Infrastructure Constraints Report

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1. Introduction

The Hastings District is experiencing unprecedented levels of growth and there is a need to invest significantly in infrastructure to provide the required development capacity. Infrastructure includes 3 Waters (drinking water, wastewater and stormwater), transportation, parks and open spaces, and community facilities. The role of infrastructure is to improve our social, economic, environmental and cultural well-being and support more sustainable and resilient outcomes. The rapid growth being experienced in Hawke's Bay over the last six years has made planning for future growth a high priority reinforcing the need for future development capacity to be identified and serviced.

In September 2021, the key findings from a housing capacity assessment undertaken by Barker & Associates, predict that the Hastings population is expected to grow to between 104,600 and 119,800 (from around 87,000) over the next 30 years with household numbers (estimated at 31,300 in 2020), increasing to 42,300 in the long-term by 2050[1].

The National Policy Statement on Urban Development 2020 (NPS-UD) requires local authorities to provide "*at least sufficient development capacity*" for housing and business land over a 30 year horizon. This development capacity must be both plan-enabled (by a statutory planning instrument) and able to be serviced by infrastructure on a timely basis.

Hastings District is a Tier 2 local authority under the NPS-UD and is therefore also required to provide sufficient development capacity for the expected demand plus 15-20% additional capacity as a "competitiveness margin". This makes the ability to plan and deliver growth-related infrastructure essential for councils in meeting Government requirements under the NPS-UD.

In accordance with the NPS-UD, the councils (HBRC, HDC and NCC) as Tier 2 local authorities are required to prepare a Future Development Strategy (FDS). The councils, together with Central Hawke's Bay and Wairoa District Councils, have also agreed to prepare a Regional Spatial Strategy (RSS) which is a regional strategic plan signalled in the proposed Spatial Planning Act. Notwithstanding the lack of a statutory basis for a RSS at this time, it is intended that the Future Development Strategy, together with the Kotahi Plan being developed by HBRC, will form fundamental building blocks of the RSS.

The NPS-UD provides that "*the purpose of an FDS is:*

a) To promote long-term strategic planning by setting out how a local authority intends to:
   i. Achieve well-functioning urban environments in its existing and future urban areas; and
   ii. Provide at least sufficient development capacity, … ,over the next 30 years to meet expected demand; and

b) Assist the integration of planning decisions under the Act with infrastructure planning and funding decisions."

In the context of a well-functioning Napier-Hastings Urban Environment, the councils wish to prepare a FDS that provides for sufficient development capacity in a manner appropriate to the sub-region, its strengths and constraints. The definition of "well-functioning" under the NPS-UD (Policy 1) is…..

"urban environments that, as a minimum:

(a) have or enable a variety of homes that:

[1] STR-4-2-21-987

(i) meet the needs, in terms of type, price, and location, of different households; and

(ii) enable Māori to express their cultural traditions and norms; and

(b) have or enable a variety of sites that are suitable for different business sectors in terms of location and site size; and

(c) have good accessibility for all people between housing, jobs, community services, natural spaces, and open spaces, including by way of public or active transport; and

(d) support, and limit as much as possible adverse impacts on, the competitive operation of land and development markets; and

(e) support reductions in greenhouse gas emissions; and

(f) are resilient to the likely current and future effects of climate change."

Core strategic matters and guiding principles to be addressed within the FDS include:

- Preserving and protecting the high-value, versatile soils of the Heretaunga plains
- Managing land and water in accordance with *te Mana o te Wai and Te Oranga o te Taiao.*
- Providing for hapū and iwi values and aspirations for urban development
- Recognising the likely impacts of climate change and associated resilience requirements in future planning, land and resource use
- Providing for development capacity in a manner consistent with sustainable resource management
- Providing for a high-amenity, well-functioning Napier-Hastings urban environment.

1.1. Purpose

This report presents analysis of the current physical capacity of infrastructure (the assets and services) that support the Hastings urban area including Havelock North and Flaxmere. This report is intended to apprise the current situation in respect of the various infrastructure services under the control of the Hastings District Council, alongside the levels of service and standards that determine each service.

It is not a report about solutions to constraints.

The analysis relies on the current evidence available (reports, modelling and operational knowledge) to identify where current limitations in our networks exist and to assess the impact of predicted greenfield and brownfield growth on capacity.

This report also includes information on the extent of resource consent limits (wastewater and stormwater discharges) and the consumption of resources (drinking water) where it may impact our ability to maintain services to existing and future communities.

In assessing each service, the intent is to identify where capacity is available and to focus on key constraints that must be addressed for significant growth to be supported in the short to medium period (2 to 10 years) and longer term (30+ years). Importantly, the servicing of growth through infrastructure must be implemented in a structured and planned way without compromising the existing communities Council serves.

This report is not intended to determine the extent of the infrastructure response to overcome the growth demands predicted to occur however it is an important first step in providing the foundation for further work to support the development of an Essential Services Development Plan (ESDP) which will then inform the Future Development Strategy.

The ESDP will provide detail on the solutions required to address deficiencies in infrastructure and services identified through the Constraints Report. It will also set priorities and objectives to align with Council's growth forecasts so that upgrades and investments are prioritised to the greatest need.

1.2. Report Structure

The infrastructure constraints presented in this report are evaluated separately under the following sub-headings:

Section 2: Drinking Water

Section 3: Wastewater (including trade waste)

Section 4: Urban Stormwater (including flood risk)

Section 5: Transportation

Section 6: Parks and Open Spaces

Section 7: Community Facilities

These sections will, where applicable, identify interdependencies where they exist so that the context of constraints and causation are presented. An example would be where wastewater capacity is impacted by the influence of stormwater inflow and infiltration or where access to drinking water sources may be influenced by legislation.

1.3. Plan Change 5[(2)]

Plan Change 5 (notified in October 2022) introduces changes to the Hastings District Plan to enable more housing including three storey houses and apartments to be built within existing residential areas. The proposal aims to protect our fertile soils from being built on as well as meeting our current and future housing needs.

As the development landscape changes, this density of development will have implications for infrastructure and services across Hastings, Flaxmere and Havelock North. Urban development, in particular infill, has increased the demand for services and current infrastructure constraints may be an impediment to proposed medium density growth in many areas.

A more structured and coordinated approach is required between developers and Council to ensure that the move to a more intensive urban form is not hindered by inadequate services and growth does not lead to diminished levels of service or unacceptable financial cost to the wider community. The management and coordination of development alongside planned infrastructure upgrades is therefore necessary for Plan Change 5 and the Medium Density Strategy to be successfully implemented.

1.4. Statement on Climate Change

Climate change is already affecting New Zealand. Temperatures have increased, glaciers are melting and sea levels have risen over the past century. Such changes are expected to continue, with far-reaching consequences across all the value domains that underpin wellbeing in New Zealand – namely, the natural environment, human capital, the economy, the built environment and governance. [(3)]

[2] https://www.hastingsdc.govt.nz/hastings/projects/plan-change-5-right-homes-right-place/

[3] Ministry for the Environment. 2020. *National Climate Change Risk Assessment for Aotearoa New Zealand: Main report – Arotakenga Tūraru mō te Huringa Āhuarangi o Āotearoa*: *Pūrongo whakatōpū*. Wellington: Ministry for the Environment.

Aotearoa New Zealand experiences a wide range of natural hazards – from earthquakes and volcanoes to erosion, landslides and extreme weather events. Climate change will increase the severity and frequency of some of those hazards, including flooding, heatwaves, drought and wildfire. We will also face new risks as a result of slow-onset, gradual changes such as sea-level rise, ocean warming, more hot days, and more rainfall in some parts and less in others. If the number and value of assets increases, that can also contribute to increasing risk exposure over time. These effects will impact New Zealanders in different ways – and there is a risk that some groups may be disproportionately impacted. [4]

The Hastings District Council has not as yet adopted a policy on climate change. However, the National Climate Change Risk Assessment for Aotearoa New Zealand (2020) provides an overview of how New Zealand may be affected by climate change-related hazards, and identifies the most significant risks and opportunities. It also highlights gaps in the information and data needed to properly assess and manage the risks and opportunities. The Government has also released a National Adaption Plan (NAP) in August 2022. The NAP sets out Aotearoa New Zealand's response to the most significant risks identified in the Risk Assessment. It is also noted that Regional Vulnerability Assessments are underway and will be incorporated into our planning processes in due course.

Hastings District Council staff consider the following risks as being of priority in regards to the draft NAP: water security (quantity and quality), natural disaster resilience (particularly land use planning), the ability to adequately fund our response and remain financially sustainable, drought, erosion and sea level rise (HDC has significant assets in low-lying areas), extreme rainfall events, fuel prices and other externalities, and the resources (human and financial) required to adapt to Government policies. The NAP does not place any specific responsibilities on Local Government at this stage, but the sector is likely to play a key role in many of the outcomes sought in the NAP.

The urgent risks below in Table 1.4 represent a broad range of issues and shows the two most urgent, hence most significant, risks in each domain. Some risks, like those to the human, built and natural environment domains, are driven by vulnerabilities. In some cases, particularly in the natural environment, more research is urgently needed to understand the risks better before they can be properly managed. Other risks, for instance in governance and the economy, require urgent action to enable effective adaptation across all domains.

The following table is from the National Climate Change Risk Assessment for Aotearoa New Zealand and shows the two most urgent, hence most significant, risks in each domain.

1.5. Most significant risks in each domain based on urgency ratings

Risk	Ratings	
	Urgency	Consequence
Natural environment (N)		
N1 Risks to coastal ecosystems, including the intertidal zone, estuaries, dunes, coastal lakes and wetlands, due to ongoing sea-level rise and extreme weather events.	78	Major
N2 Risks to indigenous ecosystems and species from the enhanced spread, survival and establishment of invasive species due to climate change.	73	Major
Human (H)		
H1 Risks to social cohesion and community wellbeing from displacement of individuals, families and communities due to climate change impacts.	88	Extreme

[4] From NAP Exec Summary page 10

H2 Risks of exacerbating existing inequities and creating new and additional inequities due to differential distribution of climate change impacts.	85	Extreme
Economy (E)		
E1 Risks to governments from economic costs associated with lost productivity, disaster relief expenditure and unfunded contingent liabilities due to extreme events and ongoing, gradual changes.	90	Extreme
E2 Risks to the financial system from instability due to extreme weather events and ongoing, gradual changes.	83	Major
Built environment (B)		
B1 Risk to potable water supplies (availability and quality) due to changes in rainfall, temperature, drought, extreme weather events and ongoing sea-level rise.	93	Extreme
B2 Risks to buildings due to extreme weather events, drought, increased fire weather and ongoing sea-level rise.	90	Extreme
Governance (G)		
G1 Risk of maladaptation across all domains due to the application of practices, processes and tools that do not account for uncertainty and change over long timeframes.	83	Extreme
G2 Risk that climate change impacts across all domains will be exacerbated because current institutional arrangements are not fit for climate change adaptation. Institutional arrangements include legislative and decision-making frameworks, coordination within and across levels of government and funding mechanisms.	80	Extreme

(Table 10 page 43 - National Climate Change Risk Assessment for Aotearoa New Zealand)

1.6. Infrastructure and Climate Resilient Development

Many of our existing communities are located in areas that are likely to be impacted by climate change to varying degrees. Our ability to adapt to these impacts require plans and actions to reduce risk, keep people safe and ensure that the natural environment, human capital, our economy and the built environment are resilient.

Infrastructure provides services that extend across all areas of our lives and is fundamental to supporting community wellbeing. Infrastructure assets are long-life and are not easily moved or upgraded as the effects of climate change intensify.

The ability to adapt will require careful consideration of future predictions, hazard mapping, vulnerability, the critical nature and consequence of service failures and supply chain disruptions plus our ability to maintain existing levels of service and meeting future growth needs.

A key objective of our growth strategies (residential, commercial and industrial) will be to ensure that as much as possible, the location and design of new developments (greenfield) and redevelopment proposals (including medium density and intensification areas) are guided and regulated to account for climate change impacts in their design and implementation. Critical actions from the NAP include:

- Develop guidance to support asset owners to evaluate, understand and manage the impacts and risks of climate change on their physical assets and the services they provide.
- Scope a resilience standard or code for infrastructure to encourage risk reduction and resilience planning in existing and new assets.
- Integrate adaptation into Treasury decisions on infrastructure to ensure decision-making for new assets and across major renewal or upgrade programmes considers climate risks.

- Develop and implement the Waka Kotahi Climate Adaptation Plan to enable climate-resilient transport networks and journeys, connecting people, products and services for a thriving Aotearoa.

The government has set out three key objectives to build resilient infrastructure:

Code	Objective	Explanation
INF1	Reduce the vulnerability of assets exposed to climate change	• Understand where infrastructure assets and their services are exposed and vulnerable to climate impacts. • Prioritise the risk management of assets so that services can continue if disruption occurs.
INF2	Ensure all new infrastructure is fit for a changing climate	• Consider long-term climate impacts when we design and invest in infrastructure, so the right infrastructure is in the right places. • Understand future adaptation options and finance them as part of the investment in new infrastructure to build capacity to adapt.
INF3	Use renewal programmes to improve adaptive capacity	• Consider long-term climate impacts when making decisions to maintain, upgrade, repair or replace existing infrastructure.

Source: Table 8 - Ministry for the Environment. 2022. Aotearoa New Zealand's first national adaptation plan. Wellington. Ministry for the Environment.

While this document is not intended to set out a response to how we manage future challenges (including climate change), some of the constraints and issues that are identified are already being affected or influenced by climate change to some degree.

An example of this is evident across the older parts of our urban and rural stormwater network that were originally designed for rain events that are not representative in today's climate. Increased rainfall intensities and peak flows, coupled with more impervious surface area, mean our pipes are overwhelmed on a more frequent basis resulting in overland flows, surface ponding and flash flooding. This challenges conventional approaches and requires a step change in how we plan and implement solutions that minimise these impacts while balancing the need to utilise existing infrastructure in an efficient way. Future adaptation will also challenge the community's perspective on what a resilient future may look like and what we are prepared to accept in terms of risk.

It is also acknowledged that the longer term impacts of climate change have the potential to change settlement patterns in New Zealand and lead to changes in global migration trends (climate change related population displacement or migration). The potential change scenarios associated with these longer term climate change impacts will be developed and modelled progressively as part of the wider long-term demand analysis components of this project.

1.7. Schedule of Key Findings

The following table provides a summary of the key findings detailed within each section of the report.

Constraint	Consequence	Council Response
Hastings Urban Water Supply The amount of water we take from the underground aquifer is limited by a Consent. Since 2016, urban water supply consumption has been increasing. The TANK plan change seeks to limit any further increase in consented volumes for urban supplies.	If consumption trends continue, we may exceed consent limits by or before 2030.	Council has and continues to implement demand management and water conservation strategies including restrictions for urban and irrigation customers. Council has been successful in combining several separate consents into the Hastings allocation. This provides further headroom to cater for growth. Further strategies are underway to improve our efficient use of water including network wide pressure reduction and investigation of water meters on all connections.
Hastings Wastewater Network The urban wastewater network is reaching full capacity. Predicted growth and intensification requires additional capacity beyond the capabilities of the existing system.	Additional wastewater demand can cause surcharging of pipes and increases the risk of overflows in wet weather events.	Council is planning to build new infrastructure to provide growth capacity and improve existing network issues. Council is progressing with Investigations, strategies and upgrades to minimise stormwater impacts to the wastewater system.
Hastings Stormwater Network The Hastings urban stormwater system is vulnerable to increasing rainfall intensities and volumes due to climate change. A reduction in pervious surfaces caused by development, infill and extensions increases run-off.	Our ability to control stormwater in pipes and overland flow systems (detention ponds) is lessened. Pipes fill up faster with more stormwater present in roads and properties.	Council has rules in place to ensure that new development alleviates stormwater within the property. Mapping of overland flow and flooding will improve Council's ability to contain stormwater to designated areas.

	More overland flow increases the risk of flooding and inundation. There is growing anxiety in our communities about the risk of flooding and expectations of Council to minimise flooding are increasing.	Council is developing adaptation strategies to ensure that there are plans in place to minimise the impacts of climate change. Council and the community will need to agree a range of approaches for addressing limitations and areas that are becoming increasingly vulnerable.
Transportation Suburban roads are being used as de facto bypasses to avoid more congested areas. Road safety statistics highlight half of the district's crashes occur on urban roads. There is a high reliance on private and commercial vehicle use.	The generation of undesirable levels of traffic on access roads with increased noise, vibration and impact on amenity. More people are driving on our roads increasing the potential for frustration and risk taking behaviours to emerge.	Sustainable transport initiatives are targeted at promoting alternatives means of transport (walking and cycling) and increased use of public transport to get around. Road safety plans include improving intersection connectivity, pavement re-designs (better paths and cycleways).
Parks and Open Spaces The availability of parks and open spaces within our urban areas is below the current level of service.	Some of our local reserves and playgrounds are not always accessible or within walking distance for residents. As places to gather, participate in events and socialise, the "connectedness" of our communities is undermined.	Council has prepared a District Wide Reserve Management Plan with objectives and policies to provide consistency, transparency and community awareness of Council's intentions for managing our reserves and open spaces.

2. Drinking Water

2.1. Executive Summary

The Water Services Act 2021[5] imposes duties on drinking water suppliers to ensure that drinking water is safe and complies with the drinking water standards (Section 21). These duties also include a requirement to ensure that a sufficient quantity of drinking water is provided to each point of supply to which the supplier supplies drinking water (Section 25).

The Hastings water supply services the main urban areas of Hastings, Flaxmere and Havelock North and the adjacent townships of Bridge Pa and Paki Paki. The network provides water to 24,858 [6] domestic and commercial/industrial properties along with firefighting services across the urban area.

The Hastings supply sources water entirely from groundwater bores within the Heretaunga Plains aquifer. The major borefields are located at Frimley Park and on Eastbourne Street with smaller abstraction from Wilson Road in Flaxmere and Brookvale Rd in Havelock North.

Drinking water quality remains a high priority for HDC. The Havelock North contamination event in August 2016 was a catalyst for reviewing the level of treatment for all supplies and significant upgrades have been implemented across all of the district's drinking water supplies to comply with the New Drinking Water Standards, Quality Assurance Rules and Aesthetic Values regulated by Taumata Arowai.

The Drinking Water Strategy 2018 (WAT-20-20-18-525) sets out the approach to drinking water that has water quality and safety as the prime objectives. The strategy includes a combination of new and redefined initiatives based on investigations, modelling and science to guide the establishment of new treatment and reservoir storage at Frimley Park and Eastbourne St, new and upgraded pipes, and a booster pump station in Havelock North.

The strategy also highlights the need to ensure that Hastings has access to sufficient quantities of water to meet current and future needs, whilst ensuring water is used efficiently. New information relating to sustainable groundwater abstraction rates and stream depletion effects from groundwater abstraction across the Heretaunga Plains means that Council must use water efficiently while also ensuring that its abstractions are within sustainable allocation limits and are not having an adverse environmental effect.

Current growth projections for Hastings (expected to grow to between 104,600 and 119,800 from around 87,000 over the next 30 years) [7] mean that there will be increasing demand for water that will need to be met by the Hastings urban water supply consent. Demand will increase as development within the supply area intensifies, along with expansion of the supply area to meet new growth demands and to supply areas which are currently not serviced.

Average annual consumption has been increasing since the early 2000s but has accelerated in more recent years. The main constraint for the Hastings drinking water supply is the ability to access

[5] https://www.legislation.govt.nz/act/public/2021/0036/latest/LMS374564.html?search=ts_act_water_resel_25_a&p=1

[6] HDC 2022 Rating Information

[7] STR-4-2-21-987 Napier and Hastings Housing Assessment Summary Report Housing Capacity Assessment NPSUD 2021 Barker and Associates

sufficient quantities of water to meet our reasonable domestic, commercial and small industrial needs within the next 10 years as growth continues to increase our base consumption rates.

The impact of residential growth is apparent in our consumption data which shows a continuing upward trend and it is expected that this trend will continue in the foreseeable future. While this will be offset to some degree by the resource consent application to combine several separate consents into the Hastings allocation, on current predictions we will reach our maximum consented volume before 2030 based on current projections.

Figure 2.1.1 Increased Consent Volume (August 2022)

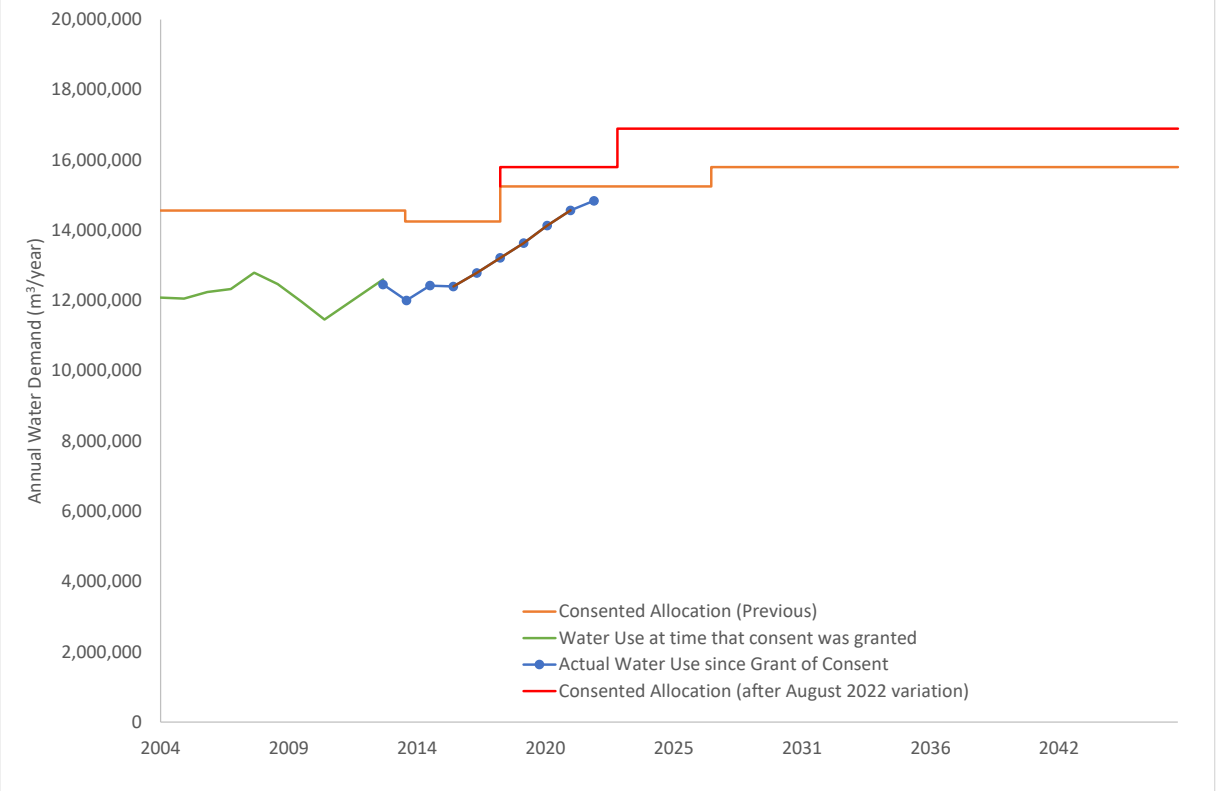
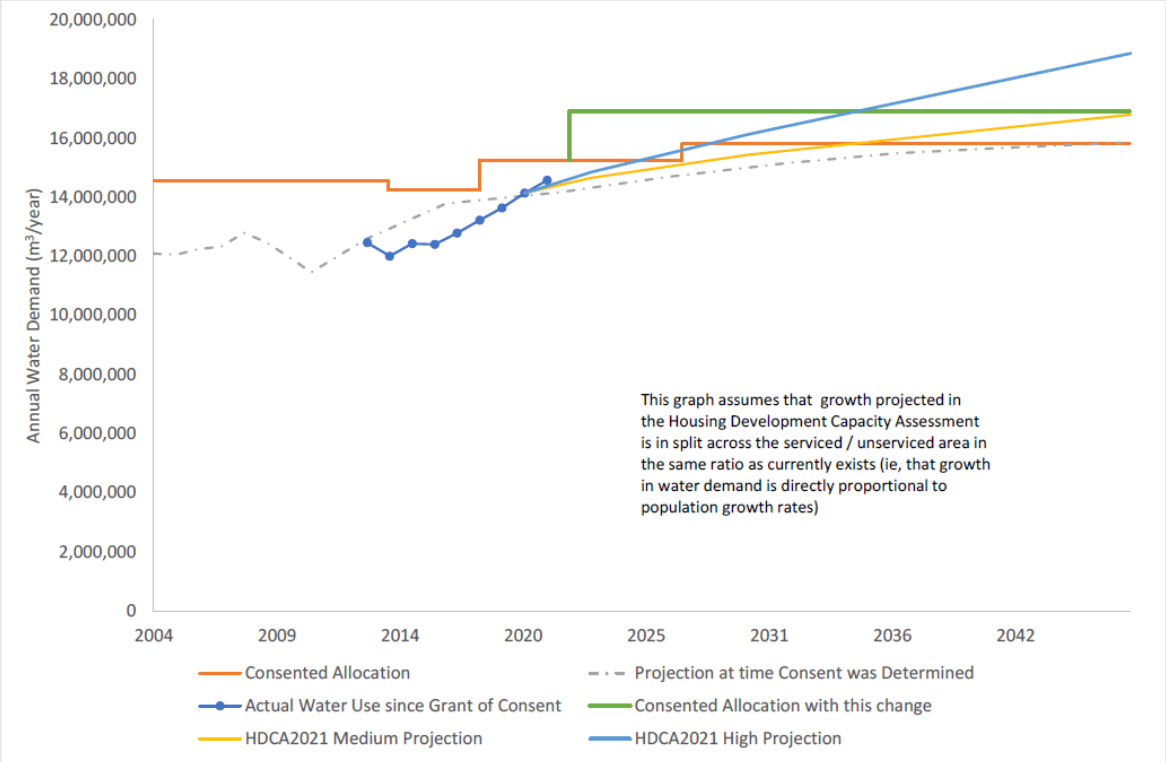


Figure 2.1.2 Projected Water Demand with Updated Population Projections [8]



The predictions shown above in Figure 2.1.2 are based on our historic and current consumption rates and estimates of future water demand using a medium and high growth scenario. These projections do not account for potential reductions from demand management programmes that are underway to reduce network wide leakage (leak detection and accelerated asset replacements), pressure reduction and the potential for domestic water metering to be progressed over a similar timeframe. It is anticipated that these measures will realise some gains in capacity (potentially 5% to 10%) to buffer our future needs, improve our resilience and increase our efficient use of water however these gains will only be gradually achieved as part of this suite of long-term initiatives.

Our distribution network capacity to meet fire-fighting and domestic service levels is variable and is influenced by seasonal demand and the way the network is currently configured. Despite some localised issues, there are no significant constraints that would prohibit servicing residential growth occurring within the current serviced area. However, demand for water to supply larger industrial needs or to service developments or extensions beyond the existing network cannot be guaranteed and will require specific analysis to determine what capacity if any, is available.

While large industrial users are self-serviced and have their own water sources, new rules on surface and groundwater takes (TANK Plan Change 9)[9] will limit access to additional water such that industrial expansion or new industrial activities will be constrained and they may then rely more heavily on the Hastings supply to meet their essential water needs. The impact of the TANK Plan Change on the HDC water supply will be better understood once the rules are in place but at the time of this report, the plan change process has not concluded and is still subject to appeal.

[8] WAT-20-10-23-1519 AUTH-120019-04 Application Resource Consent Hastings Urban water supply - allocation transfer PakiPaki & Napier Road AUTH-120019-05

[9] Hawke's Bay Regional Council Regional Resource Management Plan to manage water quality and quantity for the Tūtaekurī, Ahuriri, Ngaruroro and Karamū (TANK) catchments.

The primary constraint that is impacting the Hastings drinking water supply, and in particular the ability to manage future demand, is the ability to access sufficient quantities of water to meet our reasonable domestic, commercial and small industrial needs within the next 10 years. Council's approach to meeting our future growth needs will therefore necessitate a dual approach of ongoing efficiency improvements alongside retaining existing allocations already provided to Council for municipal water supply.

2.2. Level of Service Statement

The aim of Council's Drinking water activity is to provide a continuous safe, potable water supply that helps ensure public health.[10]

Council's key strategic objectives are based on legislative requirements and community outcomes. In particular *Section 10 of the Local Government Act* defines the purpose of Local Government and Council has identified the drinking water activity as an essential service that contributes towards the Council objective *to provide healthy drinking water and sanitary services*.

The Water Services Act 2021[11] imposes duties on drinking water suppliers to ensure that drinking water is safe and complies with the drinking water standards (Section 21). These duties also include a requirement to ensure that a sufficient quantity of drinking water is provided to each point of supply to which the supplier supplies drinking water (Section 25).

The Hastings District Council operates 11 water supplies within its district. The main Hastings urban supply is located over the Heretaunga Plains aquifer, and comprises the city of Hastings and the townships of Havelock North, Flaxmere, Bridge Pa and Paki Paki. The population served by the supply is estimated to be 64,764 people making this a large drinking-water supply.

A number of smaller supplies are located across the district supplying drinking water to the communities of Te Pohue, Waipatu, Waipatiki, Whirinaki and Esk, Omahu, Whakatu, Clive, Haumoana/Te Awanga, and Waimarama.

These townships are excluded from the capacity assessment.

2.3. Overview

The Hastings supply sources water entirely from groundwater bores within the Heretaunga Plains aquifer. The major borefields are located at Frimley Park and on Eastbourne Street with smaller abstraction from Wilson Road in Flaxmere and Brookvale Road in Havelock North. The small satellite townships of Bridge Pa and Paki Paki are connected to the Hastings supply (refer Figure 2.3.1).

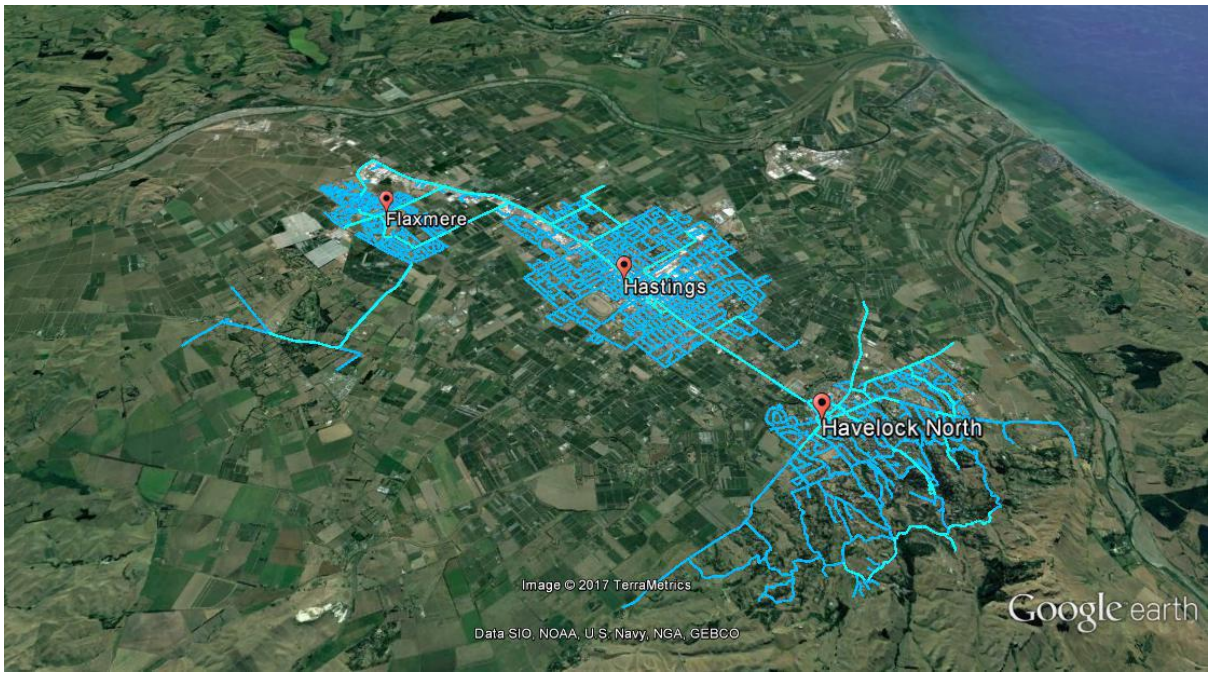
The distribution system is divided into six water supply zones, comprising seven booster pump stations and 20 treated water storage reservoirs across eight sites. The zones are interconnected and the supply is dynamic in operation with sources influencing multiple zones.

Historically, large scale users (food processing) have been able to access their own water supplies through private bores and there is significant 'wet industry' within the Hastings network that has utilised the Heretaunga Plains aquifer for their primary industry needs. These businesses are also supported via the HDC municipal supply to provide their potable water needs and general fire-fighting capability however they do not rely on the Hastings supply for process related activities.

[10] HDC Asset Management Plan (2021)

[11] https://www.legislation.govt.nz/act/public/2021/0036/latest/LMS374564.html?search=ts_act_water_resel_25_a&p=1

Figure 2.3.1 – Layout of the Hastings Urban Water Supply (excludes Paki Paki)



In March 2018, Council adopted the HDC Drinking Water Strategy (WAT-20-20-18-525). The purpose of this document was to review Council's strategy for providing drinking water services in light of the Havelock North contamination event in August 2016. The strategy presents a vision for the delivery of water services that has water quality and safety as its prime objective.

The strategy also highlights the need to ensure that Hastings has access to sufficient quantities of water to meet current and future needs, whilst ensuring water is used efficiently. New information relating to sustainable groundwater abstraction rates and stream depletion effects from groundwater abstraction across the Heretaunga Plains means that Council must use water efficiently while also ensuring that its abstractions are within sustainable allocation limits and are not having an adverse environmental effect.

In August 2017, Hawkes Bay Regional Council announced that *"new scientific advice… indicates the effects of current groundwater takes from the Heretaunga Aquifer are at the limit of what is environmentally acceptable.*[12] The Regional Council also stated that the science advice indicates that all groundwater takes from the Heretaunga Plains Aquifer are ultimately connected to surface water flow, albeit that the effect of the takes vary with location. It noted that "at the current usage levels, the groundwater is not being used unsustainably as there is still considerably more water entering the aquifer every year providing spring flows and flowing out to sea than is taken for use.

However, the current groundwater volumes abstracted over a year have a significant effect on the Ngaruroro River and spring-fed streams and a detrimental effect on in-stream ecology."[13]

Water supply, in particular potable water for health and hygiene purposes, is a critical service for which there are significant public health and community disruption effects if the supply is interrupted. The resilience of the overall system is therefore an important consideration in the development of the water supply strategy. Council is still in the process of defining and developing criteria for assessing

[12] Hawkes Bay Regional Council, Press Release, 18 August 2017.

[13] HDC Drinking Water Strategy 2018 (page 11)

and building in resilience to the supply system. This notwithstanding, the following principles have been considered in developing this strategy. [14]

Resilience includes being able to access sufficient water from multiple sources, treatment processes are able to continue via independent power (back-up generation) and sufficient reservoir storage to maintain emergency supplies and to minimise disruptions. Resilience also means having a distribution network that provides security in the delivery of essential water and fire-fighting even under adverse conditions or civil defence emergencies.

2.4. Water Allocation (TANK Plan Change)

The HB Regional Council TANK Plan Change (Proposed Plan Change 9) proposes to add new rules to the Regional Resource Management Plan to manage water quality and quantity across the Tūtaekurī, Ahuriri, Ngaruroro and Karamū catchments including the Heretaunga Plains groundwater aquifer. These new provisions seek to address a range of issues in respect of allocation limits, stream depletion effects and setting minimum flows as well as protecting the quality of source water for drinking water supplies. The TANK Plan gives priority to water for human health, community and town supply.

https://www.hbrc.govt.nz/assets/Document-Library/TANK/TANK-Plan-booklet-2020.pdf

The Ngaruroro catchment is at full allocation and the Karamū catchment is currently considered to be over allocated. No allocation limits for groundwater resources are currently set in the RRMP. Instead, environmental guidelines indicated that the safe yield identified for an aquifer should not be exceeded and groundwater takes should not cause a reduction in the flow of rivers, levels of springs or lakes or ecologically significant wetlands. [15]

The vast majority of recharge to the Heretaunga aquifer system is via recharge from the Ngaruroro River. The Heretaunga Plains aquifer is considered to be fully allocated and new rules will place higher performance standards on abstraction to ensure water is used efficiently and, as municipal supplies are significant users of this resource, this will impact existing consents and allocations in the future. In accordance with S 86(3)(a) of the RMA, the proposed TANK Rules have immediate legal effect from the date of notification and therefore are currently in effect despite appeals not yet being resolved.

The NPS-UD requires Councils to ensure that there are sufficient quantities of water to cater for growth including urban residential needs as well as support for commercial and industrial expansion in the future. Clause 3.22 of the NPSUD requires the Council to maintain a "competitiveness margin" of development capacity over and above the expected demand "in order to support choice and competitiveness in housing and business land markets." The competitiveness margin required to be provided is 20% in the short to medium term, and 15% in the long term. The NPSUD defines the short term as less than 3 years, the medium term as 3-10 years and long term as 10-30 years. Given that there is at least 20 years remaining in the consent term for the Hastings water supply, this falls into the long term category. Council may therefore be required to provide water supply which provides for 15% above the demand projected in Figure 2.5.1.

2.5. Hastings Consent

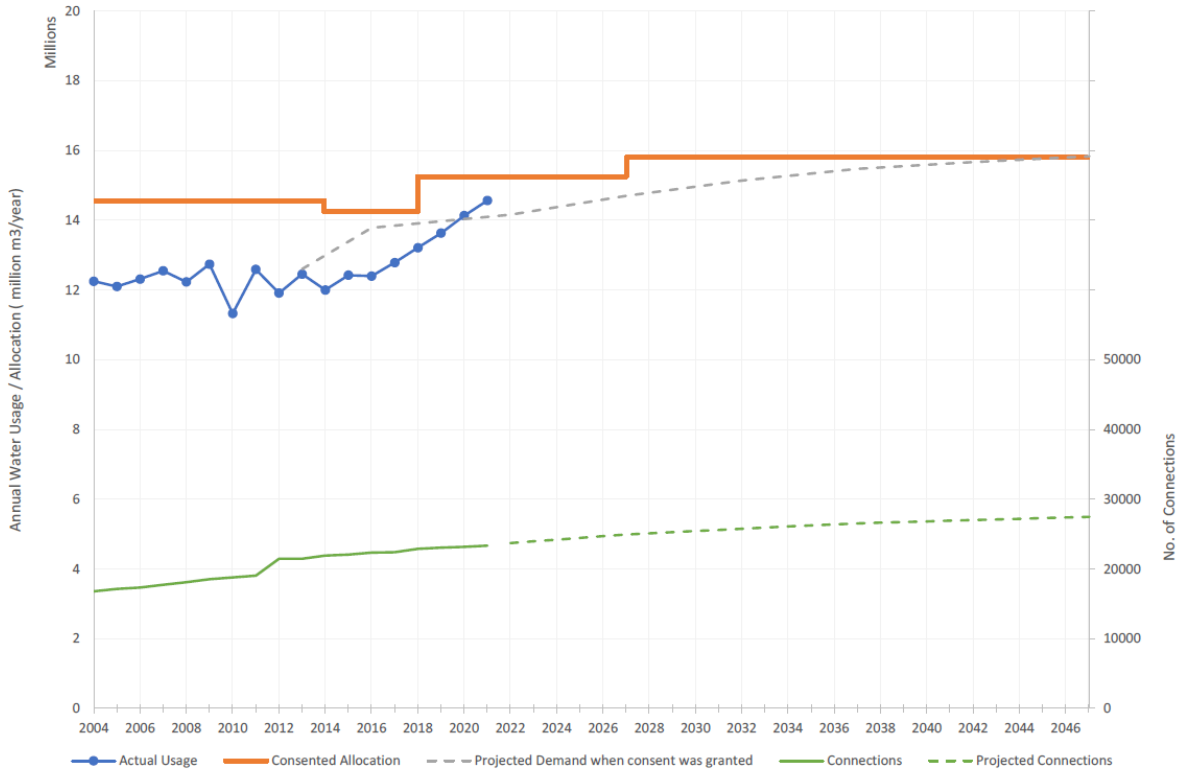
The Hastings urban water supply consent was granted in June 2014 and expires on 31 May 2047. At the time that the Hastings urban supply consent was granted, the annual water volume required was determined by projecting forward the average annual demand from 2003-2010 based on the projected population growth as per HPUDS 2010. The population projection was that, over the term

[14] HDC Drinking Water Strategy (WAT-20-20-18-525) page 12.

[15] Final TANK Section 32 Report March 2020

of the consent, the system would need to service an additional 14,530 persons representing a 27% increase over the term of the consent. As a result, the consent provided for a stepped increase in annual allocation from 12.5 million m3/year at the commencement of the consent, through to 15.8 million m3/year towards the end of the consent term.[16]

Figure 2.5.1 Comparison of Actual Water Demand v Consent Allocation (2014)



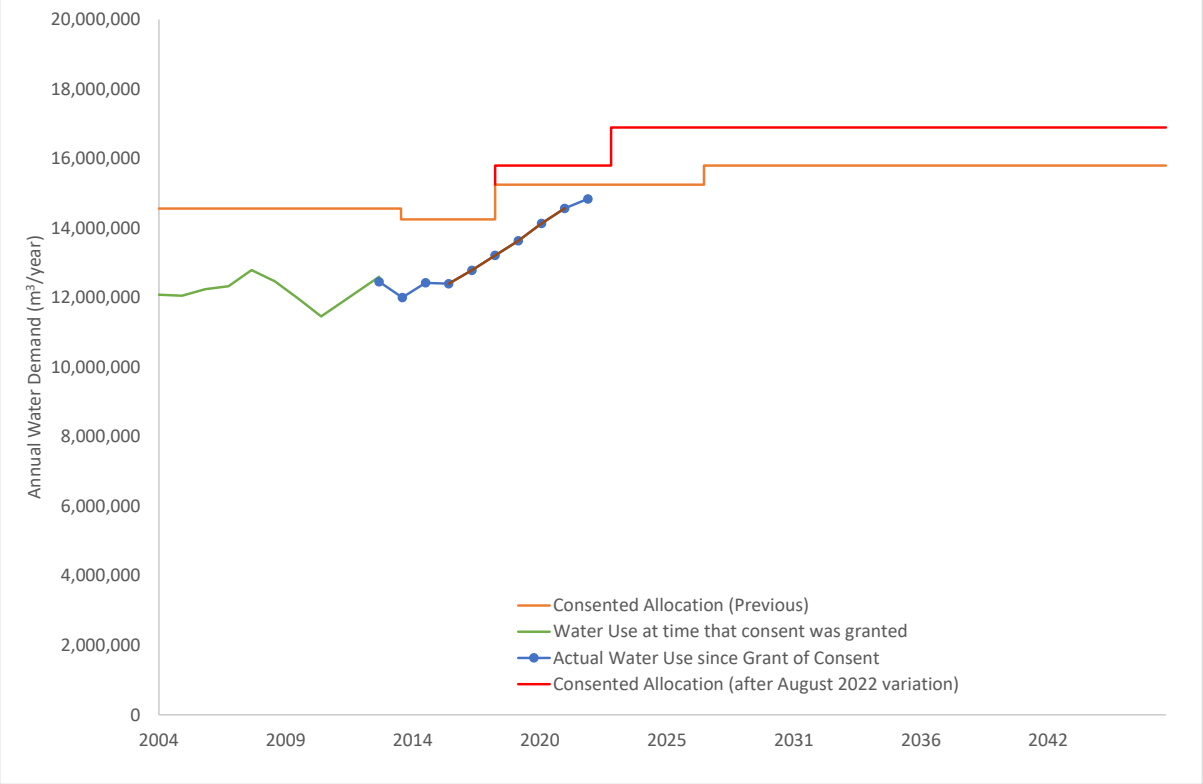
In recent years, the community has been growing at a greater rate than projected at the time the consent was granted, and this accelerated growth is projected to continue. Despite ongoing implementation of network efficiency measures, water allocation under the Hastings urban water supply consent is insufficient to meet projected community growth.

