of sustainability outcomes.

Planning for sustainability outcomes is therefore identified as a core consideration in the development of the plan. It is important to note that although the intention to plan the future urban zone to be sustainable has been clearly laid out, to achieve this outcome, this principle needs to be considered and upheld during all subsequent planning and design decisions and during the plan change and resource consent processes.

This report provides an assessment of the *Warkworth Structure Plan* (the Plan) against sustainability opportunities identified in the *Warkworth Structure Plan – Sustainability Topic Report (June 2018)* which was prepared to inform the development of the Plan. In addition, it provides an assessment of the Plan against regional policy and strategic outcomes relevant to sustainability.

Green infrastructure is a key component of the Plan, in the form of Protection Areas and Future Esplanade (20m buffer). This has the potential to deliver a range of significant sustainability outcomes and supports the Auckland Plan 2050 direction to, *'Use Auckland's growth and development to protect and enhance the natural environment'* and focus area *'To use green infrastructure to deliver greater resilience, long-term cost savings and quality environmental outcomes'*.

This report concludes that the Plan supports many of the sustainability opportunities identified in the *Sustainability Topic Report*. Further opportunities to enhance sustainability outcomes, both in the Plan and during subsequent planning and design decisions, are outlined in section 5 of this report. From a policy perspective, the Plan aligns with policies and strategic outcomes considered of most direct relevance to an assessment of sustainability.

## 2 Purpose and scope of the report

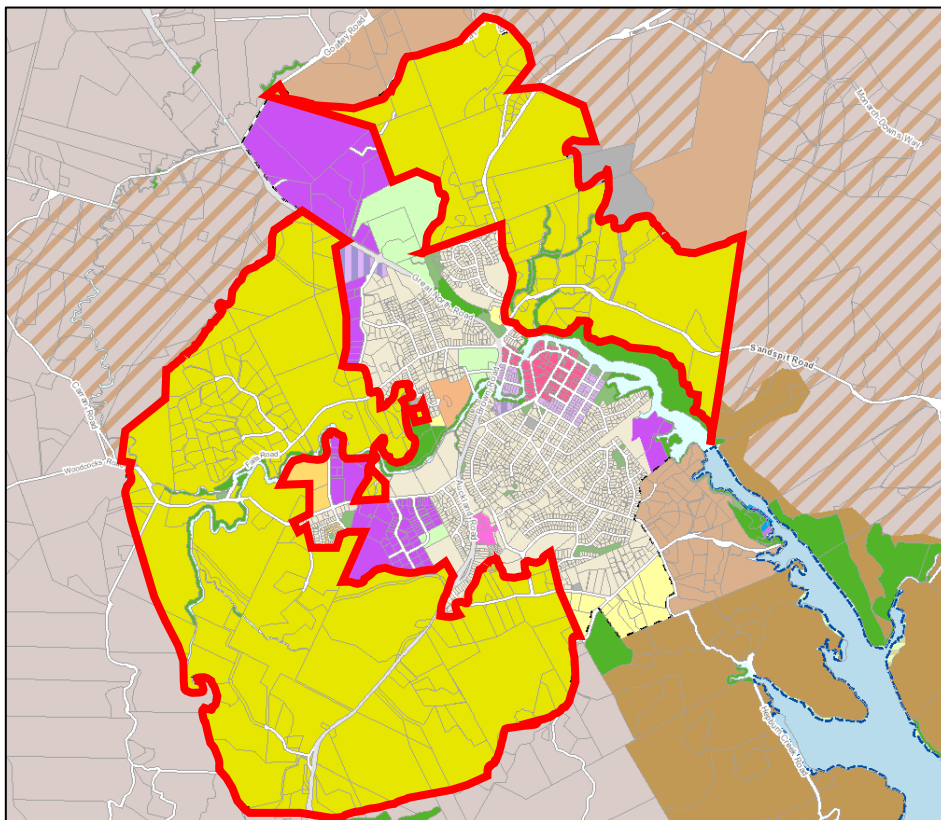
This is one of a number of reports that have been prepared for the Warkworth Structure Plan (the Plan) as part of the supporting information behind the structure plan document. This report outlines the existing environment in the study area and assesses the Plan in relation to sustainability.

Sustainability opportunities relating to the development of the Warkworth Structure Plan were outlined in the *Warkworth Structure Plan – Sustainability Topic Report (June 2018) (Sustainability Topic Report)*<sup>1</sup> and are not discussed in detail in this report.

### 2.1 Study Area

The study area for the Warkworth Structure Plan is the Future Urban zone around Warkworth. It comprises around 1,000ha of land. The study area is shown outlined in red on Figure 1 below.

**Figure 1:** Warkworth structure plan study area (outlined in red)



<sup>1</sup> <https://www.aucklandcouncil.govt.nz/have-your-say/topics-you-can-have-your-say-on/warkworth-structure-plan/Pages/consultation-documents.aspx#panelLinks>

## **3 Existing environment**

### **3.1 Description of study area**

This study area is located around the existing Warkworth town centre extending to Clayden Road in the north and to Thompson Road and Avice Miller Scenic Reserve in the south.

The study area is a highly modified landscape of predominantly horticultural, agricultural and rural-residential land use. Small patches of native vegetation are present across the landscape, mostly confined to gullies and riparian margins. The study area consists of rolling hillsides, with many small gully systems surrounding watercourses opening up to flatter areas. The watercourses are part of the Mahurangi River catchment and eventually discharge to the Mahurangi Harbour. The area immediately outside of the study area is zoned under the Auckland Unitary Plan operative in part (AUP-OP) as Rural – Countryside Living; Mixed Rural; and Rural Production Zone.



## 4 Warkworth Structure Plan

### 4.1 Overview of Warkworth Structure Plan

The Warkworth Structure Plan sets out the pattern of land uses and the supporting infrastructure networks for the Future Urban zoned land around Warkworth. In preparing the Warkworth Structure Plan, the following were considered:

- the context of the existing town in Warkworth
- the opportunities and constraints of the structure plan area as identified in 16 technical papers<sup>2</sup>
- the feedback received from various stakeholders and public engagement events<sup>3</sup>.

The structure plan is show in **Figure 2**.

Some of the key high-level features of the Warkworth Structure Plan include:

- Ecological and stormwater areas are set aside from any built urban development.
- The new residential areas across the Future Urban zone enable around 7,500 dwellings and offer a range of living types from spacious sections around the fringe to more intensive dwellings such as town houses and apartments around the new small centres and along public transport routes.
- Warkworth's local and rural character is protected through various measures including provisions to protect the bush-clad town centre backdrop by the Mahurangi River and retaining the Morrison's Heritage Orchard as a rural feature of the town.
- New employment areas are identified, comprising land for new industry (e.g. warehousing, manufacturing, wholesalers, repair services) and land for small centres (e.g. convenience retail, local offices, restaurants/cafés). The existing Warkworth town centre by the Mahurangi River will remain as the focal point of the town.

The land uses are supported by infrastructure including:

- Prioritising active transport in Warkworth through a separated walking and cycling network providing connectivity to new and existing centres, employment areas, schools and public transport stations.
- A roading network including a potential southern interchange on Ara Tūhono – Pūhoi to Warkworth (south facing ramps only).
- A public transport network built upon the recently introduced 'New Network for Warkworth' and in the long term has a bus station/interchange in Warkworth's southern Local Centre and a Park and Ride near the potential Ara Tūhono – Pūhoi to Warkworth southern interchange.

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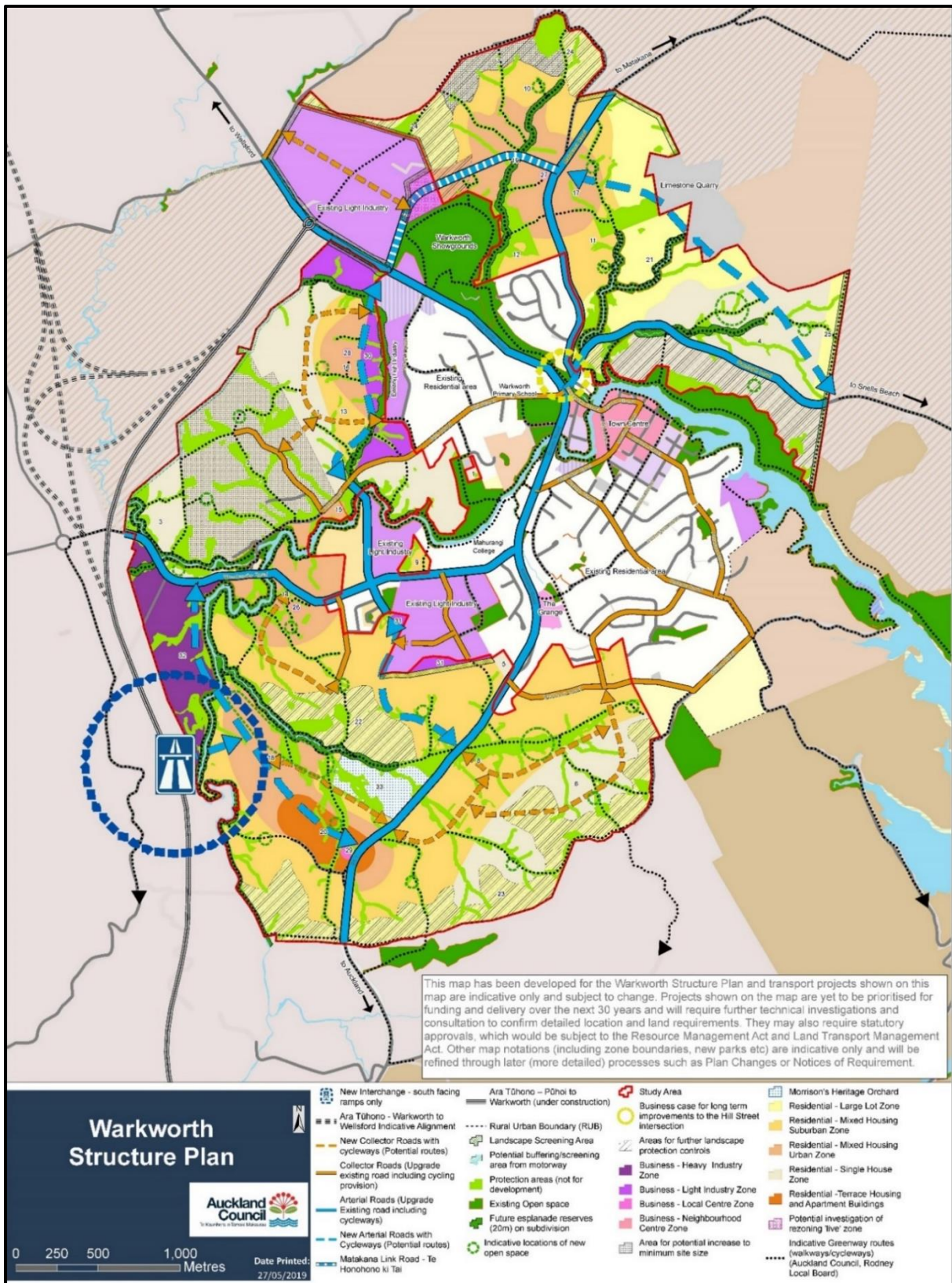
<sup>2</sup> 16 topic papers that were prepared in February 2018 as part of initial consultation on the structure plan

<sup>3</sup> This includes feedback from mana whenua, business, resident and community groups, engagement survey findings and community workshops held to generate land use ideas for the Warkworth area.

- Other infrastructure providers for utilities such as wastewater, water, power supply, telephone, broadband, community facilities, schools, and healthcare have plans underway to service the planned growth of Warkworth.

Further details on the Warkworth Structure Plan can be found in the structure plan document on the project website.

**Figure 2: Warkworth Structure Plan**





## 4.2 Assessment summary

*‘Sustainability and natural heritage’* is one of the seven planning principles for the Plan. Under this principle it states, *‘Plan to enable development of the Future Urban zone to be sustainable, including having a compact urban form, providing local employment options, enabling extensive active and public transport routes, and minimising discharges to air and water bodies’*. In addition, under this principle it states, *‘Design the Future Urban zone to be able to adapt to the effects of climate change’*.

Planning for sustainability outcomes is therefore identified as a core consideration in the development of the plan. It is important to note that although the intention to plan the future urban zone to be sustainable has been clearly laid out, to achieve this outcome, this principle needs to be considered and upheld during all subsequent planning and design decisions and during the plan change and resource consent processes.

Although not explicitly referenced as *‘Sustainability and natural heritage’*, most of the planning principles also contribute towards the delivery of sustainability outcomes. Table A1 (Appendix A) identifies the alignment of the planning principles with the sustainability opportunities identified in the *Warkworth Structure Plan – Sustainability Topic Report (June 2018) (Sustainability Topic Report)*.

The Plan proposes a mix of land uses including a range of residential zones, four small centre zones and three areas zoned for industry. In addition, possible school locations and park locations have been identified. This mix of land uses suggests that the proposed zoning will to some extent promote a functioning, self-sustaining community as many of the everyday needs of residents could be met within the future urban area and the existing Warkworth urban area. The Plan has a projected job yield of 5,000 and a projected dwelling yield of 7,500, this includes an assumption that residential zoned areas will yield 0.5 jobs per household. This figure attempts to capture home-based employment. The total employment yield for Warkworth once fully developed – including the Future Urban Zone (FUZ) and existing parts of Warkworth – is 12,600 (FUZ 4,990, non-FUZ 7,600) with a projected dwelling yield of 10,600 (FUZ 7,464, non-FUZ 3,130). This would be a job to dwelling ratio of 1.2 (FUZ 0.67 and non-FUZ 2.43). This ratio (for Warkworth once fully developed) is positive, in terms of promoting a self-sustaining community and reducing the need for residents to travel to access employment.

Higher density residential zones are assigned around the four small centres zones. Land surrounding Neighbourhood Centres Zones Mixed Housing Urban (MHU) Zone and land surrounding Local Centres Zone is assigned as Terrace Housing and Apartment Buildings (THAB) Zone with MHU Zone then surrounding the THAB zone, except where Protection Areas have been identified. This suggests that a compact urban form will be achieved around the small centre zones. However, only 400 dwellings (5% of total) are projected in the Terrace Housing and Apartment Buildings (THAB) Zone and 1,900 dwellings (26% of total) in the Mixed Housing Urban (MHU) Zone.