Figure 2.5.1 above shows that growth (as depicted by new connections) has been increasing steadily since 2004. In the period from 2004 to 2016, annual consumption has been largely unchanged which can be attributed to the effectiveness of water conservation measures and irrigation restrictions constraining total annual volumes. However, from 2016 onwards there is a distinct and consistent increase in annual consumption that can no longer be buffered by current demand management measures alone.

The annual consumption for 2021 was 14.565 million cubic metres representing a headroom of only 685,000 cubic metres per annum. On current projections, consumption could exceed the consent limit in the next few years. A consent variation was approved in August 2022 which increased the annual allocation volume under the Hastings urban consent to 16,892,000 m3/year. This was achieved by transferred unused allocations from the Council's Napier Road and Paki Paki consents to the Hastings urban supply and did not constitute any new allocation from the aquifer.

[16] Application to Transfer Allocation from AUTH-114789.01 (Napier Road) and AUTH-113287.01 (Paki Paki) to Hastings Urban Water Supply Consent (AUTH-120019.04)

Figure 2.5.2 - Increase in total consented volume. (2022)



Council has an ongoing commitment to implementing its programmes of work that ensure continual improvements in water conservation and network efficiency but it is recognised that there is a practical limit to the amount of growth that can be achieved through efficiency and conservation measures alone.

The HDC Water Conservation & Demand Management Strategy (2021)[17] refers to the American Water Works Association (AWWA) general guidelines for Infrastructure Leakage Index (ILI) target setting and based on these guidelines, it is considered that an ILI in the range of 4 - 8 is appropriate for Hastings. HDC's current aim is to maintain non-revenue water loss (NRW) of no more than 20% or an ILI of 4 – 8 until network wide pressure reduction measures are able to be undertaken. The latest water loss survey results estimate up to 29% of unaccounted for water with an ILI of 5.74.[18]

2.6. Heretaunga Plains Urban Development Strategy (HPUDS)

Growth has been occurring at a greater rate than anticipated in HPUDS 2010, which is what the original resource consent projections were based on. HPUDS was reviewed in 2016/2017 and the updated HPUDS 2017 document (STR-4-2-17-813) states:

• *"Key findings from a review of demographic and economic growth information since 2009, indicates that population and household numbers since 2009 have exceeded the Statistics New Zealand 'medium' growth projections on which 2010 HPUDS was based, and that a medium – high projection should be adopted."*

[17] WAT-20-25-21-109

[18] HDC Water Loss Assessment 2021/22 (Stantec Report)

• *"Population growth within the study area from 2009 – 2015, was 5,500 people, or an increase of 4.4% to a population of 131,400. This was higher than that projected in 2009 (by 1,080) and was driven by both natural population increase (4,594) and net migration gain (1,106)."*

• *"The total number of 'households' in the study area increased by 3,063 to 51,455 between 2009 and 2015. This is an increase of 6.3% and exceeded the projections made six years ago by 545 households."*

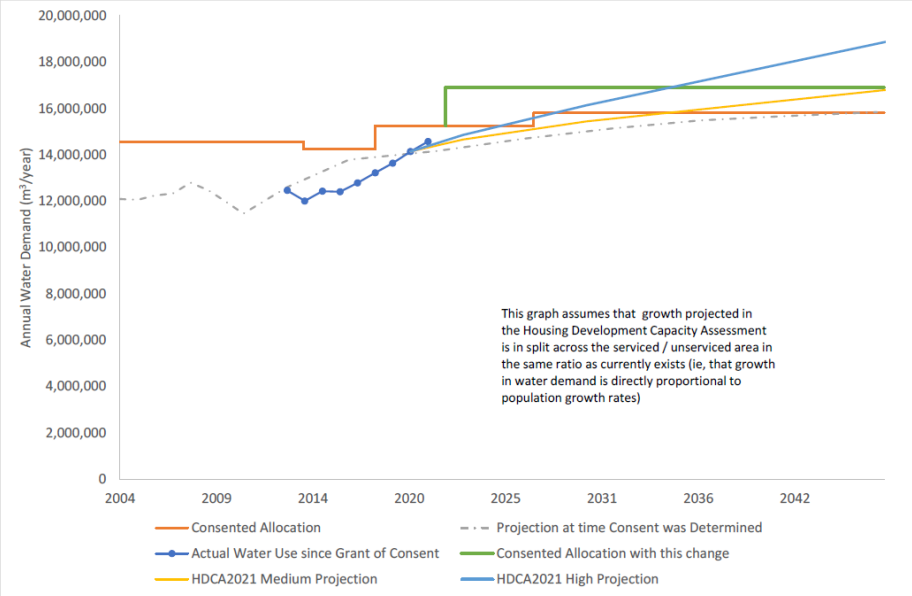
• *"The average number of people per household reduced from 2.6 in 2009 to 2.55 in 2016."*

2.7. Current Growth Projections

In September 2021, the key findings from a housing capacity assessment undertaken by Barker & Associates, predict that the Hastings population is expected to grow to between 104,600 and 119,800 (from around 87,000) over the next 30 years with household numbers (estimated at 31,300 in 2020), increasing to 42,300 in the long-term by 2050[19]. The current growth projections are that there will be increasing demand for water that will need to be met by the Hastings urban water supply consent. This will occur as development within the supply area intensifies, along with expansion of the supply area to meet growth demands and to supply areas which are currently not serviced.

Transferring water which is already allocated for public water supply purposes (under the Napier Road and Pakipaki bore consents) increases the overall allocation to provide some additional headroom for the next 5 years depending on the actual rate of growth. In summary, Council's approach to meeting growth needs will necessitate a dual approach of ongoing efficiency improvements alongside retaining existing allocations already provided to Council for municipal water supply. Figure 2.7.1 provides an indication of predicted water demand.

Figure 2.7.1 Projected Water Demand with Updated Population Projections [20]



2.8. Distribution Network

The Hastings water supply distribution network delivers treated drinking water to the greater Hastings urban area including Havelock North, Flaxmere and the satellite townships of Bridge Pa and Paki Paki.

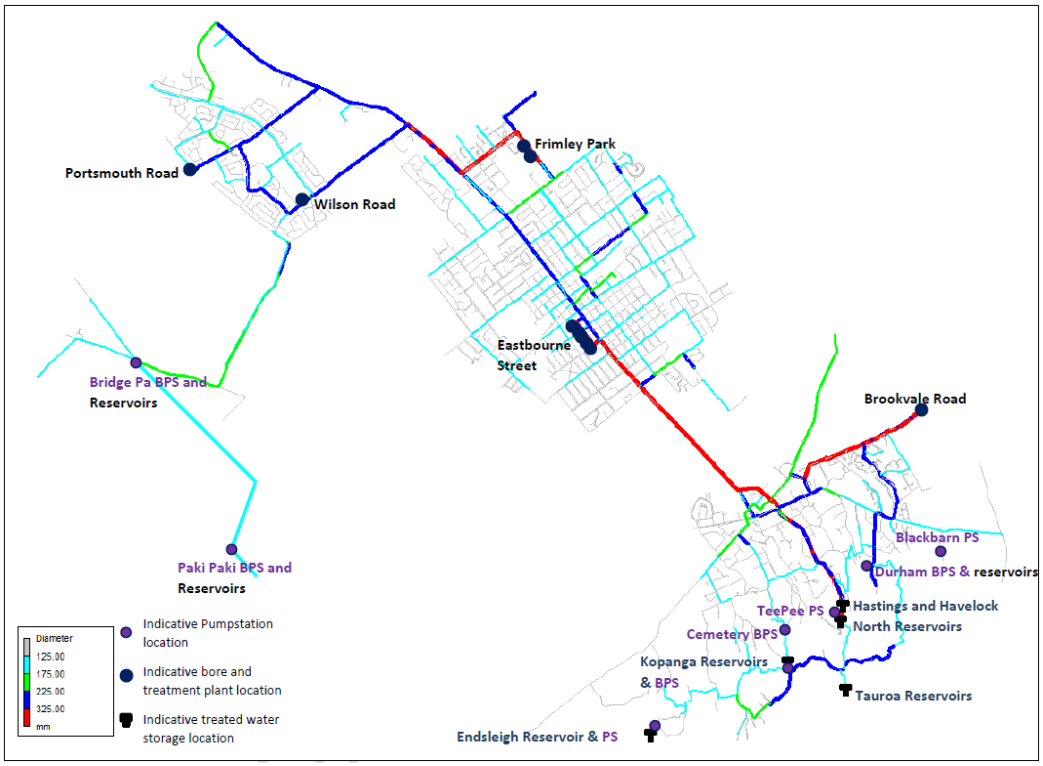
[19] STR-4-2-21-987 Napier and Hastings Housing Assessment Summary Report Housing Capacity Assessment NPSUD 2021 Barker and Associates

[20] WAT-20-10-23-1519 AUTH-120019-04 Application Resource Consent Hastings Urban water supply - allocation transfer PakiPaki & Napier Road AUTH-120019-05

In total the system delivers drinking water to 21,850 connections (residential, commercial and industrial).

The network extent is shown in the Figure 2.8.1 below.

Figure 2.8.1 Hastings Water Supply Distribution Network



The distribution system is dynamic in operation in that it functions as an integrated and open supply across all areas comprising seven booster pump stations and 20 treated water storage reservoirs across eight sites. Treated water from the water treatment plants (WTP) is currently distributed directly to customers with no treated water storage provided at the WTP or prior to customers receiving supply. The network is therefore heavily dependent on pumping directly from the source water bores to maintain operating pressures and keep reservoirs full.

Capital works currently underway, and due for completion mid-2023, include additional post-treatment storage which will change the system from on-demand pumping from the aquifer to on-demand pumping from the treated storage reservoirs. Aquifer abstraction rates will then be decoupled from the reticulation demand and more closely matched to average demand allowing for steady, less variable abstraction rates.

2.9. Reservoir Storage

The Hastings, Havelock North, Flaxmere and Bridge Pa zones are currently serviced by two large 10,000m3 reservoirs (Hastings 1 and 2) and two smaller Havelock North reservoirs 1940m³ and 1230m³. During high summer demand reservoir storage in these reservoirs can be reduced to as little as four hours, and during winter months typical storage is approximately 12 hours. These main reservoirs are used to supply elevated areas, support firefighting capacity, maintain supply in the event of treatment plant outages and to supplement high demand where it exceeds pumping capacity. The smaller reservoirs are all located in the Havelock North hills and act as staging reservoirs for further pumping to elevated residential areas.

The Havelock North zone is operated by HDC as two separate zones: Havelock North and the Havelock North High-Level Zone (HLZ). The Havelock North High Level Zone is primarily serviced by the Tauroa reservoir (460 m3) and several smaller concrete or plastic reservoirs including Kopanga (225 m3) and Endsleigh (2 x 25 m3). Most of the smaller reservoirs provide at least 12 hours storage during the winter months. There are five small booster pump stations which transfer water from the lower pressure zone into the Havelock Nth HLZ including a number of smaller reservoirs. The five discrete zones that currently make up the Havelock Nth HLZ are Endsleigh, Aintree, Kopanga, Tauroa and Durham Drive. A number of these boosted areas in the Havelock North HLZ do not have reservoir storage and therefore, without intervention will lose water during a power outage.

2.10. Bridge Pa and Paki Paki

The Bridge Pa and Paki Paki Booster Pumping Stations source water from the Flaxmere zone. Under normal operation, at each site water feeds four 25m3 reservoirs from which the pumps source water and deliver to the Bridge Pa and Paki Paki zones. In a power fail or pump outage a controlled bypass valve can be opened to provide continuity of supply to the community via direct connection to the Flaxmere supply.

All booster stations have either a facility for an HDC portable generator to be plugged in or a generator to be hard-wired in the event of a prolonged power outage.

2.11. Source Water Distribution (Winter/Summer Comparison)

Figure 2.11.1, Figure 2.11.2 below show the modelled influence of each source under normal operation in minimum (winter) and peak (summer) demand. The table also provides a brief description of how the primary water sources operate under seasonal conditions.

Figure 2.11.1 Summer 6:30am

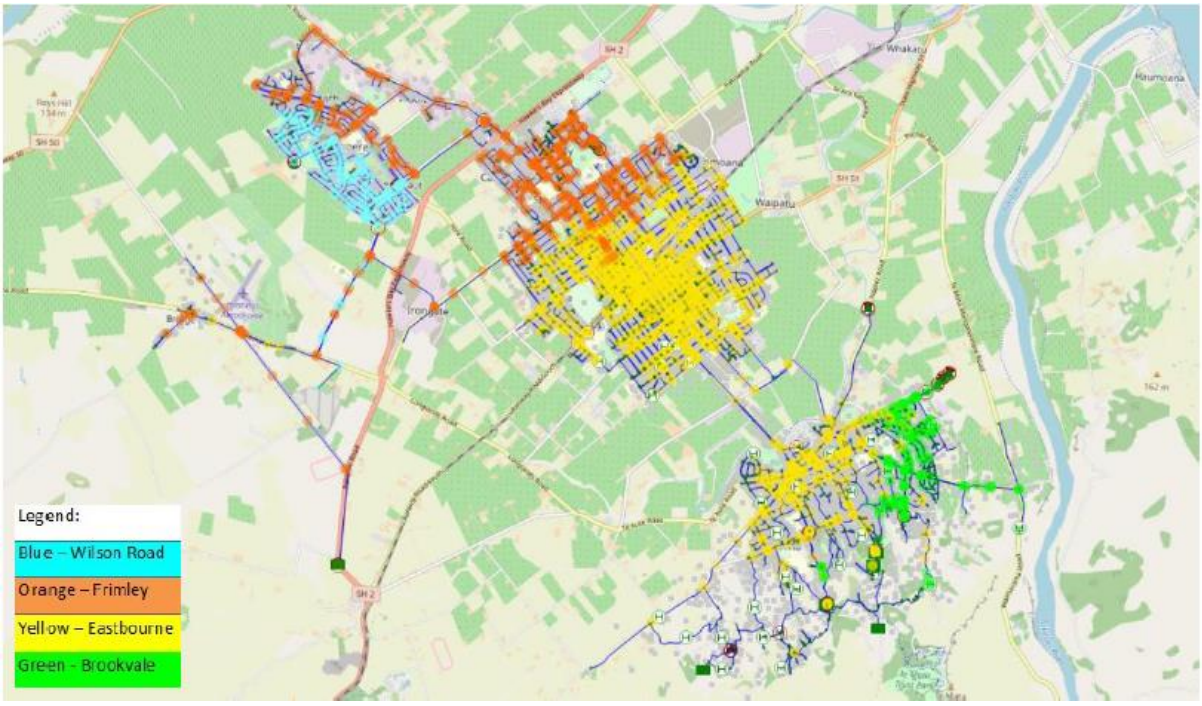
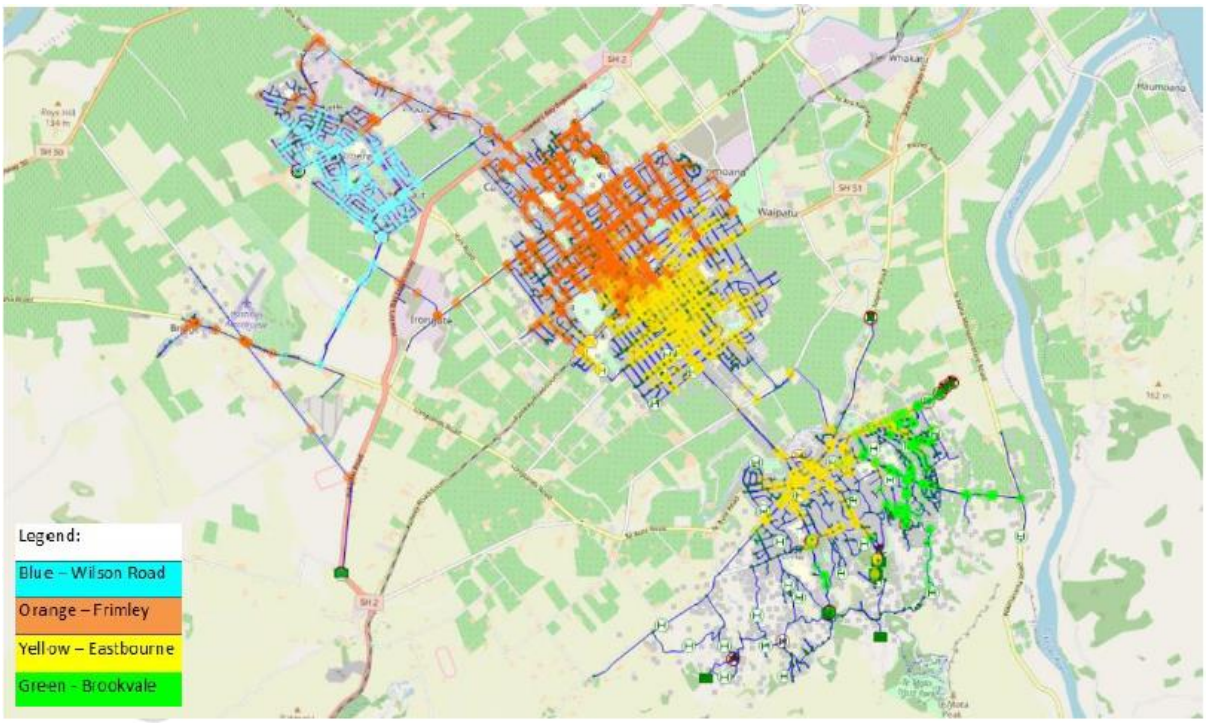


Figure 2.11.2 Winter 6:30am



Supply area	Peak Demand	Minimum Demand
Havelock North	Brookvale mainly confined to Arataki with Eastbourne providing primary supply.	Relatively even supply of water from Eastbourne and Brookvale supplies.
Hastings	Primary supply from Eastbourne supported by Frimley. Eastbourne water supplies as far west as Pakowhai Road.	Relatively even supply from Eastbourne and Frimley. Frimley water supplies as far east as the railway with some influence across the railway.
Flaxmere	Primary supply from Wilson Road with significant support from Frimley. Frimley supplies Omahu Industrial area and as far south as Flaxmere Ave.	Primary supply from Wilson Road supported by Frimley. Wilson Road supplies all of Residential Flaxmere and a portion of Omahu Road industrial.
Bridge Pa /Paki Paki	Mixture of supply from Wilson, Frimley and Eastbourne.	Relatively even supply from Wilson and Frimley.

2.12. Current Initiatives – Frimley WTP, Eastbourne WTP, Havelock North Booster Pump Station

The Havelock North contamination event in August 2016 was a catalyst for reviewing the level of treatment for all supplies managed by HDC. The Drinking Water Strategy 2018 (WAT-20-20-18-525) outlined a new approach to drinking water that has water quality and safety as the prime objectives. The strategy includes a combination of new and redefined initiatives based on investigations, modelling and science to inform how Council intends to progress in meeting the targets and timeframes proposed to establish new treatment and reservoir storage at Frimley Park and Eastbourne St, and a booster pump station in Havelock North.

In addition to this new infrastructure, the strategy has required network changes (new and upgraded pipes) to ensure that the new treatment plants and water storage can be efficiently distributed across the network and will fully comply with the New Drinking Water Standards, Quality Assurance Rules and Aesthetic Values as regulated by Taumata Arowai. Optimisation assessments considered existing and new layouts to ensure that the distribution network will function under the proposed future operating regime. The pipework options which were considered in the optimisation model are summarised in diagram 2.12.1 below.

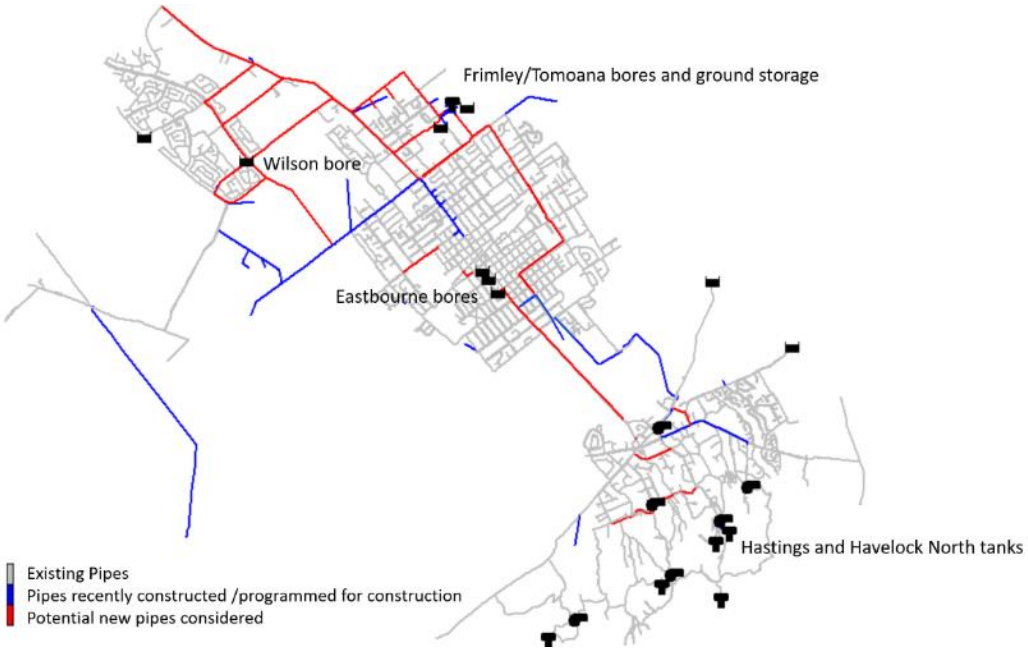


Figure 2.12.1 – Pipework Options Considered in Optimisation Model

2.13. Planned Network Changes (from 2023 onwards)

There will be a significant change in the way that the distribution network will be managed once the new treatment plants, reservoirs and pump stations are operational mid-2023. At Frimley and Eastbourne, bore water will be extracted at a constant rate and treated before being delivered to the onsite reservoirs rather than being pumped directly into the network. From the onsite reservoirs, variable-speed high lift pumps will deliver water to the network at a fixed pressure reflecting a hydraulic grade of 80m, and at a flow rate equal to the demand on the network at the time. The reservoirs will provide a buffer to ensure peak demand on the network can be met without impacting the rate of abstraction at the bores.

The installation of treated water reservoirs at the Eastbourne and Frimley WTPs will increase the total storage capacity in the supply to greater than 24 hours in winter and approximately 12 hours in summer.

These changes will also result in the establishment of four defined operational zones which will separate the network based on the location of source and treatment, pipe layout, valve locations and geographical area. These zone areas are designated as Flaxmere, Hastings West, Hastings East and Havelock North as shown in the figures below.

Figure 2.13.1

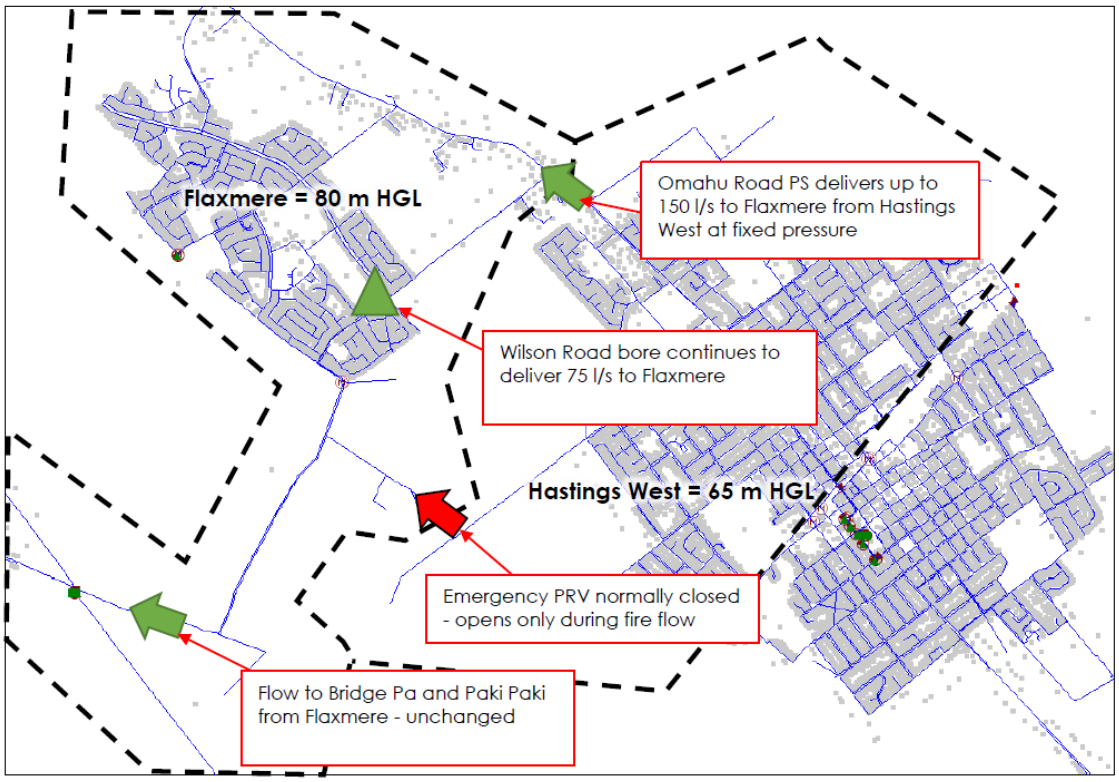


Figure 2.13.2

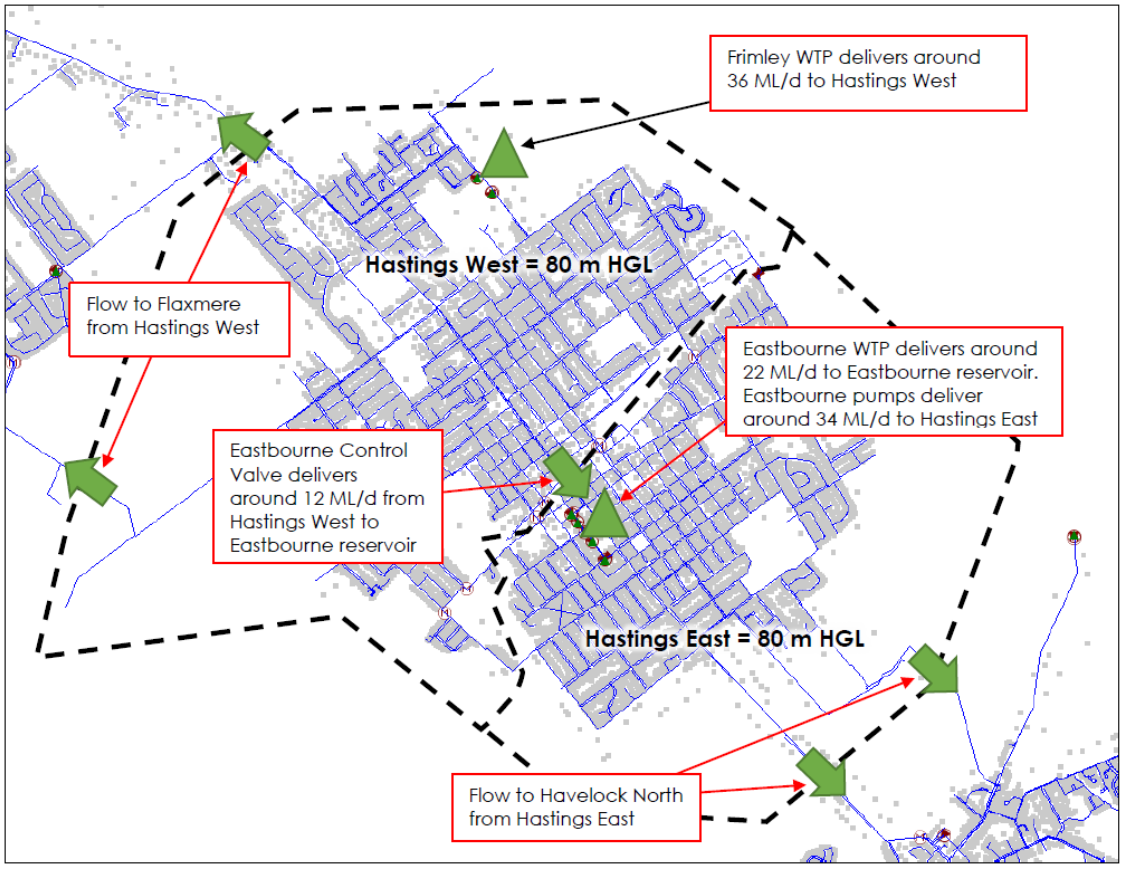
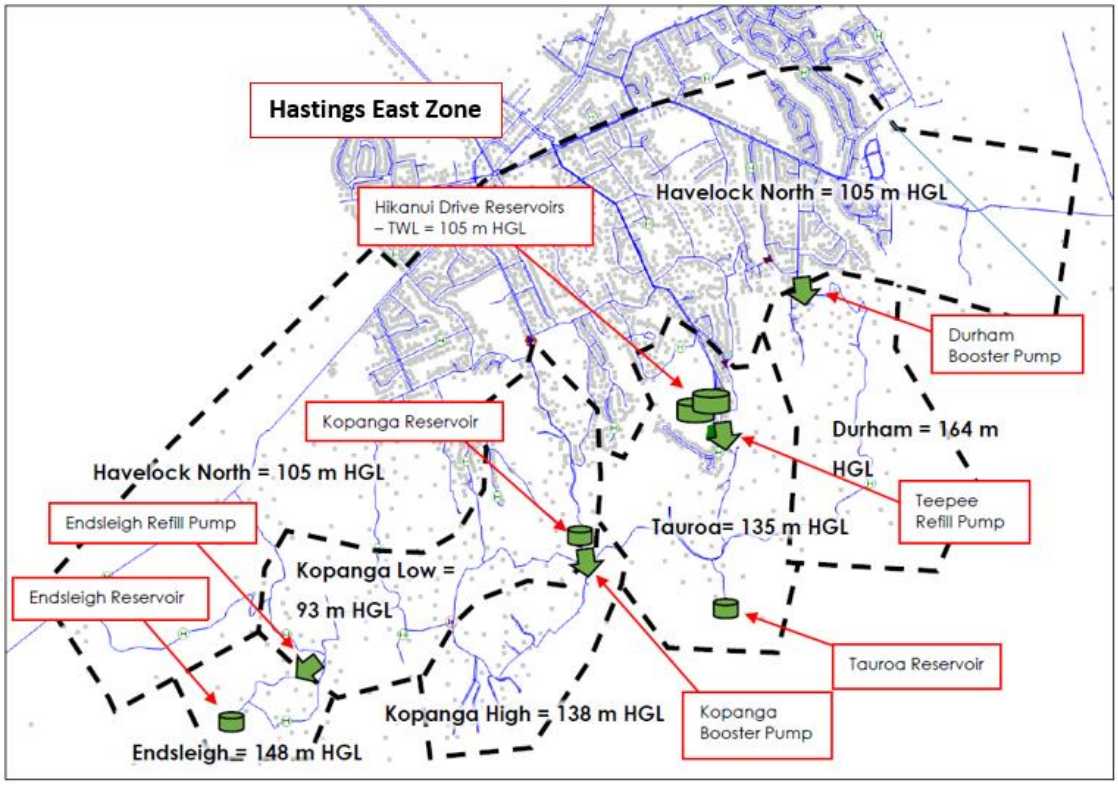


Figure 2.13.3



Rather than the system trying to dynamically balance demand and pressure across all parts of the network, the zones will enable each area to operate more efficiently to meet local demand using reservoir storage to buffer variations in flowrates from the cyclic nature as demand peaks and troughs during a typical day.

2.14. Network Wide Pressure Reduction

A significant benefit over the existing operation is the ability to reduce system pressures in each zone which currently operate between 900kPa and 1100kPa or more to maintain water at considerable elevation in the Havelock North reservoirs and at the same time meet demand across the entire system. These pressures are considered to be very high and result in higher use (high availability), increased leakage and reduced asset lives so there are obvious benefits in implementing network wide pressure reduction strategies in tandem with other demand management initiatives.

2.15. Pressure Management Areas

Since 2008, the Hastings District Council has been developing pressure management areas (PMAs) within Hastings and Havelock North. Areas have been selected where they are not directly involved in replenishment of the reservoir or in areas where bulk reticulation is located. Benefits have been realised within these zones in terms of reduction of both water consumption and leakage rates. Further implementation of pressure management will be considered following completion of major WTP and network infrastructure upgrades to understand how PMAs will fit alongside network wide pressure reduction.

Figure 2.15.1 – Pressure Management Areas

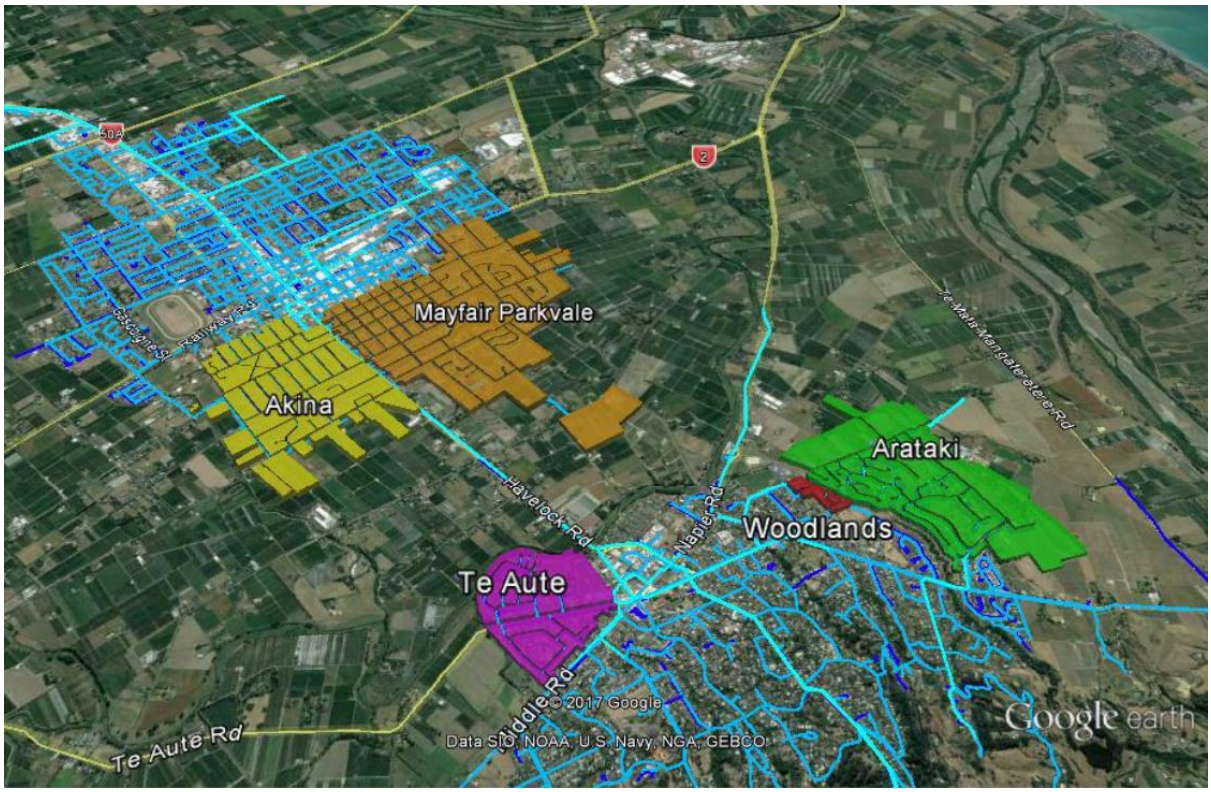
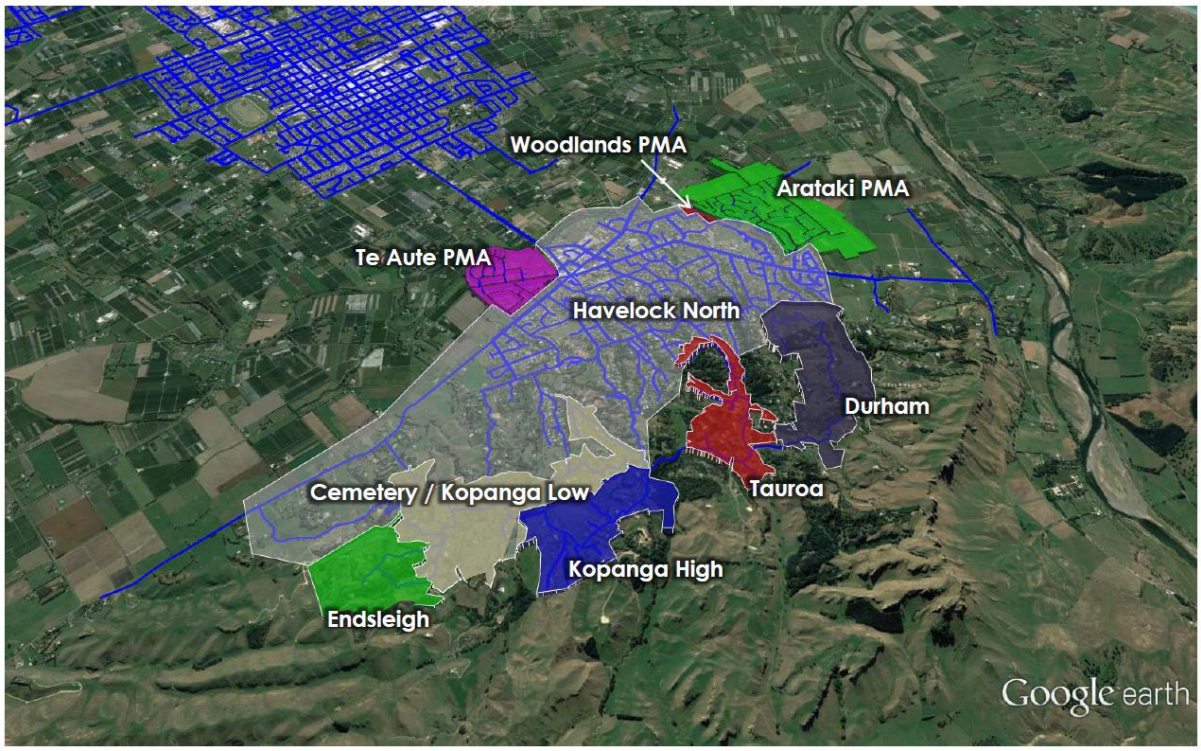


Figure 2.15.2 – Havelock North High Level Zone



Source: WAT-20-15-20-491

When pressure is reduced, water loss is reduced by a comparable fraction, e.g. if pressure is reduced by 30% then water loss can also be reduced by 30%. This is often the main driver for pressure management. Water mains burst frequency will also be reduced, and although the relationship is not as clear as for water loss there are predictive equations to estimate likely savings. Reduced customer use and increased infrastructure life are also accepted benefits, but these are harder to measure.

Customer consumption includes volumetric use (filling a sink or a washing machine to a set level), and activities where use is based on time rather than volume (e.g. lawn and garden irrigation). Australian studies on pressure reduction was shown to result in a 10% reduction in overall residential customer consumption under summer conditions noting that unlike water loss, no reduction in water use can be expected in winter, and in autumn / spring the effects will be reduced.

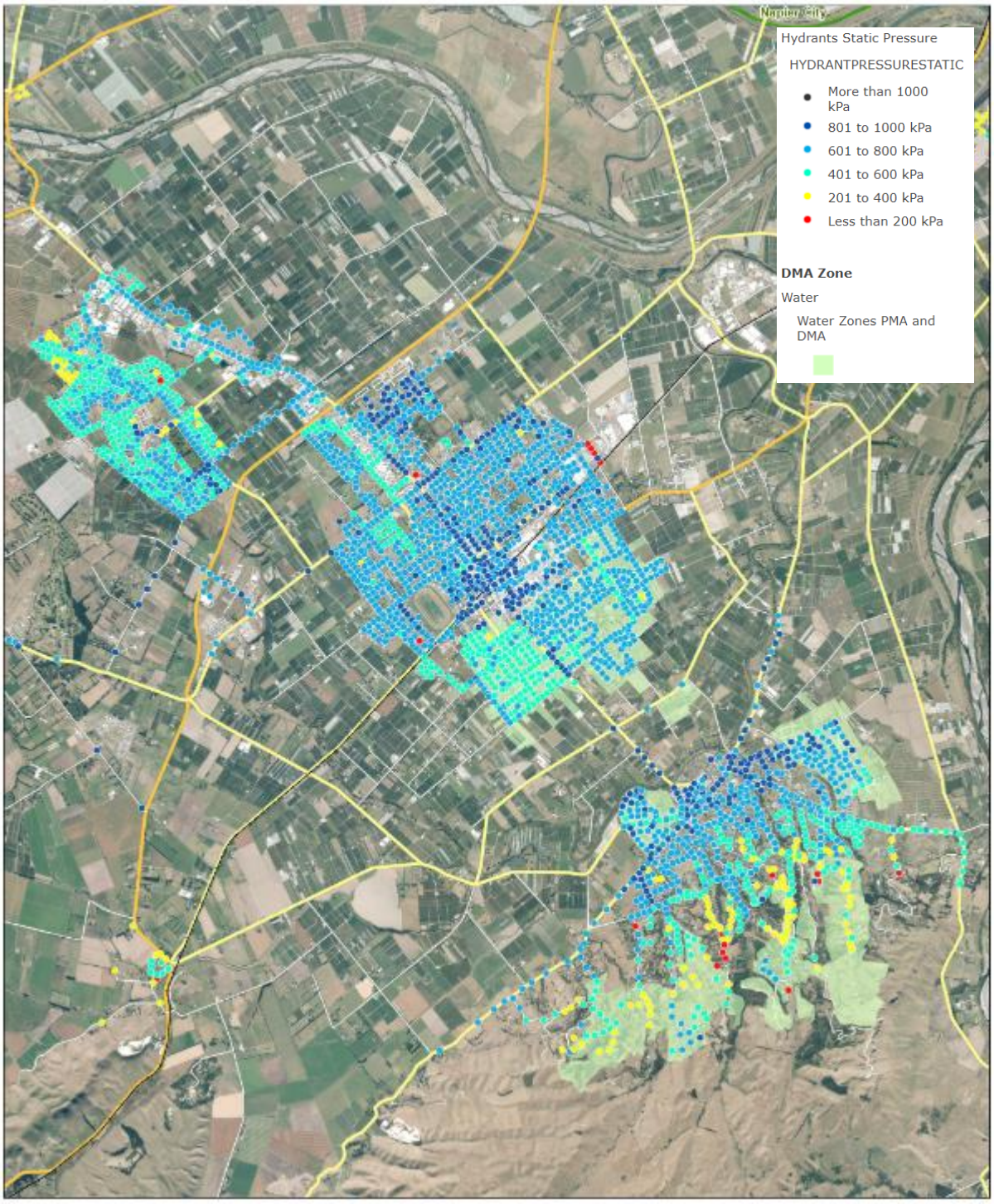
2.16. Pressure and Flow

To understand the variable nature of pressure and flow across the network, the following two diagrams show the static network pressures and the flowrate achieved from hydrant testing over several years.