The extent to which the compact urban form is “quality” will be determined by subsequent planning and design decisions and during the plan change and resource consent processes. About 70% of land is zoned as Mixed Housing Suburban (MHS) Zone, Single House (SH) Zone and Large Lot (LL) Zone. The majority of dwellings are projected in the MHS zone (3,200 dwellings, 43% of total) and SH zone (1,700 dwellings, 23% of total). 200 dwellings are projected in the LL zone (3% of total), yet the gross area of the LL zone accounts for 19% of the site area.

It is considered that the Plan could provide further opportunity to enable a compact urban form through increasing the density of some residential zoning. It is recognised that existing constraints, such as topography, may limit the opportunity to assign higher density residential zones in some locations. The impact of increasing residential density on the job to dwelling ratio, and therefore opportunity to promote a self-sustaining community, should also be considered.

The THAB Zone, MHU Zone, and to some degree MHS Zone, identified in the Plan are expected to deliver higher density residential development than is currently found in Warkworth. In this way, the residential zoning can be considered a more efficient use of land than existing residential development in Warkworth and in comparison, will reduce the need for further urbanisation in the future, allowing rural land to be retained for other functions. However, as outlined above it is considered that the Plan could provide further opportunity to enable a compact urban form through increasing the density of some residential zoning. This would further enable a more efficient use of land to reduce the need for further urbanisation in the future.

The Plan proposes to incorporate green infrastructure, in the form of Protection Areas and Future Esplanade reserves (20m buffer). The Plan has identified green infrastructure opportunities at an early stage and is considering how these could optimise the integration of other functions. This is an important component of the Plan and central to delivering a range of significant sustainability outcomes.

This 'green corridor' provides a significant opportunity to deliver a number of functions in order to achieve multiple benefits. These include opportunities for biodiversity enhancement, creating ecological corridors and protecting and enhancing the urban forest. Integrating active travel routes within the 'green corridor' presents an opportunity to promote low carbon and active transportation modes and enhance connectivity within the structure plan area and to the existing Warkworth urban area. In turn, this provides an opportunity to connect people with nature to improve physical and mental health and wellbeing.

The NIWA report on climate change projections and impacts for the Auckland region<sup>4</sup> projects increased rainfall intensity and a greater risk of flooding. The green infrastructure outlined in the Plan should provide enhanced resilience to flooding and support climate change adaptation. The floodplains within the structure plan area are associated with watercourses and so generally fall within Protection Areas or Future Esplanade, where the 20m buffer should provide additional resilience to flooding. A stormwater assessment of the Plan has been produced separately.

A small part of the Local Centre Zone is located in a floodplain area, whereas the Neighbourhood Centre Zones are not. This could place the Local Centre Zone at a greater risk of flooding with associated risks to people, property and infrastructure.

It is not possible to identify from the Plan to what extent opportunities to plan for more efficient and resilient community/district scale utilities and infrastructure have been considered at this stage. Subsequent planning decisions made during the plan change processes and resource consent process will determine to what extent this opportunity is realised.

A detailed assessment of the Plan against the sustainability opportunities identified in the Sustainability Topic Report and relevant policy and strategic outcomes is provided in Appendices A and B of this report.

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<sup>4</sup> Auckland region climate change projections and impacts, technical report. TR2017/030  
<http://www.knowledgeauckland.org.nz/publication/?mid=1747>

## 5 Conclusion

This report concludes that the Plan supports many of the sustainability opportunities identified in the *Sustainability Topic Report*. Further opportunities to enhance sustainability outcomes, both in the Plan and during subsequent planning and design decisions, are outlined in section 5 of this report. From a policy perspective, the Plan aligns with policies and strategic outcomes considered of most direct relevance to an assessment of sustainability.

*'Sustainability and natural heritage'* is one of the seven planning principles for the Plan. Although not explicitly referenced as *'Sustainability and natural heritage'*, most of the planning principles also contribute towards the delivery of sustainability outcomes.

Decisions made during the plan change and resource consent processes will strongly influence to what extent sustainability outcomes are delivered. It is therefore critical for the delivery of sustainability outcomes that sustainability principles are considered and upheld in all subsequent planning and design decisions

Green infrastructure is key component of the Plan, in the form of Protection Areas and Future Esplanade (20m buffer). This has the potential to deliver a range of significant sustainability outcomes and should remain as a key component of the future urban area during subsequent planning and design decisions and during the plan change and resource consent processes. If this component of the Plan is lost or significantly scaled back, the ability for the future urban area to deliver sustainability outcomes will be reduced.

The Plan has identified green infrastructure opportunities at an early stage and this supports the *Auckland Plan 2050* direction to, *'Use Auckland's growth and development to protect and enhance the natural environment'* and focus area *'To use green infrastructure to deliver greater resilience, long-term cost savings and quality environmental outcomes'*.

The projected job to dwelling ratio for Warkworth once fully developed is 1.19 (FUZ 0.67 and non-FUZ 2.43). This ratio (for Warkworth once fully developed) is positive, in terms of promoting a self-sustaining community and reducing the need for residents to travel to access employment.

### Recommendations:

- Planning for sustainability outcomes is identified as a core principle in the development of the Plan. To successfully embed this approach in the development of the future urban zone, sustainable design principles should be considered and implemented in all subsequent planning and design decisions and during the plan change and resource consent processes.
- It is considered that the Plan could provide further opportunity to enable a compact urban form and a more efficient use of land through increasing the density of some residential zoning. It is recognised that existing constraints such as topography, may limit the opportunity to assign higher density residential zones in some locations. The impact of increasing residential density on the job to dwelling ratio, and therefore the opportunity to promote a self-sustaining community, should also be considered.
- The Protection Areas shown in the Plan should be maintained during all subsequent planning and design decisions and during the plan change and resource consent processes. Opportunities for these Protection Areas to grow and protect the urban

forest, through the planting of new trees and vegetation and the protection of existing trees and vegetation, should be optimised in line with the principles of Auckland's Urban Ngahere (Forest) Strategy.

- The design of the 'green corridor' should be carefully considered to ensure that multifunctional benefits are fully realised. For example, the opportunity to integrate active travel routes will need to be carefully considered alongside the opportunity for biodiversity enhancement and ecological corridors to ensure all opportunities are optimised and to ensure outcomes are not compromised.
- The Warkworth Structure Plan Transport map shows an Indicative Walking Cycling network for growth areas (in addition to arterial and collector roads)<sup>5</sup>, this network should be maintained and enhanced, where appropriate, during all subsequent planning and design decisions and during the plan change and resource consent processes in order to promote active transport modes.
- The opportunity to promote low carbon and active transportation modes within the structure plan area and to and from the area will have a significant impact on sustainability and should be considered and optimised in all subsequent planning and design decisions and during the plan change and resource consent processes.
- A stormwater assessment of the Plan has been produced separately and this should be considered in the context of the projected impacts of climate change (increased rainfall intensity and a greater risk of flooding). This includes impacts on the Local Centre Zone which is understood to be located in a floodplain area. This could place the Local Centre Zone at a greater risk of flooding with associated risks to people, property and infrastructure.
- Additional climate change projections and impacts identified in the NIWA report on climate change projections and impacts for the Auckland region should be considered in subsequent planning and design decisions to ensure that the future development can adapt to the impacts of climate change.
- Subsequent planning decisions made during the plan change and resource consent processes should fully consider and identify opportunities to deliver efficient and resilient community/district scale utilities including the opportunity for decentralised renewable energy.
- The opportunity to deliver enhanced sustainability outcomes through passive design principles should be considered and optimised in subsequent planning and design decisions and during the plan change and resource consent processes. This includes the location and orientation of individual sites in addition to building orientation and design.
- The mix of land uses proposed in the Plan are an important factor in determining the employment yield and influencing sustainability outcomes. Subsequent planning decisions should consider to what extent any land use change will impact on opportunities for local employment and the need for residents to travel to access employment. Reducing opportunities for local employment will reduce the potential to deliver sustainability outcomes.