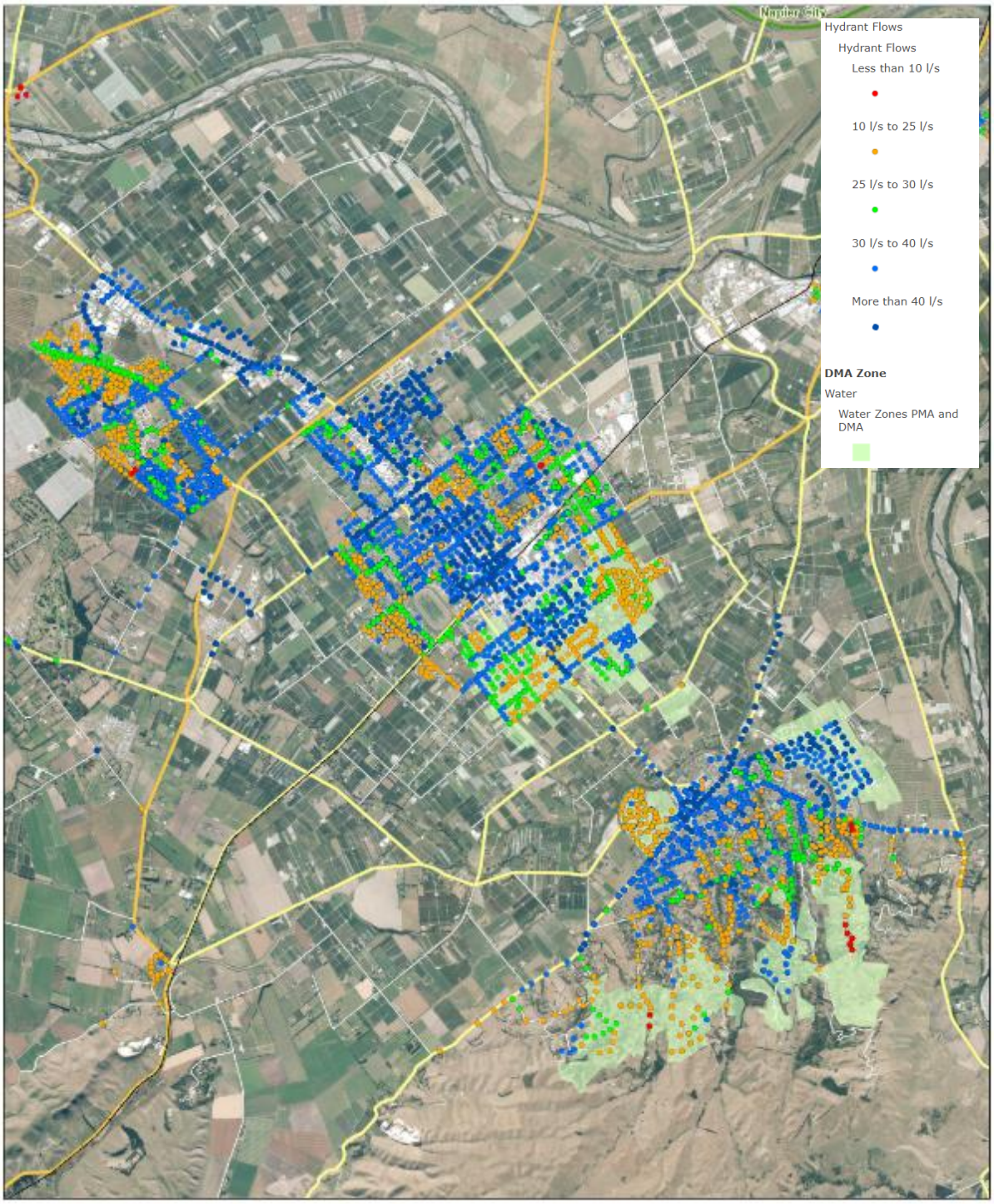
These diagrams indicate the significantly higher pressures required within Hastings to sustain pressures in the elevated areas of Havelock North and where we have reduced flows toward the extremities of the reticulation.

Summertime peak flows exacerbate pressure and flow distribution issues and it is not uncommon to have short term pressure and flow issues to residential properties in elevated areas of Havelock North but also in some parts of Hastings where our network connectivity is limited. The open nature of the water distribution network means that higher demand from areas closer to our water sources and pumping stations will be preferentially served at the expense of those who are further away.

Some of these issues will be resolved when the network reconfiguration commences (see Section 2.13 Planned Network Changes above) as this will allow more defined areas to operate in isolation from the rest of the network and be better serviced from storage.


Napier City
Hydrants Static Pressure
HYDRANTPRESSURESTATIC
More than 1000 kPa
801 to 1000 kPa
601 to 800 kPa
401 to 600 kPa
201 to 400 kPa
Less than 200 kPa
DMA Zone
Water
Water Zones PMA and DMA

2.17. Flow

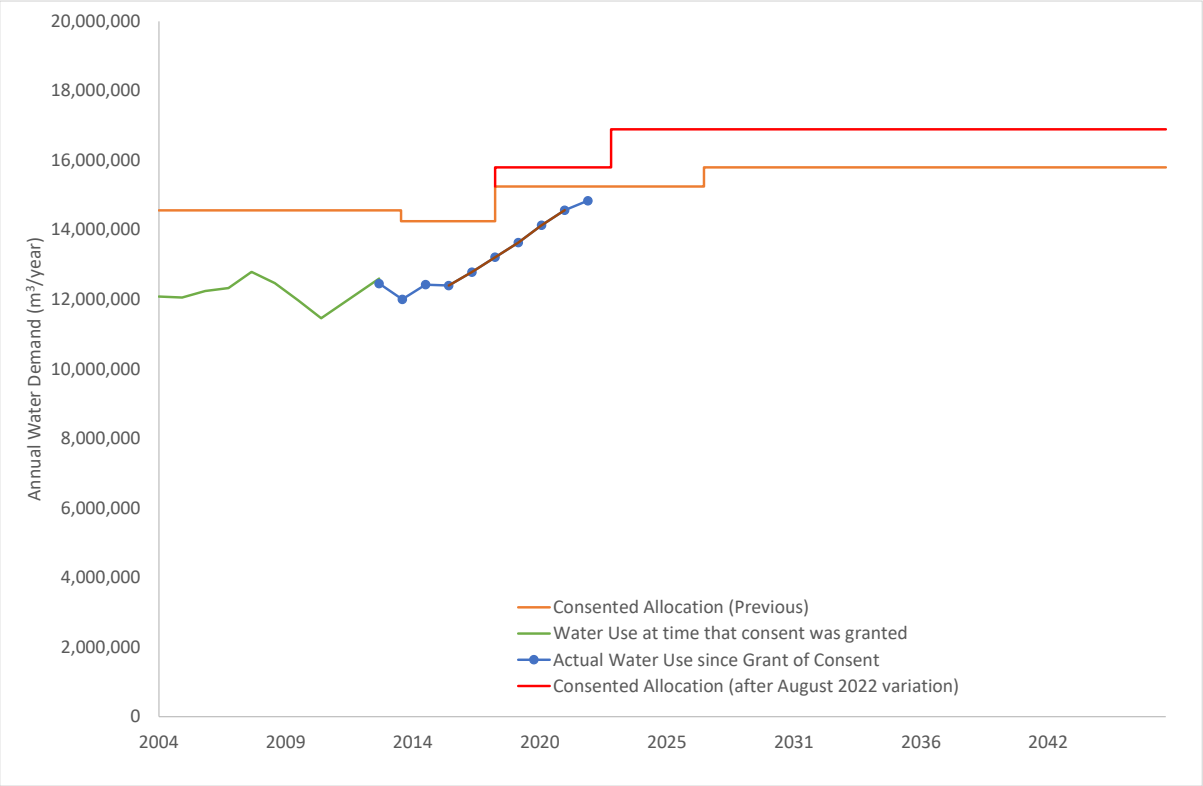

Napier City
Hydrant Flows
Hydrant Flows
Less than 10 l/s
10 l/s to 25 l/s
25 l/s to 30 l/s
30 l/s to 40 l/s
More than 40 l/s
DMA Zone
Water
Water Zones PMA and DMA

2.18. Drinking Water Summary

The main constraint for the Hastings drinking water supply is the ability to access sufficient quantities of water to meet our reasonable domestic, commercial and small industrial needs within the next 10 years.

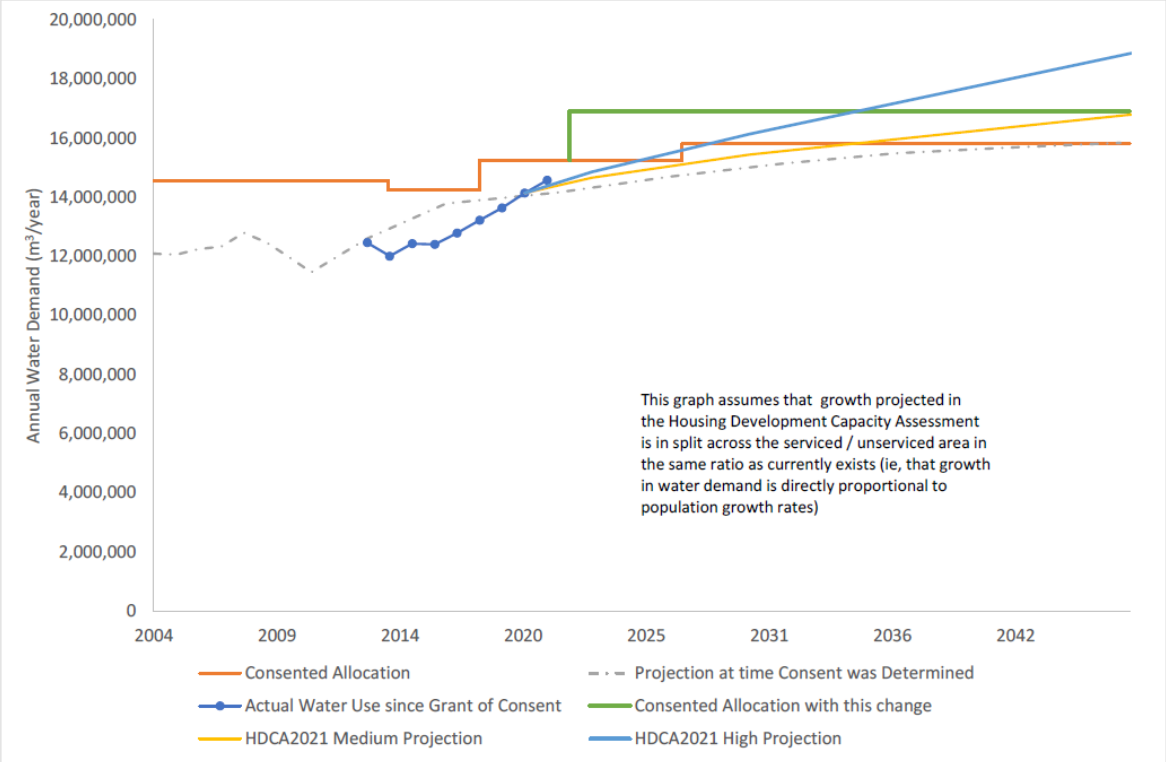
The impact of residential growth is apparent in our consumption data which shows a continuing upward trend and it is expected that this trend will continue in the foreseeable future. While this will be offset to some degree by the resource consent application to combine several separate consents into the Hastings allocation, on current predictions we will reach our maximum consented volume before 2030 based on current projections.

Figure 2.18.1 Increased Consent Volume (August 2022)



The predictions shown below in Figure 2.18.2 are based on our historic and current consumption rates and estimates of future water demand using a medium and high growth scenario. These projections do not account for potential reductions from demand management programmes that are underway to reduce network wide leakage (leak detection and accelerated asset replacements), pressure reduction and the potential for domestic water metering to be progressed over a similar timeframe. It is anticipated that these measures will realise some gains in capacity (potentially 5% to 10%) to buffer our future needs, improve our resilience and increase our efficient use of water however these gains will only be gradually achieved as part of this suite of long-term initiatives.

Figure 2.18.2 Projected Water Demand with Updated Population Projections



In summary, Council's approach to meeting our future growth needs will necessitate a dual approach of ongoing efficiency improvements alongside retaining existing allocations already provided to Council for municipal water supply.

3. Wastewater

3.1. Executive Summary

HDC currently supplies domestic wastewater services to approximately 70% of the district's population but primarily limited to the urban areas of Flaxmere, Hastings and Havelock North along with the small communities of Whakatu and Clive.

All domestic and industrial wastewater is conveyed to the wastewater treatment plant in East Clive where each flow train receives treatment prior to recombining before disposal into Hawke Bay. The wastewater treatment facility has a consent which allows a maximum daily discharge of 2,800 litres/second. The average dry weather flow is approximately 1,100 litres/second and peak flows are approximately 2,000 litres/second. There is adequate capacity at the plant for current and future growth.

Council's current Engineering Code of Practice (ECoP) together with the Land Development and Subdivision Infrastructure Standard NZS 4404:2010, defines wastewater parameters to calculate demand from a typical household equivalent for new residential and industrial areas. Anecdotally, a figure of 0.5 litres/sec/hectare was used as a level of service (LoS) proxy for network demand which in its day was representative of a 750m2 section. This has been useful to provide an indication of overall wastewater volumes for planning and growth purposes representing a density of 12-15 household equivalents per hectare.

The rate of development (infill and new subdivision) has accelerated over the last 20+ years and lot sizes are on average closer to 350m2. Wastewater demand is now well above historic values and further intensification (medium density housing and an inner city living precinct) will necessitate a review of the LoS in the ECoP to ensure it reflects future anticipated demand in conjunction with monitoring of network performance to identify and plan for upgrades to maintain operational capacity.

Where development exceeds the level of service, consideration needs to be given to whether:

- high density infill should continue to be permitted anywhere in the residential zone and services upgraded to match the anticipated demand
- higher density development is limited to particular areas where capacity is, or can more readily be, made available
- development is capped at a density that can be serviced by existing infrastructure based on detailed modelling to determine actual demand and available capacity

With over 440km of wastewater mains, pipes and connections to manage, network modelling plays a key role in predicting where limitations in the network may be occurring but may not have been apparent from operational observations alone e.g. surcharging greater than 0.5m above pipe full.

The introduction of dynamic modelling in more recent years has enabled predictive analysis to be undertaken to better understand the dynamic and interconnected state of the network, determine where the network may be under performing and to evaluate the cumulative effects of current and future growth on capacity. It is also a valuable planning tool that assists in identifying where the network may come under pressure from growth in the future enabling upgrade works to be programmed ahead of anticipated growth.

Analysis of the wastewater network in the sections below, has considered how each sub-catchment is performing and extends to including the known effects of inflow and infiltration (I&I) as well as

applying future growth demand. The results also take into consideration the effects of upstream catchments on lower parts of the network to assist in understanding where constraints are more localised and where they are more systemic in nature.

The Macro View

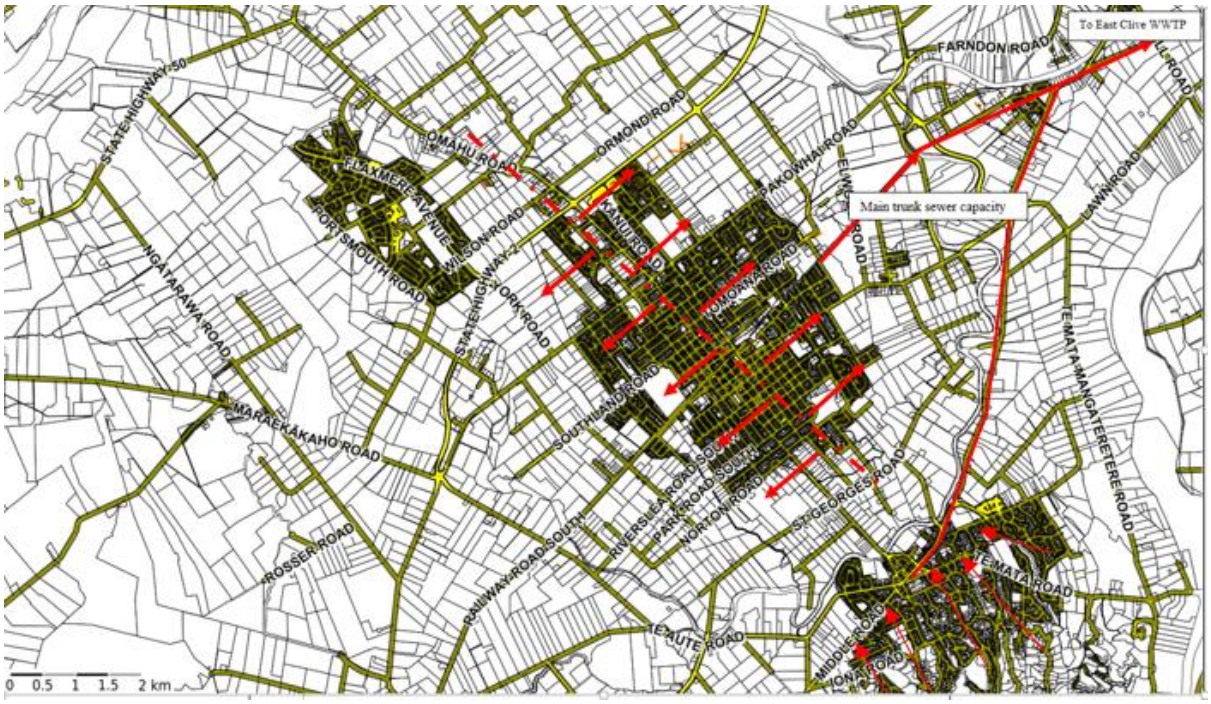
Results of the sub-catchment investigations clearly show that capacity is limited across many parts of the urban wastewater network. This is the result of a combination of factors that have occurred over many decades including greenfield growth, intensification from urban subdivision, factors that are related to asset deterioration and topography (primarily I&I), plus environmental changes i.e. rainfall patterns and increased flooding.

Many of these issues are compounded by the way the network has grown and expanded from its core beginnings (the Brick Arch in Hastings and the Napier Rd trunk main in Havelock North), into an expansive interconnected system of interceptor mains, local infrastructure and pump stations that extend for many kilometres to then all converge at a single large domestic trunk sewer outlet.

There is a limit to how far you can efficiently extend wastewater services away from the core bulk infrastructure and in many cases this involves complex arrangements that include multiple pumping stations and mains, and large distances to get the wastewater where it needs to go. This also places greater reliance on the older parts of the system to carry this additional load whilst ensuring that these assets continue to function in perpetuity.

An example of this is evident across the south-western half of Hastings and Flaxmere where due to topography, wastewater drains by gravity away from the trunk sewer and then has to be pumped back northward to then gravitate to the main trunk sewer. Likewise in Havelock North, a similar arrangement is in place to collect and pump wastewater south of the CBD into the Napier Rd trunk main. Figure 3.1.1 below shows the general fall of the land away from a central high point through the middle of Hasting which places a greater reliance on pumping as a primary means of conveyance.

Figure 3.1.1 – Direction of Wastewater Flows

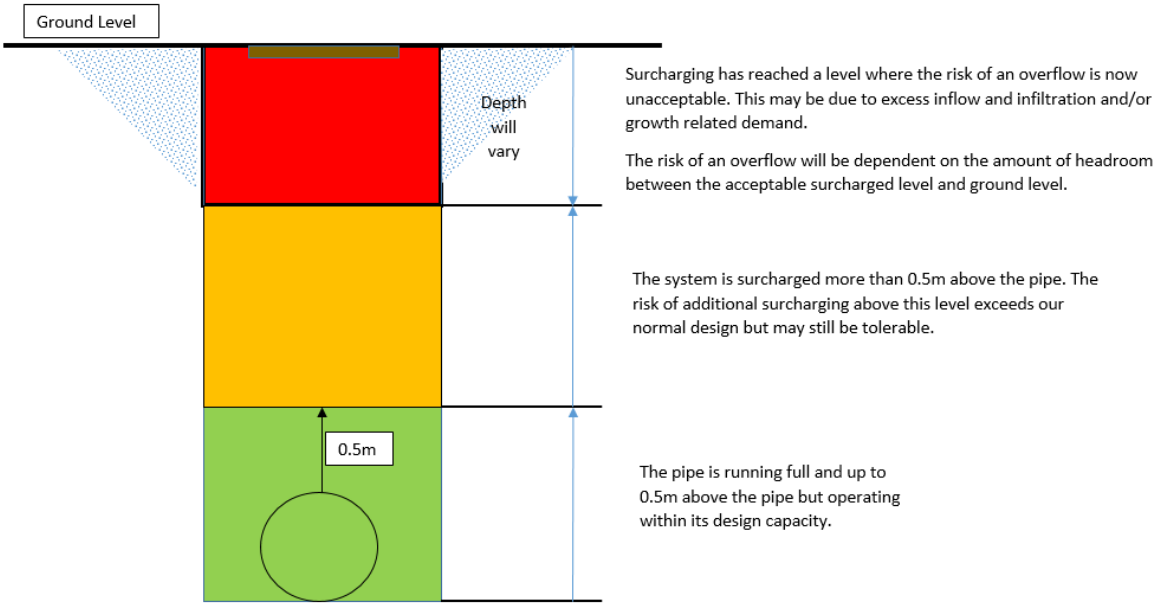


Expansion of our communities has occurred over a considerable period of time and the cumulative effects of growth on downstream capacity has not always been wholly accounted for at a network wide level. Infrastructure investment has sometimes been focused on relieving local area constraints so that new growth can be accommodated for in those areas of demand however the "slow creep" consumption across the wider network has until now, largely been absorbed. At a macro level, the analysis clearly indicates that the network can no longer absorb any further growth and substantive investment is required to keep ahead of capacity constraints before they become operationally untenable through excessive surcharging and overflows.

A Micro Level Assessment

Modelling has analysed each of the wastewater sub-catchments in both dry weather (typical daily operations) and in a 5 year rain event to account for inflow and infiltration (I&I) into the wastewater network during a typical design storm. The modelling scenarios include growth factored in to provide a comparison of dry and wet conditions in the current and future state. Industry standard wastewater pipe design allows for up to 4 times the dry weather flow in wet weather situations which is used as the base case for determining when the system is constrained and to what level. The following diagram is useful in explaining the colour coded rankings.

Figure 3.1.2 Colour Code for Dry and Wet Weather Pipe Condition



The wet weather analysis highlights areas of risk where surcharging occurs in excess of 0.5m above the pipe and where there is an increased risk of wastewater overflows occurring. Environmental standards are also ratcheting up the importance of avoiding wet weather overflows as much as possible but with a primary focus on eliminating dry weather overflows altogether. Outside of mains blockages, there are no areas where dry weather overflows are considered to be a risk.

The urban areas listed below represent those parts of the network that are the most constrained and/or will be the most impacted by growth:

- Flaxmere
- Oliphant Rd (including Harding Rd)
- Raureka (including Southland Rd, Hemi St, Akina Park, Murdoch Rd)
- Fitzroy Ave

- Akina (including Clive St, Lyell St)
- Southland Rd & St Aubyn St West
- Louie St & Hood St
- Mahora (including Frederick St and Waipuna St pump stations, Frederick St and Williams St gravity)

This modelling has also taken into account the additional capacity required to service greenfield developments that are projected to come on-stream in the next 15 years, as part of the overall assessment of existing and future growth impacts. Known residential greenfield areas that are included in the growth modelling include Flaxmere, the Heretaunga/Tamatea settlement Trust (HTST) block adjacent to Flaxmere, the Lyndhurst extension, Kaiapo Rd and an intensified Howard Street scenario. Servicing of these areas is influenced by the catchments that they will discharge into as follows:

- Flaxmere – Wilson Rd pump station
- HTST Block – IAF Expressway Pump Station and Rising Main (new infrastructure)
- Lyndhurst Extn – IAF Gravity Pipeline to Coventry Rd (new infrastructure)
- Kaiapo Rd – Oliphant Rd, Huia St pump station, Maraekakaho Rd
- Howard St – Park Rd North pump station

Macro Level Solutions

The mature state of the existing wastewater network means that we are at the limit of continuing to cater for growth through extensions and upgrades alone. At this stage the ongoing effort, expense and disruption to “tweak around the edges” is no longer viable and the cost to rebuild the network exceeds the cost to build new infrastructure.

New infrastructure provides an opportunity to significantly increase network capacity and at the same time reduces the need to upsize existing assets that are otherwise operating effectively and in sound condition. This new approach also creates opportunities to optimise the location of these new assets, minimise costs, improve operational resilience and relieve existing constraints.

The following plans (3.1.2 & 3.1.3) provide a general traffic light summary of the Hastings, Flaxmere and Havelock North wastewater systems. Red depicts areas that are constrained with little or no capacity for growth, orange as moderately constrained but able to support some level of growth, and green representing areas that are not constrained and have sufficient capacity to facilitate medium density intensification.

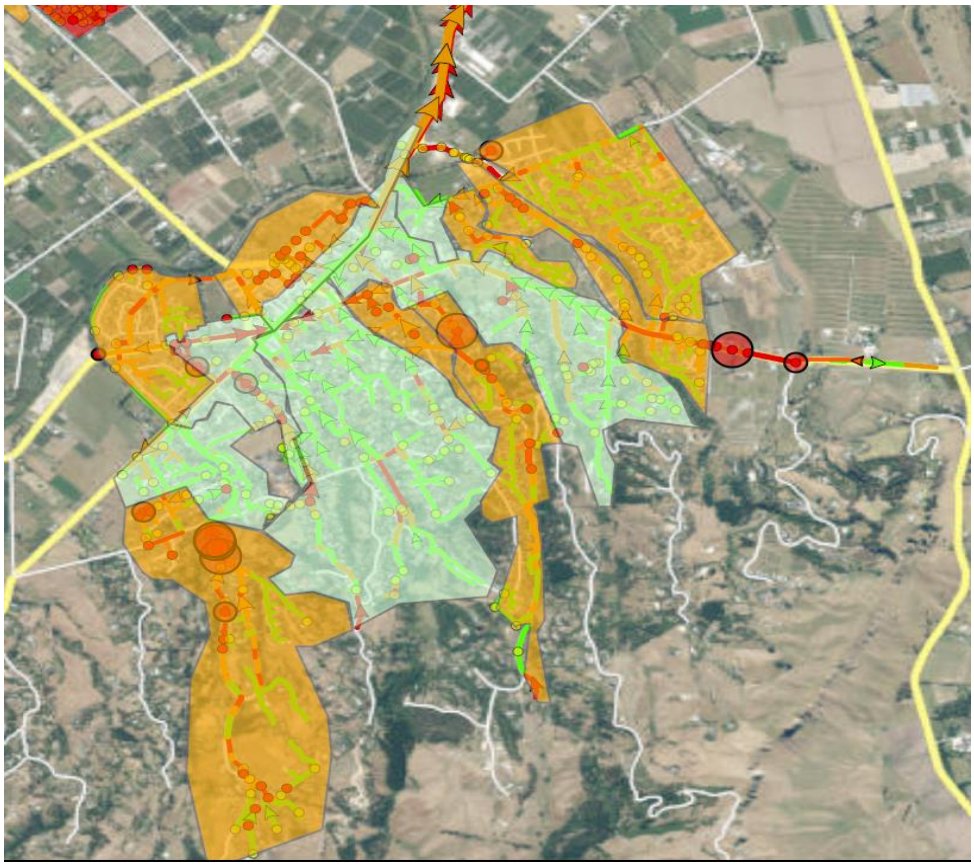
These plans also show where proposed new bulk infrastructure works in Hastings are to be constructed in the next 2 years (2023 and 2024) as part of the Infrastructure Acceleration Fund (IAF) works to prepare for future growth. This government support package has been set up to help fund new and upgraded “enabling” infrastructure such as transport, three waters and flood management infrastructure to improve housing outcomes in areas of need.

These new pipes and pump station(s) will divert wastewater flows away from existing infrastructure and directly downstream to the large domestic trunk sewer thereby bypassing some of the more congested parts of the system and creating new capacity at the same time. Local area new works and upgrades will still be necessary to join up to the new bulk infrastructure but the extent of these works will be substantially reduced. An initial forward works programme has been prepared (through an amendment to the LTP) to ensure that all of the growth related works are timed to align with known greenfield and medium density zones. The LTP amendment is attached as Appendix A.

Figure 3.1.2 – Hastings and Flaxmere Wastewater Constraints

The inner city living precinct is highlighted as yellow in the plan to distinguish it from residential areas however, as this area straddles a number of wastewater catchments, it has not as yet been categorised. Further detailed analysis is commencing to understand where constraints may exist and what level of density and occupation there may be in the future.

Figure 3.1.3 – Havelock North Wastewater Constraints



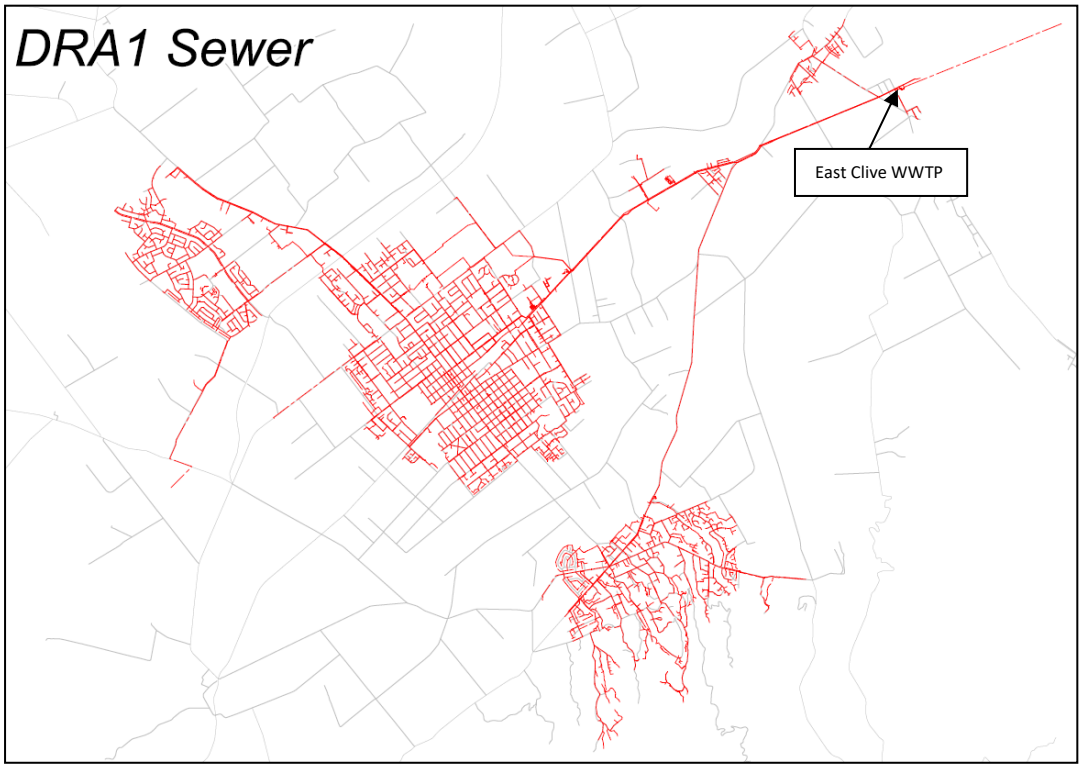
3.2. Overview of the Wastewater Service

The Hastings District Council currently supplies domestic wastewater services to approximately 70% of the district's population but primarily limited to the urban areas of Flaxmere, Hastings and Havelock North along with the small communities of Whakatu and Clive. A small domestic wastewater system services the largely holiday population at Waipatiki Beach and is managed by HDC however Waipatiki is excluded from this assessment.

The Hastings wastewater system includes:

- The integrated domestic wastewater system servicing the communities of Hastings, Flaxmere, Havelock North, Whakatu and Clive
- The separated industrial wastewater network which collects trade waste from industries in Omahu Rd

All domestic and industrial wastewater is conveyed to the wastewater treatment plant in East Clive where each flow train receives treatment prior to recombining before disposal into Hawke Bay. All domestic wastewater is screened to remove the gross solids component then passes through a Biological Trickling Filter (BTF) where high quality treatment is provided. The separated industrial wastewater passes through a milli-screen and then, along with the treated domestic effluent, is discharged via the long 2.75km ocean outfall into Hawke Bay.



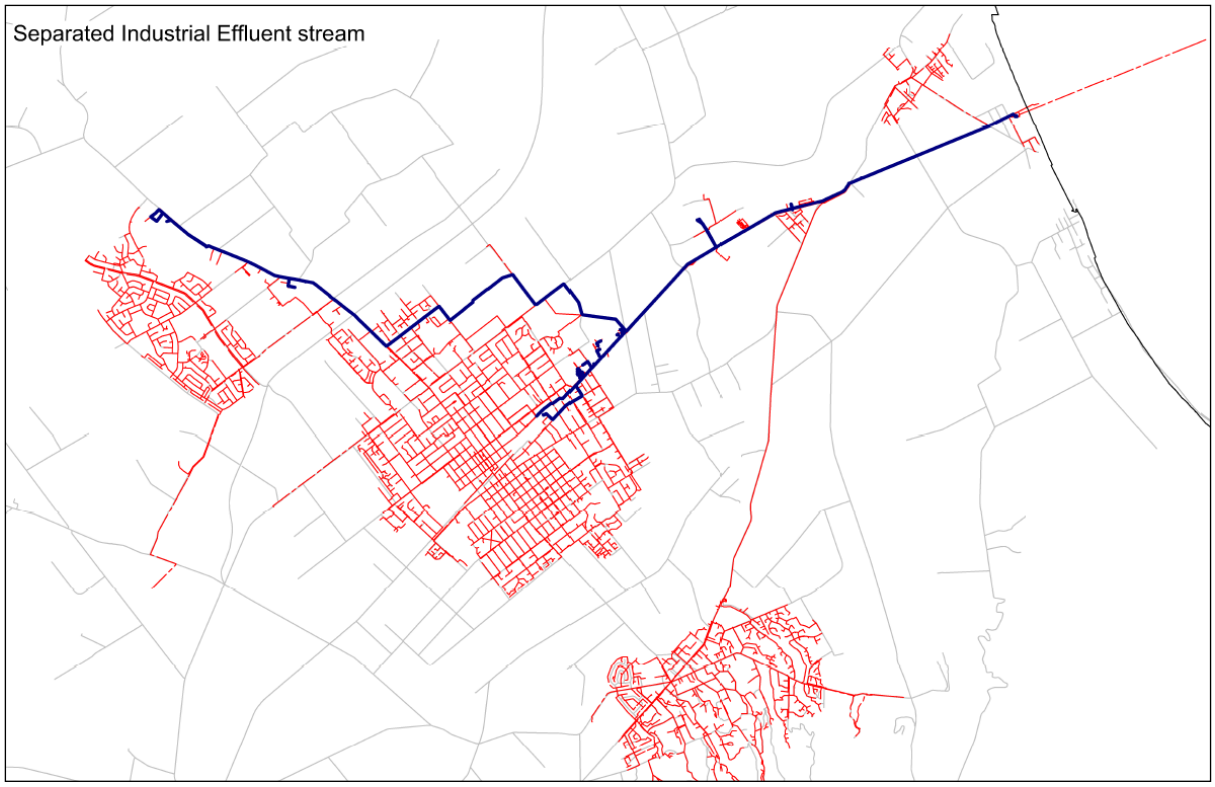


Figure 3.2.1 – HDC Domestic & Separated Industrial Effluent Network

3.3. East Clive Wastewater Treatment Plant

The Hastings treatment plant at East Clive receives all of the domestic wastewater and non-separable trade waste, industrial trade waste and septic tank waste into the plant. The domestic waste stream makes up approximately 50% of the total average annual flows. On average the industrial flow component makes up approximately 50% of the total wastewater flow however during the peak processing season (February to May) the proportion of industrial flow into the treatment plant increases by as much as 400%.

The wastewater facility has a consent which allows a maximum daily discharge of 2,800 litres/second. The average dry weather flow is approximately 1,100 litres/second and peak flows are approximately 2,000 litres/second. There is adequate capacity for current and future growth within the consented limits.

3.4. Trade Waste Disposal

Council's Hastings District Council Consolidated Bylaw 2021 Chapter 7 regulates the discharge of Trade Waste from commercial and industrial premises. As well as rules regulating the amount and characteristics of wastewater it also contains provisions to ensure that the costs to collect, treat and dispose of trade waste are recovered fairly and equitably amongst users.

Trade Waste is discharged into either the domestic (sanitary waste) network or the separated trade waste reticulation where that is available. Waste discharged into the domestic network must be conveyed and treated with that flow, via the BTF treatment plant and the bylaw limits these discharges (flow and characteristics) to ensure they do not compromise capacity or the treatment process. Waste discharged into the separated trade waste system has different requirements and may require onsite treatment prior to discharge.

3.5. Why we provide a Wastewater Service

Council's key strategic objectives are based on legislative requirements and community outcomes. In particular *Section 10 of the Local Government Act* defines the purpose of Local Government and Council has identified the wastewater activity as an essential service that contributes towards the Council objective to provide healthy drinking water and sanitary services.

Council provides wastewater facilities for the following reasons:

- Public Health and Safety – The provision of wastewater activity promotes health and wellbeing of the community by ensuring all wastewater systems owned and operated by the Council provide adequate and satisfactory collection, treatment and disposal of wastewater according to current legislation at an affordable cost
- Environmental – The provision of wastewater activity enables properly treated wastewater discharges to the environment and thereby promoting the protection of the environment

The Level of Service and performance framework includes the following:

- Wastewater system performance measures that ensure that the system safely collects, conveys, and treats our domestic and trade waste for discharge into Hawke Bay
- Resource consent compliance to ensure the environment is protected
- Reliability and fault resolution measures that help ensure availability of the service

Council's current Engineering Code of Practice (ECoP) together with the Land Development and Subdivision Infrastructure Standard NZS 4404:2010, defines wastewater parameters to calculate demand from a typical household equivalent for new residential and industrial areas. Anecdotally, a figure of 0.5 litres/sec/hectare was used as a level of service (LoS) proxy for network demand which in its day was representative of a 750m2 section. This has been useful to provide an indication of overall wastewater volumes for planning and growth purposes representing a density of 12-15 household equivalents per hectare.

The rate of development (infill and new subdivision) has accelerated over the last 20+ years and lot sizes are on average closer to 350m2. Wastewater demand is now well above historic values and further intensification (medium density housing and an inner city living precinct) will necessitate a review of the LoS in the ECoP to ensure it reflects future anticipated demand in conjunction with monitoring of network performance to identify and plan for upgrades to maintain operational capacity

Where development exceeds the level of service, consideration needs to be given to whether:

- high density infill should continue to be permitted anywhere in the residential zone and services upgraded to match the anticipated demand
- higher density development is limited to particular areas where capacity is available
- development is capped at a density that can be serviced by existing infrastructure based on detailed modelling to determine actual demand and available capacity

3.6. Demand Management

As noted in the introduction, higher density development is under consideration for Hastings, Flaxmere and Havelock North areas. The wastewater network will likely be a constraint to growth in many areas. Urban development, in particular infill, is imposing demands on the wastewater

infrastructure that cannot always be met beyond the site of the development or in the timeframes desired by the developer.

A more structured and coordinated approach is required between developers and Council to ensure that where infrastructure constraints are identified, there is a future plan for works to increase capacity and the timeframes for implementation are clearly established. The management and coordination of development alongside planned infrastructure upgrades is therefore necessary for the Medium Density Strategy [21] to be successfully implemented.

3.7. Wastewater Network Planning and Modelling

MWH (now Stantec) built and calibrated a hydraulic model of the HDC sewer network during two phases between 2014 and 2016. Phase 1 of calibration was completed in 2015 based on data collected in 2014. During this phase the model was calibrated at trunk level, where reasonably high confidence in model predictions for the performance of the trunk sewers was achieved, according to the report.

Network performance assessment based on the initial calibration has revealed performance issues in upstream catchments. A decision was made to carry out a Phase 2 flow monitoring and calibration, which focussed on the upstream catchments with identified problems. Phase 2 calibration was completed in 2016 based on data collected in the same year.

In 2019, a review was undertaken as part of a sewer flow monitoring and model enhancement programme which found that:

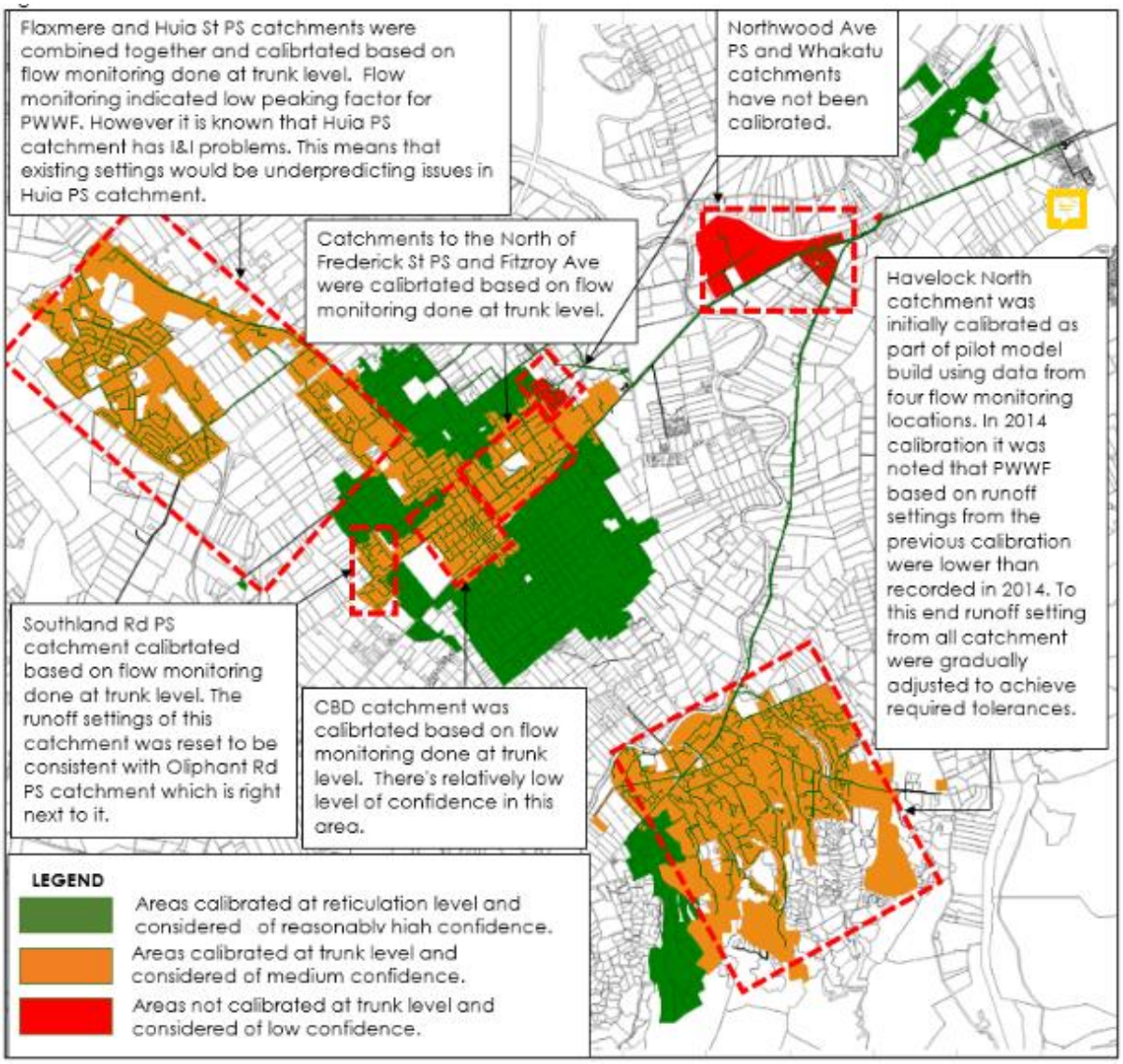
> *The current model has incorporated network calibration, further network upgrades, and network assessments as requested by HDC. Catchment calibration has been undertaken for both the domestic sewerage and the trade system. No calibration of flows arriving at the WwTP has been undertaken by either of the previous calibration phases. The model does not attempt to model sewer quality. (pg 2).* [22]

Figure 3.8.1 provides a summary of the Hastings, Flaxmere and Havelock North wastewater network model state after the phase 1 & 2 calibration work.

[21] Plan Change 5

[22] HDC Existing WW Model Review Report (Stantec 2019)

Figure 3.8.1 - Calibration confidence for each modelled area after Phase 1 and 2 calibration is represented below.



The following issues should be noted by all users of the Hastings Wastewater Network model:

Model Type - the Hastings Wastewater Network Model is a Type 1 Simplified or Strategic Model at trunk level and Type 2 Planning Model in discreet upstream parts of the catchment.