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<sup>5</sup> Warkworth Structure Plan Transport map



## Appendices

**Appendix A:** Assessment of the Warkworth Structure Plan against sustainability opportunities

**Appendix B:** Assessment of the structure plan against regional policy and strategic outcomes

## Appendix A: Assessment of the Warkworth Structure Plan against sustainability opportunities

### A-1: Alignment of planning principles with sustainability opportunities

Table A1 lists the seven Planning Principles (the Principles) for the Warkworth Structure Plan (the Plan) and identifies which aspects of those Principles are relevant to this sustainability assessment report and how they align with the sustainability opportunities outlined in the *Warkworth Structure Plan – Sustainability Topic Report (June 2018) (Sustainability Topic Report)*.

Table A2 provides an assessment of the Plan and proposed zoning against the sustainability opportunities identified in the *Sustainability Topic Report*.

**Table A1:** Alignment of the Principles with environmental constraints and principles outlined in the Environment Topic Report.

Planning principles	Planning principles relevant to this topic paper	Alignment with sustainability opportunities <sup>6</sup>
<b>1. Mahurangi River is Warkworth's taonga</b> <ul style="list-style-type: none"> <li>Protect the Mahurangi River from the effects of urbanisation as a matter of paramount importance in the development of the Future Urban zone.</li> <li>Use the development of the Future Urban zone to improve the health and quality of the Mahurangi River wherever possible.</li> <li>Treat all the tributaries in the Future Urban zone as being vital to the health of the Mahurangi River.</li> </ul>	None directly relevant	N/A
<b>2. Character and identity</b> <ul style="list-style-type: none"> <li>Celebrate Warkworth's heritage, both Maori and European, and its relationship with mana whenua</li> </ul>	<ul style="list-style-type: none"> <li>Use the Future Urban zone efficiently to protect against the need for further urban expansion into Warkworth's valued rural hinterland.</li> </ul>	<ul style="list-style-type: none"> <li>Enable an efficient use of land to reduce the need for further urbanisation in the future, allowing rural land to be retained for other functions.</li> </ul>

<sup>6</sup> *Warkworth Structure Plan – Sustainability Topic Report (June 2018)*

Planning principles	Planning principles relevant to this topic paper	Alignment with sustainability opportunities <sup>6</sup>
<ul style="list-style-type: none"> <li>Retain the current town centre as the focal point and ‘beating heart’ of Warkworth.</li> <li>Protect the views from the current town centre to the bush clad northern escarpment of the Mahurangi River and the rural views out from the Future Urban zone that contribute to Warkworth’s rural character.</li> <li>Apply lower density residential zones to areas valued for their landscape and character.</li> <li>Use the Future Urban zone efficiently to protect against the need for further urban expansion into Warkworth’s valued rural hinterland.</li> </ul>		
<p><b>3. A place to live and work</b></p> <ul style="list-style-type: none"> <li>Provide a range of housing options in Warkworth so that it is a place for people to live at all stages of life.</li> <li>Provide new local employment areas (e.g. small centres, industrial areas) so people can work locally in Warkworth.</li> </ul>	<ul style="list-style-type: none"> <li>Provide new local employment areas (e.g. small centres, industrial areas) so people can work locally in Warkworth.</li> </ul>	<ul style="list-style-type: none"> <li>Sufficient scale to deliver a mix of land uses to promote a self-sustaining community.</li> </ul>
<p><b>4. Sustainability and natural heritage</b></p> <ul style="list-style-type: none"> <li>Plan to enable development of the Future Urban zone to be sustainable, including having a compact urban form, providing local employment options, enabling extensive active and public transport routes, and minimising discharges to air and water bodies.</li> </ul>	<ul style="list-style-type: none"> <li>Plan to enable development of the Future Urban zone to be sustainable, including having a compact urban form, providing local employment options, enabling extensive active and public transport routes, and minimising discharges to air and water bodies.</li> <li>Design the Future Urban zone to be able to adapt to the effects of climate change.</li> <li>Protect and enhance existing bush/natural areas and create ecological corridors</li> </ul>	<ul style="list-style-type: none"> <li>Plan for sustainability outcomes from the outset.</li> <li>Sufficient scale to deliver a mix of land uses to promote a self-sustaining community.</li> <li>Promote mixed use areas to reduce the need to travel within the structure plan area.</li> <li>Plan for a quality compact urban form that supports a low carbon development model.</li> <li>A structure plan informed by Auckland specific climate change projections.</li> </ul>

Planning principles	Planning principles relevant to this topic paper	Alignment with sustainability opportunities <sup>6</sup>
<ul style="list-style-type: none"> <li>Design the Future Urban zone to be able to adapt to the effects of climate change.</li> <li>Protect and enhance existing bush/natural areas and create ecological corridors linking the Future Urban zone to other ecological areas.</li> </ul>	<p>linking the Future Urban zone to other ecological areas.</p>	<ul style="list-style-type: none"> <li>Integrate green infrastructure that supports climate change adaptation.</li> <li>Integrate urban forest planning into the development of the structure plan to support an increase in urban forest canopy cover.</li> <li>Delivering co-benefits through stormwater management as a result of integrating stormwater management with other land uses to deliver multiple functions.</li> </ul>
<p><b>5. A well-connected town</b></p> <ul style="list-style-type: none"> <li>Use the development of Warkworth's growth areas to help address Warkworth's existing road congestion through integrated land use and transport planning and new infrastructure.</li> <li>Provide convenient, segregated, and safe walking and cycling routes through the Future Urban zone connecting residential areas with key locations (e.g. schools, parks, centres), and the existing town, and to regional walking/cycling routes.</li> <li>Provide convenient, high quality public transport routes through the Future Urban zone (connecting to the rest of Warkworth, the surrounding rural settlements, and Auckland).</li> </ul>	<ul style="list-style-type: none"> <li>Use the development of Warkworth's growth areas to help address Warkworth's existing road congestion through integrated land use and transport planning and new infrastructure.</li> <li>Provide convenient, segregated, and safe walking and cycling routes through the Future Urban zone connecting residential areas with key locations (e.g. schools, parks, centres), and the existing town, and to regional walking/cycling routes.</li> <li>Provide convenient, high quality public transport routes through the Future Urban zone (connecting to the rest of Warkworth, the surrounding rural settlements, and Auckland).</li> </ul>	<ul style="list-style-type: none"> <li>Plan for transit-oriented development (TOD) to increase the accessibility and appeal of public transport to a greater number of people.</li> <li>Promote low carbon and active transportation modes within the structure plan area and to and from the area.</li> <li>Enable efficient multi-modal transport when planning the transport network.</li> </ul>
<p><b>6. Quality built urban environment</b></p> <ul style="list-style-type: none"> <li>Design the Future Urban zone to enable high-quality and integrated urban development that reinforces the town's identity.</li> </ul>	<ul style="list-style-type: none"> <li>Locate higher density residential areas around appropriate amenities.</li> <li>Provide well located and accessible areas of open space linked by a green network of</li> </ul>	<ul style="list-style-type: none"> <li>Plan for a quality compact urban form that supports a low carbon development model.</li> <li>Promote healthy lifestyles through active design principles; a land use mix and street layouts that encourage walking, cycling,</li> </ul>