Model Confidence - The model has been calibrated at over 32 sites for a mix of flow, velocity and depth over two different periods. Users of the model must familiarise themselves with the degree of calibration achieved at the calibration sites local to the points of interest and determine the model accuracy regarding flow and depth. Report 'Hastings Sewer Network Model Development and Calibration Report' submitted by MWH in August 2015 and 'Hastings Sewer Network Model Phase 2 Calibration Report' submitted by Stantec in December 2017 identified modelling issues as below:

- Some areas of the calibration did not observe suitable rainfall depths for appropriate calibration and should be treated with caution
- The model has not been validated against long term flow data (e.g. at the WwTP) and may not represent seasonal wetness or ground water variations that could have a significant effect on the model predicted peak flows and volumes

- The model does not represent the changes to dry weather flows during key public and school holidays
- The trade waste contributions in Hastings can vary significantly due to fruit picking and canning seasons and this is not represented in the model
- The fruit picking season may also result in a significant increase in temporary residents in Hastings and surrounds which may affect DWF peak flows and volumes.

Further reviews are ongoing to determine the next tranche of work that will enhance the existing model, improve its accuracy (through calibration and data validation programmes) and to ensure that the model is maintained in an appropriate state for predictive analysis.

3.8. Overflows

Wastewater overflows occur when untreated wastewater enters public or private property, waterways and the sea, and can lead to negative effects on public health, the environment and social and cultural values. The causes for wastewater network overflows are complex, ranging from:

– Connections: Illegal private stormwater connections to sewage networks

– Pipes: Ageing pipes that receive subsoil inflows via leaky joints or cracked pipelines

– Blockages: Flushing of inappropriate material into the system that causes blockages

– Designed overflow: A significant majority of wastewater networks are designed to overflow in particular circumstances; primarily when rainwater inundates the network.

Complete elimination of wastewater overflows is not affordable for New Zealand in the near term. However, the frequency of wastewater overflows could be reduced significantly over time for many communities, through a better understanding of network performance, upgrades to infrastructure and improvements to operations.

In the long-term, complete elimination could become an attainable aspiration for some communities. Community expectations about overflows are changing, with many communities now expressing a preference for little or no discharge of untreated wastewater into freshwater or onto recreational beaches. For Māori, there is widespread abhorrence to the discharge of wastewater to natural waterways, both for cultural and spiritual reasons, and due to the risks posed to mahinga kai (food gathering place, activity of harvesting food). [23]

3.9. Inflow and Infiltration (I&I)

As wastewater network systems age, the infrastructure tends to deteriorate and in turn the likelihood that I&I will enter the sewer generally increases. Extraneous water from infiltration/inflow sources reduces the capacity and capability of sewer systems and treatment facilities to transport and treat domestic and industrial wastewater. Inflow and infiltration is the process of liquids other than wastewater, such as stormwater and groundwater, entering the wastewater system. I&I is a complex issue requiring multi-disciplinary strategies to firstly understand their occurrence and then in addressing their impacts on wastewater networks. Furthermore, it has historically been difficult to accurately predict the amount of I&I reduction corresponding to a certain level of system rehabilitation.

Overflows are a combination of the base flow from the community and the addition of rain water entering either directly through illegal connections (e.g. downpipes into gully traps), through ponding that then enters into the system or indirectly from groundwater entering through cracks, joints and

[23] ADDRESSING WET WEATHER WASTEWATER NETWORK OVERFLOW PERFORMANCE. WATER NEW ZEALAND Good Practice Guide. Pg 1.

other pipe failures. Wastewater system design includes an allowance of 4 x ADWF to cater for stormwater inflows and infiltration (I&I).

Operational data and modelling is used to determine how the network is performing and in particular to predict where I&I is adversely affecting performance and increasing the risk of wastewater overflows.

An inflow and infiltration study was conducted in 2016 (Inflow & Infiltration Strategy Parts 1 & 2) [24] to help determine if excessive I&I exists in the Hastings sewer system and to recommend remedial measures. Prior to this study, HDC had ascertained that there are no I&I sources affecting the wastewater discharge at the Wastewater Treatment Plant (WWTP) and three mainland trunk sewers but raised concerns about I&I sources in the reticulation, such as wastewater spills predicated by modelling work and known localised overflows and inflows in the wastewater network. This study included I&I investigations completed to date and investigations planned for the future.

3.10. Other Non-Asset Demand Management Strategies

Demand Management strategies are used as alternatives to the creation of new assets. They are aimed at modifying customer demands to achieve:

- Social, environmental and legislative objectives for Hastings District
- The delivery of cost-effective services
- Defer the need for new assets and optimise the performance/utilisation of the existing assets.

3.11. Summary of Demand Management Methods

The table below summarises the demand management methodologies for wastewater:

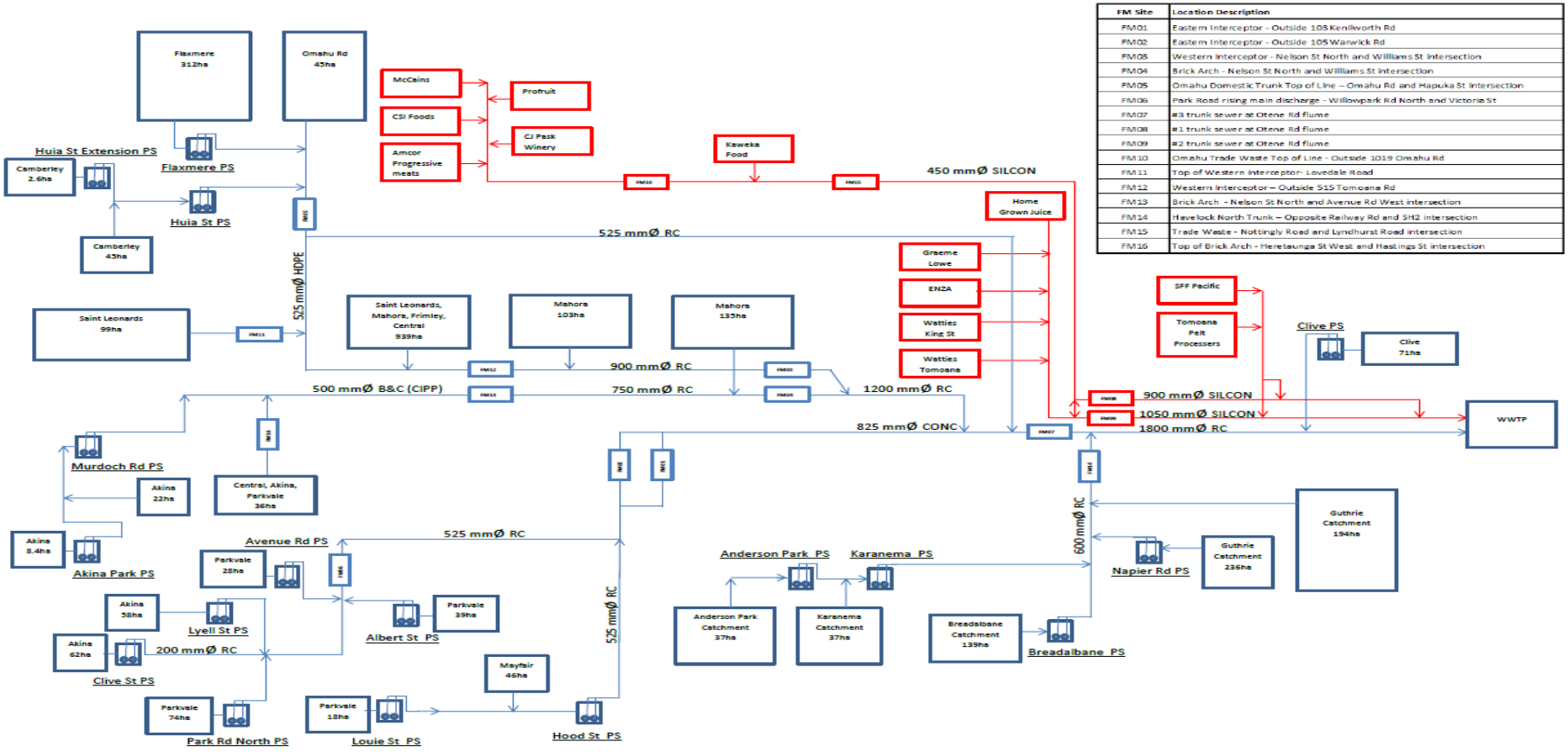
Table – Demand Management Methods

Strategy	Objective/ Description
Operations	Reduce direct stormwater entry into the wastewater reticulation system by detection and control The use of smoke testing and ongoing property inspections programmes will continue to assist in the reduction of direct stormwater entry into the wastewater system thereby reducing overflows in peak wet weather periods and reducing the loadings (and ongoing operations costs) at the treatment plants From international and national studies it is known that a large component of inflow and infiltration does occur on private property. The remedial work on private service lines will be a major cost within the community (for the individual property owners) in the future
Operations	The instigation of an integrated renewals strategy that considers the effects and consequences of: • Reduced ingress of ground water into the reticulated system via a proactive renewals programme that targets the areas most affected by stormwater flooding and infiltration • Use of modelling to ascertain effects and constrains within the systems • Increasing storage capacity at priority pump stations

[24] Infiltration and Inflow Strategy (MWH, Part 1 – April 2016; Part 2 – May 2016)

Strategy	Objective/ Description
Regulation	The use of the District Plan to control the areas in which development can occur and the associated density that is permitted
Consolidated Bylaw	To protect the Councils wastewater reticulation and treatment processes, promotion of waste minimisation, regulation of new and existing connections, setting performance requirements The promotion of on-site pre-treatment for the major industrial contributors
Education	Implementation of Wastewater education programmes aimed at increasing community awareness of the impacts of direct stormwater disposal into the wastewater system
Embargo	Prevent development from occurring where there is no spare capacity available in the existing wastewater system. This is expected to be a temporary measure to allow infrastructure to be installed to meet demand

3.12. Hastings Wastewater Network Schematic



FM Site	Location Description
FM01	Eastern Interceptor - Outside 108 Kenilworth Rd
FM02	Eastern Interceptor - Outside 105 Warwick Rd
FM03	Western Interceptor - Nelson St North and Williams St Intersection
FM04	Brick Arch - Nelson St North and Williams St Intersection
FM05	Omahu Domestic Trunk Top of Line – Omahu Rd and Hapuka St Intersection
FM06	Park Road rising main discharge - Willowpark Rd North and Victoria St
FM07	#3 trunk sewer at Otene Rd flume
FM08	#1 trunk sewer at Otene Rd flume
FM09	#2 trunk sewer at Otene Rd flume
FM10	Omahu Trade Waste Top of Line - Outside 1019 Omahu Rd
FM11	Top of Western Interceptor- Lovedale Road
FM12	Western Interceptor – Outside 515 Tomoana Rd
FM13	Brick Arch - Nelson St North and Avenue Rd West intersection
FM14	Havelock North Trunk – Opposite Railway Rd and SH2 intersection
FM15	Trade Waste - Nottingly Road and Lyndhurst Road intersection
FM16	Top of Brick Arch - Heretaunga St West and Hastings St intersection

3.13. Wastewater Catchment Analysis

This section provides more specific detail at a sub-catchment level and also includes commentary on any potential impacts to the downstream receiving catchment. This information is based on a combination of sources including modelling outputs, reports, data from the GIS system, historic and operational information from staff and contractors.

3.14. Tarbet Street and Flaxmere

The suburb of Flaxmere was established in 1965 when the then Hastings City Council purchased and subdivided over 160ha of land for housing development. At the time the City of Hastings was seeking to deal with population growth and the need to expand onto land within the jurisdiction of the then Hawke's Bay County Council. The County sought to protect the fertile Heretaunga Plains land immediately adjoining the existing city and directed new development to an area of the Plains west of Hastings City onto 'poor quality' gravely soil of little value for livestock farming, cropping or orcharding. Hindsight has shown that this land is in fact immediately adjoining and sharing similar attributes to the famed Gimblet Gravels red wine viticultural area. [25]

Figure 3.15.1 Flaxmere Wastewater Catchments

The Flaxmere wastewater network is the largest of the Hastings wastewater catchments. The network services the Flaxmere community and includes the small Tarbet Street sub-catchment that discharges

[25] STR-24-2-11-531 Strategies & Development Projects - Urban Design - Flaxmere Town Centre - History of Flaxmere Timeline & Case Study by Philip McKay

into Flaxmere Ave opposite Ramsey Cres. Current information shows Flaxmere as having a resident population of approximately 12,000 people.

Wastewater reticulation terminates at the Wilson Road pump station which pumps wastewater via a 375mm diameter rising main into a manhole in Wilson Rd approximately 1.6km downstream towards Omahu Rd.

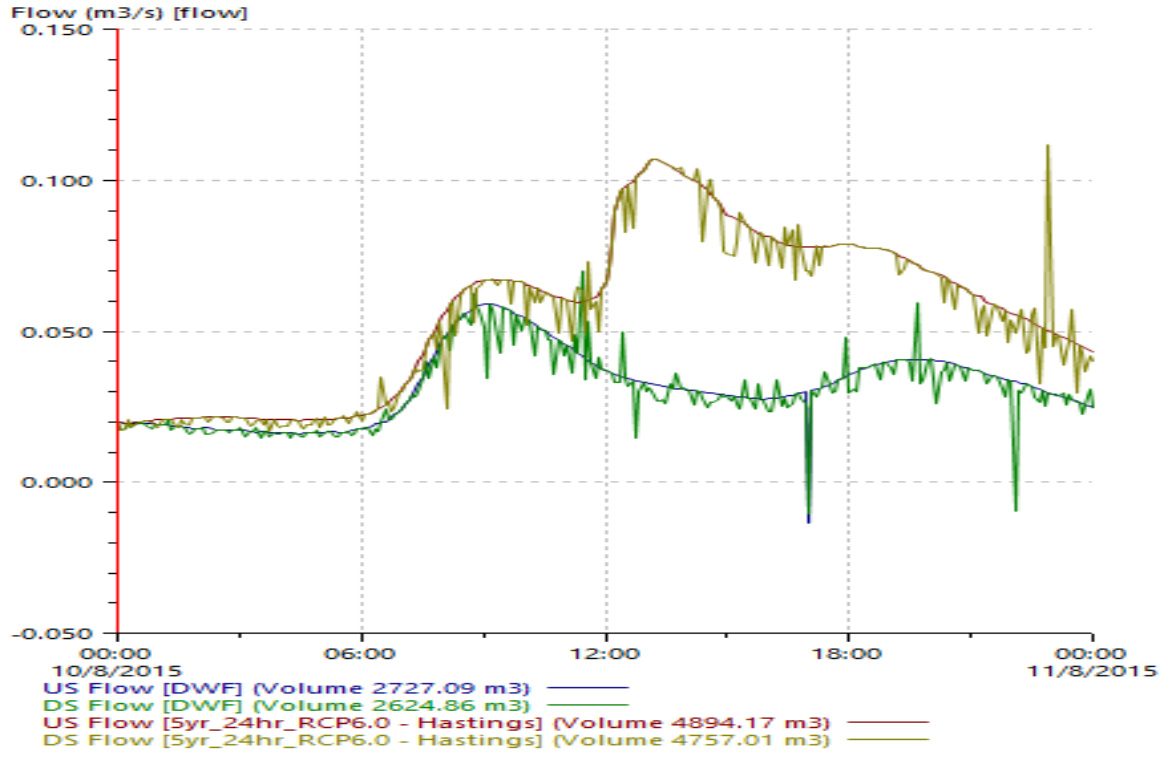
In the last two years, there has been significant development in the Tarbet Street catchment including the Waingākau Housing Project where plans are to build upwards of 120 homes. In addition to this, HDC has undertaken staged development at 244 Flaxmere Drive and developments are underway in the Town Centre and Gum Tree which collectively will yield 300 new homes.

3.15. Network Analysis

The Flaxmere pump station was built in 1965 and was designed for a population of 5,500 people. [26] The original specifications and pumping capacity (91 l/s) are the same today however there has been an increase in pump operating times and wastewater volume due to a much larger population. As a rough guide, the pump station is in operation for around 8 hours per day (derived from SCADA pump run times) which equates to an average dry weather flow (ADWF) of approximately 220 litres/person/day for the 2.6 million cubic metres of wastewater that passes through this pump station every day.

Dynamic modelling of the current dry and wet weather flows (Figure 3.16.1) show that dry weather flows are well within the capacity of the pump station (90 l/s) however wet weather flows result in surcharging in the wet well and local network. Modelling with future growth factored in (Figure 3.16.2) shows how that growth increases base flows and has a detrimental impact on the future operation of the pump station.

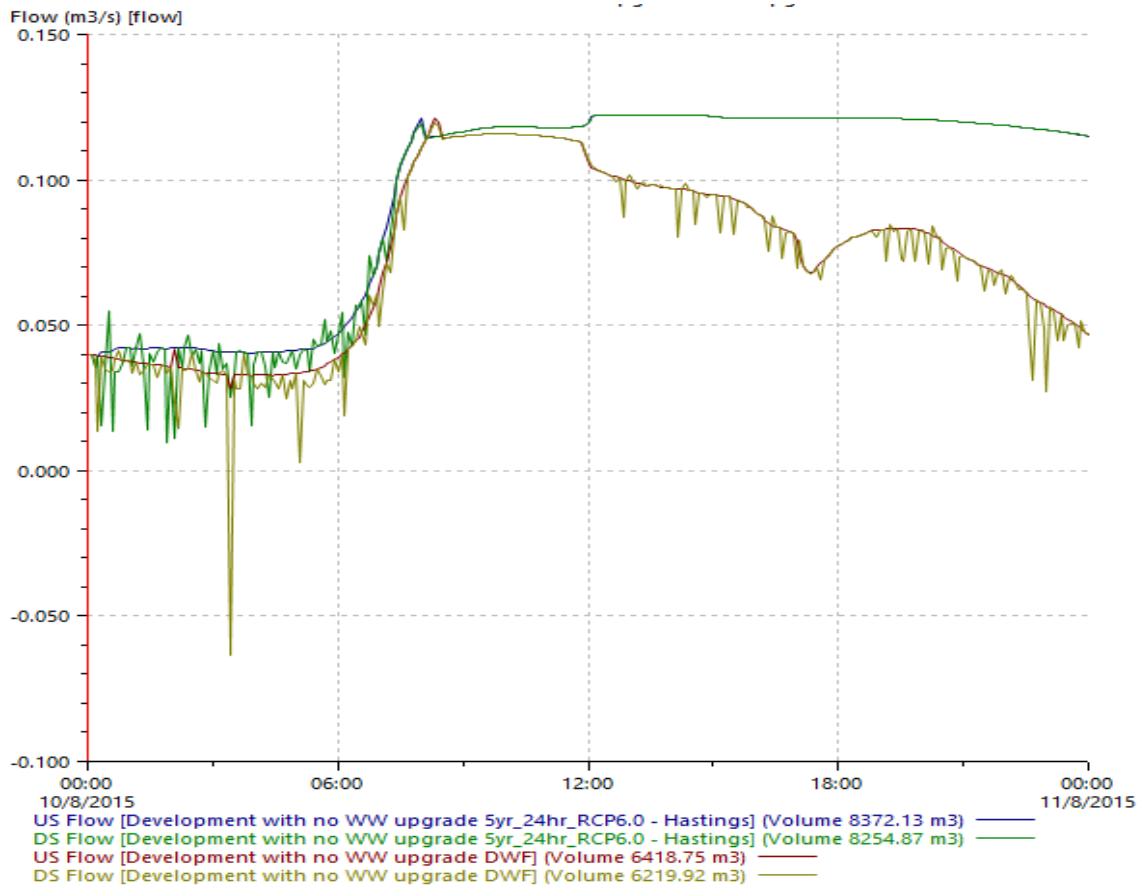
Figure 3.16.1 – Daily Diurnal Flows (Base and 5 Year Rain Event – No Growth)



[26] MAP-3-14-5256

Modelling of the catchment (Figure 3.16.2 below) shows the effects on the network where pipes within Flaxmere are surcharged and overflowing and the pump station is running continuously at peak flows.

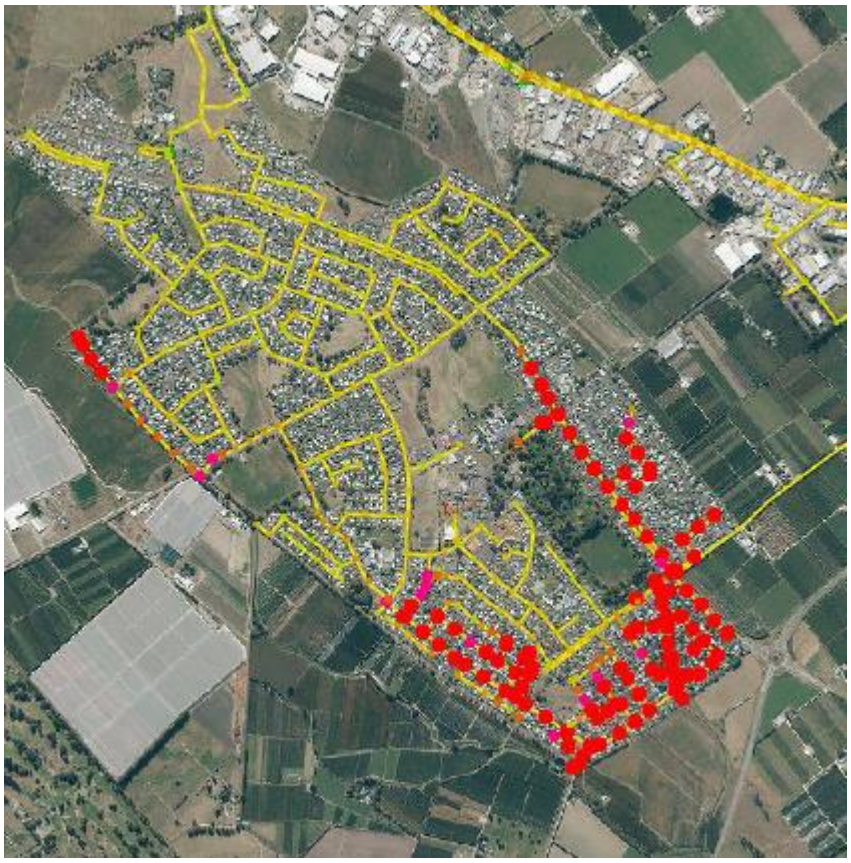
Figure 3.16.2 – – Daily Diurnal Flows (Base and 5 Year Rain Event – With Growth)



Sections of the collector network in Portsmouth Road, Flaxmere Drive, Carnarvon Drive, Peterhead Road, Sunderland Drive and Dundee Drive are operating in surcharged conditions during the 5 year storm with an increased risk of overflows occurring.

Figure 3.16.3 below shows the manhole locations where the system is surcharged and vulnerable to overflows and in particular the immediate areas around Dundee Drive which feeds directly into the wastewater pump station at Wilson Road.

Figure 3.16.3 – Predicted Surcharging – At Risk Manhole overflow locations



Summary

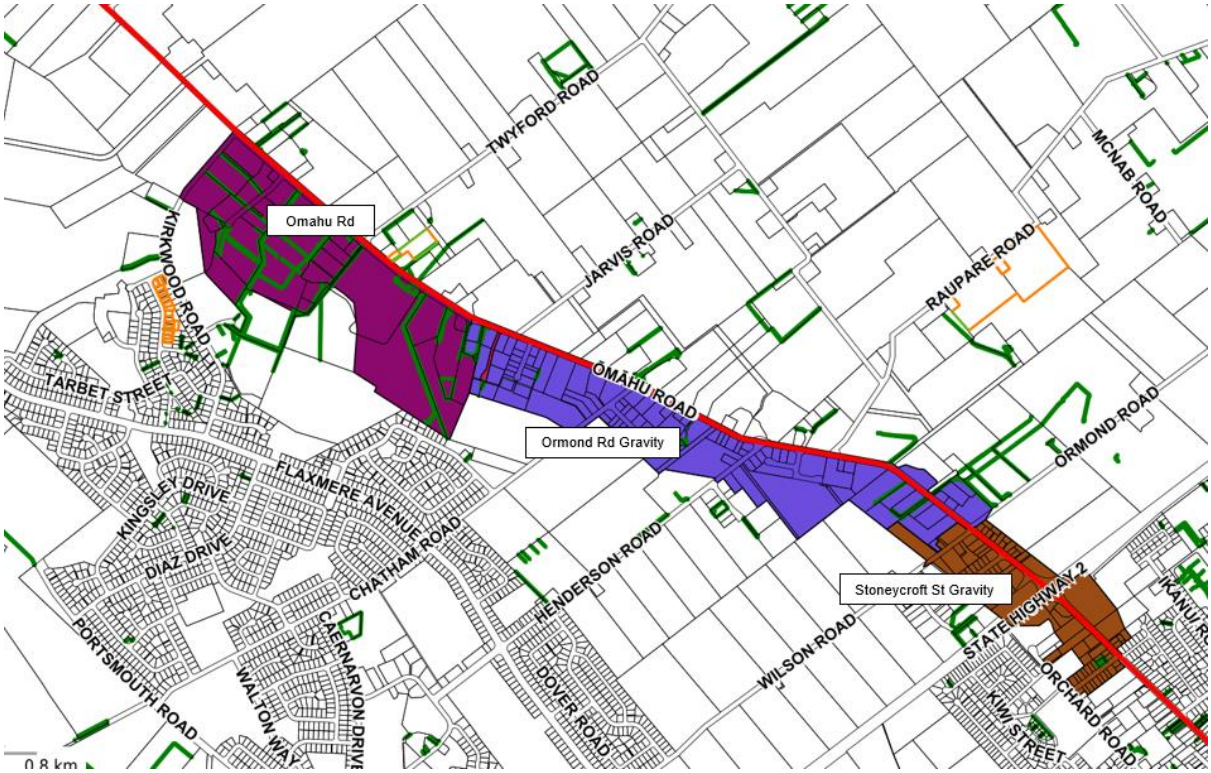
What this analysis confirms is that the Flaxmere wastewater system is currently operating adequately on a day to day basis however there is an increasing risk that additional base flows from growth will increase operational risks in the longer term unless peak pumping capacity can be increased.

The impact of rain derived flows into the reticulation pushes the system to where wastewater overflows are predicted to occur and the pump station can no longer cope with the increase in peak flows. It is also important to state that more severe rain events plus the impacts of climate change will exacerbate a network that is becoming increasingly vulnerable.

Catchment	Current Dry	Current Wet	Growth Dry	Growth Wet
Tarbet St				
Flaxmere				

3.16. Omahu Road Industrial Area, Ormond Road Gravity, Stoney Creek Gravity

The Omahu industrial wastewater catchment sits at the upper end of the Omahu Industrial area in Hastings. It includes a small pump station that is located at the end of James Rochfort Place which receives domestic wastewater from nearby industries with the balance of discharges via gravity to Omahu Road. The recent Omahu North Industrial Area includes two new wastewater systems, one discharging to Omahu Rd via a pump station and a larger network and pump station discharging to the Ormond Road gravity catchment. There are no known capacity issues in the Omahu catchment.



The Ormond Rd and Stoneycroft St catchments receive wastewater from Omahu industrial and the Flaxmere catchment and these flows are then conveyed into the downstream Maraekakaho Rd catchment. Both catchments are thin ribbon areas to Omahu Rd where there are predominantly industrial and commercial premises with small pockets of residential housing and little scope for large scale growth.

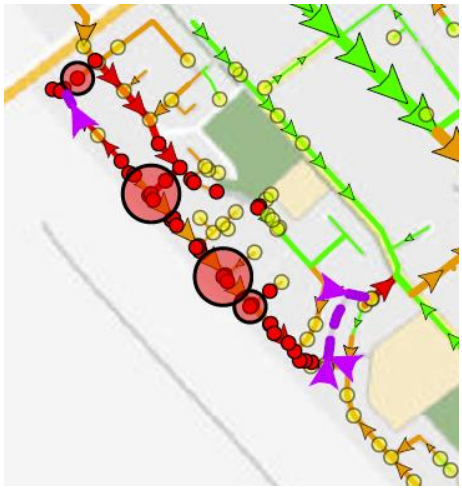
The domestic trunk main downstream of Wilson Rd (where Flaxmere discharges into) is a 525mm diameter concrete pipe that is silicon enriched to reduce the potential for corrosion from hydrogen sulphide and sits alongside the 450mm dia. separated industrial trunk main that is also silicon enriched. There are no known capacity issues apart from a small section of main downstream of the Flaxmere rising main discharge in Wilson Rd which modelling shows to be constrained.

Catchment	Current Dry	Current Wet	Growth Dry	Growth Wet
Omahu Rd				
Ormond Rd				
Stoney Creek Rd				

3.17. Huia St Extension, Huia St, Camberley

The Huia St catchment straddles parts of the industrial area (Stevens Place and Manchester Street) and services the Camberley residential area. Within Camberley there is a small lift station (Huia Street Extension) that services a low lying pocket of residential housing and the combined discharge is pumped to Orchard Rd where it gravitates to the Maraekakaho gravity system via Canning Street and into Omahu Rd.

There are known areas within Camberley where the reticulation is under capacity in the 5 year rain event. The entire area is reliant on pumping and capacity issues arise at the pump stations in quite moderate rain events. There is potential for housing intensification in this area which could see the resident population increase requiring capacity increases which could also resolve known problems.



Alternative solutions may be influenced by servicing options for intended greenfield residential development in the Kaiapo area which is immediately adjacent to and downslope of Camberley.

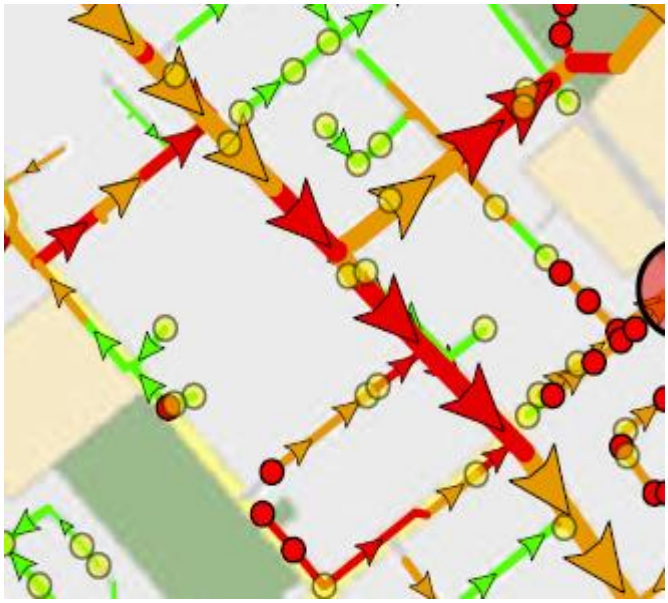
Catchment	Current Dry	Current Wet	Growth Dry	Growth Wet
Huia St Extension				
Huia St				

3.18. Maraekakaho Road Gravity

The Maraekakaho catchment sits strategically at the western entry into the Hastings wastewater system where it receives wastewater from all of the western catchments and Camberley including the separated industrial trade waste sewer trunk main from the Omahu Industrial area.

The catchment straddles the area between Omahu Rd and Orchard Rd which is primarily commercial in nature with small pockets of residential housing. It also receives all wastewater from the Hastings Hospital across a number of connections to the streets surrounding the site. The top end of the Western Interceptor starts at Hapuku St and has historically shared wastewater flows from Omahu Rd. In the last decade or so, this main has been valved off meaning that all wastewater continues down Omahu Road and into Heretaunga St.

There are few constraints and the catchment itself is probably unlikely to experience significant changes as a result of urban residential growth. However, the hospital site is being considered for redevelopment and upgrading which could concentrate health services in the area and increase the number of people visiting daily for health care needs.



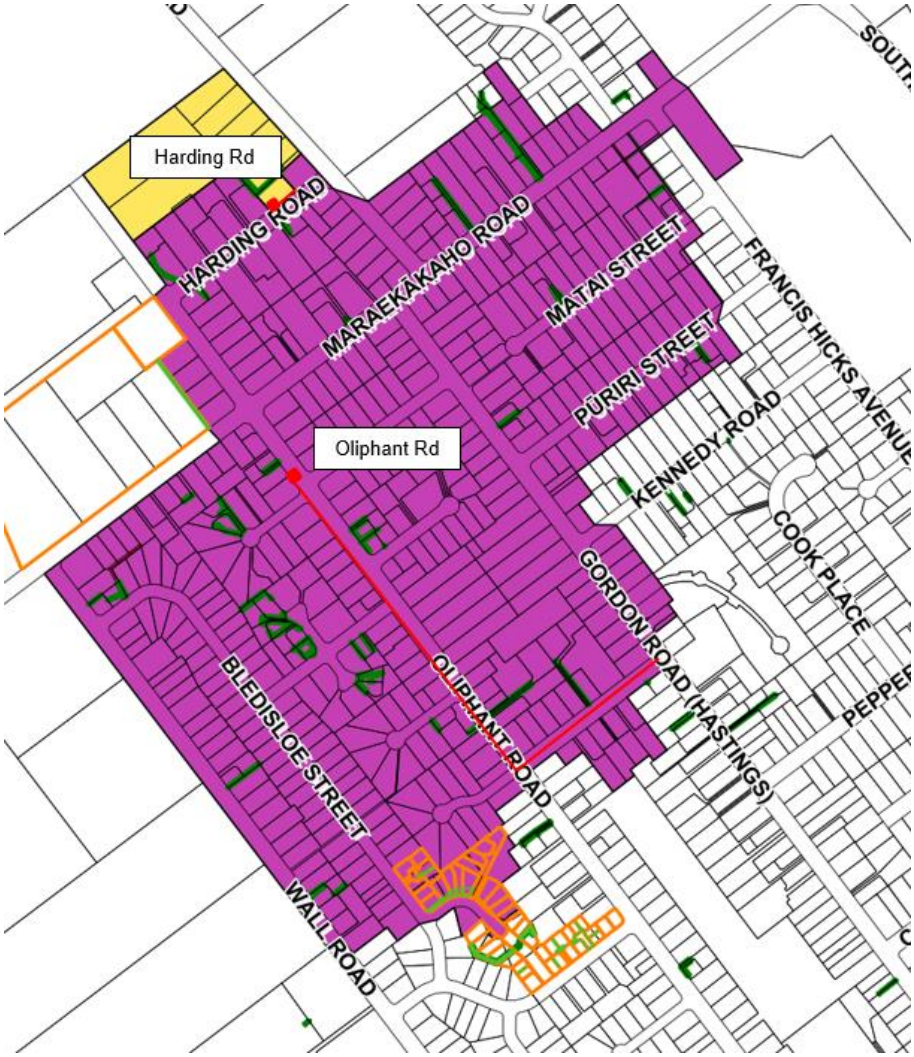
Modelling shows that the sewer main in Canning Rd experiences moderate surcharging in the 5 year rain event and this will be exacerbated by increased flows from Camberley and the hospital. Modelling also confirms surcharging in the section of sewer main between Hapuku St and Pakowhai Rd where the 600mm diameter trunk sewer and an associated 375mm wastewater main converge into a 560mm diameter main which then discharges into the Townshend St gravity system in Heretaunga St West. This will be exacerbated by growth primarily in Flaxmere and with the additional flows from the proposed HTST development at Irongate/York.

Catchment	Current Dry	Current Wet	Growth Dry	Growth Wet
Maraekakaho				

3.19. Harding Road, Oliphant Road

Harding Road is a very small catchment that services 8 properties via a small pump station that discharges into the Oliphant Road catchment. There are no current or future capacity issues anticipated and it is anticipated that this catchment will be redirected to the future Kaiapo wastewater system. However, as Harding Road discharges into the Oliphant Rd catchment, any growth will contribute to existing problems and hence is downgraded to reflect this.

The Oliphant Rd catchment is sizeable and includes areas within St Leonard and Raureka. The catchment drains to the Oliphant Rd pump station which is located in Oliphant Rd opposite Wentworth St. The sewer rising main (200mm diameter PVC main) heads along Oliphant Rd, into Florence St and discharges into a manhole in Gordon Rd which then feeds into the Pepper St main.

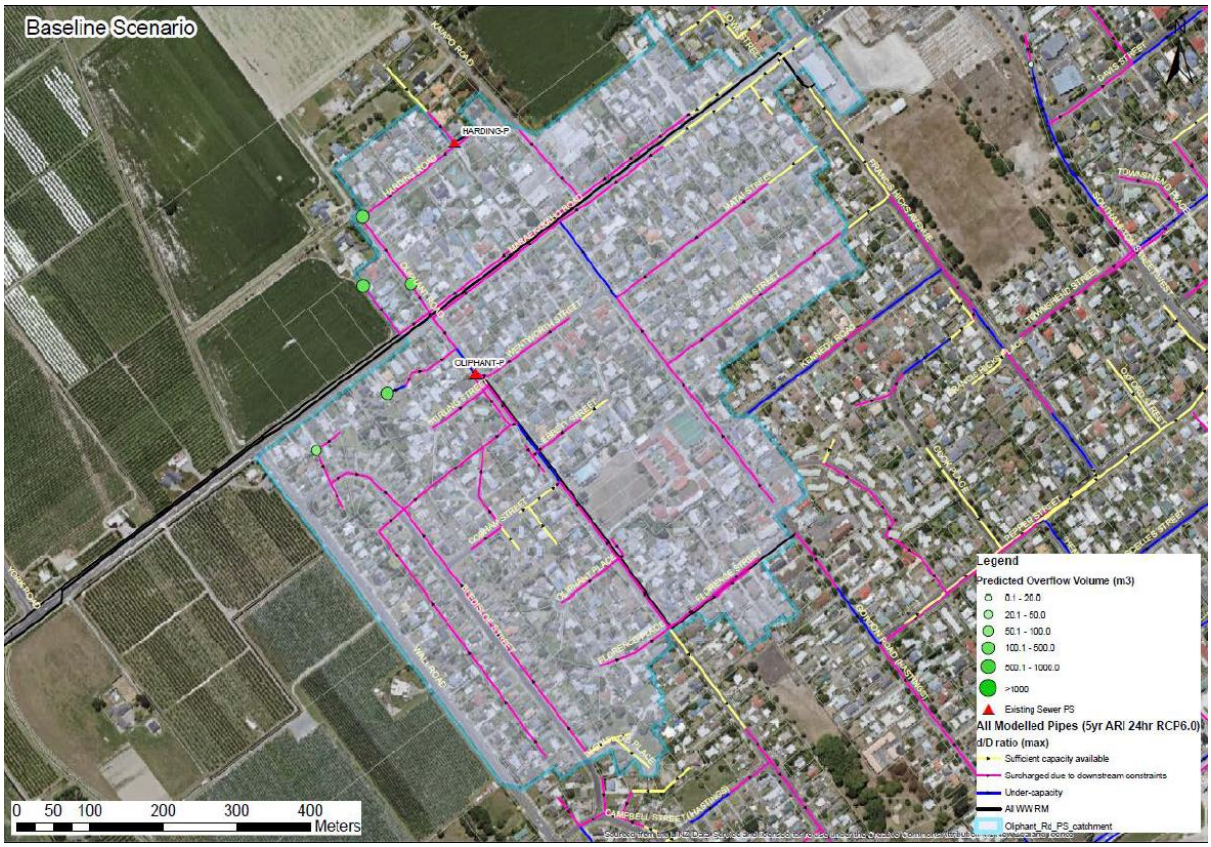


The Oliphant Road catchment performance was assessed in May 2021 due to an application in the area proposing to construct 90 new residential units. This modelling report (WAT-14-35-21-178) confirms that the catchment is heavily constrained both in the reticulation and at the pump station.

The model indicates that the network fails to fully contain the flow within the network during wet weather event largely due to under-capacity of Oliphant Road Pumping Station and some under-capacity in the gravity network. The existing system does not achieve the required level of service as per HDC's ECoP. [27]

[27] WAT-14-35-21-178 #1110 Oliphant Road Development Wastewater Options Assessment Report (Stantec - May 2021) page 7

Figure 3.20.1- Baseline Scenario showing performance of existing system within Oliphant Road PS catchment



(Source: Figure 1, Appendix WAT-14-35-21-178)

The pump station capacity limitations cause surcharging in pipes immediately adjacent to the pump station but also contribute to effects within the Wall St/ Bledisloe Rd reticulation due to the flat and low lying nature of pipes in this area. As noted in the report, the risk of overflows is high and upgrades are required to resolve these issues regardless of any growth implications that will simply add to the scale of work required.

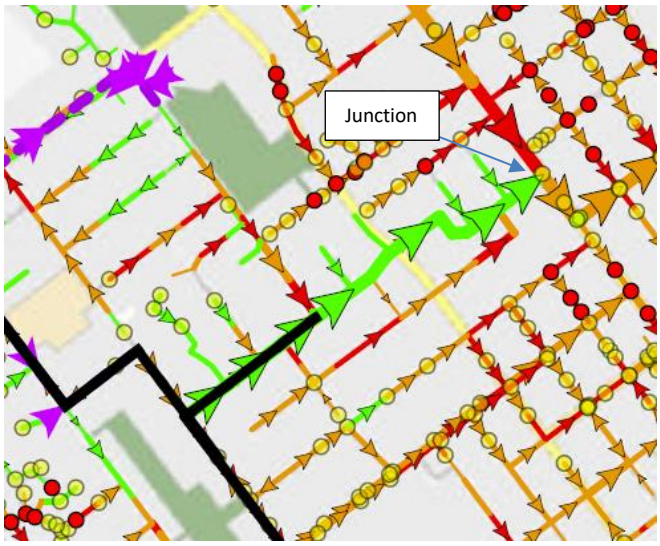
There is the potential to consider a joined up solution when the Kaiapo greenfield development services are developed as this area alone will contribute significant additional wastewater. It is however increasingly unlikely that an upgraded Oliphant Rd catchment will be able to cope with Kaiapo due to further limitations that exist downstream of Oliphant Rd.

Catchment	Current Dry	Current Wet	Growth Dry	Growth Wet
Harding Rd				
Oliphant Rd				

3.20. Pepper Street Gravity

The Pepper Street gravity catchment links between Oliphant Road and Townshend Street and services the immediate residential area of St Leonards. Conveyance of wastewater is via a 750mm diameter reinforced concrete main and modelling confirms that there is sufficient spare capacity to cater for urban intensification within this catchment area plus the surrounding Oliphant Road and Southland Road catchments.

Modelling indicates that even under wet weather conditions, this main is not surcharged. Further analysis also confirms that the impact of upgrades to the Oliphant Road pump station and input from the Southland Road catchment (including intensification) could be catered for via the Pepper Street main. The issue of capacity then moves to the Townshend Street gravity catchment where this flow, coupled with the substantive flows from Omahu Road (via Heretaunga St) become apparent. The consequence of pushing more wastewater into a constrained network is highlighted in this situation requiring additional work downstream to realise the capacity that is available within the Pepper Street catchment.



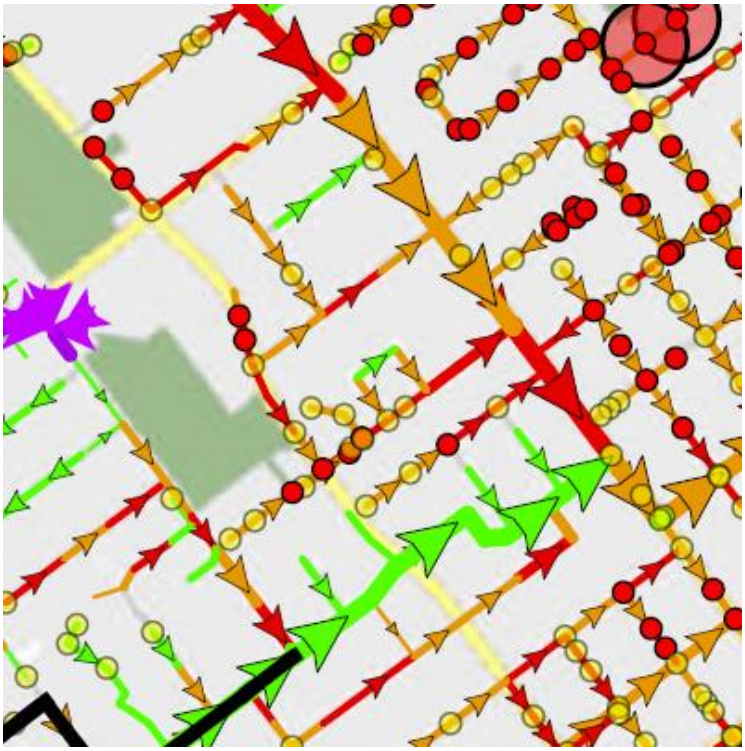
At the junction of the Pepper St and Heretaunga St mains, surcharging can occur with an increase in the potential for overflows. While this constraint does not impact on the Pepper St main and the catchments above, consideration of the overall network effects are still required to ensure that upgrades and approvals for substantive intensification do not create unacceptable conditions downstream. The catchment ranking therefore reflects this.

Catchment	Current Dry	Current Wet	Growth Dry	Growth Wet
Pepper St				

3.21. Townshend Street Gravity

The Townshend St catchment collects wastewater from the Stortford Lodge commercial strip and residential areas into the Heretaunga Street trunk sewer main. This trunk sewer also conveys all of the upstream flows from Omahu Road and above into the downstream Tōmoana Road gravity catchment. This main trunk sewer upsizes from a 560mm diameter main to a 900mm diameter main at Lovedale Rd where the Pepper Street (and above) catchments discharge at this location and just prior to entering the Tōmoana gravity catchment.

Modelling shows that the Heretaunga Street trunk sewer immediately upstream of the Pepper Street inflow, operates in a surcharged state suggesting that there is a capacity and/or head loss issue at this major junction. This also affects the majority of the local reticulation where pipes connect into the Heretaunga Street main. The modelling also indicates that there may be several streets where local constraints exist and are exacerbated by growth.



The adjacent modelling plan shows the surcharged state of the reticulation in this area. This modelling is based on the 5 year rain event and includes a component of future growth in the analysis. The future state model also assumes that the Western Interceptor (WI) situated upstream at Hapuku St is open and taking a proportion of flow from the western catchments, in particular Flaxmere.

With the Western Interceptor isolated (the normal operational state), the effects in Heretaunga St and in the local network will be greater with the potential for overflows to occur. Further analysis will be required to optimise the future network arrangement once the final growth plan has been finalised. In the interim it is assumed that the WI will remain closed as the model shows that this main is also surcharged if it receives wastewater from Omahu Road.

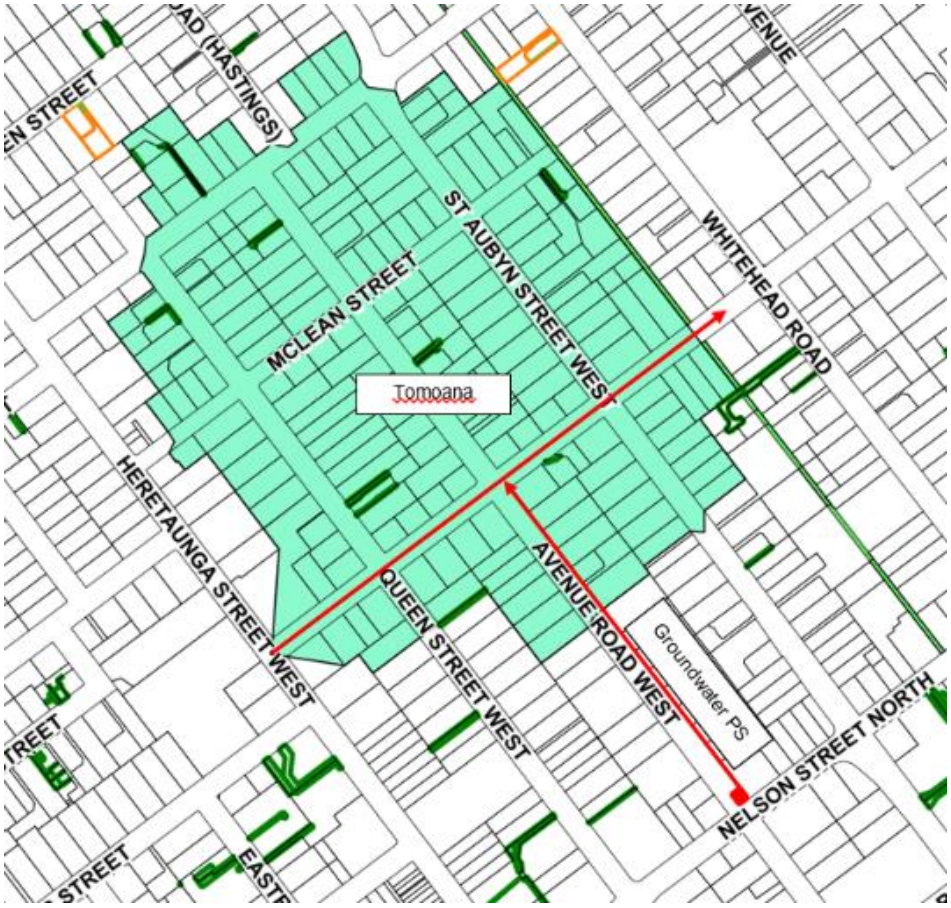
The Townshend Street catchment is where flows from the western most catchments (Flaxmere, Omahu, Camberley) combine with flows from Stortford Lodge. The lack of capacity in the Heretaunga Street main (in the 5 year rain event) is exacerbated by growth and this impacts the local network which is also surcharged. This constraint has implications for the upstream catchments where increased flows from growth will create a cascade effect downstream and in the Townshend Street catchment.

Catchment	Current Dry	Current Wet	Growth Dry	Growth Wet
Townshend St				

3.22. Tōmoana Road Gravity Catchment

The Tōmoana catchment is a relatively small cluster of streets that drain to the 900mm diameter trunk sewer situated in Tōmoana Road. This trunk sewer carries a substantial proportion of wastewater from the western and southern catchments as it traverses to the Brick Arch interceptor in Nelson Street

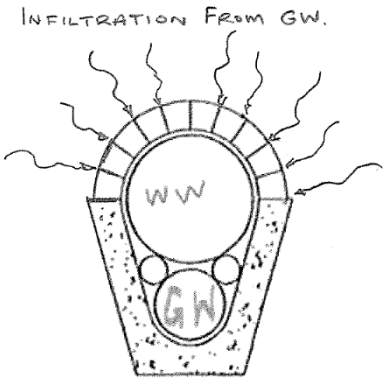
North. Modelling shows that many of the streets are impacted to a degree by surcharging in the trunk sewer and relatively flat grades within the street reticulation during a 5 year rain event.



3.23. Groundwater Discharge

A controlled groundwater discharge enters the 900mm diameter trunk sewer in Tōmoana Road from a pump station located on the intersection of Avenue Street West and Nelson Road North. This groundwater is collected from the Heretaunga Street section of the Brick Arch via a separate 225mm diameter PVC pipe.

Groundwater separation was instigated in 2001 as part of the sewer rehabilitation works on the Heretaunga St section of the Brick Arch that runs through the Hastings CBD from Willowpark Road to Nelson Street North. Rehabilitation was undertaken to remove significant infiltration that was occurring due to the deteriorated nature of the brick lining which was impacting wastewater capacity. Rehabilitation involved the insertion of a 225mm dia pipe into the invert of the egg-shaped sewer with a 450mm dia pipe sitting above to carry wastewater. Separation is maintained whereby the sewer main is continuous through manholes but the stormwater pipe is sectioned to allow groundwater to be collected and maintain separation. There is a continuous base flow of around 9 litres per second that is diverted to the Tōmoana Road trunk sewer.



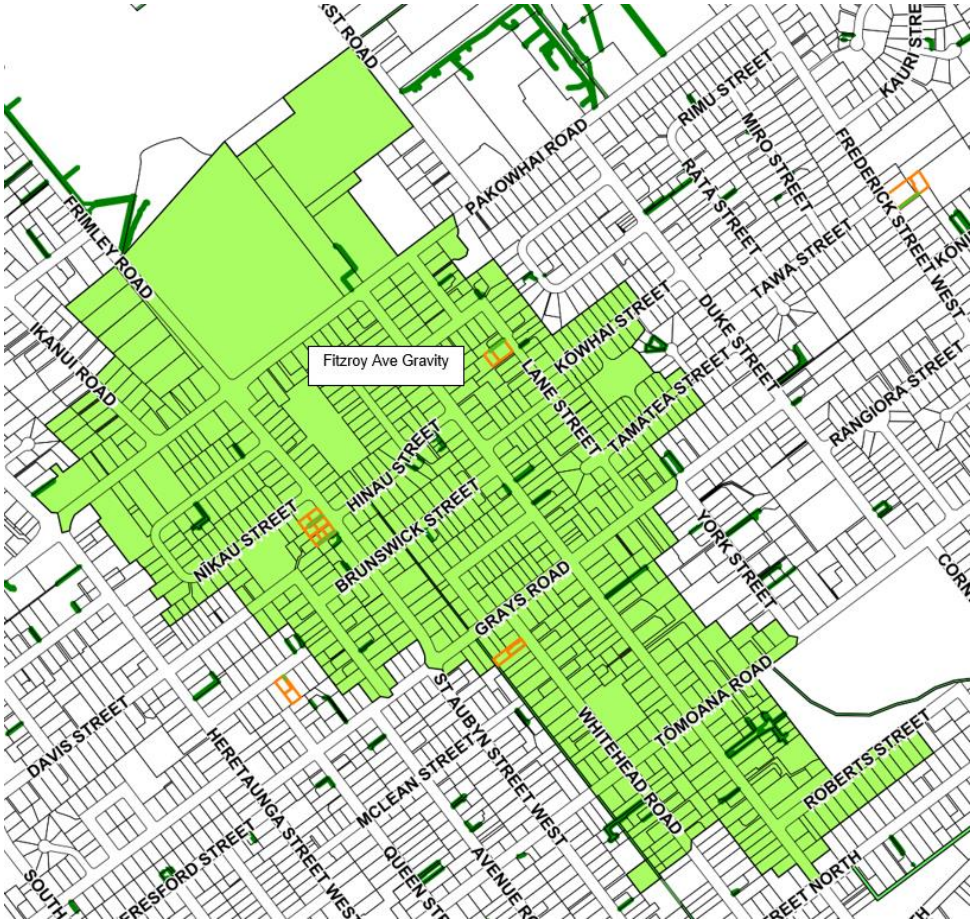
While this system has been successful in increasing capacity in CBD Brick Arch section, the separated groundwater is ultimately returned to the wastewater system downstream so the benefits are limited to the CBD area. Further investigative work is underway to determine whether the discharge is suitable for diversion to the stormwater system which will assist in recovering some wastewater capacity for growth.

The Tōmoana catchment exhibits similar characteristics to that of the immediate upstream catchment and is ranked similarly.

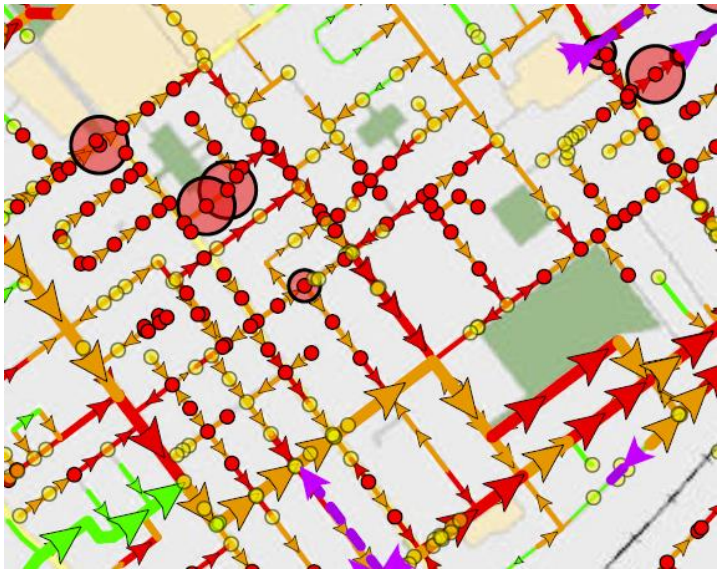
Catchment	Current Dry	Current Wet	Growth Dry	Growth Wet
Tōmoana Rd				

3.24. Fitzroy Avenue Gravity

The Fitzroy Avenue catchment collects urban stormwater from an area that stretches from Pakowhai Road to Nelson Street North. Wastewater gravitates in an easterly direction to Tōmoana Road and joins the combined wastewater flows from Tōmoana Road before discharging into the Brick Arch via Roberts and Kitchener Street.



Modelling indicates that the western quadrant including Nikau Street and Hinau Sreet and some sections on St Aubyn Street West are constrained and there have been operational issues in these areas during rain events. Operational issues include flat and shallow pipes, dips and depressions in mains resulting in regular debris removal, ingress of gravel and inflow and infiltration from old cracked and leaking pipes as well as capacity limitations introduced from the sleeving of old reinforced concrete pipes using polyethylene.



The dual collector sewers in Fitzroy Ave (225mm and 300mm dia) discharge into the 900mm trunk main which is already known to be moderately constrained in the 5 year rain event. Surcharging can be accommodated via a higher level 300mm main that gravitates down to the Nelson Street North Brick Arch which relieves some localised pressure on the 900mm dia. main. The Fitzroy Ave catchment is currently unable to support comprehensive residential intensification due to a combination of exisiting infrastructure issues plus increasing limitations in the trunk sewer network to accommodate additional flows from the upstream catchments.

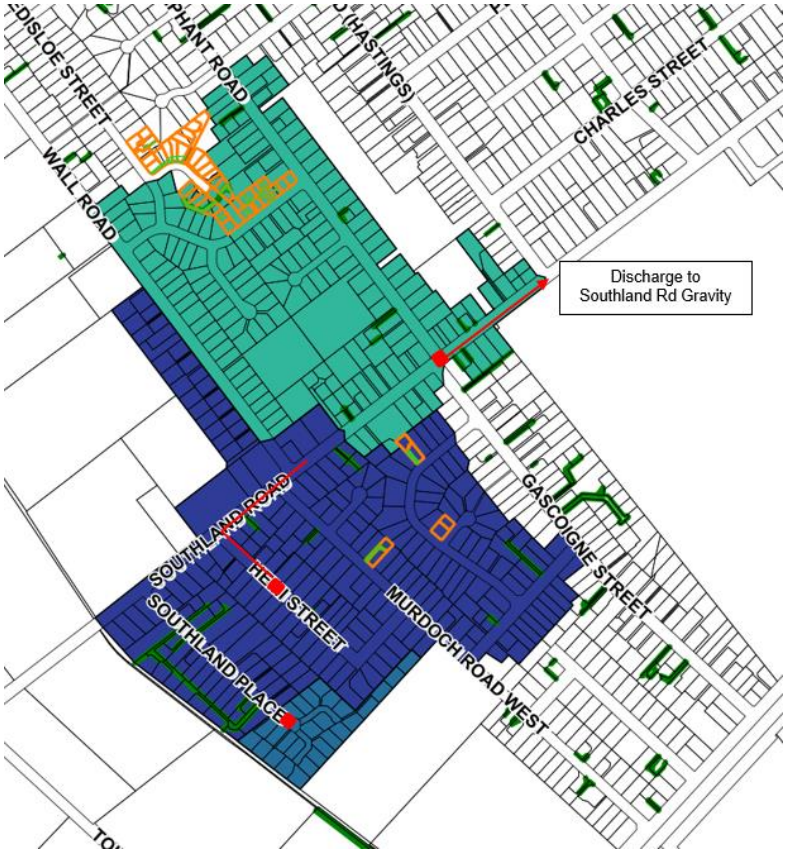
Catchment	Current Dry	Current Wet	Growth Dry	Growth Wet
Fitzroy Ave				

3.25. Nelson Street North Gravity

This catchment straddles the lower end of the Brick Arch sewer and also accommodates flows from commercial properties in King Street North. It is the last urban catchment on the western side of the railway prior to the No.3 trunk sewer. The trunk sewers are deep in this location and while they operate in a surcharged state, there is little impact on the Nelson St urban network therefore some capacity is available to support urban intensification.

Catchment	Current Dry	Current Wet	Growth Dry	Growth Wet
Nelson St Nth				

3.26. Southland Place, Hemi Street, Southland Road Pump Stations



This cluster of catchments are all reliant on pumping to discharge wastewater into the Southland Rd gravity catchment. Southland Place operates via a small lift station that gravitates to the Hemi St pump station which discharges into Southland Rd. This joins with local flows from the Southland Rd catchment into the Southland Rd pump station at the intersection with Oliphant Rd. The rising main terminates at a manhole on the intersection of Gordon Rd and Southland Rd prior to entering into the Southland Rd gravity catchment.

Southland Place is very small and services less than 30 properties which are recent builds so is unlikely to have further growth potential.

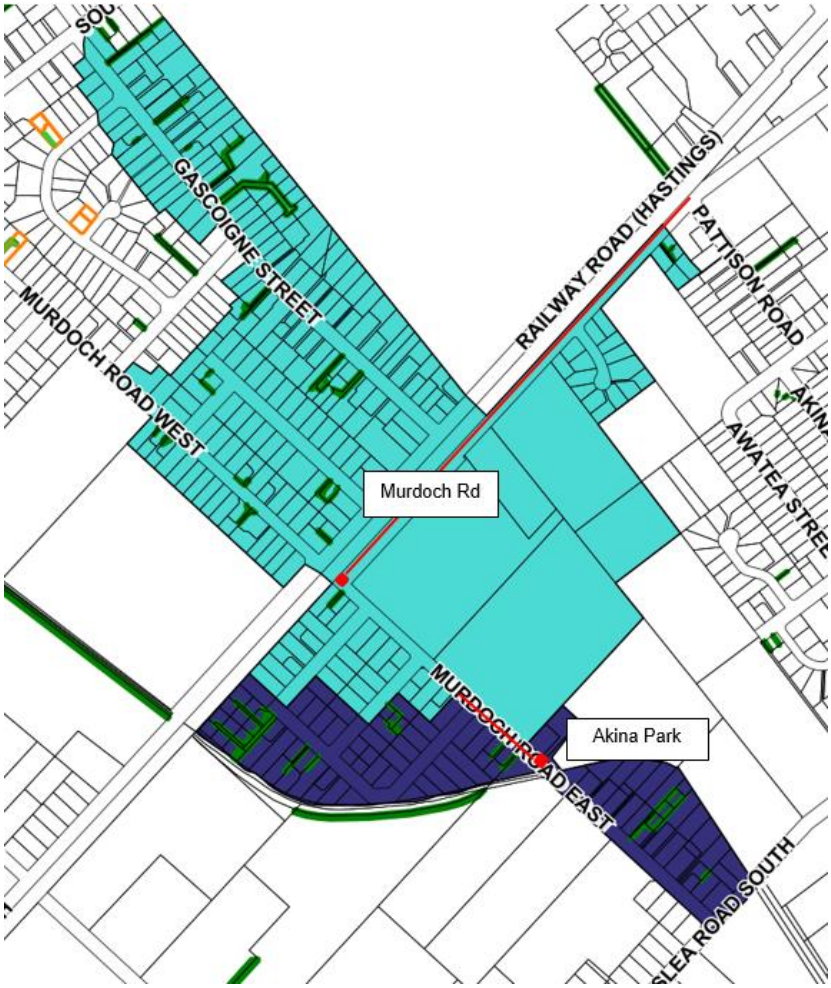
Modelling outputs are consistent with operational knowledge of the network and pump station performance which confirms that these catchments are heavily impacted during the 5 year storm event with surcharging to the extent that overflows occur without some level of intervention. That intervention includes the deployment of sucker trucks on a continuous basis to Hemi St where the pump station is overwhelmed and service to the local community can be affected.

The primary issue appears to be inflow and infiltration from within the local network and this I&I continues for a sustained period after rain has abated. This area would be a prime candidate for an intensive investigation at a property level to ascertain where I&I may be occurring to enable solutions to be implemented and potentially create some local capacity for intensification. Until this work is undertaken the catchment will remain heavily constrained.

Catchment	Current Dry	Current Wet	Growth Dry	Growth Wet
Southland Place			N/A	N/A
Hemi St				
Southland Rd				

3.27. Akina Park, Murdoch Road

The Akina Park and Murdoch Rd pump stations service the most southern wastewater catchments in Hastings. Akina Park discharges into the Murdoch Rd system which pumps wastewater north to discharge at a manhole opposite Pattison Rd at the head of the Russell St gravity catchment.



The residential area to the west of the railway line discharges via a single 150mm diameter poly-ethylene sleeved wastewater pipe at Murdoch Rd. There are a number of operational issues in this area including flat grades, regular blockages, I&I issues in Gasgoine St and the area suffers from a relatively high water table especially when it rains. Some of these issues are thought to stem from the use of polyethylene materials in the local reticulation and the restriction at Railway Rd has been problematic for many years.

Modelling confirms that the entire network in the Murdoch Rd and Akina Park areas is surcharged in the 5 year rain event and this causes backing up and overflows to the lowest lying properties. Murdoch Rd pump station is known to be overwhelmed in moderate rain events requiring the deployment of sucker trucks to keep the area serviceable and to prevent overflows. The area is unlikely to be able to support intensification without significant efforts to address the underlying capacity constraints.

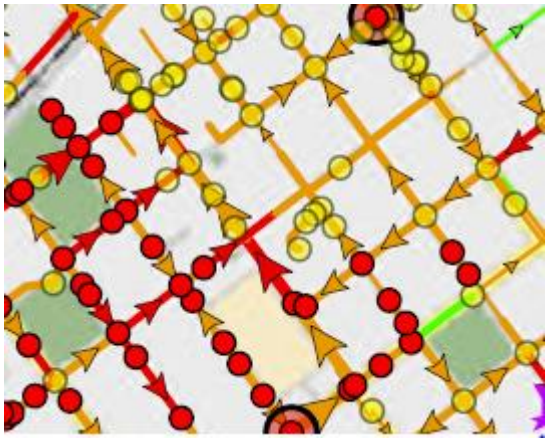
Further analysis of pump station capacity will be required to ascertain whether the existing pump stations would need to be upgraded once the I&I issues have been resolved.

Catchment	Current Dry	Current Wet	Growth Dry	Growth Wet
Akina Park				
Murdoch Rd				

3.28. Heretaunga Street East Gravity

This catchment straddles the area immediately east of the Hastings CBD between Hastings Street and Willowpark Road and Southampton Street and St Aubyn Street. It includes a mix of residential and commercial premises, a school and supermarket which discharges trade waste into the domestic system.

The top end of the Brick Arch commences at the intersection of Willowpark Rd and Heretaunga St East and follows Heretaunga St through the CBD to Nelson St. As discussed in the Tōmoana catchment section above (Section 3.23) the Brick Arch has been rehabilitated and infiltration of groundwater has been separated from the wastewater flow.

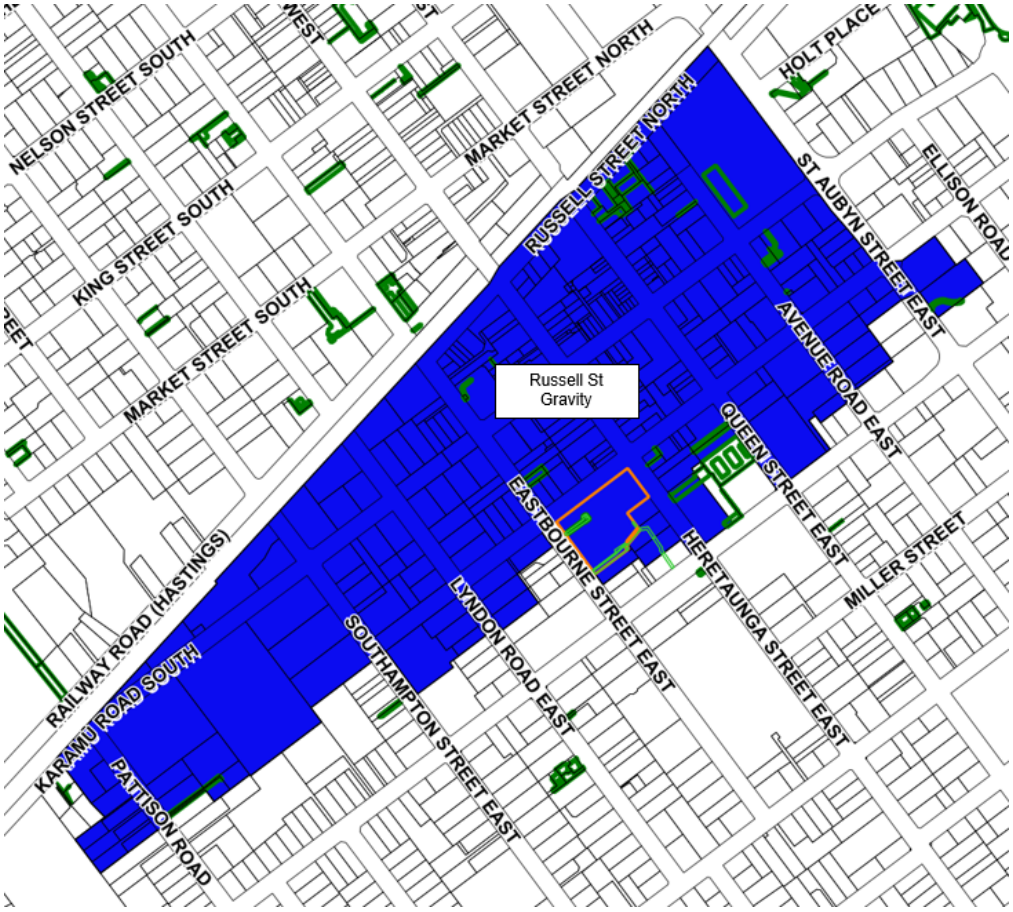


Modelling shows that the local reticulation is moderately surcharged in the 5 year rain event which will limit the extent of overall development however some level of residential development can be accommodated subject to the locality and density of any proposal. Intensification in the CBD (inner city living precinct) could be the catalyst for more substantive reticulation upgrades to extend into the Heretaunga St catchment particularly if the Brick Arch were to be replaced or duplicated or alternatively, upstream catchments being redirected to create capacity in the local network.

Catchment	Current Dry	Current Wet	Growth Dry	Growth Wet
Heretaunga St				

3.29. Russell Street Gravity

The Russell Street catchment receives wastewater from Akina, Murdoch and Heretaunga Street East catchments and this combined discharge flows into the Southland Road gravity catchment on its way to the Nelson Street Brick Arch. The catchment sits on the eastern side of the railway corridor and extends across the CBD area from St Aubyn St East to Southampton Street and between the railway line and Hastings Street.



This area is fully commercialised and is already experiencing pockets of commercial redevelopment including the Opera House precinct, the Herald Tribune corner and Rush Munroe's in Albert Park. There is some potential for the inner city living precinct to expand into this area which could increase the base wastewater demand but at this stage the modelling shows that there are no significant issues in the area between Heretanga St and St Aubyn St and only moderate surcharging occurs in this part of the network.

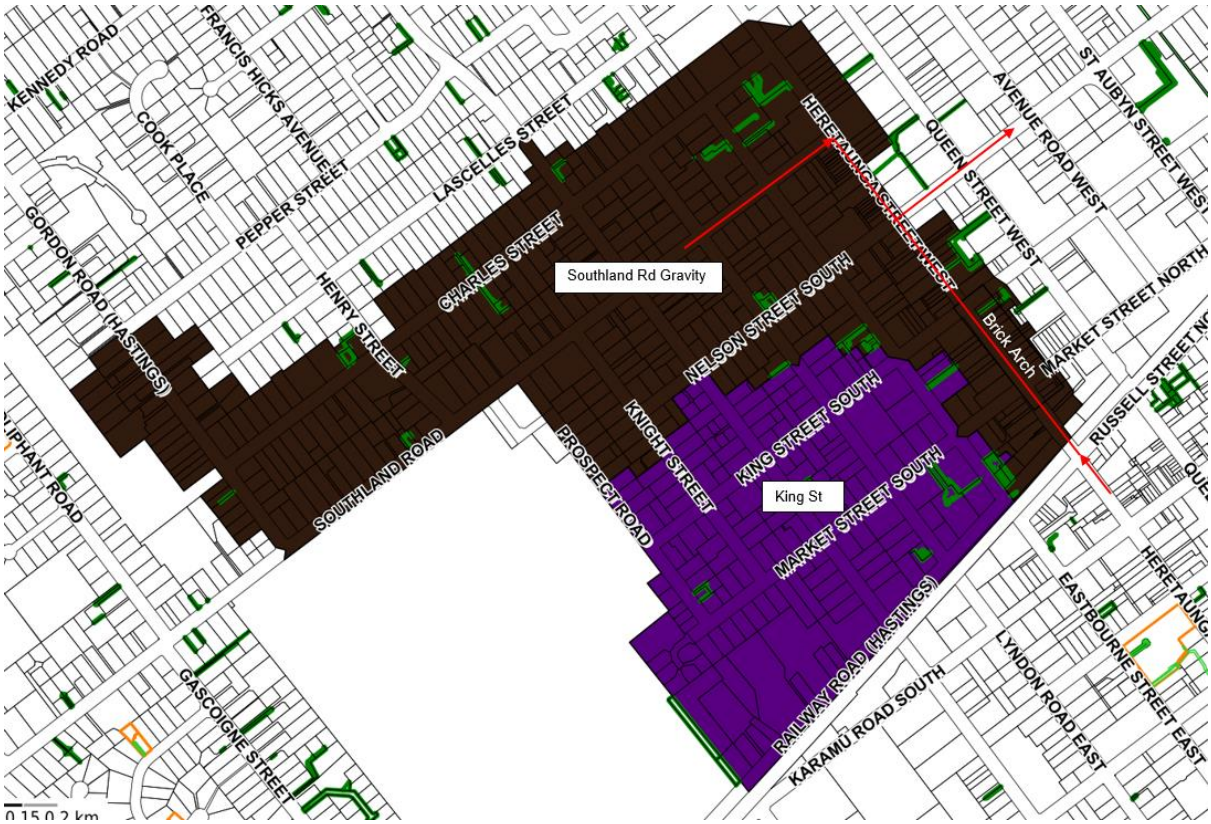
The block between Southampton Street and Eastbourne Street (including Karamū Rd Sth) experiences additional surcharging in streets possibly as a result of some sections being HDPE slip-lined (125mm diameter). This block ultimately feeds into the Brick Arch at Heretaunga Street.

Catchment	Current Dry	Current Wet	Growth Dry	Growth Wet
Russell St				

3.30. King Street, Southland Road Gravity

The King St gravity catchment is a standalone area that services a largely urban residential area between the Racecourse and the CBD along with commercial blocks on the CBD fringe. All wastewater flows gravitate to the bottom end of the Southland Rd catchment and into the Brick Arch in Heretaunga St West.

The Southland Rd catchment is sizeable in its extent and encompasses residential and commercial areas of the city including the CBD west of the railway line. This catchment also serves as a major junction for wastewater flows from upstream catchments including Southland Place, Hemi Street, Southland Rd pump station, Akina Park, Murdoch Road, King Street, Heretaunga Street and Russell Street.



At a street level, the King Street reticulation is moderately surcharged in the 5 year rain event but the current risk of overflows is considered low. Future demand from growth is uncertain however there are considerable opportunities on the fringe of the CBD area for commercial redevelopment/ apartment style living and the Racecourse presents significant potential for more intensive urban residential development if this land were to become available. The rating however excludes the Racecourse land from this final assessment due to the uncertainty of future development in this space.

Catchment	Current Dry	Current Wet	Growth Dry	Growth Wet
King St				

The Southland Rd catchment is constrained in its ability to convey flows from upstream catchments combined with wastewater generated within the catchment area. This is compounded in rain events where I&I exacerbates problems at a street level across many parts of the network and growth will add to these issues.

It is also important to note that upsizing in Southland Rd to increase capacity must be considered alongside reducing I&I to acceptable levels in the upstream catchments otherwise the new capacity will simply be replaced by the excess stormwater that is currently not able to be accommodated and exits the system as overflows.

Figure 3.30.1

Figure 3.30.1 shows the impact that upstream catchments can have on downstream networks that are already constrained but also highlights that future infrastructure upgrades to create capacity for growth need to include solutions to address existing issues that have the potential to simply consume the new capacity that has been created.

The adjoining Pepper St catchment has spare capacity that could assist in supporting future growth by redirecting some of the upstream catchment flows into the Pepper St main but this needs to be further modelled to understand if adverse impacts further downstream may occur.

Catchment	Current Dry	Current Wet	Growth Dry	Growth Wet
Southland Rd				

3.31. St Aubyn Street Gravity

The St Aubyn St catchment sits immediately to the north of the CBD from Heretaunga St West to Fitzroy Ave and between the railway line and Tōmoana Rd. The catchment is predominantly commercial in nature with urban residential inputs on the western side of Nelson St North. The lower end of the Brick Arch traverses the catchment conveying a large proportion of the city's wastewater to the No.3 trunk sewer.

Modelling indicates that the local reticulation in the CBD is constrained due to surcharging in the 5 year rain event but the level of surcharging does not show as being at concerning levels that would result in overflows. However, operational knowledge within this part of the CBD suggests that there are capacity issues under normal operation where high localised demand can present problems in the reticulation. Determining the actual (and future) wastewater demand across the CBD and calibrating the wastewater model is a priority as redevelopment of commercial premises e.g. the Kiwibank Call Centre, can result in significant increases in staff numbers where they were low before.

Our confidence in the model outputs in this part of the network needs to be viewed with some caution and the impact of an inner city living precinct, with conversion of commercial buildings to apartment style living, will significantly increase the wastewater demand.

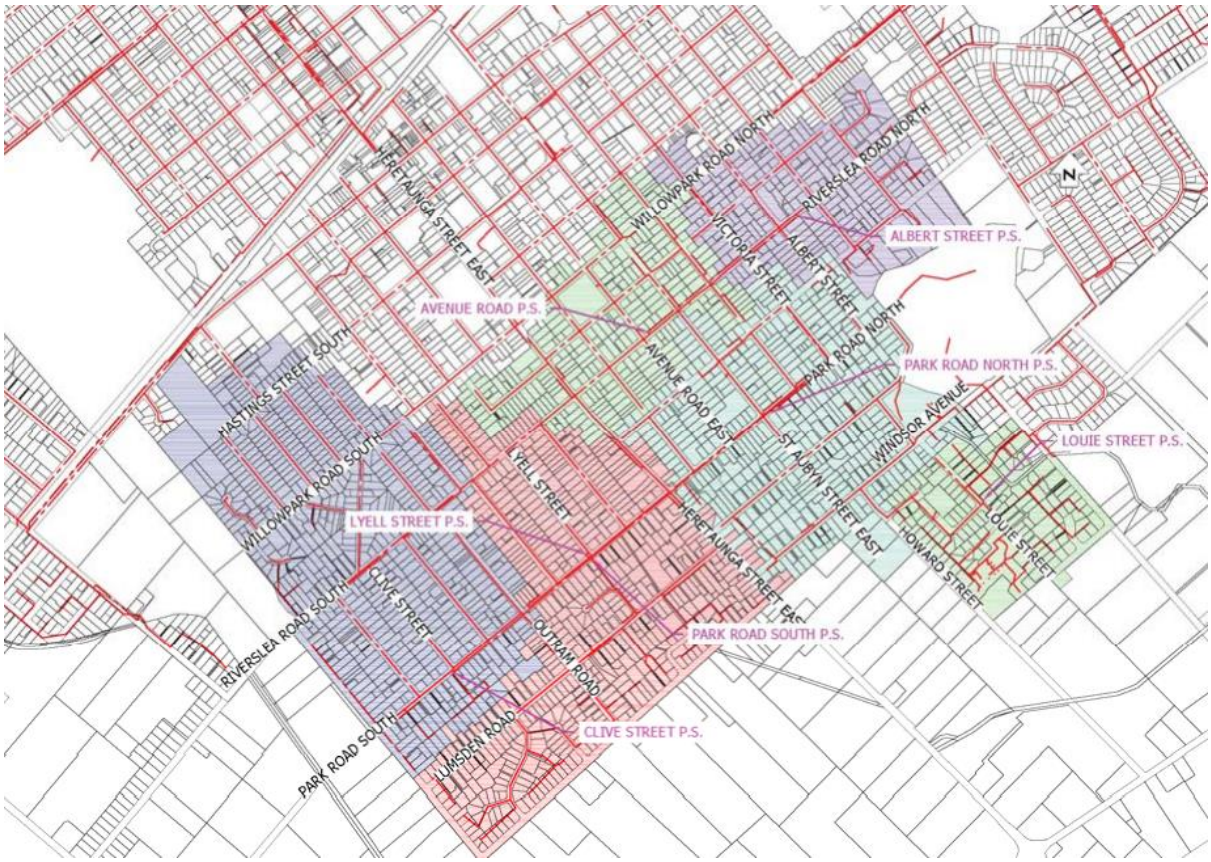
It is anticipated that the CBD network will require upgrading to account for future growth and this will need to include options for creating additional capacity in the Brick Arch system to cater for existing and future growth capacity or alternatively, bypassing the central part of the network in and around the Brick Arch. Ranking in this catchment therefore reflects a cautionary approach.

Catchment	Current Dry	Current Wet	Growth Dry	Growth Wet
St Aubyn St				

3.32. Park Road Rising Main

The Park Road rising main services the Akina and Parkvale areas within Hastings. HDC's sewer renewal strategy classifies the rising main as Category A – a high priority pipeline critical to the HDC sewer network.

Figure 3.32.1 Park Road Rising Main Catchments



The Park Road rising main and associated pump stations have had a history of operational and maintenance issues due to the complex arrangement (up to 6 pumps into a single rising main) and interdependency of the pump stations. The area is prone to significant inflow and infiltration which has a detrimental effect on the local network and can quickly overwhelm the pump stations. This results in heavily overloaded pipes, backed up connections with consumers unable to use the system, and overflows on private property. The greatest risk is at or close to the pump stations which are in the lowest lying locations and due to limited existing wet well capacity, the system relies on storage within the immediate upstream pipework.

In 2017, a Master Plan study (File Ref: PRJ18-95-0108) was undertaken looking at options to improve the level of service in the Akina and Parkvale areas and remove the risk of overflows in the 1 in 5 year rain event. This study set out a programme of works to address the complex issues associated with the way the Park Road Rising Main is configured, factor in future proposed developments within the catchment area and prioritise the significant investment required to renew the Victoria Street rising main and eastern interceptor which are immediately downstream of the Park Rd rising main.

The analysis included an updated assessment of inflow and infiltration in the area based on previous work which indicated that all of the sub-catchments within the Park Rd rising main network experience I&I due to the following:

- The low-lying areas in Lumsden Place (Lyell Street pump station catchment), which have the potential to flood, are now developed and could be a source of stormwater inflow if the gullies are not raised high enough above ground level

- The Park Road rising main catchments have the worst inflow sources due to known overflow incidents and/or wastewater overflows predicted by hydraulic modelling, and I+I analysis yielding high peaking factors in comparison with threshold values
- Infiltration and inflow (I+I) analysis recorded high rainfall dependent infiltration (RDI) and higher than threshold groundwater infiltration (GWI), a sign of possible leaky pipe joints within the system
- The catchments were predicted by network modelling to have dry weather flow surcharges/spills.

This work also indicated that groundwater infiltration (GWI) was significantly above the recommended indicator of 20% for dry weather GWI. The table below compiles the various catchment I&I.

Pump Station Name	Catchment Area (Ha)	Catchment Population		Dry Weather – Groundwater Infiltration	Wet Weather Flow Peaking Factor
		2017	2046	% of ADWF Volume	
Clive Street	62	2286	2799	42%	5.7
Lyell Street	59	2248	2928	76%	12.0
Park Road South	N/A	N/A	N/A	N/A	N/A
Park Road North	92	2292	3113	58%	5.4
Albert Street	39	1099	1099	83%	3.7
Avenue Road	28	1172	1172	56%	4.3
Louie Street	18	407	407	25%	3.8
Hood Street	65	1617	1617	55%	5.0

Source: Table 3.1- Park Rd Rising Main Master Planning (pg 28) File Ref: PRJ18-95-0108

A wet weather peaking factor of 8 is typically adopted as an upper threshold that would trigger the need to implement I&I management or rehabilitation programmes aimed at reducing I&I.

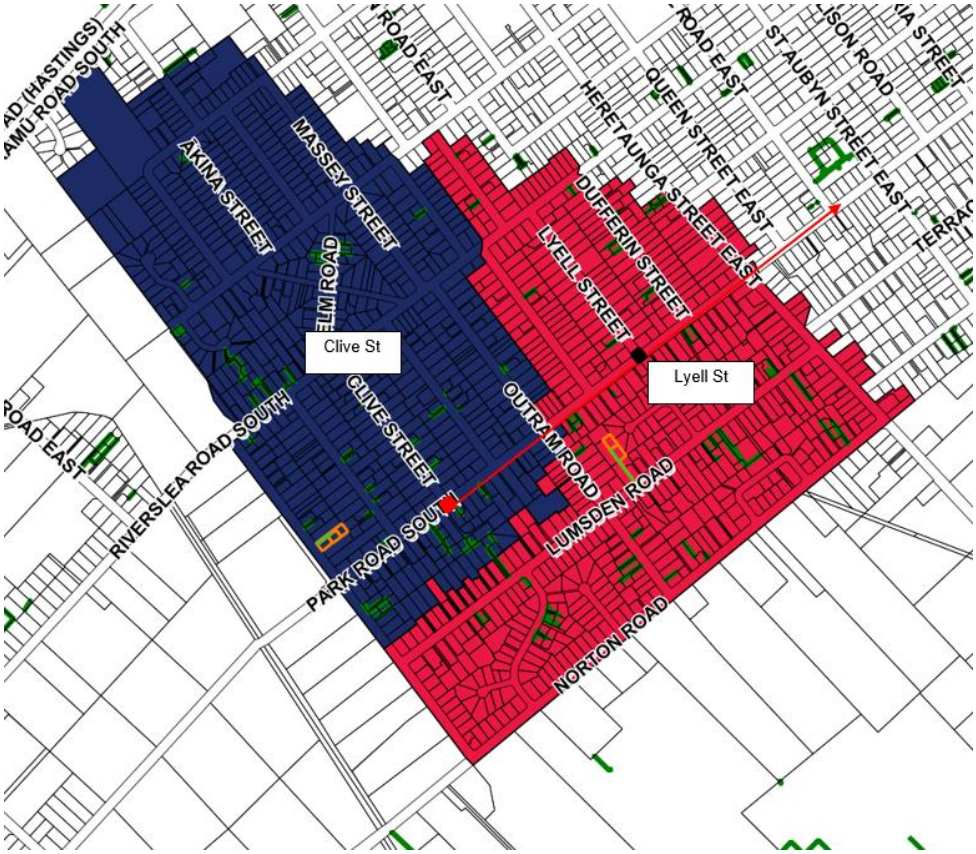
A range of upgrade works were recommended to address existing issues and to cater for anticipated growth out to 2046, based on the HPUDS (2017) projections. These works included:

1. Construction of a dedicated rising main to service Avenue Rd and Albert Park pump stations
2. Construction of a dedicated rising main for the Park Rd North pump station
3. Replace Clive St pump station rising main
4. Rehabilitation of the Park Rd Sth/Nth rising main to service Clive St and Lyell St pump stations
5. Upgrading of pump capacity
6. Upgrading of local reticulation to remove under capacity sections and choke points
7. Upsizing of the Eastern Interceptor

At the time of writing this report, items 1, 2, 3 and 4 were complete and the Eastern Interceptor upgrade contract has been awarded with construction commencing in the first quarter of 2023. Further investigations are ongoing to identify I&I areas of concern and to develop a strategy for addressing rainfall derived flows in this sector of the network.