Planning principles	Planning principles relevant to this topic paper	Alignment with sustainability opportunities <sup>6</sup>
<ul style="list-style-type: none"> <li>• Locate higher density residential areas around appropriate amenities</li> <li>• Provide well located and accessible areas of open space linked by a green network of walking and cycling trails along the streams.</li> </ul>	<p>walking and cycling trails along the streams.</p>	<p>and other forms of active transportation and recreation.</p> <ul style="list-style-type: none"> <li>• Recreational land uses at sufficient scale and located within walking distances of residential areas to support a healthy, active community.</li> <li>• Connecting people with nature to improve physical and mental health and wellbeing.</li> </ul>
<p><b>7. Infrastructure</b></p> <ul style="list-style-type: none"> <li>• Plan for infrastructure (transport, water, etc) to be ready before new houses and businesses are built in the Future Urban zone.</li> <li>• Provide for social and cultural infrastructure (i.e. libraries, halls, schools, community meeting places) to support the needs of the community as it grows.</li> </ul>	<p>None directly relevant</p>	<p>N/A</p>

**Table A2:** An assessment of the Plan and proposed zoning against the sustainability opportunities identified in the *Sustainability Topic Report*.

Sustainability opportunities	Assessment summary
<b>Site context</b>	
<ul style="list-style-type: none"> <li>• Plan for sustainability outcomes from the outset.</li> <li>• Sufficient scale to deliver a mix of land uses to promote a self-sustaining community.</li> <li>• Promote mixed use areas to reduce the need to travel within the structure plan area.</li> <li>• Plan for more efficient and resilient community/district scale utilities and infrastructure.</li> <li>• Aim to reduce earthworks and balance cut and fill volumes to minimise environmental impacts.</li> </ul>	<ul style="list-style-type: none"> <li>• <i>“Sustainability and natural heritage”</i> is one of the seven planning principles for the Plan. Under this principle it states, <i>“Plan to enable development of the Future Urban zone to be sustainable, including having a compact urban form, providing local employment options, enabling extensive active and public transport routes, and minimising discharges to air and water bodies”</i>. This suggests that planning for sustainability outcomes from the outset is a core consideration in the development of the plan. Decisions made during the plan change process will influence to what degree sustainability outcomes are delivered through the development of the Future Urban Zone.</li> <li>• The Plan proposes a mix of land uses including a range of residential zones, four small centre zones and three areas zoned for industry. In addition, possible school locations and park locations have been identified. This mix of land uses suggests that the proposed zoning will to some extent promote a functioning, self-sustaining community as many of the everyday needs of residents could be met within the future urban area and the existing Warkworth urban area. The Plan has a projected job yield of 5,000 and a projected dwelling yield of 7,500, this includes an assumption that residential zoned areas will yield 0.5 jobs per household. This figure attempts to capture home-based employment. The total employment yield for Warkworth once fully developed – including the Future Urban Zone (FUZ) and existing parts of Warkworth – is 12,600 (FUZ 4,990, non-FUZ 7,600) with a projected dwelling yield of 10,600 (FUZ 7,464 non-FUZ 3,130). This would be a job to dwelling ratio of 1.2 (FUZ 0.67 and non-FUZ 2.43).</li> <li>• The four small centre zones and surrounding residential zoning provide an opportunity for mixed used areas that could reduce the need to travel within the structure plan area.</li> <li>• It is not possible to identify from the Plan to what extent opportunities to plan for more efficient and resilient community/district scale utilities and infrastructure have been considered at this stage. Subsequent planning decisions made during the plan change processes and resource consent process will determine to what extent this opportunity is realised.</li> <li>• It is understood that the Plan is proposing to assign most industry zones to flatter areas to reduce the earthworks required to accommodate the large footprint typical of business/industrial development. Further analysis would be required to assess to what extent the Plan has aimed to reduce earthworks and balance cut and fill volumes to minimise environmental impacts.</li> </ul>
<b>Urban form</b>	

<ul style="list-style-type: none"> <li>• Plan for a quality compact urban form that supports a low carbon development model.</li> <li>• Plan for transit-oriented development (TOD) to increase the accessibility and appeal of public transport to a greater number of people.</li> <li>• Enable an efficient use of land to reduce the need for further urbanisation in the future, allowing rural land to be retained for other functions.</li> <li>• Respond to passive design principles in terms of the location and orientation of individual sites and land use zones.</li> </ul>	<ul style="list-style-type: none"> <li>• It is understood that the dwelling yield for the Plan is around 7,500. Higher density residential zones are assigned around the four small centres zones. Land surrounding Neighbourhood Centres Zones Mixed Housing Urban (MHU) Zone and land surrounding Local Centres Zone is assigned as Terrace Housing and Apartment Buildings (THAB) Zone with MHU Zone then surrounding the THAB zone, except where Protection Areas have been identified. This suggests that a compact urban form will be achieved around the small centre zones. However, only 400 dwellings (5% of total) are projected in the Terrace Housing and Apartment Buildings (THAB) Zone and 1,900 dwellings (26% of total) in the Mixed Housing Urban (MHU) Zone. The extent to which the compact urban form is “quality” will be determined by subsequent planning and design decisions and during the plan change and resource consent processes. About 70% of land is zoned as Mixed Housing Suburban (MHS) Zone, Single House (SH) Zone and Large Lot (LL) Zone. The majority of dwellings are projected in the MHS zone (3,200 dwellings, 43% of total) and SH zone (1,700 dwellings, 23% of total). 200 dwellings are projected in the LL zone (3% of total), yet the gross area of the LL zone accounts for 19% of the site area. The density of residential zones is highest around the small centre zones and is then graded out to lower density zones towards the edges of the study area. It is considered that the Plan could provide further opportunity to enable a compact urban form through increasing the density of some residential zoning. It is recognised that existing constraints such as topography, may limit the opportunity to assign higher density residential zones in some locations.</li> <li>• The proposed Southern Centre Bus Interchange is located in, or adjacent to, the Terrace Housing and Apartment Buildings (THAB) Zone, this has the potential to enable transit-oriented development (TOD) in this area. The frequency and availability of services will also determine the potential for TOD to be delivered in this area. Based on the information currently available, it is not possible to assess to what extent TOD will be delivered across the Plan as a whole, to increase the accessibility and appeal of public transport to a greater number of people.</li> <li>• The THAB Zone, MHU Zone, and to some degree MHS Zone, identified in the Plan are expected to deliver higher density residential development than is currently found in Warkworth. In this way, the residential zoning can be considered a more efficient use of land than existing residential development in Warkworth and in comparison, will reduce the need for further urbanisation in the future, allowing rural land to be retained for other functions. However, as outlined above it is considered that the Plan could provide further opportunity to enable a compact urban form through increasing the density of some residential zoning. This would further enable a more efficient use of land to reduce the need for further urbanisation in the future.</li> </ul>
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	<ul style="list-style-type: none"> <li>Based on the information currently available, it is not possible to assess to what extent the Plan responds to passive design principles in terms of the location and orientation of individual sites and land use zones. The opportunity to deliver enhanced sustainability outcomes through passive design principles should be considered and optimised in subsequent planning and design decisions and during the plan change and resource consent processes.</li> </ul>
<b>Sustainable transport and accessibility</b>	
<ul style="list-style-type: none"> <li>Promote low carbon and active transportation modes within the structure plan area and to and from the area.</li> <li>Enable efficient multi-modal transport when planning the transport network.</li> </ul>	<ul style="list-style-type: none"> <li>The Future Esplanade (20m buffer) identified in the Plan, which is connected to Protection Areas and the main Mahurangi river, provides a continuous 'green corridor' linking the four small centre zones and existing Warkworth centre with residential areas across much of the structure plan area. Integrating active travel routes within this 'green corridor' presents a significant opportunity to promote low carbon and active transportation modes and enhance connectivity within the structure plan area and to the existing Warkworth urban area. Successfully integrating active travel routes will require well-considered design and convenient connections. The Warkworth Structure Plan Transport map shows an Indicative Walking Cycling network for growth areas (in addition to arterial and collector roads), this network should be maintained and enhanced, where appropriate, during all subsequent planning and design decisions and during the plan change and resource consent processes in order to promote active transport modes.</li> <li>Based on the information currently available, it is not possible to assess to what extent the transport network will enable efficient multi-modal transport.</li> </ul>
<b>Climate change adaptation</b>	
<ul style="list-style-type: none"> <li>A structure plan informed by Auckland specific climate change projections.</li> <li>Integrate green infrastructure that supports climate change adaptation.</li> </ul>	<ul style="list-style-type: none"> <li>The NIWA report on climate change projections and impacts for the Auckland region<sup>7</sup> projects increased rainfall intensity and a greater risk of flooding. A stormwater assessment of the Plan has been produced separately and this should be considered in the context of the projected impacts of climate change. Some of the Local Centre Zone is located in a floodplain area, whereas Neighbourhood Centre Zones are not. This could place the Local Centre Zone at a greater risk of flooding. Additional climate change projections and impacts identified in the NIWA report should be considered in subsequent planning and design decisions to ensure that the future development can adapt to the impacts of climate change.</li> <li>The Protection Areas and Future Esplanade (20m buffer) are a good example of integrating green infrastructure to support climate change adaptation. The floodplains within the structure</li> </ul>

<sup>7</sup> Auckland region climate change projections and impacts, technical report. TR2017/030  
<http://www.knowledgeauckland.org.nz/publication/?mid=1747>



	<p>plan area are associated with watercourses and so generally fall within Protection Areas or Future Esplanade, where the proposed 20m buffer should provide additional resilience to flooding.</p> <p>Future Esplanade (20m buffer) areas and Protection Areas have been identified around some of the main stream tributaries of the Mahurangi River, this will partly allow the natural form and function of watercourses to be protected, supporting resilience to increased rainfall intensity and flooding.</p>
<p><b>Forestry and natural carbon assets</b></p>	
<ul style="list-style-type: none"> <li>Integrate urban forest planning into the development of the structure plan to support an increase in urban forest canopy cover.</li> </ul>	<ul style="list-style-type: none"> <li>The assessment below is based on comments made in the <i>Natural Environment Assessment - Warkworth Structure Plan (June 2019)</i> and suggests that overtime the development of the structure plan can support an increase in urban forest canopy cover: Most existing areas of native vegetation have been incorporated into the Protection Areas and Future Esplanade Reserves designations on the plan. These areas will include mature healthy trees. An assessment for potential notable trees in the FUZ has not been undertaken. The Protection Areas and Future Esplanade (20m buffer) if appropriately restored over time will create corridors of native habitat connecting fragments of native vegetation. Because this mapping has been closely aligned to the freshwater system it will result in a network of native habitat relatively evenly spread throughout the future urban area. This opportunity for development to support an increase in urban forest canopy cover should be considered and optimised in subsequent planning and design decisions and during the plan change and resource consent processes.</li> </ul>
<p><b>Stormwater management</b></p>	
<ul style="list-style-type: none"> <li>Delivering co-benefits through stormwater management as a result of integrating stormwater management with other land uses to deliver multiple functions.</li> </ul>	<ul style="list-style-type: none"> <li>The Future Esplanade (20m buffer) and Protection Areas provide a significant opportunity to integrate stormwater management with other functions such as recreation, biodiversity enhancement, ecological corridors, urban forest and active transport routes.</li> </ul>
<p><b>Health and wellbeing</b></p>	
<ul style="list-style-type: none"> <li>Promote healthy lifestyles through active design principles; a land use mix and street layouts that encourage walking, cycling, and other forms of active transportation and recreation.</li> </ul>	<ul style="list-style-type: none"> <li>The Future Esplanade (20m buffer) identified in the Plan, which is connected to Protection Areas and the main Mahurangi river, provides an opportunity to promote healthy lifestyles through encouraging walking and cycling and providing active transport routes to the new small centres and the existing Warkworth centre.</li> </ul>

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| <ul style="list-style-type: none"><li>• Recreational land uses at sufficient scale and located within walking distances of residential areas to support a healthy, active community.</li><li>• Connecting people with nature to improve physical and mental health and wellbeing.</li></ul> | <ul style="list-style-type: none"><li>• Three possible large park locations (2x suburb parks and 1x sports park) are identified in the Plan. It is suggested that the parks should be surrounded by higher density zones than those currently shown (in particular the large park to the North East), to provide better access to quality open space for those people living in higher density housing/neighbourhoods. It is recognised that there are other factors to consider such as topography.</li><li>• Integrating active travel routes within the 'green corridor' (Future Esplanade and Protection Area) provides a significant opportunity to connecting people with nature to improve physical and mental health and wellbeing.</li></ul> |
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## Appendix B: Assessment of the structure plan against regional policy and strategic outcomes

The Warkworth structure plan has been assessed against policies and strategic outcomes considered of most direct relevance to an assessment of sustainability.

### B-1: Assessment against the Auckland Plan 2050

Adopted by Auckland Council in 2018, this is Auckland’s spatial plan and development strategy which provides the basis for aligning the Council’s implementation plans, regulatory plans, policy development, funding programmes and internal operations and investments, including that of council-controlled organisations.

It identified three key challenges for the Auckland Region and how to address them over the next 30 years:

- Population growth and its implications;
- Sharing prosperity with all Aucklanders, and
- Reducing environmental degradation.

Key to the Auckland Plan is that social, economic and environmental outcomes are integrated into the region’s decision making. The Auckland Plan sets out clear directions including the need to develop a quality compact urban form to accommodate Auckland’s growth, using Auckland’s growth to protect and enhance the natural environment and ensuring Auckland’s infrastructure is future-proofed.