3.33. Akina Wastewater Catchment (Clive Street, Lyell Street)

The Akina catchment covers a large urban residential area from Copeland Rd in the south up to Heretaunga St East and from Norton Rd across to Akina St and Massey St just south of the CBD. The area comprises two catchments, Clive St and Lyell St, which are serviced by pump stations that discharge into a common rising main in Park Rd South. The rising main then continues via Park Rd North and Victoria St to finally discharge into the top of the Eastern Interceptor at Willowpark Rd North. The rising main was rehabilitated in 2020 using a 355mm diameter PE sleeve inside the original 375mm reinforced concrete main. (Refer CON2019061 & WAT-14-15-19-529)



The upgrade works have successfully reduced the potential for overflows and backing up to occur however the extent of I&I into the system is still an issue that requires further work (onsite investigations, stormwater modelling etc.) to develop targeted programmes for minimising direct inflows and groundwater infiltration. The catchment ratings reflect the ongoing limitations that exist and will continue to limit the ability to accommodate redevelopment and intensification in this area.

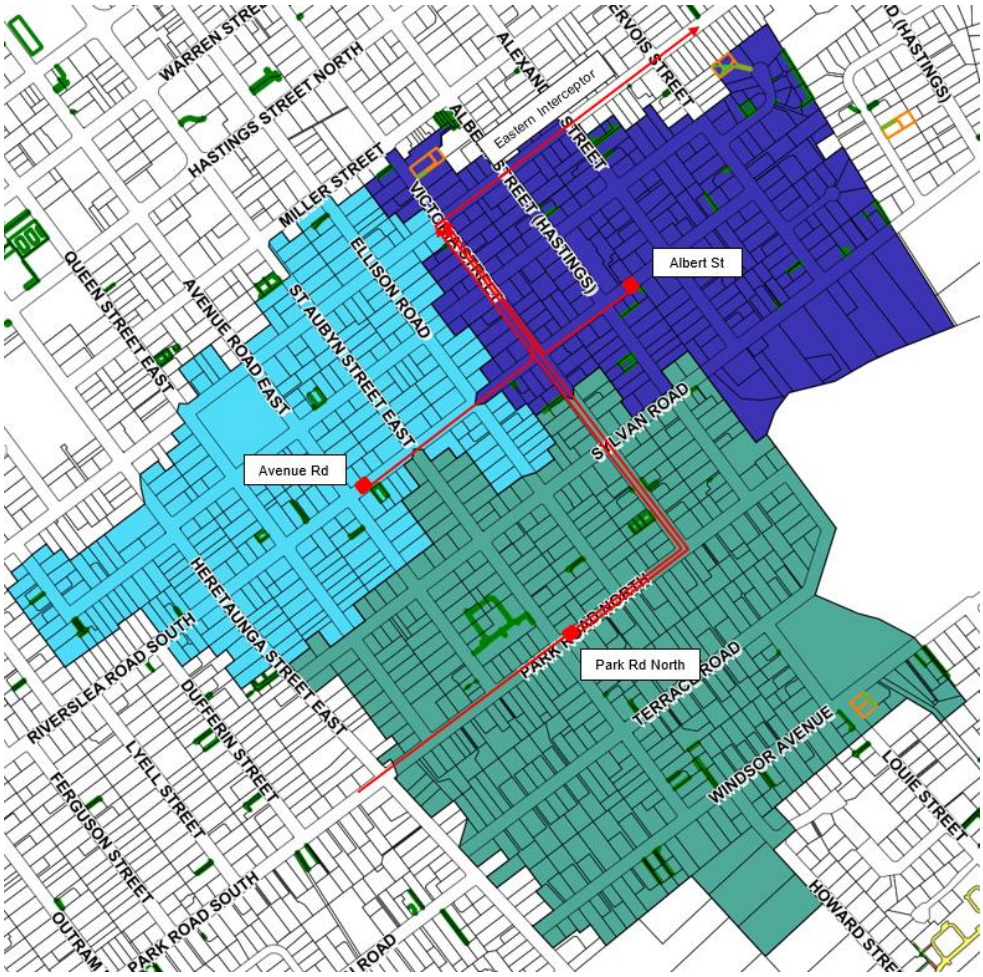
Catchment	Current Dry	Current Wet	Growth Dry	Growth Wet
Clive St				
Lyell St				

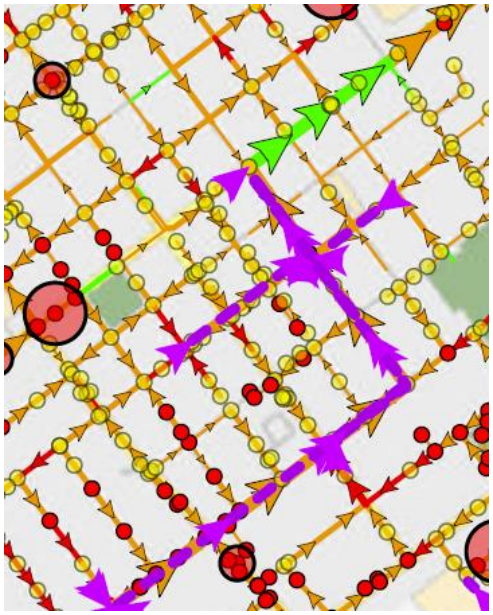
3.34. Park Road North, Avenue Road, Albert Street

This cluster of catchments includes the residential area bounded by Windsor Avenue, Heretaunga Street East and Willowpark Road.

As described in the Park Rd Rising Main section, the Park Road pump station now has a dedicated rising main that discharges into the top end of the Eastern Interceptor and is no longer influenced by the other pumped catchments in this area.

Likewise, Avenue Road and Albert Street operate on a separate rising main and these catchments, along with the discharge from Clive Street and Lyell Street converge on the Eastern Interceptor at the Victoria Street, Willowpark Road North intersection.



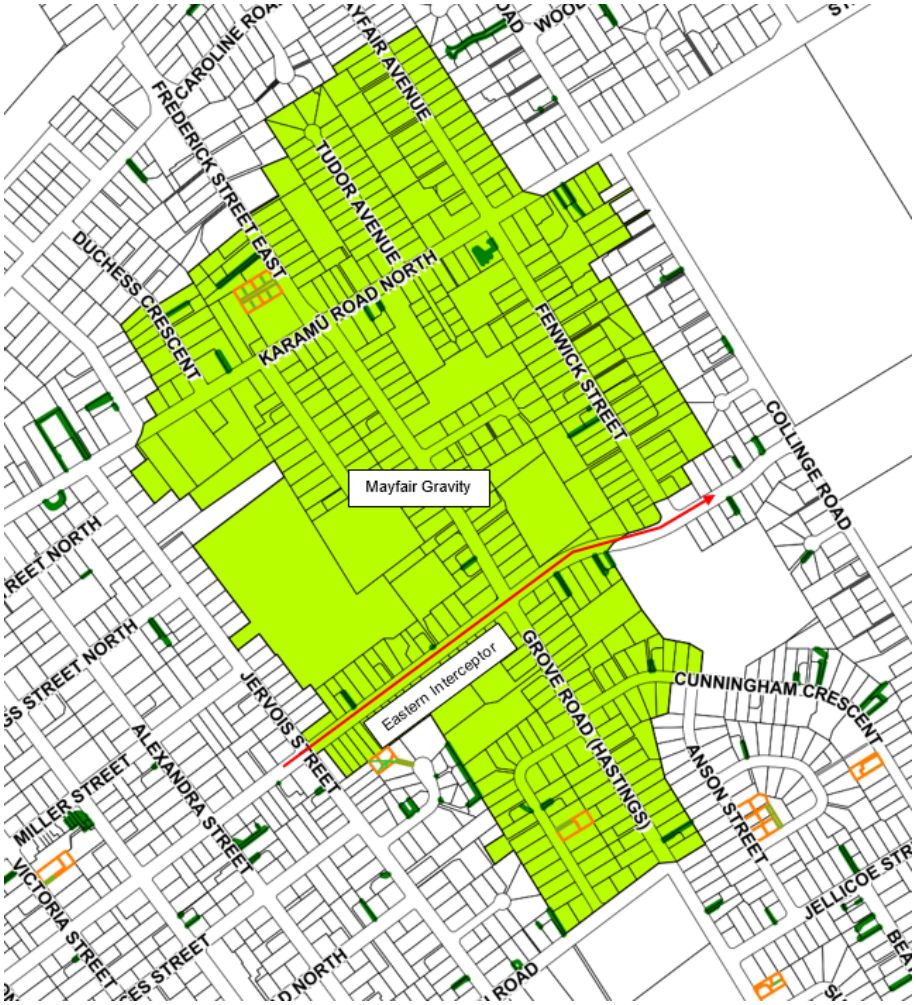


Modelling shows that these catchments are moderately surcharged in the 1 in 5 year rain event with some localised pinch points where relining with PE sleeves has resulted in hydraulic constrictions and ongoing maintenance issues. Despite this, these catchments have some capacity to cater for intensification dependent on the scale of development and location. The Park Rd catchment is also able to cater for residential intensification in the Howard St greenfield development where wastewater infrastructure is currently being built. The intention is that as this new growth materialises, the Park Rd North pump station will be upsized to meet the future increase from this development and other anticipated medium density in the area.

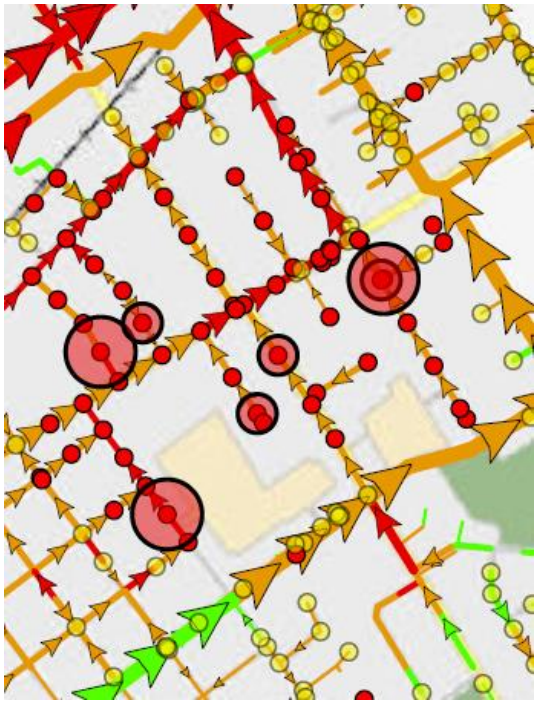
Catchment	Current Dry	Current Wet	Growth Dry	Growth Wet
Park Rd North				
Avenue Rd				
Albert St				

3.35. Mayfair Gravity

The Mayfair wastewater catchment is largely residential in nature but includes the St John's High School and the commercial strip along Karamū Rd North including the Mayfair shopping precinct. The Eastern Interceptor passes through the catchment via Willowpark Rd North but does not pick up much of the wastewater flows within the catchment as the majority of the local infrastructure drains into Karamū Rd North and then into Mayfair Ave where it exits into the Caroline Rd catchment.



Modelling shows that the 300 diameter concrete wastewater main in Karamū Rd is surcharged in the 5 year rain event and this carries downstream into Mayfair Ave. Asset information shows this wastewater main as being constructed in 1912 and it is a candidate for renewal however its location in private properties along Mayfair Ave presents complications for renewal or rehabilitation.



A study of the catchment was undertaken in February 2021 (File Ref: PRJ18-95-0112) to determine whether diversion options could enable the Mayfair Ave main to be abandoned. The study showed the surcharging that occurs in this area is related to downstream capacity issues even with the recent upgrade of the Eastern Interceptor through Warwick Rd.

The modelled surcharging in a 5 year rain event still has headroom capacity i.e. the potential risk of overflows is considered to be low and diverting the Fenwick and Karamū Rd mains into the Eastern Interceptor could be accommodated. The long-section analysis below shows the extent of surcharging and freeboard available which is primarily caused by the surcharged state of the No.3 trunk sewer in the railway corridor.

The option to divert existing flows from Karamū Rd into the Eastern Interceptor is viable meaning that the 300mm diameter main in Mayfair Avenue could be abandoned without impacting local residents or the upstream network. Adopting this solution would compromise the HDC level of service to not have surcharging in a 1 in 5 year rain event which may need to be reviewed in circumstances where the risk (and consequence) of overflows is still relatively low.

EASTERN INTERCEPTOR IMPACT ASSESSMENT

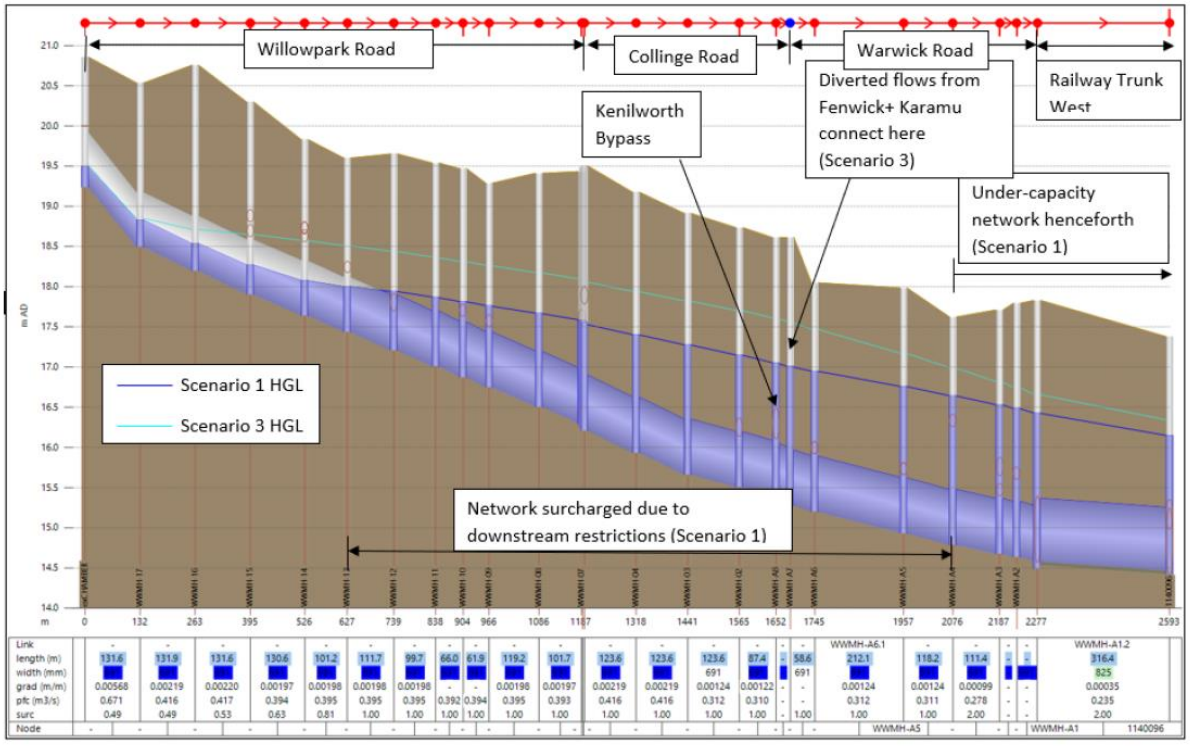


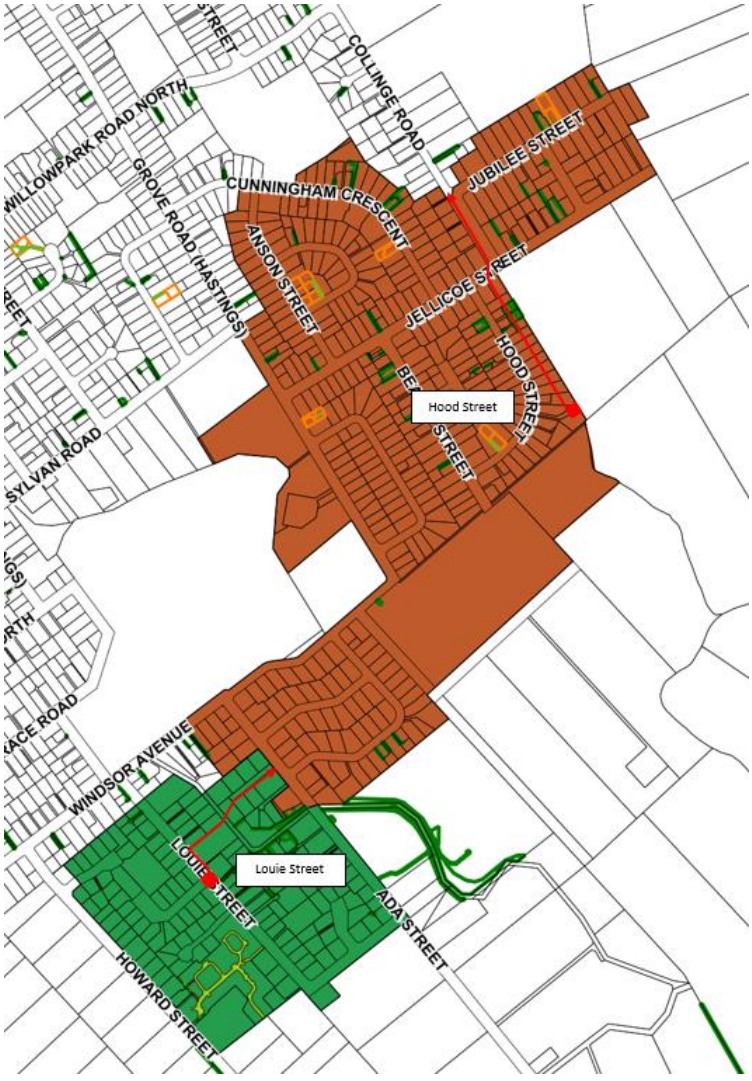
Figure 3-3: L- Section 2- Long section showing the change in HGL over the entire length of Eastern Interceptor (Scenario 1 vs Scenario 3)

The catchment ranking is therefore based on the assumption that the strategy outlined above is likely to proceed in the next 3 to 5 years.

Catchment	Current Dry	Current Wet	Growth Dry	Growth Wet
Mayfair Gravity				

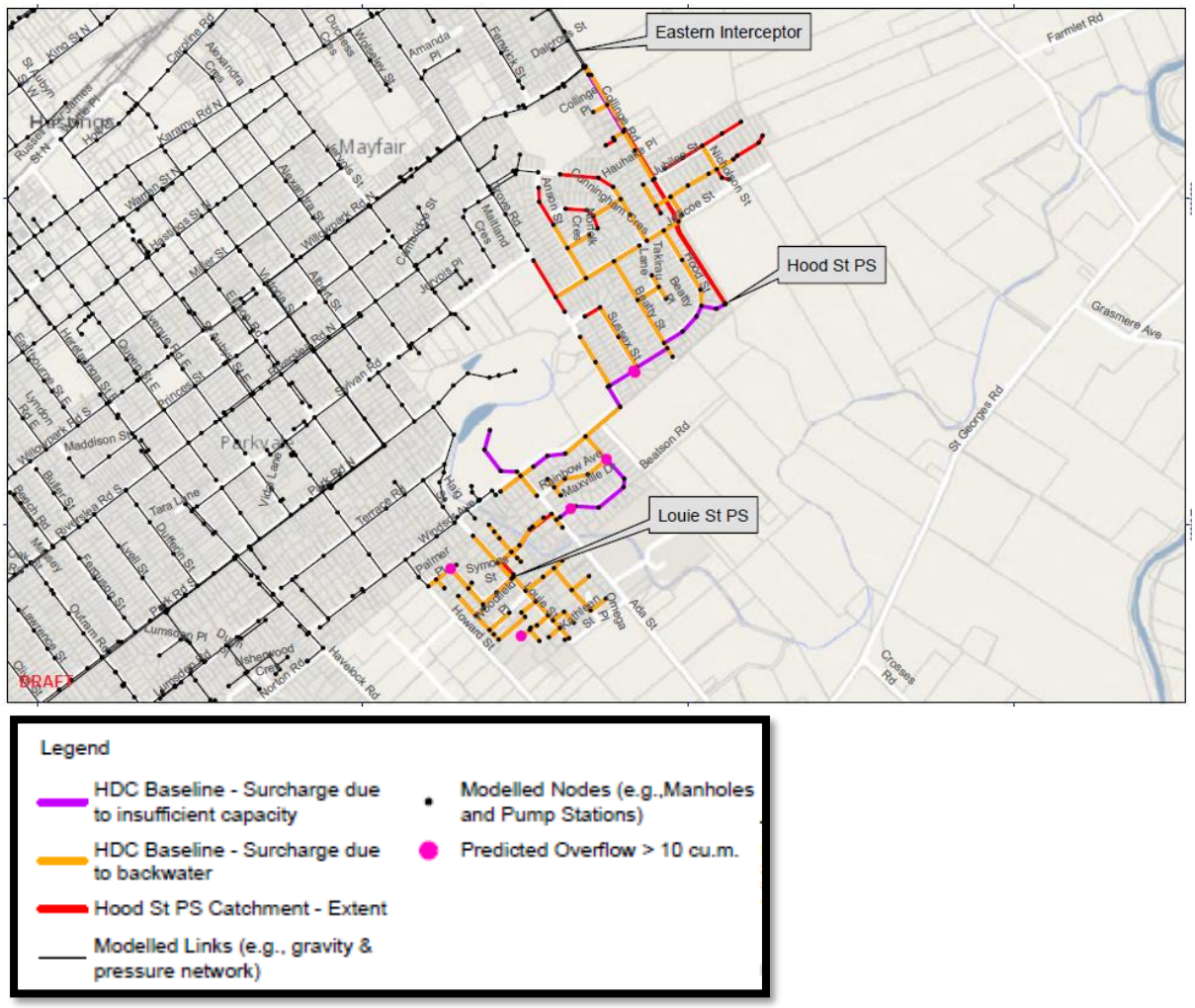
3.36. Louie Street, Hood Street

Louie St and Hood Street are two catchments that service the eastern most areas of Hastings between Howard Street and Collinge Road. The Louie Street pump station discharges into Hood Street catchment at Ada Street and the combined discharge from both areas is pumped to Collinge Road upstream of the Eastern Interceptor via the Hood Street pump station.



The Hood Street pump station catchment has known existing wet-weather capacity issues. HDC has confirmed the wastewater network located in Sussex Street overflows during wet-weather events with two network overflows occurring in the last few years. A wastewater modelling assessment was undertaken in November 2021 [(28)] to determine the extent of upgrades required to provide capacity for proposed Kāinga Ora residential redevelopments in the Hood St catchment of 42 lots. The following diagram shows the extent of surcharging and overflow locations in the current system based on current rainfall rates without climate change applied.

[28] Hood Street Wastewater Catchment Network Modelling Report (Stantec 2021)



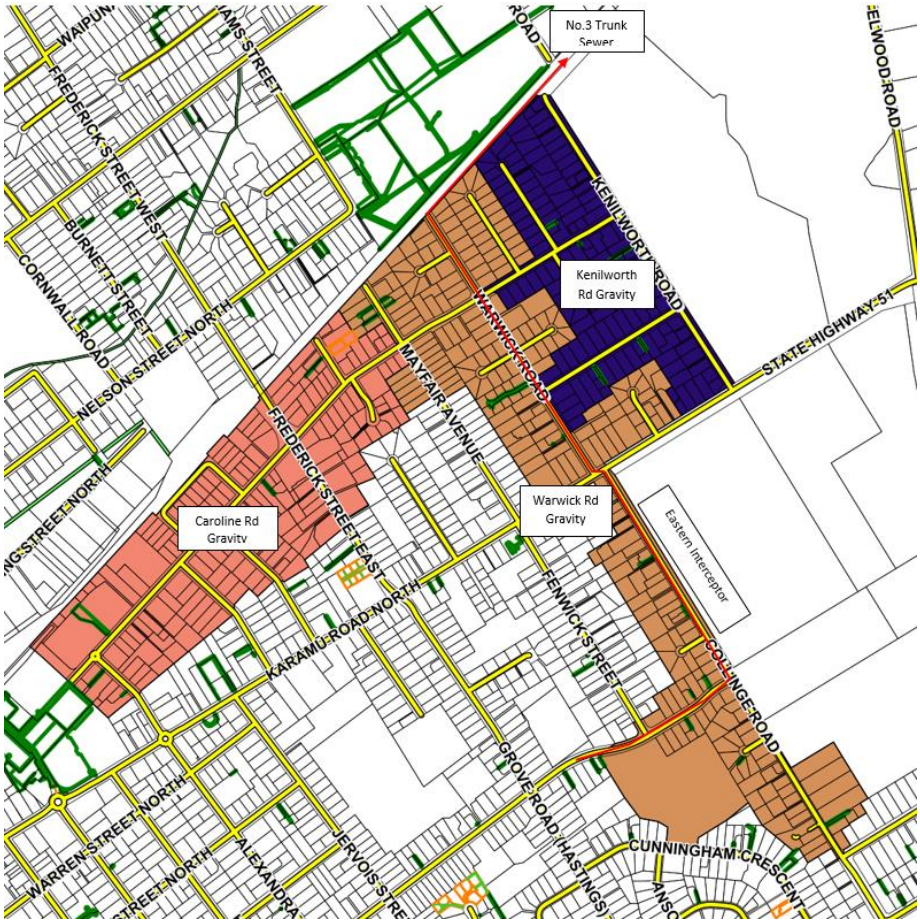
The following table summarises the upgrade options and cost estimates to resolve the existing capacity issues and to cater for climate change factors and future growth in the Louie and Hood St catchments. The options include providing significant wet weather storage to accommodate up to 600m3 of wastewater designed to buffer storm flows into the Hood St wastewater pump station. The alternative involves a significant upgrade to the Louie St and Hood St pumping stations. Both of these options rely on network upgrades to around 35% of wastewater mains across the two catchments to increase capacity and conveyance capability.

Louie PS Catchment					
Scenario	Total Length of gravity network upgrade	Divert Louie Street PS and upgrade capacity	Gravity Upgrades Cost Estimate	Pump station Upgrade Cost Estimate	Total Cost Estimate
HDC Baseline	0.50 km	40 L/s	$1.2M	$1.7M	**$2.9M**
HDC Future					
Hood PS Catchment - PS Upgrade Option					
PS Upgrade Option					
Scenario	Total Length of gravity network upgrade	Pump Station Capacity Upgrade	Total Gravity Upgrades Cost Estimate	Pump station Upgrade Cost Estimate	Total Cost Estimate
HDC Baseline	2.35 km	80 L/s	$7.9M	$2.6M	**$10.5M**
HDC Future		100 L/s	$8.0M	$2.9M	**$10.9M**
Wet Weather Storage Option					
	Total Length of gravity network upgrade	Storage Volume	Total Gravity Upgrades Cost Estimate	Wet Weather Storage Cost Estimate	Total Cost Estimate
HDC Baseline	2.90 km	360 m^3	$8.4M	$1.9M	**$10.3M**
HDC Future		600 m^3	$8.4M	$3.3M	**$11.7M**

This study provides detail on the extent of wastewater constraints across the existing Hood and Louie St catchments and highlights the need for significant upgrades to address LoS issues and the impacts of climate change, provide for current demands from Kāinga Ora developments in this area and to future proof capacity for growth in the future.

Catchment	Current Dry	Current Wet	Growth Dry	Growth Wet
Louie St				
Hood St				

3.37. Caroline Road, Warwick Road, Kenilworth Road



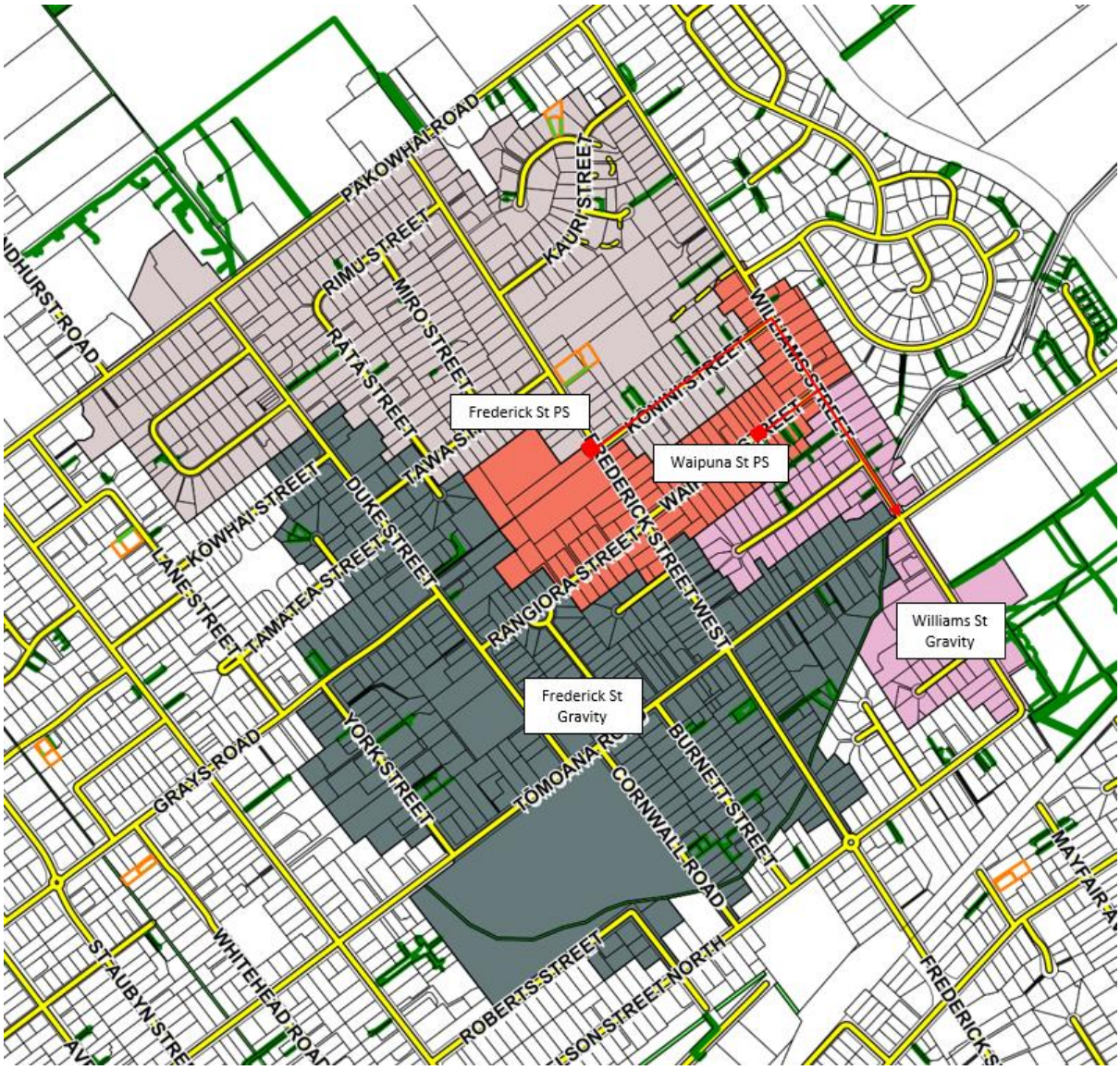
These three catchments are immediately upstream of the main trunk sewers and are intersected by the Eastern Interceptor which traverses Collinge Rd and Warwick Rd before discharging into the head of the No.3 trunk sewer. Modelling indicates that there are some issues with surcharging in the Caroline Rd sewer (which services the Large Format Retail area) and elevated levels in the local reticulation of all 3 areas. While these areas are not currently considered to be at high risk of overflows in the 5 year rain event, the risk of overflows will increase with growth both within these catchments and across the wider network.

Analysis indicates that the Kenilworth Rd catchment is likely to be impacted by backwater effects and surcharging in the No.3 trunk sewer which is then transmitted upstream within the adjacent local networks. Modelling of trunk sewer capacity is underway to better predict the conditions that lead to this surcharging including how growth will be a contributor in the future. This work will also enable the development of options for managing wastewater flows when the system is impacted by rain events.

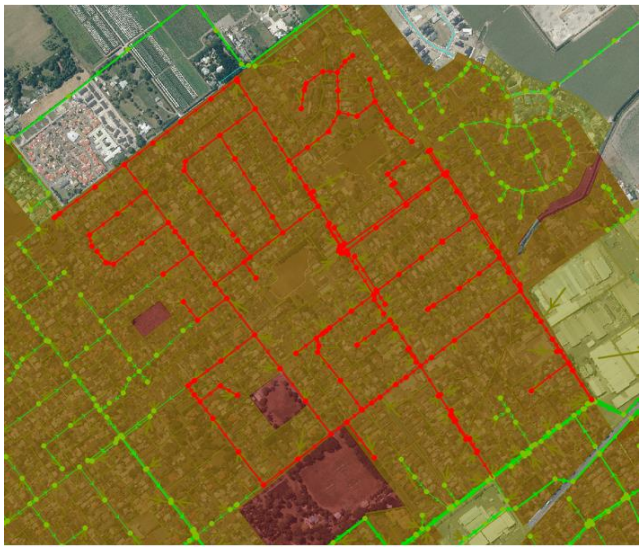
Catchment	Current Dry	Current Wet	Growth Dry	Growth Wet
Caroline Rd				
Warwick Rd				
Kenilworth Rd				

3.38. Mahora

This cluster of catchments make up the Mahora suburban area. They include the Frederick Street and Williams Street gravity catchments and the areas serviced by Frederick Street and Waipuna Street pump stations.



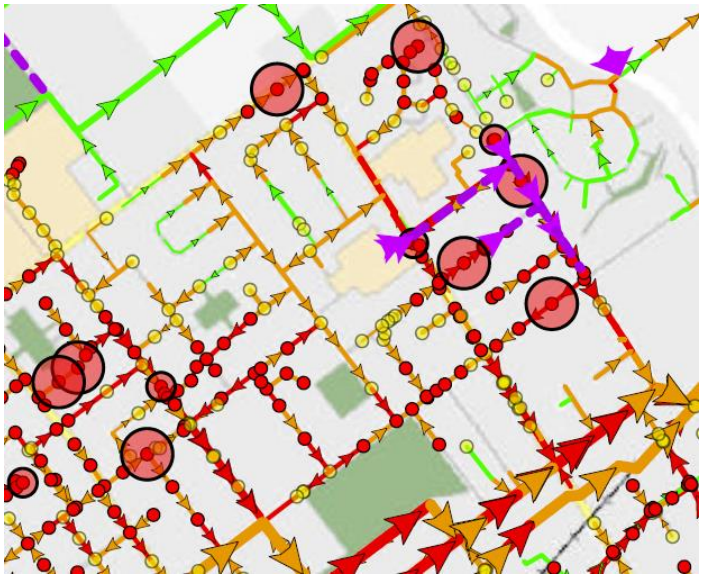
Modelling information was reviewed in 2022 [29] to verify the extent of bifurcations (interconnects) between the Frederick St and upstream Fitzroy catchment and to confirm pump station parameters.



This analysis confirms the potential for several overflow locations in York St, Grays Road, Tamatea St, Kowhai Street and Duke Street in the modelled 5 year rain event. It has also been confirmed that the Frederick Street and Waipuna Street pump stations are under capacity in a wet weather scenario but are managing dry weather flows under current demand.

Further work is required to identify rain derived sources and in particular modelling indicates that the Mahora School may be a major contributor to wet weather flows into the Waipuna pump station.

Other upgrades identified include Frederick Street West between Tōmoana Road and Nelson Street and Williams Street downstream of the Tōmoana Rd intersection where the combined rising main discharge from both pump stations enters into the gravity network.



The Mahora suburb is already identified as a Medium Density area and the impacts of MD growth will exacerbate existing wastewater issues. A number of options are being investigated to redirect some wastewater flows into other parts of the network where capacity is available. This has the potential to reduce the volume of wet weather flows at the pump stations and reduce surcharging effects in the local network as part of a suite of upgrades that will be required to ensure this area is development ready.

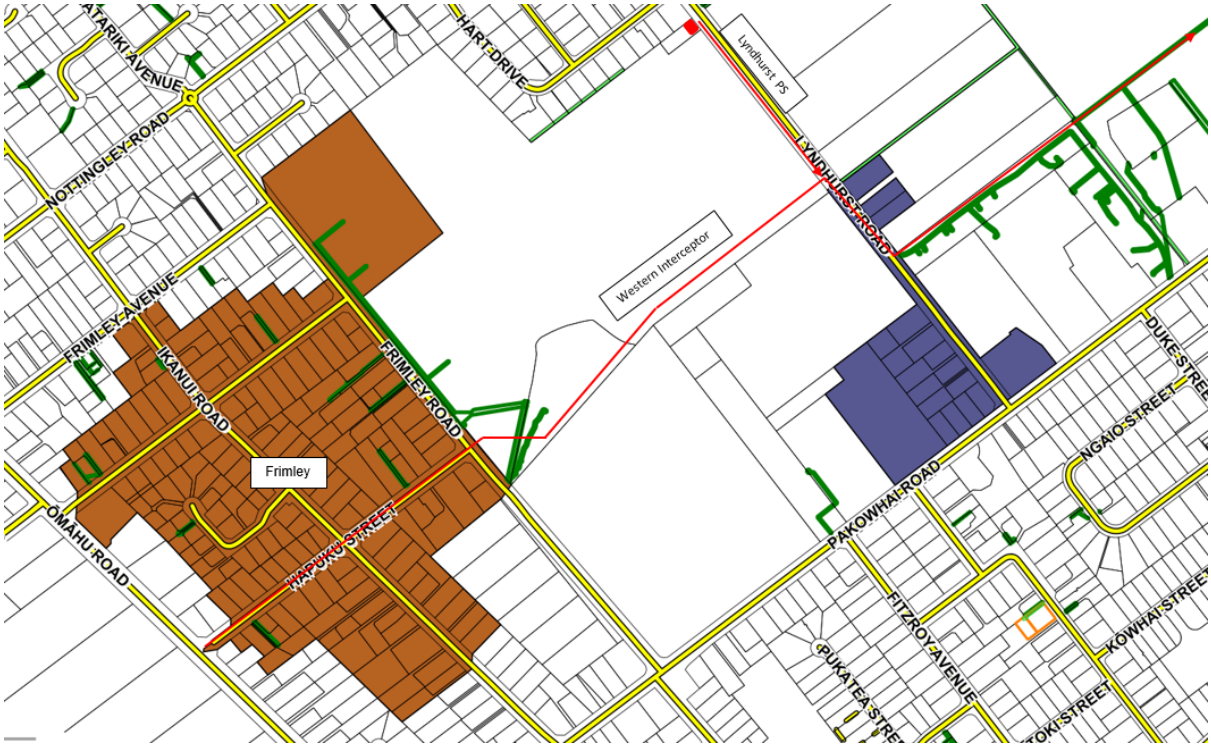
Catchment	Current Dry	Current Wet	Growth Dry	Growth Wet
Frederick St PS				
Waipuna St PS				
Frederick St Gravity				
Williams St Gravity				

[29] HDC Internal Email Report – Mahora Medium Density Upgrade (Joe Xie – 12 October 2022)

3.39. Frimley & Western Interceptor

The Frimley urban area sits between Omahu Road and Frimley Road. Wastewater gravitates to Frimley Road and discharges into the Western Interceptor at the Hapuku/Frimley Road intersection. Modelling in the 5 year rain event shows that this area is performing without issue and can cater for growth.

The Western Interceptor (WI) is a 525mm diameter pipe that commences in Hapuku St at the intersection with Omahu Rd and terminates at Otene Rd where it joins the No.3 trunk sewer. This main is isolated from flows that travel down Omahu Rd and into Heretaunga St and only receives wastewater from the Frimley and Lyndhurst areas of Hastings.



The WI is normally closed at Omahu Rd and this is the standard operational configuration. Modelling has been undertaken to assess how the system operates with the WI open at Omahu Rd and receiving flows from the upper catchments including Flaxmere, Omahu and Camberley. The results show that there is very little benefit to the Hastings wastewater network downstream in terms of relieving pressure (Heretaunga St, Brick Arch, Nelson St) and the WI operates in a surcharged state which is exacerbated downstream of Lyndhurst Rd where all of the domestic wastewater from the Lyndhurst urban area enters the WI.

Western Interceptor Closed (Normal configuration)

Western Interceptor Open

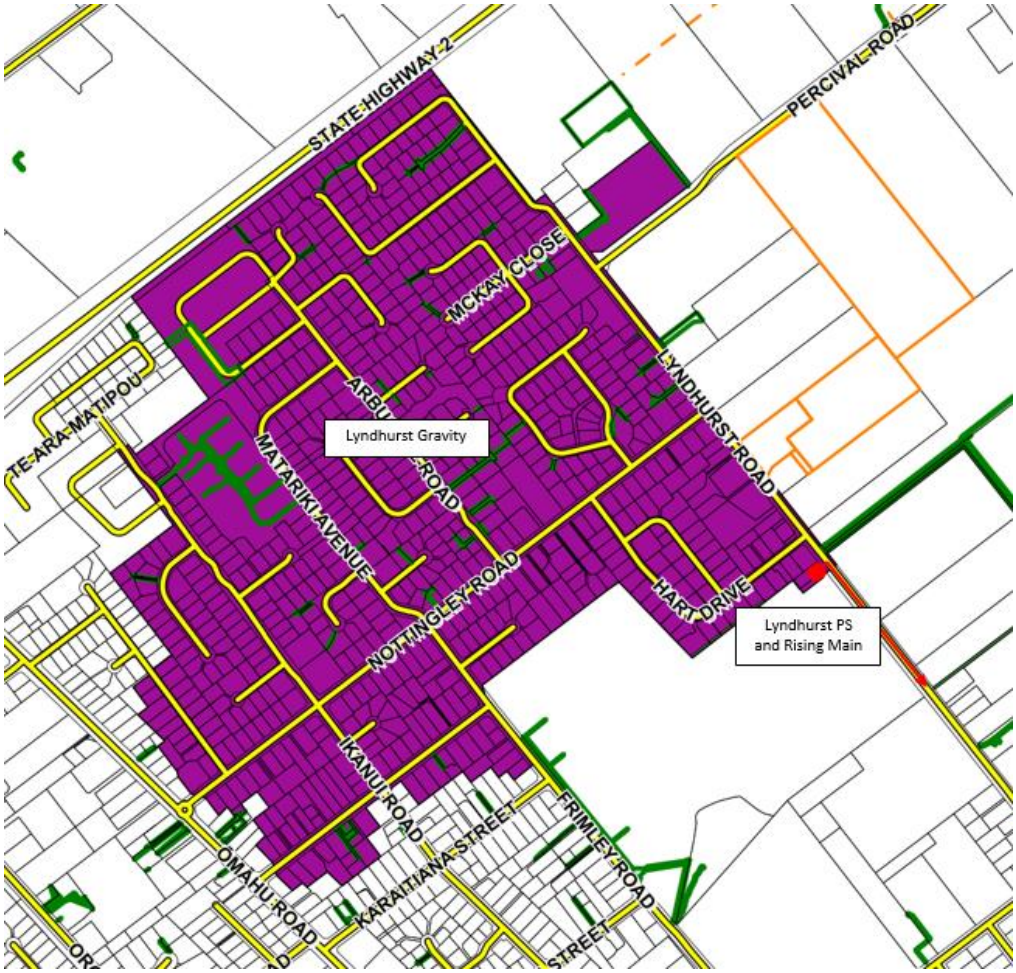
These results do however provide an insight into how the WI might be better utilised in a future growth environment where sub-catchment flows are preferentially redirected to the WI as an alternative to creating capacity in Heretaunga St and downstream of the Western Interceptor. This would require careful consideration of flow control to ensure that the WI was not overloaded at the expense of other network efficiencies.

Catchment	Current Dry	Current Wet	Growth Dry	Growth Wet
Frimley Gravity				

3.40. Lyndhurst

The Lyndhurst residential area encompasses a large urban development block between Nottingley Rd and the Expressway, and Omahu Rd and Lyndhurst Rd. Properties to the east of Nottingley Rd were developed at a similar time to Frimley (1960s and 70s) whereas the Lyndhurst subdivision (west of Nottingley) has seen ongoing development since the mid 2000s when the Stage 1 infrastructure was first initiated.

It is important to note that the wastewater network was originally designed to accommodate the entire development area but recognising that development would be staged and implemented over many years. This meant that the layout of internal infrastructure was only indicative but the bulk infrastructure in Lyndhurst Rd was designed and built to cater for the entire area based on yields expected at the time.



As development has progressed we have experienced an increase in the density of housing along with retirement village style living in the area. The overall increase in population has exceeded the original wastewater design and also in how wastewater has been distributed internally across the area. While changes in layout have been able to be accommodated through design, more recent hydraulic analysis[30] recommended that the pump station and a section of the 225mm diameter wastewater main in Lyndhurst Rd required capacity upgrades. This ensured that the Lyndhurst area would maintain our level of service standards in the 5 year rain event and that the risk of surcharging and overflows would be minimised.

[30] STR-16-06-12-18-22 - Lyndhurst Rd Stage 2 Development HDC Sewer Capacity Review 2018

Figure 3-1: Performance of Sewer A-F if areas 1, 2 and 3 are developed

Very recent modelling work in August 2022 [31] confirms that pumps were upgraded in 2021 however a review of operational data and population counts in the Lyndhurst area and remodelling of the local network has identified further upgrades are necessary as flow and population data are greater than those used in the 2018 modelling exercise.

As Lyndhurst is a new development area, it is unlikely to experience further increases in density through redevelopment. The more recent and new developments are already at a higher density and Council is not planning to provide additional capacity over and above the current levels or to undertake upgrades other than to implement works as recommended in the hydraulic modelling report(s).

3.41. Other Hastings Catchments

Northwood – A recent development area that is serviced by the Northwood pump station discharging into the lower section of the Western Interceptor. A discreet catchment that is not known to have any capacity issues, will not be impacted by growth nor does it create any downstream issues.

Pakowhai Rd Gravity – A very small catchment around Pakowhai Rd and Williams St intersection. No known issues.

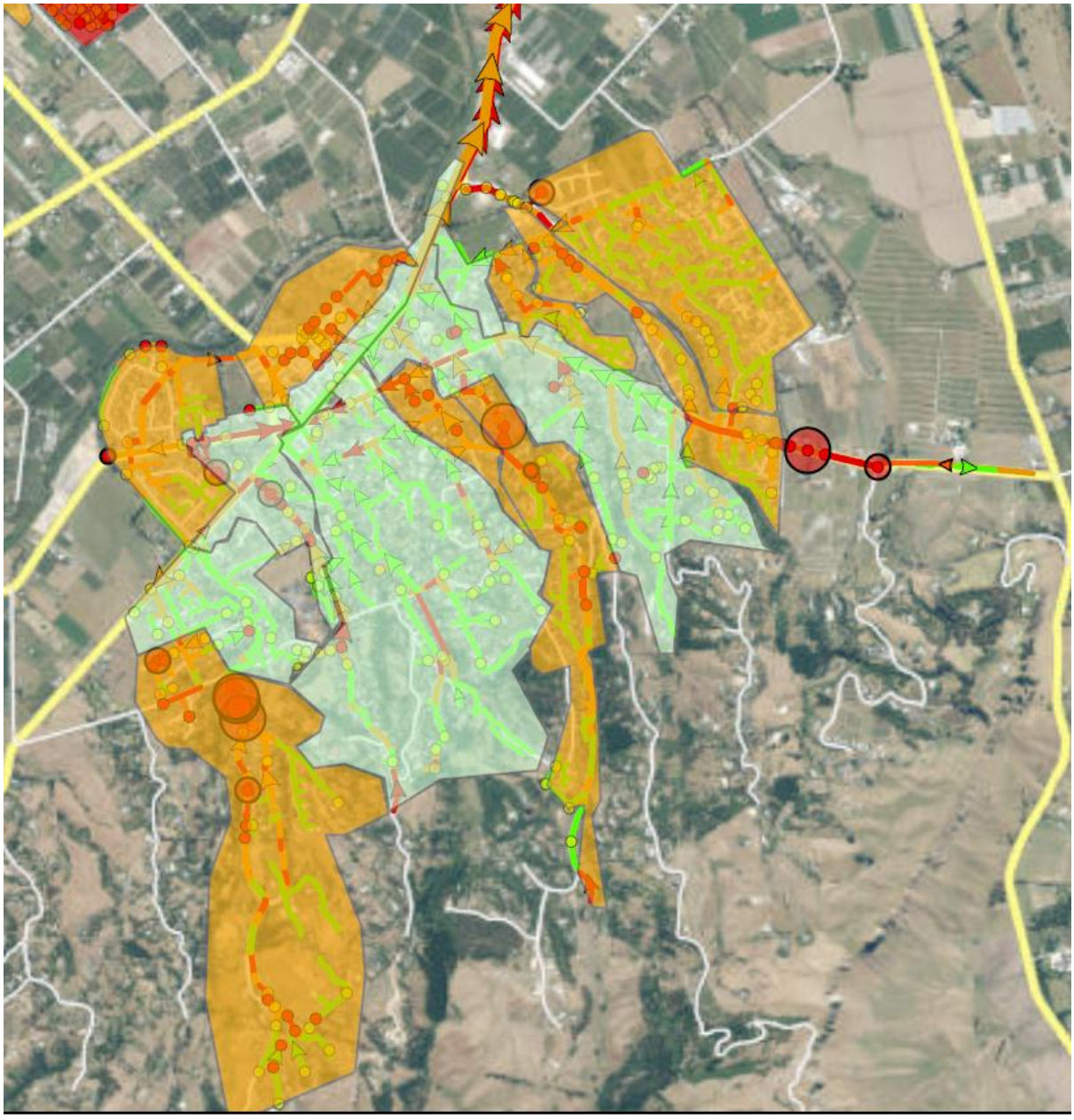
King St, Watties and Coventry Rd – Small areas providing domestic wastewater service to industrial and commercial operations. Not considered to be relevant to this urban growth constraints report.

[31] HDC Internal report – Frimley Pump Station Catchment Capacity Assessment (Joe Xie, August 2022).

3.42. Havelock North

The Havelock North wastewater network services a series of catchments that are treated by the Hastings Wastewater Treatment Plant at East Clive. The network feeds into the Napier Road Wastewater interceptors that join with the main Hastings interceptors at Whakatū. The network includes the following catchments:

- Breadalbane Road
- Napier Rd (including Tanner Street Pump Station)
- Tokomaru Drive
- Havelock Nth (including Greenwood Road and Franklin Terrace.)
- Napier Road (including Blackbarn Pump Station and Te Mata Extn.)
- Arataki Road
- Anderson Park Pump Station
- Karanema Drive Pump Station



The township is serviced by collector mains in Middle Rd to the south and Napier Rd to the north which collect wastewater from the elevated areas in the hills above. Lower lying areas in Te Aute Rd and the CBD rely on pump stations to lift flows into Napier Rd and there are several minor pump stations located in the valleys (Greenwood Rd, Franklin Tce, Tanner St etc.) to lift wastewater up to the gravity sections of the network. There are also a number of private pump stations that service housing clusters due to the terrain limiting access for gravity discharge.

All wastewater from Havelock North is conveyed to the No.3 trunk sewer at Whakatu via two trunk sewers located in Napier Rd and SH5. In 2015, a new PE 700mm trunk main was installed to increase capacity and future-proof services to the Village. The original 600mm diameter reinforced concrete pipe is offline but is available to provide capacity when flows are severely impacted by rain (Inflow &Infiltration) which has been an ongoing issue for many years.

The impacts of I&I coupled with significant growth has required major upgrades to be implemented over the last 25 years as part of growth capacity provision in the wider Hastings Wastewater network. This work is now supporting continued expansion to the south in Middle Rd and Iona. Residential expansion into the Havelock Hills continues and this adds to the wastewater burden particularly where pumping is required. The network continues to extend away from the bulk collector mains and this will be problematic in the future if this expansion continues without thought to re-engineering parts of the network to ensure pipes are not overloaded and surcharged. While the current suite of upgrades has released some pressure, it is almost inevitable that Council will at some point have to plan for much wider network improvements to meet the needs of a growing community.

High level analysis of the current network shows that in general the network is performing as intended. It should be noted that the wastewater model for Havelock North is at a relatively basic level with a low confidence rating in the outputs produced from modelling analysis. There are improvements needed to optimise provision of growth capacity in the Brookvale area, and further growth may occur in the Middle Road and Anderson Park localities. Anecdotally, there are also operational issues during wet weather events, particularly in the elevated areas, where ponding occurs within properties that enters into the wastewater system creating issues in the lower parts of Havelock North. Ongoing surveillance at a property level is required to identify and remedy these direct inflows.

While the Havelock catchments and growth areas have benefited significantly from growth related investment over the past 20-25 years, future growth means that further investment is likely to be required, particularly in Brookvale and Anderson Park areas (dependent on growth location decision-making).

3.43. Summary of Sub-Catchment Analysis

Table 3.44.1 below collates the sub-catchment analysis into a useful comparison table. Catchments are highlighted where they are considered a priority based on either current known constraints or will be constrained by predicted greenfield and/or brownfield growth.

Table 3.43.1 - Sub-Catchment Analysis

Catchment	Current Dry	Current Wet	Growth Dry	Growth Wet
Tarbet St				
Flaxmere				
Omahu Rd				
Ormond Rd				
Stoney Creek Rd				
Huia St Extension				

Huia St				
Maraekakaho				
Harding Rd				
Oliphant Rd				
Pepper St				
Townshend St				
Tōmoana Rd				
Fitzroy Ave				
Nelson St Nth				
Southland Place			**N/A**	**N/A**
Hemi St				
Southland Rd				
Akina Park				
Murdoch Rd				
Heretaunga St				
Russell St				
King St				
Southland Rd				
St Aubyn St				
Clive St				
Lyell St				
Park Rd North				
Avenue Rd				
Albert St				
Mayfair Gravity				
Louie St				
Hood St				
Caroline Rd				
Warwick Rd				
Kenilworth Rd				
Frederick St PS				
Waipuna St PS				
Frederick St Gravity				
Williams St Gravity				
Frimley Gravity				

Statement of Proposal : Long Term Plan Amendment – Dealing with growth

Some decisions and changes that are made by Council require an amendment to the Council's Long Term Plan. It is not uncommon for Council to review matters within its Long Term Plan to respond to changes in context or to account for new information.

In 2023/24 the Council proposes to refine its approach to dealing with the considerable growth pressure being experienced in the district and more particularly the growth infrastructure needed for the future of the district.

Nature and scope of the amendment

Managing growth is highlighted as a key issue within the Council's 2021-31 Long Term Plan, and that growth forecast and the pressures that come with it are now being experienced in our planning and service delivery. In particular, there is a need to plan for and deliver additional network infrastructure capacity earlier than envisaged in order to provide development capacity for the period 2024 – 2029 and beyond.

The establishment of a dedicated growth unit has been the first step to addressing these pressures. What the Council is now proposing is a response to the cumulative impact of both recent and forecast growth, particularly on Council's wastewater network. Recent and currently occurring housing, industrial and commercial development has used up almost all of the available capacity within the Hastings and Flaxmere wastewater network. This growth has been more rapid and intensive than originally envisaged resulting in additional pressure for services from networks that are not designed for this level of development.

The time has come where the historical approach of localised upgrades and extensions to the existing network will not efficiently or effectively accommodate future growth.

Asset planning work is indicating that less substantive works will also be required on the water supply network to improve distribution efficiency and reduce water loss in order to create the capacity for growth. Work by the Hawkes Bay Regional Council has signalled over-allocation of the region's groundwater resource and imposed a very high bar on additional water allocations. This makes the efficient use of the resource we do have access to vitally important.

It is not unusual that through the development cycle of a city there comes a time when significant infrastructural investments are required to ensure the city is "fit for the future"; be that a new arterial road route, a wastewater treatment plant, a landfill facility or in this case major new wastewater mains and associated connecting works to the existing network.

Investigation work on these proposed investments to ensure development capacity were not sufficiently advanced for them to be included in the 2021-31 Long-Term Plan or Development Contributions Policy.

This proposal outlines the updated approach to providing additional network infrastructure capacity, the reasons for the proposed approach, the Council's legal responsibilities in respect of future residential and industrial/Commercial capacity, the funding solution being proposed and the fiscal impacts of this approach. **It provides both an overview of the full proposal and the specific impacts for the 2023/24 year compared with the Long Term Plan forecast for that same year.**

Why provide development capacity for growth?

We are growing

- Hastings District is currently experiencing significant and rapid growth. Statistics New Zealand's latest population estimate (2021) for Hastings District is 90,100; an increase of 5,400 since the 2018 estimate (84,700).
- Building consent volumes have grown significantly: excluding consents for solid fuel heaters, residential building consents granted have risen from 685 in calendar year 2015 to 1021 in 2021 – an increase of 49%; with new dwelling consents increasing from 180 to 517 or 187%.
- Commercial building consents are similar in volume to 2015, however the estimated value of the works consented has increased by in excess of 150% (from $95M to more than $250M).
- Resource consent volumes have increased year on year from 428 in 2015 to 673 in 2021. Uptake of development land in both the residential and industrial sectors has been at a rate above both projected rates and historic trends and infill housing follows a similar trend.
- We need more houses – as at June 2022 there were 762 households registered on the Ministry of Social Development's social housing register, with an estimated shortage of between 1,000 and 1,600 houses overall.

We have responded – but growth runs strong

The Council has been taking action to respond to this growth pressure. Beginning in 2015, the Council initiated a number of structure planning and planning processes to make available a number of areas of land for residential and industrial development. Infrastructure investments were programmed and subsequently made alongside these planning changes, with appropriate revisions made to the Council's Development Contributions Policy. Through this work, the Lyndhurst Stage 2, Howard St, Brookvale and Iona residential development areas were initiated, as was the rezoning and infrastructure servicing of the Irongate and Ōmāhu Industrial areas.

These initiatives and investments by Council have helped enable the significant residential and industrial development and investment Hastings has seen since 2015. However, even that unprecedented rate of rezoning and infrastructure development has not been enough to keep up with growth demand. The rate of growth being experienced is rapidly using up available development land (both residential and business land) and network infrastructure capacity (particularly with respect to the Hastings urban wastewater network and consented water supply volumes). And the population driven housing shortage has continued to worsen, with 762 households on the MSD social housing register as at 30 June 2022 (there were 69 households on the register as at 30 September 2016). Based on the 2021 Housing Capacity Assessment, there is a current shortage of approximately 1,300 in Hastings currently. In 2021, demand was expected to grow by another 1,600 – 1,800 households by the end of 2023, although open borders and changed migration settings may reduce those predicted numbers. Nonetheless, significant new housing stock is expected to be required both in the immediate future and over the coming decades.

Council is acting to make new development areas available in the short to medium-term, including in Flaxmere and with structure planning work on the Lyndhurst Extension area, Kaiapo Road and the Heretaunga Tamatea Settlement Trust owned land at Irongate/Stock/York Road. However, Council has also understood that action is required now to ensure the availability of development land and infrastructure capacity over the medium to longer-term.

The Chief Executive has responded to this context by establishing a Future Growth Unit to lead and coordinate future growth planning, infrastructure and funding activity across the Council. This brings focused resource to bear on medium to longer-term growth management work (including responding to new legislative responsibilities outlined below). The Chief Executive has also moved to augment, where possible in the external employment and consultant markets, resourcing being applied to immediate-term building and resource consenting activity and short to medium-term structure planning work.

New legislative responsibilities

Alongside this high-growth context, statutory requirements on Council to provide development capacity have also increased. The National Policy Statement on Urban Development 2020 (NPS-UD) requires councils to "*provide at least sufficient development capacity in its region or district to meet expected demand for housing".* It also requires councils to provide sufficient development capacity for business land. Development capacity refers to land being available that is able to be developed under the planning objectives, policies and rules that apply **and** for which there is adequate infrastructure capacity to enable development.

Councils in tier 1 or 2 urban environments (Hastings and Napier are a tier 2 urban environment) are required to adopt housing bottom lines in their District Plans or Regional Policy Statements clearly stating the development capacity that is sufficient to meet expected housing demand plus an appropriate competitiveness margin. The NPS-UD also requires councils in tier 1 and 2 urban environments to work together to prepare and adopt a Future Development Strategy (FDS) for that urban environment.

These increased requirements come amidst wider proposed changes to the legal framework for planning and growth management. The Government has signalled that the Resource Management Act 1991 (RMA) will be replaced by three pieces of legislation. The proposed Natural and Built Environment Act (NBEA) will replace the RMA and provide the legal framework for statutory planning instruments and consents. The proposed Strategic Planning Act will introduce a requirement for regional spatial strategies to guide high-level strategic planning on a regional basis. In addition, a proposed Climate Change Adaptation Act is likely to address issues relating to managed retreat and funding and financing adaptation.

Collectively, these current and prospective legal requirements signal a more collaborative and regionalised approach to planning and growth management. Councils will need to work together regionally, and with mana whenua and central government agencies, in the development of both spatial plans and statutory plans under NBEA.

The wider regional context will therefore affect the work to be carried out and impact on the Hastings District. The constraints on Napier City in terms of additional development capacity generally, and industrial capacity in particular, are likely to create further demand pressures on Hastings. Both Napier and Central Hawke's Bay are also experiencing relative significant growth in the residential sector which will also influence the regional

development capacity picture. Efforts to address housing shortage, such as Kāinga Ora's investment programme, will also continue to affect how available development capacity is utilised in Hastings and beyond, creating flow on effects in the development market. These are just some of the broader contextual issues that have been considered in developing this proposal.

Future uncertainty

The Government has initiated a major reform process of the Three Waters sector. One of the impacts of this is likely to be that councils will lose some measure of control over the commissioning and delivery of growth-related infrastructure. While the new water entities are intended to be 'plan-takers', enabling councils to specify growth related investment requirements, entities will be faced with investment demands from a number of councils. It seems unlikely that all of these demands will be able to be met concurrently. While the envisaged water industry system may turn out to be responsive to growth demands, it seems clear that councils will no longer have direct control over what infrastructure will get built when.

Coupled with this loss of direct control in the future, the transition process signalled in the Water Services Entities Bill also creates some uncertainty. The Bill proposes that Council Three Waters investment expenditure decisions not included within Long-Term Plans will be subject to further consideration and decision-making by the Chief Executive of the Department of Internal Affairs.

These factors have led Council to the conclusion that amending its Long-Term Plan to provide for identified growth related infrastructure requirements will provide greater certainty for the development community, for the proposed water entity and in terms of Council's obligations to provide infrastructure ready development capacity under the National Policy Statement on Urban Development.

What does the infrastructure solution look like?

Current state assessment

In assessing Hastings' overall infrastructure situation as it relates to growth, the picture that emerges is that the older, core three waters networks have almost reached their full or 'natural' capacity as 'growth-responsive' additions have been made to them over time. Investment in additional arterial infrastructure is required to enable new development capacity.

In terms of wastewater, while there is capacity in the main interceptor sewer pipes connecting the urban areas to the treatment plant at East Clive and a planned additional biological trickling filter at the plant is required, the internal networks and pump stations within Hastings (which help service Hastings and Flaxmere) are either at or reaching capacity. The construction of new 'arterial capacity' is required to enable wider uptake of medium density development and urban intensification, and to provide for future new growth areas. Adding to this picture, Hastings is located on a 'hump' that runs along Omahu Road and Heretaunga Street. This means potential growth areas around the south and west of Hastings drain away from the main trunk infrastructure connecting Hastings to the East Clive treatment plant. Growth on this side of Hastings puts pressure on our ability to pump wastewater to the north into our trunk sewers.

In terms of water supply, abstraction limits in the Council's municipal water supply resource consent provide a constraint to development capacity. Improved network distribution infrastructure is required to improve network efficiency and reduce network pressure and water loss, thereby improving efficiency of use and providing capacity for growth while still delivering flows required for firefighting.

The approach to stormwater will also need to adapt to growth pressures, increasing environmental standards and the future impacts of climate change. New and upgraded infrastructure will be required to provide stormwater capacity and treatment in respect of development in particular catchments and sub catchments, as well as work with the Hawke's Bay Regional Council to address overall capacity issues in their Heretaunga Plains network. These stormwater works may involve land purchases or designations as part of structure planning or subdivision processes and are likely to be addressed catchment by catchment. As development occurs over time, there are also likely to be transport, parks and reserves and community infrastructure requirements. However, these investment requirements are not as well defined as wastewater and drinking water requirements as yet, and, aside from stormwater, are not affected by the Three Waters reform process. Accordingly, this Long-Term Plan amendment focuses on identified requirements for wastewater and water supply. Other growth investment requirements will be identified as growth infrastructure planning work continues through the FDS and Essential Service Development Plans, and included in subsequent Long-Term Plan processes.

Proposed approach – A total $230m investment

The main capital investment component in this amendment is in building new wastewater main trunk infrastructure. This comprises major new wastewater pipes which add macro-level wastewater capacity to the Hastings and Flaxmere network, improving capacity and improving connectivity to the main trunk interceptor pipes that convey wastewater to the East Clive Wastewater Treatment Plant. This new infrastructure redirects wastewater from existing urban areas , which will in-turn free up capacity in the Hastings City network to enable the district's housing objectives (in relation to higher density developments) to be achieved, whilst continuing to support planned greenfield developments. Allowing more intensive urban development and restricting development away from the fertile Heretaunga soils has been a key objective for some time and is embedded in Council's growth policy and planning framework.

The township of Havelock North by comparison has had substantive wastewater and drinking water investment since the early 2000s in response to growth pressure. Although the township is not constrained to the same extent as Hastings and Flaxmere, continued expansion to the south and in the Havelock North hills will necessitate continued future investment in new infrastructure.

Key components of the wastewater investment are as follows:

- **Stage 1 Pāharakeke Wastewater Pump Station and Rising Main (HTST Irongate Development) –** This wastewater project will link the Heretaunga Tamatea

Settlement Trust greenfield housing development Irongate/York/Stock Road via the main Hastings wastewater network and the Stage 2 works outlined below. This will enable around 400 additional houses.

- Stage 2 Pāharakeke Wastewater Gravity Main (Ōmahū Rd to No.3 Trunk Sewer) – This major pipeline will run from the junction of State Highway 2 and Ōmāhu Road along SH2 to the Hawke's Bay Regional Sports Park, along the bottom boundary of the Sports Park, through the Lyndhurst extension area and via easements to Evenden Road, along Evenden Road crossing over Pākowhai Road, and continuing along the alignment for the proposed North-Eastern Connector to Coventry Road to discharge at the No. 3 trunk sewer. This new sewer main will collect wastewater flows from Flaxmere and the western parts of Hastings, creating capacity in the existing Hastings network for medium-density housing and new growth areas.

- Karamū/Waipatu/Ōtene Rd Pump Station and Trunk Sewer Main – This project will provide a major wastewater outlet pipe for the eastern side of Hastings from Karamu Road North along State Highway 51 and down Bennett Road to discharge at the No. 3 trunk sewer in Ōtene Road. The pipe will redirect wastewater flows from the eastern and southern parts of Hastings, creating capacity in the existing Hastings network for medium-density housing and new growth areas. As well as providing additional wastewater capacity to Hastings, the pipe will also serve papakāinga development around Waipatu.

Together the three components are vital to enabling over 4,000 additional homes to be serviced over the next 15 years, with further additional housing beyond that. They also provide domestic sewer capacity for commercial and industrial growth. The total estimated cost of the three projects is $31.5M.

In addition to these major capacity enhancing pipes, further wastewater investment is required to fully utilise the capacity that these new projects are intended to provide. Future works will connect new development areas and areas of the existing urban wastewater network to the new capacity. This investment is made up of the following broad components:

- Southern wastewater link $36.4M
- Medium density wastewater capacity upgrades $78.0M
- Inner City Living capacity upgrades $14.2M
- Hood Street Wastewater upgrade $ 9.6M
- Havelock North capacity investigations $ 1.0M
- East Clive WWTP capacity upgrades $29.0M

These components compliment the major main trunk wastewater investments outlined above, linking new capacity with localities within the city and creating capacity for growth within the wider wastewater network. This will ensure wastewater services for planned and likely new development areas as well as capacity for medium-density and apartment developments in the inner city and parts of the existing urban area.

The other wastewater investment provided for delivers a community based solution to the Kohupātiki community. A sewer pump station will be constructed within the Kohupātiki area, and a pipeline under the Clive River linking with the main domestic wastewater interceptor travelling to the East Clive Wastewater Treatment Plant near the intersection of SH 51 and Richmond Road. The cost of this programme component is $1.18M.

This project will enable the development of papakāinga housing within the Kohupātiki community.

Other Infrastructure

Water Supply

- Waipatu – a water supply main will be laid along Karamu Road, SH 51 and Bennett Road. This project will be laid alongside the main sewer works and will enable the development of papakāinga housing in the Waipatu area. Project value - $3.6M

- Growth and resilience improvements to the water supply network – improvements across the municipal water supply network are programmed to help accommodate growth, improve network efficiency and ensure network resilience. This programme is estimated to cost $25.4M.

Transport

- Irongate/York Rd - public roadway connections between the existing roading network and the Irongate/York development

- Capacity Improvements – minor roading improvements to support housing development at Kohupātiki, Tangoio, Te Hauke and Mōteo.

What's the proposed programme sequencing?

Sequencing of the proposed investment is important as we don't know with absolute certainty key drivers such as the rate of population and housing growth, and we do not control macro factors such as economic conditions and activity.

The overall programme ($230m over 10 years) has been split into 2 distinct stages as follows:

Stage 1: Growth Ready - Years 1-3

This stage would put in place the main arterial infrastructure (big pipes) and some of the necessary linking infrastructure to set the district up to accommodate future growth. It would also unlock wastewater capacity to enable those areas initially prioritised for intensification to be developed. This stage is costed at circa $85m (with $18m funded from the Government Infrastructure Acceleration Fund).

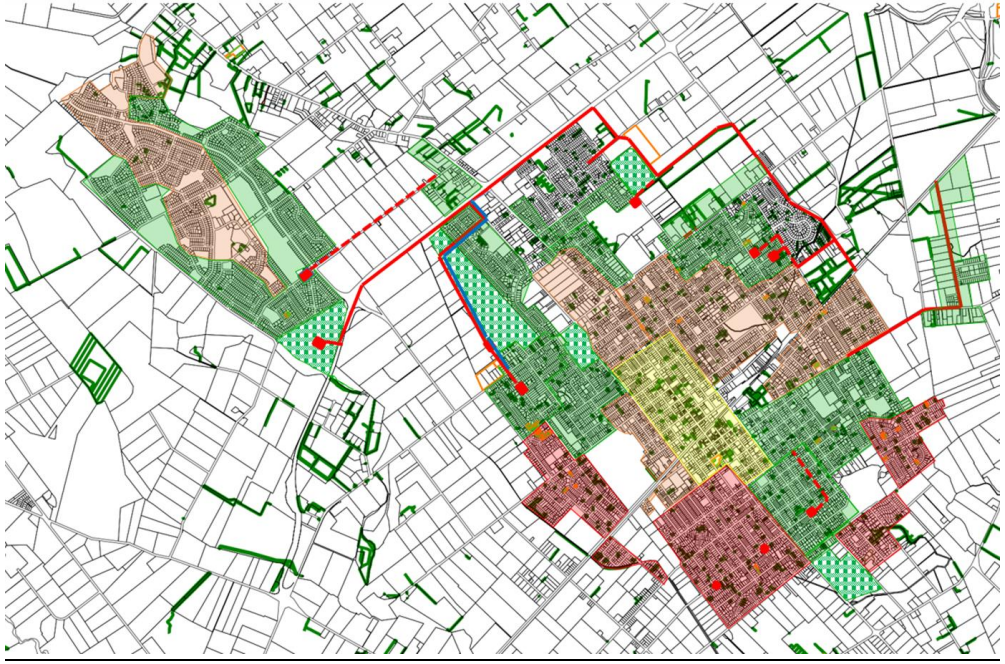
Stage 2: Growth Reactive – Years 4-10

This stage will see the balance of the local infrastructure and upgrades at the East Clive Wastewater Treatment Plant ($116m + $29m) rolled out between years 4-10 to progressively unlock further areas for intensified development and to provide additional treatment capacity for the increased flows. Importantly, the rollout of these investments can be timed with market conditions and demand. Therefore should the market "cool down" investment can be delayed and alternatively should it be warranted investment can be stepped up. This is how Council can optimise the capex spend and minimise its investment risk.

The proposal on a map

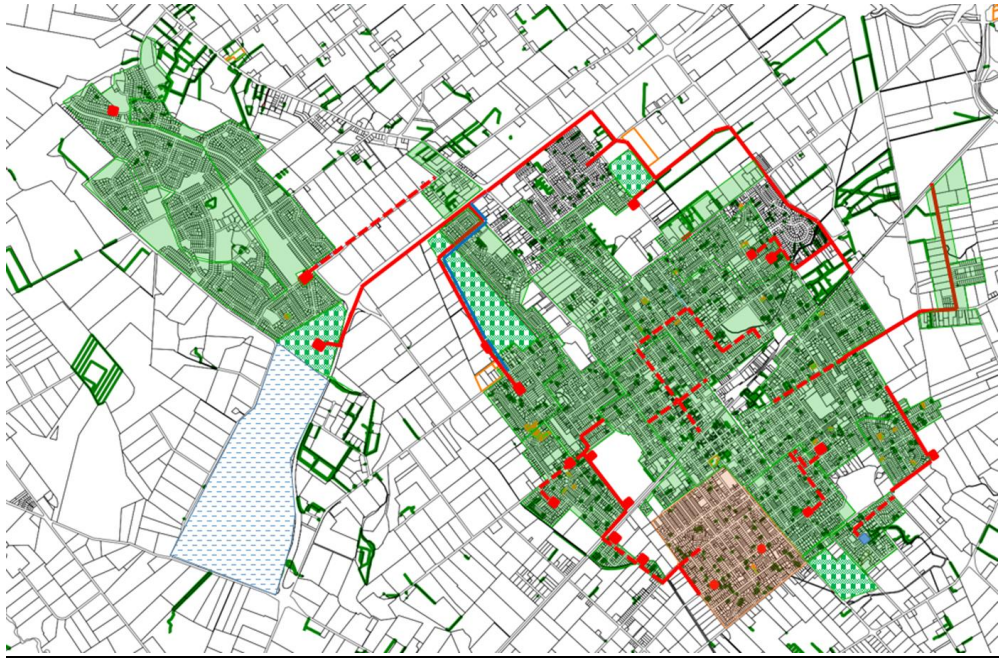
Growth Ready

The map below depicts those areas unlocked for development via the Stage 1 Growth Ready phase (the areas shown as green). Whilst some areas are opened up for development, others remain constrained dependant on further infrastructure investment.



Growth Reactive

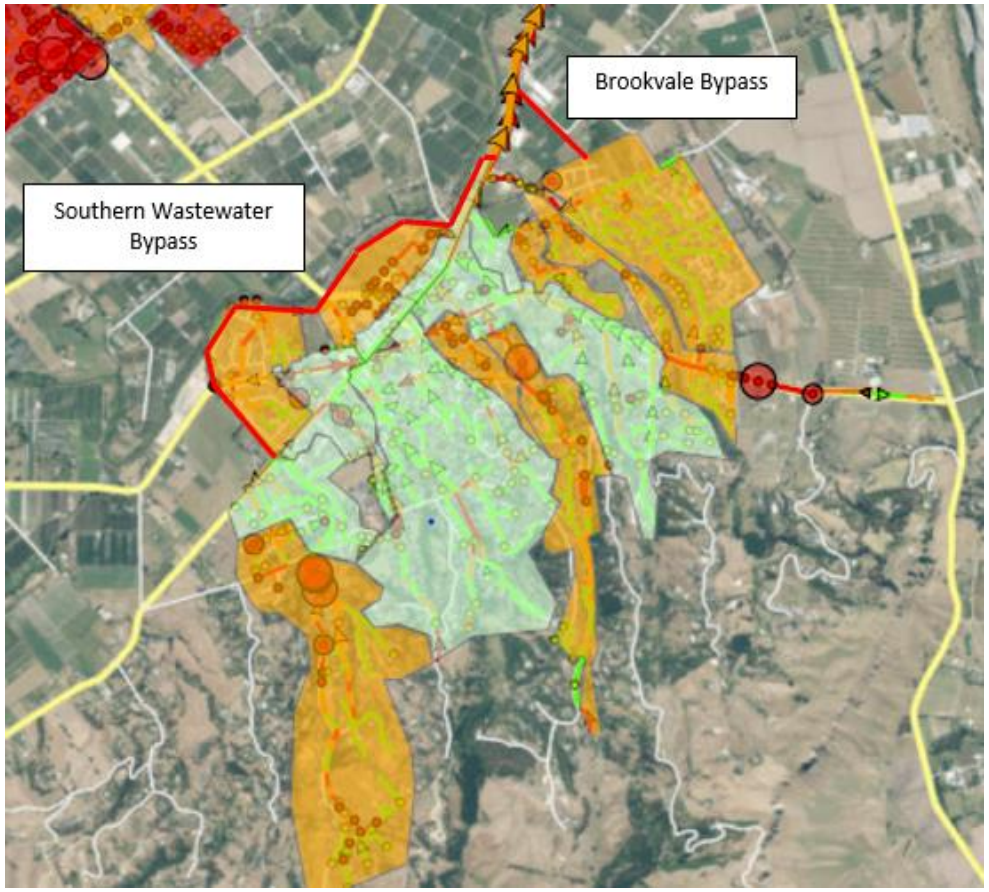
The map below depicts those areas further unlocked for development beyond the Stage 1 Growth Ready phase – via the Stage Two Growth Reactive phase. This additional investment makes most of Hastings serviceable for intensified development, other than the Akina area.



Havelock North

The Havelock North wastewater system was substantially upgraded in the early/mid 2000s to provide capacity for expansion into the Havelock North hills, Arataki and to the south in Middle Rd and Iona Rd, and in 2015, a second trunk sewer pipe was constructed in Napier Rd in response to significant growth pressures and wastewater constraints. The eastern catchments (Anderson Park and Karanema) rely on pump stations and there are known capacity issues that will be exacerbated as growth extends further to the south and along Te Aute Rd and Middle Rd. It is anticipated that new bulk infrastructure will be required in the next 10 to 20 years as that growth materialises.

The following map shows areas of Havelock North that have capacity issues that will require upgrades (pipes and pump stations) including options to construct bypass trunk sewers to relieve capacity and cater for future growth.



In Short

Network wide improvements include the upsizing of pump stations and the larger mains that feed into and out of these stations along with network strengthening to optimise capacity at a street level where development is occurring. Investment in new and existing water and wastewater infrastructure to align with growth as it occurs will ensure that we remain responsive to intensification across the urban footprint.

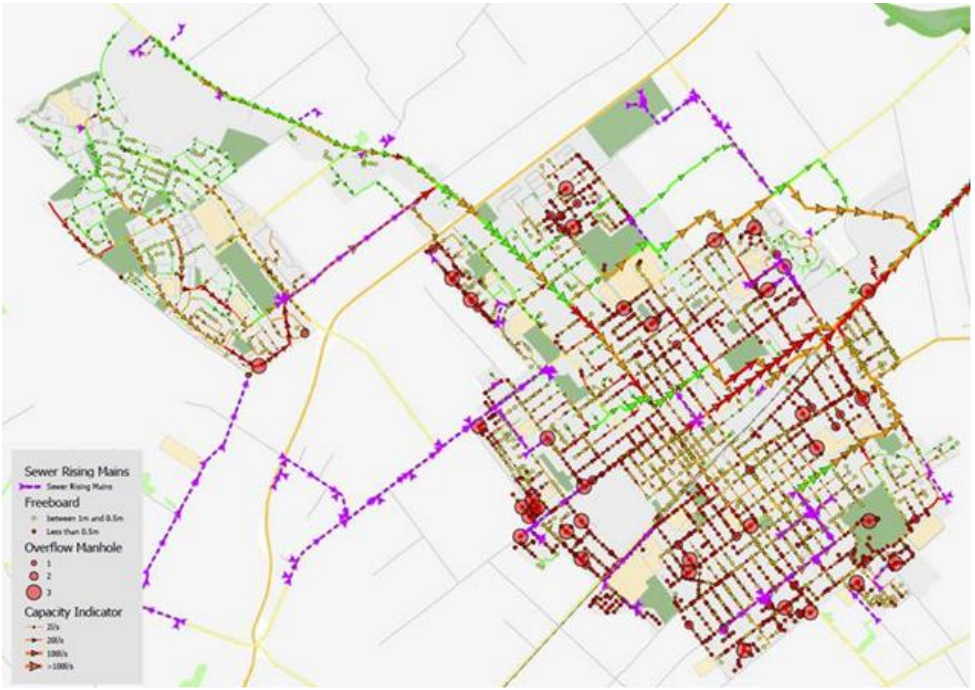
Alternative options consideration

A business case assessment was undertaken on the proposed major trunk main wastewater investment. This looked at whether there were alternative options to the investment proposed. Doing nothing was discounted based on network modelling and the imperative under the HPS-UD to provide at least sufficient network capacity. The modelling demonstrated that the network was already at capacity at various locations under low scale wet-weather events. It also demonstrated that the current network would not provide the capacity required under the NPS-UD in the context of growth demand for housing being experienced and projected (even at low to moderate growth projections).

The alternative approach to investing in new main trunk infrastructure around the edges of Hastings requires replicating that capacity within the existing network that runs through Hastings. This would involve significant upsizing of pipes and pump stations within Hastings and/or the construction of duplicate mains across the network. The added complexity of trying to implement large scale upgrades on an operational network in built up areas, plus the level of disruption to consumers and the public, would add significant cost and time delays in delivering these projects which are needed now.

A high level cost analysis to deliver the Growth Ready phase was undertaken to evaluate the difference between these options and shows that the brownfield (through the existing urban area of Hastings) upgrade option could be upwards of $60M or more over the $85M proposed via the greenfield proposal (infrastructure around the edge of the city). **The advantages of building new infrastructure offline and in areas that are more remote cannot be underestimated and based on these factors, the investment package proposed in this Long Term Plan ammendment is preferred.**

Outlined below is a spatial representation of what the "do nothing" option would look like and the infrastructure servicing constraints it would bring. Many parts of the network are impacted and in particular, the constraints through the central areas of the network are exacerbated by increased flows in the upstream catchments that collectively discharge to the north and east. Effectively the Council would be saying **NO** to future development, and be unable to meet the various national policy directives in respect of providing for future growth. (More detail can be found in the Infrastructure Constraints Report).



Further Works

The proposed works set out above (under the "Growth Ready" and "Growth Reactive" approach) are the growth-related infrastructure requirements known at the time preparing this amendment. However, there are number of growth-related investment needs that have not yet been fully identified. These include investments in stormwater (including land purchases), and broader investments in the transport network, parks and reserves and community facilities. These investment needs will be identified through work to be undertaken on the FDS, Essential Service Development Plans and Local Area Plans over the next year to 18 months, and will be incorporated in the 2024-34 Long-Term Plan and subsequent planning processes.

How would this infrastructure solution be paid for?

At a high level the funding would be split as follows:

Government $18m

Growth – Development Contributions $129m

Community - Debt $83m

Government Funding

The Council have been working with government agencies on positioning Hastings appropriately to accommodate future growth. This work has culminated in a significant funding assistance grant ($18.5m) from the Government's Infrastructure Acceleration Fund (IAF) to accelerate the necessary infrastructure for the district to enable housing development. The IAF funding provides a significant contribution to the main trunk wastewater projects outlined above, as well as contributions to the Waipatu water supply extension, the wastewater connection to Kohupātiki, and transport improvements at the York Road/Irongate development and at Tangoio, Mōteo and Te Hauke.

However, this grant only covers a portion of the total infrastructure required to accommodate growth over the life of this Long-Term Plan and beyond. The criteria and rules for the IAF required that the developer community continues to pay their "fair share" of the costs of development so that government investment does not simply result in subsidised windfall profits for developers. In addition, as outlined above, there is significant additional growth enabling infrastructure investment required to be funded over and above that receiving IAF support.

Given this proposed infrastructure investment is primarily required to enable growth, the majority of the required expenditure is proposed to be funded through Development Contributions.

Development Contributions

The Development Contributions charging regime is the established way of recovering from those persons undertaking a development a fair, equitable and proportionate portion of the total cost of capital expenditure necessary to service growth over the long term. This economic principle is expressed in law through the Local Government Act 2002.

Those costs then flow from those undertaking the development to owners and users of the homes and commercial/industrial buildings that are developed.

Given the scale of infrastructure investment required to enable new development capacity, a substantive review of the Development Contributions Policy has been undertaken alongside the planning work outlined in the sections above. To view the full detail the Development Contributions Policy can be obtained or viewed online at www.myvoicemychoice.co.nz.

Council will attempt to spread the cost of the infrastructure over the life of the asset to the extent permitted under law. Under the Local Government Act, the maximum period that the costs of growth investment can be spread over for the purposes of Development Contributions is 25 years. This approach is being adopted, where appropriate, in Council's proposed Development Contribution policy.

Ratepayer loan funding

A proportion of the cost of the proposed investment has been identified as providing benefit to the non-growth community (existing residents and ratepayers) or has allocated as a "public good" providing benefit to the wider community. Based on this allocation of benefits from the proposed expenditure, it is proposed that $83M will be funded via loan funding, with that debt financed through annual rates.

Assurance - How do we know?

In preparing this proposal the Council has drawn on various data sources and has had various elements of the work peer reviewed and tested by appropriately qualified external entities. Work in this area includes:

Growth assumptions

Housing and Business Capacity Assessment – Council has drawn on Housing and Business Capacity Assessments undertaken by Market Economics Limited to inform growth projections and available capacity. These assessments are a requirement under the NPS-UD and evaluate the sufficiency of development capacity to meet expected demand over the short, medium and long term. Specifically they are required to assess the development capacity enabled by the current district plan and future planned rezonings, commercially feasible, serviced or planned to be serviced by infrastructure and reasonably expected to be realised by the market.

The Housing Capacity Assessment housing demand projections were based on Statistics New Zealand's Sub-National Population Projections produced in 2020, based on the 2018 Census of Popluation and Dwelllings. A scenario mid-way between the medium and high projections was used to at least in part insulate against capacity shortages caused by higher than expected growth occurring, as happened between 2015 and 2020, and is consistent with the approach taken in the Heretaunga Plains Urban Development Strategy Review (2017). Updated population projections are expected to be released in December 2022 ahead of the 2023 census with new projections based on that census in 2025/2026, which will assist in ongoing tuning of the program sequencing of the stage 2 and further works over time.

Infrastructural solution review

Significant work has been undertaken in order to determine that the infrastructure solution proposed by Council is appropriate to the growth and infrastructure context Hastings is facing. In addition to extensive modelling, analysis and concept development conducted by staff and consultants to develop the proposed solution, Council has also engaged an external peer reviewer to examine and advise on its proposals. Waugh Infrastructure Limited, a leading New Zealand infrastructure advisory and asset management firm, has examined the growth and infrastructure context for the Council's decision making, the infrastructure solutions proposed, the alternatives considered, and the work undertaken and assumptions made in developing the proposal.

The review work undertaken has found that the infrastructure proposal is appropriate to the circumstances and context facing the Council. It finds that the proposal will provide the infrastructure capacity required to enable development capacity in the short, medium and long-term, and that the proposal is cost-effective in comparison to alternatives.

The Infrastructure Constraints Report can be viewed at www.myvoicemychoice.co.nz

Economic analysis

As well as allocating costs to growth based on an assessment of the extent to which particular infrastructure projects cater to growth demand, the allocation of infrastructure costs to growth is also underpinned by economic principles. The Local Government Act 2002 mandates relevant principles, including: Section 101 (3) states that in determining funding sources, councils must consider "the extent to which the actions or inaction of particular individuals or a group contribute to the need to undertake the activity"; Section 197AA states that the purpose of the Act's provisions relating to development contributions is "to recover from those persons undertaking development a fair, equitable, and proportionate portion of the total cost of capital expenditure necessary to service growth over the long term." These principles underpinned the infrastructure decisions on the allocation of cost to growth and non-growth.

To ensure the Council's approach to development contributions is consistent with the economic principles set out in the Local Government Act 2002, the Council engaged GHD Advisory to provide a peer review of the economic analysis underpinning the Development Contributions Policy. This has involved examining and providing critique of the policy options as they were developed, and undertaking a peer review of the draft Development Contributions Policy document.

The first part of the review work undertaken provided an economic assessment of the policy options which enabled Council to determine its preferred option taking account of an analysis of relevant economic principles. The second part recommended minor adjustments to the policy, and confirmed that the draft policy was aligned with sound economic principles and in alignment with the economic principles specified in the Local Government Act 2002.