**Table B1:** Auckland Plan 2050 outcomes relevant to a sustainability assessment of the Warkworth Structure Plan

Relevant Outcome	How the outcomes have been considered or applied
<b>Outcome: Homes and Places</b>	
<i>Direction 1: Develop a quality compact urban form to accommodate Auckland’s growth</i>	A compact urban form is proposed around the four small Centres Zones and much of the residential land use zoning across the site should deliver a more compact urban form than is currently found in Warkworth. It is considered that the Plan could provide further opportunity to enable a compact urban form through increasing the density of some residential zoning. This would need to consider existing constraints such as topography, which may limit the opportunity to assign higher density residential zones in some locations. The extent to which the compact urban form in these areas

Relevant Outcome	How the outcomes have been considered or applied
	is “quality” will be determined by subsequent planning and design decisions and during the plan change and resource consent processes.
<i>Direction 4: Provide sufficient public places and spaces that are inclusive, accessible and contribute to urban living</i>	Three possible large park locations are identified in the Plan. Ensuring accessibility to, and integrating active travel routes within, the ‘green corridor’ (Future Esplanades and Protection Areas) provides a significant opportunity to create public places and spaces. There will be further opportunities to deliver on this direction during subsequent planning and design decisions and during the plan change and resource consent processes.
<b>Outcome: Environment and Cultural Heritage</b>	
<i>Direction 1: Ensure Auckland’s natural environment and cultural heritage is valued and cared for</i>	Protection Areas and Future Esplanade (20m buffer) have been identified in the Plan and should provide opportunities to protect and enhance the natural environment.
<i>Direction 2: Apply a Māori world view to treasure and protect our natural environment (taonga tuku iho)</i>	This report does not set out to assess to what extent the Plan applies a Māori world view to treasure and protect our natural environment (taonga tuku iho). It is understood that a separate report is being written on this matter.
<i>Direction 3: Use Auckland’s growth and development to protect and enhance the natural environment</i>	Protection Areas and Future Esplanade (20m buffer) have been identified in the Plan and provide an opportunity to protect and enhance the natural environment. There will be significant opportunities to deliver on this direction during subsequent planning and design decisions and during the plan change and resource consent processes. Ensuring that sustainable design principles are embedded in the planning and design of buildings, infrastructure and places and spaces can minimise negative impacts on the natural environment and deliver environmental improvements.
<i>Direction 4: Ensure Auckland’s infrastructure is future-proofed</i>	Based on the information currently available, it is not possible to assess to what extent the Plan will contribute towards ensuring that



Relevant Outcome	How the outcomes have been considered or applied
	<p>Auckland’s infrastructure is future proofed. The opportunity to deliver infrastructure that is future proofed should be considered and optimised in subsequent planning and design decisions and during the plan change and resource consent processes. As outlined under this direction in the Auckland Plan 2050, new ways of delivering core services should be considered including decentralising power supplies, recycling wastewater and turning waste into resources. The ‘green corridor’ (Future Esplanade and Protection Area) creates an opportunity to provide green infrastructure that is future proofed.</p>
<ul style="list-style-type: none"> <li>- <i>Focus area 2: Focus on restoring environments as Auckland grows</i></li> </ul>	<p>Protection Areas and Future Esplanade (20m buffer) have been identified in the Plan to protect existing natural values and can provide key ecological restoration opportunities.</p>
<ul style="list-style-type: none"> <li>- <i>Focus area 3: Account fully for the past and future impacts of growth</i></li> </ul>	<p>To some extent the Plan sets out an approach to account for the past and future impacts of growth and reverse environmental decline through assigning Protection Areas and Future Esplanade (20m buffer) as outlined above. Further opportunities to deliver on this focus area should be considered and optimised through subsequent planning and design decisions and during the plan change and resource consent processes.</p>
<ul style="list-style-type: none"> <li>- <i>Focus area 5: Adapt to a changing water future</i></li> </ul>	<p>The assessment below is taken from the <i>Natural Environment Assessment - Warkworth Structure Plan (June 2019)</i>: The freshwater system (excluding ephemeral streams) has been identified and mapped for protection, including floodplains and known wetlands. Development is to be excluded from these areas. Wide planted riparian buffers will help buffer developed areas against the impact of the more frequent high intensity rain events predicted to occur and will help provide stability to stream banks that are currently prone to erosion.</p>

Relevant Outcome	How the outcomes have been considered or applied
<ul style="list-style-type: none"> <li>- <i>Focus area 6: Use green infrastructure to deliver greater resilience, long-term cost savings and quality environmental outcomes</i></li> </ul>	<p>The Plan proposes to incorporate green infrastructure, in the form of the Protection Areas and Future Esplanade (20m buffer), to deliver greater resilience and support broader environmental outcomes. The Plan has identified green infrastructure opportunities at an early stage and is considering how this could optimise the integration of other functions, such as public amenity and active transport opportunities.</p>

## B-2: Assessment against the AUP-OP Regional Policy Statement

The Auckland Unitary Plan (AUP-OP) became operative in part in November 2016 and details new land use policy, rules and zoning for Auckland, along with overlays which identify important natural and historic values and characteristics which must be considered when making decisions about land use.

The Regional Policy Statement section of the Unitary Plan outlines objectives relating to a quality built environment, residential growth, transport and climate change that are relevant to sustainability in the context of the Warkworth structure plan. For the purposes of this assessment, Objective B.10.2 Natural hazards and climate change has been considered.

**Table B2:** AUP-OP policies relevant to a sustainability assessment of the Warkworth Structure Plan

Relevant Objectives	How the objective has been considered or applied
<p><b>B10.2. Natural hazards and climate change</b>  <b>B10.2.1. Objectives</b>            (1) <i>Communities are more resilient to natural hazards and the effects of climate change.</i>            (2) <i>The risks to people, property, infrastructure and the environment from natural hazards are not increased in existing developed areas.</i>            (3) <i>New subdivision, use and development avoid the creation of new risks to people, property and infrastructure.</i></p>	<p>The NIWA report on climate change projections and impacts for the Auckland region<sup>8</sup> projects increased rainfall intensity and a greater risk of flooding. A stormwater assessment of the Plan has been produced separately and this should be considered in the context of the projected impacts of climate change.</p> <p>The comment below is taken from the <i>Natural Environment Assessment - Warkworth Structure Plan (June 2019)</i>:</p>

<sup>8</sup> Auckland region climate change projections and impacts, technical report. TR2017/030  
<http://www.knowledgeauckland.org.nz/publication/?mid=1747>

Relevant Objectives	How the objective has been considered or applied
<p>(4) <i>The effects of climate change on natural hazards, including effects on sea level rise and on the frequency and severity of storm events, is recognised and provided for.</i></p> <p>(5) <i>The functions of natural systems, including floodplains, are protected from inappropriate subdivision, use and development.</i></p> <p>(6) <i>The conveyance function of overland flow paths is maintained.</i></p>	<p><i>Some of the Local Centre Zone is located in a floodplain area, whereas the Neighbourhood Centre Zones are not. This could place the Local Centre Zone at a greater risk of flooding with associated risks to people, property and infrastructure.</i></p> <p>Additional climate change projections and impacts identified in the NIWA report should be considered in subsequent planning and design decisions to ensure that the future development can adapt to the impacts of climate change.</p>

### B-3: Assessment against Low Carbon Auckland (2014)

Low Carbon Auckland - Auckland’s Energy Resilience and Low Carbon Action Plan is intended to deliver on the target of reducing greenhouse gas (GHG) emissions by 40 per cent by 2040 as set out in the Auckland Plan. It is structured around five areas of transformation:

- Transforming the way we travel.
- Transforming the way we use and generate energy.
- Transforming our built environment and green infrastructure.
- Transforming to Zero Waste.
- Transforming forestry, agriculture and natural assets.

**Note:** Low Carbon Auckland (2014) will be superseded by the Auckland Climate Action Plan (ACAP) which is currently under development and will address both climate change mitigation and adaptation.

**Table B3:** Low Carbon Auckland actions relevant to the Warkworth Structure Plan

Relevant Actions	How the actions have been considered or applied
<ul style="list-style-type: none"> <li>• <b><i>Transforming the way we travel</i></b></li> </ul>	<p><b><i>Element 2: Increasing the use of public transport, walking and cycling</i></b></p>

Relevant Actions	How the actions have been considered or applied
<ul style="list-style-type: none"> <li>- <i>Action 8: Ensure significant improvements to cycling infrastructure, particularly focusing on improving actual and perceived safety, including separated routes and traffic calmed streets.</i></li> </ul>	<p>Integrating active travel routes within the Future Esplanade (20m buffer) presents a significant opportunity to promote cycling infrastructure and enhance connectivity within the structure plan area and to the existing Warkworth urban area. There will be significant opportunities to deliver on this action during subsequent planning and design decisions and during the plan change and resource consent processes. Opportunities to deliver on this action should be considered and optimised in subsequent planning and design decisions and during the plan change and resource consent processes.</p>
<ul style="list-style-type: none"> <li>• <b>Transforming the way we use and generate energy</b></li> </ul>	
<p><b>Element 2: Developing Auckland’s low carbon energy options</b></p>	
<ul style="list-style-type: none"> <li>- <i>Action 6: Promote and support the move to generating 90 per cent of electricity from renewable sources by 2025, providing this does not affect security of supply.</i></li> </ul>	<p>Based on the information currently available, it is not possible to assess to what extent this action has been considered or applied. Opportunities to deliver on this action should be considered and optimised in subsequent planning and design decisions and during the plan change and resource consent processes.</p>
<ul style="list-style-type: none"> <li>- <i>Action 7: Identify appropriate measures to ensure networks are adapted and flexible to enable efficient and effective uptake of local renewable energy technologies.</i></li> </ul>	<p>As above.</p>
<ul style="list-style-type: none"> <li>- <i>Action 8: Investigate the feasibility of district energy schemes that utilise (i) waste heat and chilled water systems, and (ii) forest residues.</i></li> </ul>	<p>As above.</p>
<ul style="list-style-type: none"> <li>• <b>Transforming our built environment and green infrastructure</b></li> </ul>	
<p><b>Element 1: Demonstrating leadership and creating quality exemplars of sustainable development to inspire</b></p>	
<ul style="list-style-type: none"> <li>- <i>Action 4: Ensure principles of sustainable design, including energy and water efficiency are embedded and prioritised in:</i></li> </ul>	<p>Overall, the planning principles for the Plan outline an approach to embedding sustainable design principles into the development of the structure plan (see Table A1 for alignment of the planning principles</p>

Relevant Actions	How the actions have been considered or applied
<ul style="list-style-type: none"> <li><i>all of the council's planning, strategic and placemaking programmes, and major projects</i></li> </ul>	<p>with sustainability opportunities). "Sustainability and natural heritage" is also one of the seven planning principles and outlines the following approach:</p> <ul style="list-style-type: none"> <li><i>Plan to enable development of the Future Urban zone to be sustainable, including having a compact urban form, providing local employment options, enabling extensive active and public transport routes, and minimising discharges to air and water bodies.</i></li> <li><i>Design the Future Urban zone to be able to adapt to the effects of climate change.</i></li> </ul> <p>To successfully embed this approach in the development of the future urban zone it will be necessary to consider and implement sustainable design principles in all subsequent planning and design decisions and during the plan change and resource consent processes.</p>
<ul style="list-style-type: none"> <li><b><i>Transforming forestry, agriculture and natural carbon assets</i></b></li> </ul>	
<p><b><i>Element 1: Growing the extent of urban and regional forests</i></b></p>	
<ul style="list-style-type: none"> <li>- Action 1: Integrate and consider native forestry planning when undertaking local area plans and structure planning to expand Auckland's ecological corridors.</li> </ul>	<p>The assessment below is taken from the <i>Natural Environment Assessment - Warkworth Structure Plan (June 2019)</i>:</p> <p><i>There is the opportunity to include future provisions to restore native forest through the Protection Areas and Future Esplanade Reserves on the plan. It is intended that existing areas of vegetation will be protected and enhanced, and connected through restoration planting, creating a network of protected habitat throughout the future urban area.</i></p>

**B-4: Assessment against Auckland’s Urban Ngahere (Forest) Strategy (2018)**

The assessment in Table B6 below is taken from *Natural Environment Assessment - Warkworth Structure Plan (June 2019)*:

Urban forest is defined as a network of all trees, other vegetation and green roofs in existing and future urban areas. Protecting and enhancing the urban forest delivers a wide range of environmental, social, economic and cultural benefits.

**Table B4:** Auckland’s Urban Ngahere (Forest) Strategy objectives relevant to the Warkworth Structure Plan

Relevant Objectives	How the objectives have been considered or applied
<i>Ensuring urban forest diversity</i>	<i>The Protection Areas and Future Esplanade Reserves incorporate areas of existing vegetation. Within these existing areas there is some diversity in the ecosystem types covered. The Protection Areas provide opportunities for ecological restoration to occur that could further increase the diversity of species and ecosystems within this future urban area where appropriate.</i>
<i>Providing all residents with access</i>	<i>The incorporation of future active transport routes along the Protection Areas and Future Esplanade Reserves will provide access to all residents to connect with the natural environment.</i>
<i>Deploying regulatory and non-regulatory tools</i>	<i>The structure plan is a non-regulatory tool to set out a direction that development avoids areas with existing natural values and areas where there are opportunities for restoration and enhancement. A future plan change will follow on from the structure plan and is a regulatory tool where the structure plan’s intentions can be given ‘teeth’ through statutory provisions.</i>
<i>Managing urban forest on public and private land</i>	<i>The Protection Areas and Future Esplanade Reserves cover both public and private land. Therefore, the ecological corridors created are intended to move across both public and private land.</i>
<i>Creating ecological corridors and connections</i>	<i>The Protection Areas and Future Esplanade Reserves if appropriately restored over time will create corridors of native habitat connecting</i>



Relevant Objectives	How the objectives have been considered or applied
<i>Protecting mature, healthy trees</i>	<p data-bbox="1070 201 1995 352"><i>fragments of native vegetation. Because this mapping has been closely aligned to the freshwater system it will result in a network of native habitat relatively evenly spread throughout the future urban area.</i></p> <p data-bbox="1070 360 1995 759"><i>Most existing areas of native vegetation have been incorporated into the Protection Areas and Future Esplanade Reserves on the plan. These areas will include mature healthy trees. There may be a number of mature healthy trees, particularly exotic trees not included (e.g. they are isolated from patches of vegetation, such as individual trees in paddocks) that may warrant protection for other reasons such as amenity, cultural, historic or aesthetic value rather than ecological. An assessment for potential notable trees in the FUZ has not been undertaken. Such an assessment is recommended at the Plan Change stage.</i></p> <p data-bbox="1070 807 1995 922">(It is noted that the Warkworth Structure Plan Landscape Assessment suggests retaining existing mature vegetation (e.g. some shelterbelts) where possible.)</p>



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