Development Contributions Policy

Review of allocation of works/cost to growth

The costs that make up development contributions are identified by assessing proposed infrastructure investments and determining what components or proportion of those investments are necessitated by or attributable to growth and which are not. Some investments are readily identifiable as being necessitable by growth where others are a mix of growth and non-growth. As an example, replacing an older sewer pipe and pump station would generally be a non-growth cost. However, upsizing the replacement infrastructure to provide additional capacity for growth would increase the costs of replacement. This cost increment can be attributed to growth.

Growth costs can also be allocated across different spatial catchments depending on whether the areas benefit from particular investments. In the Hastings context, development contributions for wastewater and drinking water are only charged to properties that can connect to those infrastructure networks. Other than that, Hastings tends to use a whole of network approach for allocating growth costs across new development.

As part of their infrastructure review work, Waugh Infrastructure Limited has also been engaged to review the project costs of the growth infrastructure programme. This has involved examining all of the projects within the proposed programme of infrastructure investment where there is a growth component. Waugh Infrastructure found that the project costs were reasonable.

To assist the reader The Development Contributions Review and Process Document can be viewed at www.myvoicemychoice.co.nz

Legal

The Council has consulted with legal advisors at various stages through the development of this Amendment and the Development Contributions Policy to help ensure alignment with statutory requirements and administrative law principles.

Other Key Assumptions

Forecasting assumption and effect of uncertainty	Risk / Level of Uncertainty	Risk Mitigation
FUNDING The proposal is underpinned by $18.5m of government funding. The risk would be full or partial loss of that funding.	Low	Binding contracts are in place and in progress
INFLATION The outer years of an LTP are required to be inflated in line with best practice. The approach taken with this amendment is to represent the 2023/24 new capex in today's dollars, based on project workings based on actual plans and current rates. The risk would be higher construction rates than those forecast.	Low/Medium	Appropriate project contingencies are built into the estimates to allow for any minor variations in costs
INTEREST / DEBT REPAYMENT Interest and debt repayment incurred has been assumed at 7% per annum (with financing costs assumed to be incurred in the latter part of the year, given the first call on funding will be dedicated to IAF funded expenditure. This approach aligns to the programme rollout.	Low/Medium	The assumption is based on advice from Council's treasury advisors which is regularly reviewed. Any fluctuations can be managed within Council's overall cost of funds on borrowing

In Summary - Key impacts of the growth infrastructure proposal

Below is a snapshot of the key impacts of the proposal for the 2023/24 financial year:

Key Matters	Impact 2023/24
Cost	
Total Cost	$43.4m
Funding	
Impact on external grant revenue	$18.5m
Impact on total debt	$24.9m
Impact on finance costs	Increase of $291,000
Impact on Development Contribution Revenue	Additional $9.3m
Impact on rates	Little impact on rates (0.2%)
Impact on Council Financial Strategy Limits	
Net debt as a % of income – less than 175%	142.34%
Net interest as a % of income – less than 15%	4.46%
Net interest as a % of annual rates income – less than 20%	8.43%
Liquidity Range (110% - 170%)	119%
Balanced Budget Benchmark >100%	117% (Yes Benchmark met)

Note: The fiscal ratios opposite are not materially different to those forecast in the 2021-31 Long Term Plan for the 2023/24 financial year.

Impact on Development Contributions

Residential

Type	Current	Proposed	% Change
Infill	$ 16,016	$31,490	97%
Medium Density	$ 17,870	$33,652	88%
Greenfield	$ 27,302	$42,725	56%
Rural	$ 6,894	$ 5,992	-13%

Other

Type	Current	Proposed	% Change
Commercial / Retail	$7,588	$11,869	56%
Industrial / Warehousing	$5,109	$11,470	124%
Office	$4,875	$ 9,510	95%
Hospitality / Restaurant	$12,474	$27,536	121%

What about Three Water reform?

This amendment has been put together on the basis of its impact on the Council's current Long-Term Plan. The impacts shown are given to illustrate how the Council would fund the proposal via development contributions, debt funded from rates and some external funding.

The New Zealand Government is currently in the process of reforming how the three waters are managed. The proposal is to transfer the assets and debt associated with those assets to a new entity covering the Hawke's Bay and Gisborne area. The current proposition is for a phased implementation to be completed by 2026, but entities are able to progress earlier if all Councils are in agreement.

This will mean the new water entity would take over responsibility for the rollout of the infrastructure programme identified within this amendment and be responsible for charging customers the future costs of delivering three waters services. The assets associated with three waters would also transfer to the new entity.

For these reasons the impacts of this amendment are focused on the 2023/24 year (effectively the final year for Council responsibility for delivery of these activities.

What about Cyclone Gabrielle?

Whilst Cyclone Gabrielle has had a significant impact on the Hastings District community it does not impact the work that is outlined in this proposal and the infrastructural investment required. This view is based on the fact that the underground construction pathway remains a viable route (although the construction completion may experience some delay).

It is also based on the view that if anything, the impacts of the cyclone are likely to have amplified the need to intensify development in those areas of Hastings unaffected by the cyclone, and the increased demand arising for housing as a result of the number of homes now inhabitable due to the cyclone.

Cautionary Note

An overall damage assessment and analysis of the fiscal implications on the Council along with the inter agency funding and reimbursement discussions is not complete at the time of preparing this Long-Term Plan Amendment. This project is funded for the 2023/24 year and well advanced in the concept design phase. As outlined in the section titled "What about Three water reform" the responsibility for delivery of the remaining componants of the project (beyond 2023/24) and its associated infrastructural investment will not sit with the Hastings District Council.

Opportunity to have your say

The Development Contributions Policy has been amended concurrently to reflect this proposal and should be read in conjunction with this Statement of Proposal. They can both be found at:

- http://www.hastingsdc.govt.nz
- District public libraries
- Council Central Offices, Lyndon Road
- Call us on 871 500 and we can send you the information

Finding out more

The Development Community

A pop-in information evening is being held to outline the infrastructure investment proposal and proposed changes to the Development Contributions Policy. This will be held on Tuesday 9 May, pop-in between 4.00pm – 7.00 pm, Shakespeare Room, Toitoi Hawkes Bay Arts and Events Centre.

Submissions

Submissions on this proposal and the draft Development Contributions Policy may be made in writing to the Council. Submissions close on 7 June 2023. Submissions can be made:

- Electronically at http://www.myvoicemychoice.co.nz
- By using the submission form
- Or in any other written form to the attention of Lex Verhoeven, Strategy Manager Hastings District Council, Private Bag 9002, Hastings 4156 or by email to lexfv@hdc.govt.nz

Any person who makes a submission will have the opportunity to be heard by the Council if this is requested. Hearings will be held at a Council meeting commencing 15 June 2023.

Schedule of proposed investment

Overall detailed investment plan

Project Name - Growth Ready Projects	Type	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34
Kaiapo Development Wastewater	Wastewater	100,000	5,000,000	9,000,000	0	0	1,200,000	0	0	0	0	0
Akina Capacity Upgrade (Storage and Pump)	Wastewater	100,000	2,500,000	2,500,000	0	0	0	0	0	0	0	0
Hastings Medium Density Upgrades	Wastewater	100,000	5,000,000	3,000,000	0	0	0	0	100,000	5,000,000	1,000,000	0
Park North PS Capacity Improvement and Renewal	Wastewater	3,000,000	0	0	0	0	0	0	0	0	0	0
Flaxmere PS Capacity Improvement and Renewal	Wastewater	6,300,000	0	0	0	0	0	0	0	0	0	0
Flaxmere - Rising Main Renewal	Wastewater	100,000	3,200,000	0	0	0	0	0	0	0	0	0
Kaiapo/Maraekakaho Loop main	Drinking Water	100,000	4,250,000	4,229,474	0	0	0	0	0	0	0	0
Waipatu Water supply Trunkmain	Drinking Water	3,584,151	0	0	0	0	0	0	0	0	0	0
Paharakeke Wastewater Main (Omahu rd)	Wastewater	10,071,410	4,116,957	0	0	0	0	0	0	0	0	0
Karamu/Waipatu/Otene Pump Station and Trunk Sewer	Wastewater	12,041,218	0	0	0	0	0	0	0	0	0	0
HTST Irongate/York Pump Station & Rising Main	Wastewater	4,509,645	0	0	0	0	0	0	0	0	0	0
Kohupatiki Pump Station & Rising Main	Wastewater	1,140,843	0	0	0	0	0	0	0	0	0	0
Kohupatiki Roading	Roading	1,663,724	0	0	0	0	0	0	0	0	0	0
Sub Total		**42,810,991**	**24,066,957**	**18,729,474**	**0**	**0**	**1,200,000**	**0**	**100,000**	**5,000,000**	**1,000,000**	**0**
Project Name - Growth Reactive Projects	**Type**	**2023/24**	**2024/25**	**2025/26**	**2026/27**	**2027/28**	**2028/29**	**2029/30**	**2030/31**	**2031/32**	**2032/33**	**2033/34**
Copeland/Murdoch upgrade & diversion	Wastewater	0	0	0	0	0	0	0	0	0	2,800,000	1,500,000
Louie/Ada/Hood Wastewater upgrades	Wastewater	0	0	100,000	4,000,000	4,000,000	1,500,000	0	0	0	0	0
Raureka to Pepper St	Wastewater	0	0	0	0	300,000	5,000,000	5,000,000	0	0	4,500,000	2,000,000
Pumpstation Accelerated Capacity and Renewal	Wastewater	100,000			3,000,000	4,000,000	4,000,000	5,100,000	-	-	0	0
Pumpstation Renewals	Wastewater	0	0	0	0	5,100,000	2,300,000	1,200,000	400,000	1,200,000	2,130,168	3,214,534
Rising Mains Renewals	Wastewater	0	0	0	5,100,000	4,100,000	4,100,000	3,700,000	5,300,000	2,400,000	1,400,000	2,500,000
Secondary screening and grit removal (Domestic)	Wastewater	50,000	0	0	5,000,000	3,000,000	0	0	0	0	0	0
Construct 3rd BTF and refurb. 1&2	Wastewater	250,000	0	0	2,750,000	8,000,000	8,000,000	2,000,000	0	0	0	0
Havelock North capacity investigations	Wastewater	0	0	0	0	0	0	0	0	0	1,000,000	0
Network wide presure reduction	Drinking Water	100,000	0	0	0	0	0	0	3,500,000	3,586,699	0	0
Omahu/Chatham Upgrades	Drinking Water	120,000	0	0	0	0	0	0	3,000,000	0	0	0
Maraekakaho Rd to Mangaroa & Stock road	Drinking Water	0	0	0	0	0	0	2,880,000	0	0	0	0
Irongate/Prison BPS & Storage	Drinking Water	0	0	0	0	0	0	0	0	3,650,000	0	0
HTST Roading	Roading		0	0	0	0	0	0	0	0	0	0
Sub Total		**620,000**	**0**	**100,000**	**19,850,000**	**28,500,000**	**24,900,000**	**19,880,000**	**12,200,000**	**10,836,699**	**11,830,168**	**9,214,534**
Grand Total		**43,430,991**	**24,066,957**	**18,829,474**	**19,850,000**	**28,500,000**	**26,100,000**	**19,880,000**	**12,300,000**	**15,836,699**	**12,830,168**	**9,214,534**
		Growth Ready $85m (Years 1-3)			**Growth Reactive $145m (Years 4-11)**							

Impact on Long Term Plan Group of Activities Funding Impact Statements for 2023/24

The following Group of activity Funding Impact Statements show the movements from what was contained in the 2021-31 Long Term Plan compared with the impact of this proposal.

HASTINGS DISTRICT COUNCIL: FUNDING IMPACT STATEMENT FOR 2021-31 FOR WATER SUPPLY

	Notes	Annual Plan 20/21 $'000	Year 1 21/22 $'000	Year 2 22/23 $'000	LTP Amendment 23/24 $'000	Amended Year 3 23/24 $'000	Year 4 24/25 $'000	Year 5 25/26 $'000	Year 6 26/27 $'000	Year 7 27/28 $'000	Year 8 28/29 $'000	Year 9 29/30 $'000	Year 10 30/31 $'000
SOURCES OF OPERATING FUNDING													
General Rates, uniform annual general charge, rates penalties		161	154	161		165	170	175	179	184	189	194	199
Targeted Rates		11,448	12,530	13,518		14,078	14,265	14,524	14,856	14,933	15,241	15,582	15,906
Subsidies and grants for operating purposes													
Fees and charges		317	317	328		336	345	355	365	377	389	403	415
Internal charges and overheads recovered		4,828	5,004	5,221		5,326	5,455	5,567	5,692	5,824	5,966	6,123	6,285
Local authorities fuel tax, fines , infringement fees and other receipts													
TOTAL OPERATING FUNDING (A)		**16,753**	**18,005**	**19,228**		**19,906**	**20,235**	**20,621**	**21,092**	**21,318**	**21,785**	**22,302**	**22,804**
APPLICATIONS OF OPERATING FUNDING													
Payments to staff and suppliers		8,312	9,219	9,136		9,470	9,432	9,669	9,914	9,951	10,236	10,541	10,843
Finance costs	1	1,964	2,395	2,657	26	2,691	3,016	3,060	3,160	3,233	3,283	3,340	3,407
Internal charges and overheads applied		3,481	3,862	4,084		4,191	4,288	4,375	4,481	4,576	4,688	4,822	4,938
Other operating funding applications		3	3	3		3	3	4	4	4	4	4	4
TOTAL APPLICATIONS OF OPERATING FUNDING (B)		**13,761**	**15,479**	**15,881**	**26**	**16,355**	**16,740**	**17,107**	**17,559**	**17,763**	**18,211**	**18,708**	**19,191**
Surplus (deficit) of operating funding (A-B)		**2,992**	**2,526**	**3,347**	**(26)**	**3,551**	**3,495**	**3,514**	**3,533**	**3,555**	**3,575**	**3,594**	**3,613**
SOURCES OF CAPITAL FUNDING													
Subsidies and grants for capital expenditure	2		7,679		1,671	1,671							
Development and financial contributions	3	1,324	1,021	1,027	1,317	2,349	1,036	1,040	1,045	1,050	925	930	936
Increase (decrease) in debt		22,582	26,108	(175)	942	1,722	774	4,506	3,081	606	1,045	942	1,238
Gross proceeds from sale of assets		64	104	68		177	95	52	158	121	114	151	107
Lump sum contributions													
Other dedicated capital funding													
TOTAL SOURCES OF CAPITAL FUNDING (C)		**23,970**	**34,912**	**920**	**3,930**	**5,920**	**1,905**	**5,598**	**4,284**	**1,777**	**2,083**	**2,023**	**2,281**
APPLICATIONS OF CAPITAL FUNDING													
Capital expenditure													
To meet additional demand	4	3,137	3,330	311	3,904	4,186	474	1,852	1,269		246		
To improve the level of service		21,199	30,243	1,116		1,321	679	3,031	2,098	734	755	778	932
To replace existing assets		2,626	3,865	2,841		3,964	4,246	4,230	4,449	4,597	4,657	4,838	4,962
Increase (decrease) in reserves													
Increase (decrease) of investments													
TOTAL APPLICATIONS OF CAPITAL FUNDING (D)		**26,962**	**37,438**	**4,267**	**3,904**	**9,471**	**5,400**	**9,112**	**7,817**	**5,331**	**5,658**	**5,617**	**5,894**
Surplus (deficit) of Capital funding (C-D)		**(2,992)**	**(2,526)**	**(3,347)**	**26**	**(3,551)**	**(3,495)**	**(3,514)**	**(3,533)**	**(3,555)**	**(3,575)**	**(3,594)**	**(3,613)**
FUNDING BALANCE ((A-B)+(C-D))		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Notes

1. Increase in Financing costs as per IAF summary sheet.
2. Grant from Infrastructure Acceleration Fund primarily to fund Waipatu Drinking Water Trunkmain.
3. Increase in Development Contributions related to Waipatu Drinking Water Trunkmain.
4. Increase in Additional Demand Capital budget related to Waipatu Drinking Water Trunkmain.

HASTINGS DISTRICT COUNCIL: FUNDING IMPACT STATEMENT FOR 2021-31 FOR SEWERAGE AND THE TREATMENT AND DISPOSAL OF SEWAGE

	Notes	Annual Plan 20/21 $'000	Year 1 21/22 $'000	Year 2 22/23 $'000	Year 3 23/24 $'000	LTP Amendment 23/24 $'000	Amended Year 3 23/24 $'000	Year 4 24/25 $'000	Year 5 25/26 $'000	Year 6 26/27 $'000	Year 7 27/28 $'000	Year 8 28/29 $'000	Year 9 29/30 $'000	Year 10 30/31 $'000
SOURCES OF OPERATING FUNDING														
General Rates, uniform annual general charge, rates penalties		399	379	388	396		396	441	479	520	561	585	610	635
Targeted Rates		7,404	7,596	8,000	8,456		8,456	9,164	9,702	10,420	10,919	11,582	12,257	12,790
Subsidies and grants for operating purposes														
Fees and charges		1,865	2,115	2,366	2,504		2,504	2,576	2,651	2,727	2,807	2,890	2,975	3,062
Internal charges and overheads recovered		2,631	2,631	2,723	2,793		2,793	2,869	2,952	3,035	3,132	3,235	3,345	3,449
Local authorities fuel tax, fines , infringement fees and other receipts														
TOTAL OPERATING FUNDING (A)		**12,298**	**12,720**	**13,476**	**14,149**		**14,149**	**15,049**	**15,784**	**16,701**	**17,418**	**18,291**	**19,188**	**19,935**
APPLICATIONS OF OPERATING FUNDING														
Payments to staff and suppliers		2,660	3,144	3,330	3,548		3,548	3,644	3,776	3,799	3,918	4,045	4,179	4,307
Finance costs	1	1,318	1,467	1,592	1,678	257	1,935	2,899	3,072	3,206	3,343	3,420	3,464	3,501
Internal charges and overheads applied		5,147	4,944	5,132	5,263		5,263	5,387	5,520	5,669	5,815	5,985	6,179	6,345
Other operating funding applications		7	7	8	8		8	8	8	8	9	9	9	10
TOTAL APPLICATIONS OF OPERATING FUNDING (B)		**9,132**	**9,562**	**10,061**	**10,496**	**257**	**10,753**	**11,938**	**12,375**	**12,682**	**13,086**	**13,459**	**13,832**	**14,162**
Surplus (deficit) of operating funding (A-B)		**3,165**	**3,158**	**3,415**	**3,652**	**(257)**	**3,395**	**3,111**	**3,409**	**4,019**	**4,333**	**4,832**	**5,356**	**5,773**
SOURCES OF CAPITAL FUNDING														
Subsidies and grants for capital expenditure	2					15,847	15,847							
Development and financial contributions	3	1,281	1,343	1,349	1,353	6,849	8,202	1,357	1,361	1,366	1,370	1,245	1,250	1,256
Increase (decrease) in debt	4	4,486	5,602	5,053	5,576	15,424	21,000	6,922	4,560	5,978	3,880	1,891	1,633	1,695
Gross proceeds from sale of assets														
Lump sum contributions		244	244	252	259		259	266	274	281	290	300	310	320
Other dedicated capital funding														
TOTAL SOURCES OF CAPITAL FUNDING (C)		**6,011**	**7,189**	**6,654**	**7,188**	**38,120**	**45,308**	**8,545**	**6,195**	**7,625**	**5,540**	**3,436**	**3,194**	**3,271**
APPLICATIONS OF CAPITAL FUNDING														
Capital expenditure														
To meet additional demand	5	1,612	2,200	2,613	2,681	28,063	30,744	27	28	692	714			
To improve the level of service		410	199	(134)	770		770	2,263	1,431	779	208	252	769	269
To replace existing assets	6	7,154	7,948	7,590	7,389	9,800	17,189	9,366	8,145	10,173	8,951	8,016	7,780	8,775
Increase (decrease) in reserves														
Increase (decrease) of investments														
TOTAL APPLICATIONS OF CAPITAL FUNDING (D)		**9,176**	**10,347**	**10,070**	**10,840**	**37,863**	**48,703**	**11,656**	**9,604**	**11,644**	**9,873**	**8,268**	**8,549**	**9,044**
Surplus (deficit) of Capital funding (C-D)		**(3,165)**	**(3,158)**	**(3,415)**	**(3,652)**	**257**	**(3,395)**	**(3,111)**	**(3,409)**	**(4,019)**	**(4,333)**	**(4,832)**	**(5,356)**	**(5,773)**
FUNDING BALANCE ((A-B)+(C-D))		**-**	**-**	**-**	**-**	**()**	**()**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Notes

1. Increase in Financing costs as per IAF summary sheet.
2. Grant from Infrastructure Acceleration Fund primarily to fund key Wastewater components.
3. Increase in Development Contributions related to IAF Bulk infrastructure.
4. Increase in debt due to IAF Bulk infrastructure portion not funded by Grant.
5. Increase in Capex additional demand budget due to IAF Bulk infrastructure .
6. Increase in Capital Renewal budget due to projects enabling the IAF funded Bulk infrastructure .

HASTINGS DISTRICT COUNCIL: FUNDING IMPACT STATEMENT FOR 2021-31 FOR ROADS AND FOOTPATHS

	Notes	Annual Plan 20/21 $'000	Year 1 21/22 $'000	Year 2 22/23 $'000	Year 3 23/24 $'000	LTP Amendment 23/24 $'000	Amended Year 3 23/24 $'000	Year 4 24/25 $'000	Year 5 25/26 $'000	Year 6 26/27 $'000	Year 7 27/28 $'000	Year 8 28/29 $'000	Year 9 29/30 $'000	Year 10 30/31 $'000
SOURCES OF OPERATING FUNDING														
General Rates, uniform annual general charge, rates penalties		16,681	18,291	19,968	21,830		21,830	24,118	25,801	27,705	29,383	31,086	32,824	34,640
Targeted Rates		442	564	581	597		597	614	630	648	666	685	704	723
Subsidies and grants for operating purposes		6,219	7,106	7,342	7,731		7,731	8,247	8,435	8,653	8,903	9,110	9,348	9,620
Fees and charges		1,628	2,382	2,420	2,482		2,482	2,545	2,609	2,675	2,746	2,820	2,897	2,973
Internal charges and overheads recovered		2,962	3,119	3,265	3,352		3,352	3,415	3,480	3,572	3,636	3,725	3,843	3,924
Local authorities fuel tax, fines , infringement fees and other receipts		302	302	311	319		319	327	335	343	352	362	371	381
TOTAL OPERATING FUNDING (A)		**28,234**	**31,764**	**33,887**	**36,310**		**36,310**	**39,265**	**41,291**	**43,597**	**45,686**	**47,787**	**49,986**	**52,261**
APPLICATIONS OF OPERATING FUNDING														
Payments to staff and suppliers		13,983	16,016	16,844	17,641		17,641	18,690	19,207	19,788	20,345	20,823	21,466	22,080
Finance costs		1,122	850	1,073	1,176	8	1,184	1,358	1,388	1,380	1,356	1,354	1,370	1,365
Internal charges and overheads applied		5,025	5,320	5,597	5,770		5,770	5,871	5,983	6,152	6,250	6,405	6,624	6,748
Other operating funding applications		13	13	13	14		14	14	15	15	15	16	16	17
TOTAL APPLICATIONS OF OPERATING FUNDING (B)		**20,143**	**22,199**	**23,528**	**24,601**	**8**	**24,609**	**25,934**	**26,592**	**27,335**	**27,966**	**28,598**	**29,476**	**30,209**
Surplus (deficit) of operating funding (A-B)		**8,091**	**9,566**	**10,359**	**11,709**	**(8)**	**11,701**	**13,331**	**14,699**	**16,262**	**17,720**	**19,189**	**20,510**	**22,052**
SOURCES OF CAPITAL FUNDING														
Subsidies and grants for capital expenditure	1	18,053	14,020	13,452	13,721	982	14,703	13,457	13,140	14,472	16,262	17,640	19,108	19,854
Development and financial contributions	2	1,039	1,821	1,838	1,851	826	2,677	1,862	1,873	1,885	1,896	1,492	1,506	1,520
Increase (decrease) in debt		6,199	15,154	12,816	54	(136)	(82)	(2,190)	(3,106)	(3,634)	(1,029)	(531)	(4,156)	(4,691)
Gross proceeds from sale of assets		96	48		33		33	19	78	55	36		22	111
Lump sum contributions		27	27	27	28		28	29	30	31	32	32	33	34
Other dedicated capital funding														
TOTAL SOURCES OF CAPITAL FUNDING (C)		**25,414**	**31,069**	**28,133**	**15,687**	**1,672**	**17,359**	**13,177**	**12,014**	**12,809**	**17,197**	**18,632**	**16,513**	**16,829**
APPLICATIONS OF CAPITAL FUNDING														
Capital expenditure														
To meet additional demand	3	4,025	11,534	5,885	803	1,664	2,467	246	1,026	858	3,322	2,952	95	369
To improve the level of service		15,050	13,048	15,084	7,393		7,393	7,098	5,432	6,242	8,873	11,172	12,236	12,498
To replace existing assets		14,431	16,053	17,523	19,200		19,200	19,164	20,255	21,971	22,721	23,698	24,693	26,013
Increase (decrease) in reserves														
Increase (decrease) of investments														
TOTAL APPLICATIONS OF CAPITAL FUNDING (D)		**33,505**	**40,635**	**38,493**	**27,396**	**1,664**	**29,060**	**26,508**	**26,713**	**29,071**	**34,916**	**37,822**	**37,023**	**38,880**
Surplus (deficit) of Capital funding (C-D)		**(8,091)**	**(9,566)**	**(10,359)**	**(11,709)**	**8**	**(11,701)**	**(13,331)**	**(14,699)**	**(16,262)**	**(17,720)**	**(19,189)**	**(20,510)**	**(22,052)**
FUNDING BALANCE ((A-B)+(C-D))		**-**	**-**	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**-**

Notes

1. Increased Development Contributions due to IAF funded projects.
2. Increase in debt due to IAF ancillary works (not funded by Grant).
3. Increase in additional demand capex due to $1.6m of IAF ancillary works.

Impact on Long Term Plan Financial Statements for 2023/24

The following Financial Stements show the movements from what was contained in the 2021-31 Long Term Plan compared with the impact of this proposal.

PROSPECTIVE STATEMENT OF COMPREHENSIVE REVENUE AND EXPENSE FOR THE 10 YEARS TO 30 JUNE 2031

Annual Plan 20/21 $'000		Notes	LTP (Yr1) 21/22 $'000	LTP (Yr2) 22/23 $'000	LTP Amendment 23/24 $'000	Amended LTP (Yr3) 23/24 $'000	LTP (Yr4) 24/25 $'000	LTP (Yr5) 25/26 $'000	LTP (Yr6) 26/27 $'000	LTP (Yr7) 27/28 $'000	LTP (Yr8) 28/29 $'000	LTP (Yr9) 29/30 $'000	LTP (Yr10) 30/31 $'000
	Revenue will be derived from:												
87,919	Rates		95,280	102,169		108,863	116,023	121,029	126,250	131,584	138,058	143,975	149,630
28,620	Fees and charges		34,437	36,754		39,558	41,805	42,826	43,908	45,062	46,289	47,550	48,799
5,408	Development and financial Contributions	1	5,785	5,827	9,321	15,179	5,887	5,918	5,950	5,982	5,185	5,223	5,262
27,702	Subsidies and Grants	2	37,808	26,569	18,500	40,337	22,098	21,980	23,540	25,590	27,186	28,904	29,934
3	Donations		3,603	3		3	3	4	4	4	4	4	4
	Finance revenue												
537	Other revenue		537	553		566	581	650	724	742	762	783	803
1,000	Vested Infrastructural Assets		1,000	1,034		1,062	1,091	1,123	1,154	1,191	1,229	1,269	1,308
151,190	**TOTAL REVENUE**		**178,450**	**172,908**	**27,821**	**205,569**	**187,488**	**193,529**	**201,530**	**210,156**	**218,713**	**227,708**	**235,740**
	Expenditure will be incurred on:												
94,691	Operational Costs		104,289	108,588		113,841	118,083	121,314	124,057	126,773	130,483	133,825	137,290
	Infrastructural Assets		31,124	31,330		31,595	31,646	31,699	31,754	31,811	31,873	31,936	31,999
	Property, Plant & Equipment		5,442	6,020		6,170	6,324	6,482	6,643	6,815	6,999	7,187	7,374
34,936	Depreciation and amortisation	3	36,566	37,351	1,216	38,981	39,187	39,397	39,613	39,843	40,088	40,340	40,588
	Internal interest												
	Internal interest reverse Landfill share on reserves												
6,703	Finance Costs		7,747	8,579		8,885	9,995	10,380	10,627	10,828	10,970	11,098	11,186
	Interest on Internal Borrowings												
6,703	Finance Costs	4	7,747	8,579	291	9,176	11,108	11,493	11,740	11,941	12,083	12,211	12,299
136,329	**TOTAL OPERATING EXPENDITURE**		**148,601**	**154,518**	**1,507**	**161,998**	**168,377**	**172,205**	**175,409**	**178,556**	**182,654**	**186,375**	**190,177**
14,861	**NET SURPLUS (DEFICIT)**		**29,848**	**18,390**	**26,314**	**43,571**	**19,111**	**21,324**	**26,121**	**31,599**	**36,059**	**41,333**	**45,563**
	Other comprehensive revenue:												
49,224	Gains (Losses) on Infrastructural revaluations		52,259	84,770		75,235	87,315	48,521	117,666	55,752	100,733	98,322	117,129
	Gains (Losses) on land and building revaluations												
	Gains (Losses) on other revaluations												
	Tax												
49,224	**Other comprehensive revenue:**		**52,259**	**84,770**		**75,235**	**87,315**	**48,521**	**117,666**	**55,752**	**100,733**	**98,322**	**117,129**
64,085	**TOTAL COMPREHENSIVE REVENUE**		**82,107**	**103,160**	**26,314**	**118,806**	**106,427**	**69,846**	**143,787**	**87,352**	**136,793**	**139,656**	**162,692**
	Net Surplus (Deficit) attributable to:												
14,861	Hastings District Council		29,848	18,390	26,314	43,571	19,111	21,324	26,121	31,599	36,059	41,333	45,563
	Minority Interest												
14,861			**29,848**	**18,390**	**26,314**	**43,571**	**19,111**	**21,324**	**26,121**	**31,599**	**36,059**	**41,333**	**45,563**
	Total Comprehensive revenue attributable to:												
64,085	Hastings District Council		82,107	103,160	26,314	118,806	106,427	69,846	143,787	87,352	136,793	139,656	162,692
	Minority Interest												
64,085			**82,107**	**103,160**	**26,314**	**118,806**	**106,427**	**69,846**	**143,787**	**87,352**	**136,793**	**139,656**	**162,692**

Notes

1. Development Contribution Increase related to LTP amendment ($9.278m)

2. Increase in Subsidies and Grants explained by IAF funding ($18.5m).

3. Depreciation increase due to additional Infrastructure works

4. Increase in interest partially explained by IAF funded Bulk infrastructure ($291k)

PROSPECTIVE STATEMENT OF FINANCIAL POSITION FOR THE 10 YEARS TO 30 JUNE 2031

Annual Plan 20/21 $'000		Notes	LTP (Yr1) 21/22 $'000	LTP (Yr2) 22/23 $'000	LTP Amendment 23/24 $'000	Amended LTP (Yr3) 23/24 $'000	LTP (Yr4) 24/25 $'000	LTP (Yr5) 25/26 $'000	LTP (Yr6) 26/27 $'000	LTP (Yr7) 27/28 $'000	LTP (Yr8) 28/29 $'000	LTP (Yr9) 29/30 $'000	LTP (Yr10) 30/31 $'000
	ASSETS												
	Current Assets												
1,265	Cash & cash equivalents		1,265	1,265		1,265	1,265	1,265	1,265	1,265	1,265	1,265	1,265
12,095	Debtors and other receivables		16,060	15,562	2,504	18,501	16,874	17,418	18,138	18,914	19,684	20,494	21,217
108	Inventories		108	108		108	108	108	108	108	108	108	108
13,468			17,434	16,935	2,504	19,875	18,247	18,791	19,511	20,287	21,057	21,867	22,590
	Non Current Assets												
1,066	Investments in associates		1,063	1,063	-	1,063	1,063	1,063	1,063	1,063	1,063	1,063	1,063
1,063	Investments in Council Controlled Organisations		15	15	-	15	15	15	15	15	15	15	15
1,568	Other Investments		3,400	3,635	-	4,038	4,452	4,876	5,311	5,757	6,215	6,685	7,167
-	Other Non Current Assets		-	-		-	-	-	-	-	-	-	-
3,697			4,478	4,713	-	5,116	5,530	5,954	6,389	6,835	7,293	7,763	8,245
242,116	Plant, property and equipment		313,236	324,207	-	334,393	341,380	346,335	351,327	355,316	356,193	359,436	360,692
1,941,999	Infrastructural Assets		2,166,977	2,285,061	39,711	2,421,590	2,531,837	2,600,274	2,742,412	2,824,606	2,956,057	3,084,487	3,236,016
205	Intangible Assets		1,161	1,378	-	1,916	1,587	1,411	1,054	1,001	827	782	960
2,201,485	**Total Assets Employed**		**2,503,284**	**2,632,293**	**42,215**	**2,782,890**	**2,898,582**	**2,972,766**	**3,120,692**	**3,208,045**	**3,341,427**	**3,474,334**	**3,628,503**
	LIABILITIES & EQUITY												
	Current Liabilities												
-	Bank Overdraft		-	-		-	-	-	-	-	-	-	-
17,991	Creditors and other payables		25,029	26,061	-	27,322	28,340	29,115	29,774	30,425	31,316	32,118	32,949
2,241	Employee Benefit Liabilities		3,398	3,398	-	3,398	3,398	3,398	3,398	3,398	3,398	3,398	3,398
-	Derivative Financial Liabilities					-	-	-	-	-	-	-	-
16,970	Public Debt	1	23,328	26,059	1,590	29,261	30,185	30,691	31,039	30,973	30,542	29,786	28,850
37,202			51,755	55,518	1,590	59,981	61,923	63,204	64,210	64,796	65,256	65,302	65,197
	Non Current Liabilities												
659	Provisions		1,640	1,640		1,640	1,640	1,640	1,640	1,640	1,640	1,640	1,640
480	Employee Benefit Liabilities		333	338		344	350	357	363	370	378	385	393
13,500	Derivative Financial Liabilities		7,500	5,000		3,500	2,500	1,000	1,000	1,000	1,000	1,000	1,000
152,732	Public Debt	1	209,949	234,529	14,311	263,352	271,668	276,219	279,347	278,755	274,877	268,075	259,648
167,371			219,422	241,507	14,311	268,836	276,159	279,216	282,350	281,765	277,895	271,100	262,681
	Public Equity												
1,148,483	Retained Earnings		1,234,342	1,252,701	26,314	1,296,241	1,315,333	1,336,637	1,362,739	1,394,319	1,430,361	1,471,677	1,517,224
2,615	Restricted Reserves		2,785	2,816		2,846	2,866	2,886	2,905	2,924	2,942	2,959	2,976
845,814	Revaluation Reserves		994,980	1,079,751	-	1,154,985	1,242,301	1,290,822	1,408,488	1,464,240	1,564,973	1,663,296	1,780,425
1,996,912			2,232,107	2,335,267	26,314	2,454,073	2,560,500	2,630,345	2,774,132	2,861,484	2,998,276	3,137,932	3,300,624
2,201,485	**Total Funds Employed**		**2,503,284**	**2,632,293**	**42,215**	**2,782,890**	**2,898,582**	**2,972,766**	**3,120,692**	**3,208,045**	**3,341,427**	**3,474,334**	**3,628,503**

Notes

1. Increase in Debt related to non IAF funded portion of Infrastructural spend

PROSPECTIVE STATEMENT OF CASHFLOWS FOR THE 10 YEARS TO 30 JUNE 2031

Annual Plan 20/21 $'000		Notes	LTP (Yr1) 21/22 $'000	LTP (Yr2) 22/23 $'000	LTP Amendment 23/24 $'000	Amended LTP (Yr3) 23/24 $'000	LTP (Yr4) 24/25 $'000	LTP (Yr5) 25/26 $'000	LTP (Yr6) 26/27 $'000	LTP (Yr7) 27/28 $'000	LTP (Yr8) 28/29 $'000	LTP (Yr9) 29/30 $'000	LTP (Yr10) 30/31 $'000
	Cash Flows from Operating Activities												
	Cash will be provided from												
87,919	Rates Received		95,280	102,169	-	108,863	116,023	121,029	126,250	131,584	138,058	143,975	149,630
34,565	Receipts from Customers		40,759	43,133	9,321	55,303	48,273	49,394	50,581	51,787	52,236	53,556	54,864
27,706	Subsidies Grants & Donations Received		41,411	26,572	18,500	40,341	22,101	21,983	23,544	25,594	27,190	28,908	29,938
	Goods and services tax (net)												
150,190			177,450	171,874	27,821	204,507	186,397	192,406	200,375	208,965	217,485	226,439	234,433
	Cash was applied to												
94,691	Payments to Suppliers and Employees		104,289	108,588	-	113,841	118,083	121,314	124,057	126,773	130,483	133,825	137,290
6,703	Interest Paid		7,747	8,579	291	9,176	11,108	11,493	11,740	11,941	12,083	12,211	12,299
101,394			112,035	117,167	291	123,017	129,190	132,808	135,796	138,714	142,566	146,035	149,589
48,796	**Net Cash Flows from Operating Activities**		65,414	54,707	27,530	81,490	57,207	59,599	64,579	70,252	74,919	80,404	84,844
	Cash Flows from Investing Activities												
	Cash was provided from												
2,055	Sale of Plant, property & equipment		467	315	-	786	505	452	806	551	405	846	726
-	Investments Withdrawn		-	-	-	-	-	-	-	-	-	-	-
2,055			467	315	-	786	505	452	806	551	405	846	726
	Cash was applied to												
	Purchase of Property, Plant & Equipment and Infrastructural												
110,855	Assets	1	127,948	81,537	43,431	112,396	65,530	63,921	67,337	69,797	69,599	72,190	73,918
383	Purchase of Investments		228	235	-	404	414	424	435	446	458	470	483
111,238			128,176	81,771	43,431	112,800	65,944	64,345	67,772	70,243	70,057	72,660	74,401
(109,183)	**Net Cash Flows from Investing Activities**		(127,709)	(81,456)	(43,431)	(112,014)	(65,439)	(63,893)	(66,966)	(69,692)	(69,653)	(71,815)	(73,675)
	Cash Flows from Financing Activities												
	Cash was provided from												
66,016	Loans Raised		69,228	34,363	15,901	39,214	19,072	17,030	15,928	14,009	11,689	9,190	7,401
	Cash was applied to												
5,629	Loans repaid		6,933	7,614	-	8,690	10,840	12,736	13,541	14,569	16,955	17,779	18,570
60,387	**Net Cash Flows from Financing Activities**		62,295	26,749	15,901	30,524	8,232	4,294	2,387	(560)	(5,266)	(8,589)	(11,169)
	Reconciliation of Cash Flows												
	Net Increase (Decrease) in Cash Held		()				-	()	()	-	()		()
1,265	Add Cash at Start of Year		1,265	1,265		1,265	1,265	1,265	1,265	1,265	1,265	1,265	1,265
1,265	Cash at End of Year		1,265	1,265		1,265	1,265	1,265	1,265	1,265	1,265	1,265	1,265
	Cash at End of Year Comprises												
1,265	Cash and Cash Equivalents		1,265	1,265	-	1,265	1,265	1,265	1,265	1,265	1,265	1,265	1,265
1,265			1,265	1,265	-	1,265	1,265	1,265	1,265	1,265	1,265	1,265	1,265

Notes

1. Increase in spend on Infrastructure assets relates to IAF funded bulk infrastructure and Enabling works related to IAF projects.

Impact on Long Term Plan Infrastructure Strategy

Updates have been made to the Council's Infrastructure Strategy (where appropriate) to make reference to this proposal.

The updated strategy can be found at www.myvoicemychoice.co.nz, HDC-Long Term Plan Final Amendment 2023.

4. Stormwater

4.1. Executive Summary

Councils have obligations under the Health Act 1956 and Local Government Act 2002 to improve, promote and protect public health within the District, including providing stormwater services that contribute to the protection of life, property, and the environment.

The District Plan and the Engineering Code of Practice (ECoP) provide a regulatory framework to ensure that controls and design standards for stormwater infrastructure are in place and adhered to. Infrastructure design and performance criteria are specified in the ECoP and complement the Building Act which requires that plans comply with the Building Regulations for drainage. These Building regulations specify the standards for protection of buildings against flood inundation.

The Hastings District Council (HDC) stormwater consent includes a comprehensive suite of conditions that require the Council to manage both quantity and quality of stormwater to minimise adverse effects on the environment from activities within the urban areas of Hastings, Flaxmere, Clive and Havelock North.

The HDC stormwater network operates to safely convey rainfall from properties and roads and to manage flood risks in rain events up to the design storm. Most of the stormwater eventually enters streams within Te Karamū Awa catchment, then the Karamū-Clive system which flows into the Waitangi Estuary and into Hawke Bay.

There are over 250 urban outlets where stormwater enters streams and drains that are under the management of the Hawke's Bay Regional Council. Stormwater received into HDC's network from industrial or trade premises is required to be treated to meet standards pursuant to Council's Consolidated Bylaw 2021 (Chapter 7) and these align with our stormwater consent. Some stormwater from Hastings' industrial areas discharge to land located above the Heretaunga Plains' Aquifer System and are managed by HDC via separate stormwater consents. The total replacement costs of the Hastings system (including Flaxmere and Havelock North) is $309 million [(32)].

The Hastings population is expected to grow to between 104,600 and 119,800 (from around 87,000) over the next 30 years with household numbers (estimated at 31,300 in 2020), increasing to 42,300 in the long-term by 2050 [(33)]. Industrial areas have also grown and are predicted to grow further with this expansion occurring along Omahu Road, in the Irongate area, and in the Whakatu/Tōmoana Corridor.

The stormwater network plays a crucial role in minimising flooding and mitigating effects on the environment. Potential effects on receiving environments are:

- Physical impacts/damage including inundation of properties and buildings, erosion, sediment build-up etc. (from the discharge flow)
- Surcharging of wastewater systems (from inflow and infiltration of stormwater)
- Chemical impacts (and potentially human health impacts) from contaminants in the discharges
- Microbiological impacts and human health implications where these waters are used for recreational or drinking water purposes.

[32] Stormwater Assets Management Plan (Draft 2021)
[33] STR-4-2-21-987

Industrial and urban expansion increases the volume of traffic resulting in an increase in vehicle related contaminants into stormwater runoff, an increase in impermeable areas (roofs and hardstand) which increases the rate of stormwater runoff with potential adverse effects. This increased run-off reduces the capacity within the pipe network (pipes fill up faster) with an increase in overland flows, flooding, and the release of contaminants into our waterways. The predicted impacts of climate change (more intensive rainfall rates) will only exacerbate flooding issues further.

As we move to a more intensive living environment, the solutions that are required to minimise the impacts of growth (and climate change) will require Council, the development community and the HB Regional Council to work jointly to ensure that the whole system (from property to the sea) is managed in an integrated way and that people and property are protected from flooding and the quality of stormwater that is discharged from the urban area is improved.

4.1.1 How are we performing?

Primary Pipe System - Modelling of the pipe network for a 5 year ARI event (including factors for climate change) indicates that many parts of the urban area are more susceptible to overflows and flooding due to increased rainfall intensities and run-off that exceeds the capacity that the pipes were originally designed for. This is not unexpected given today's built environment and the changes in the intensity of storm events that have increased the rates and volumes of stormwater being experienced.

Modelling shows that 50% or more of the pipe network is surcharged in the 5 year rain event and the ability for the pipe system to contain these flows has been reduced in some areas. Stormwater is increasingly likely to surcharge into roads, overland flowpaths and detention areas with some properties identified as being at risk of minor flooding.

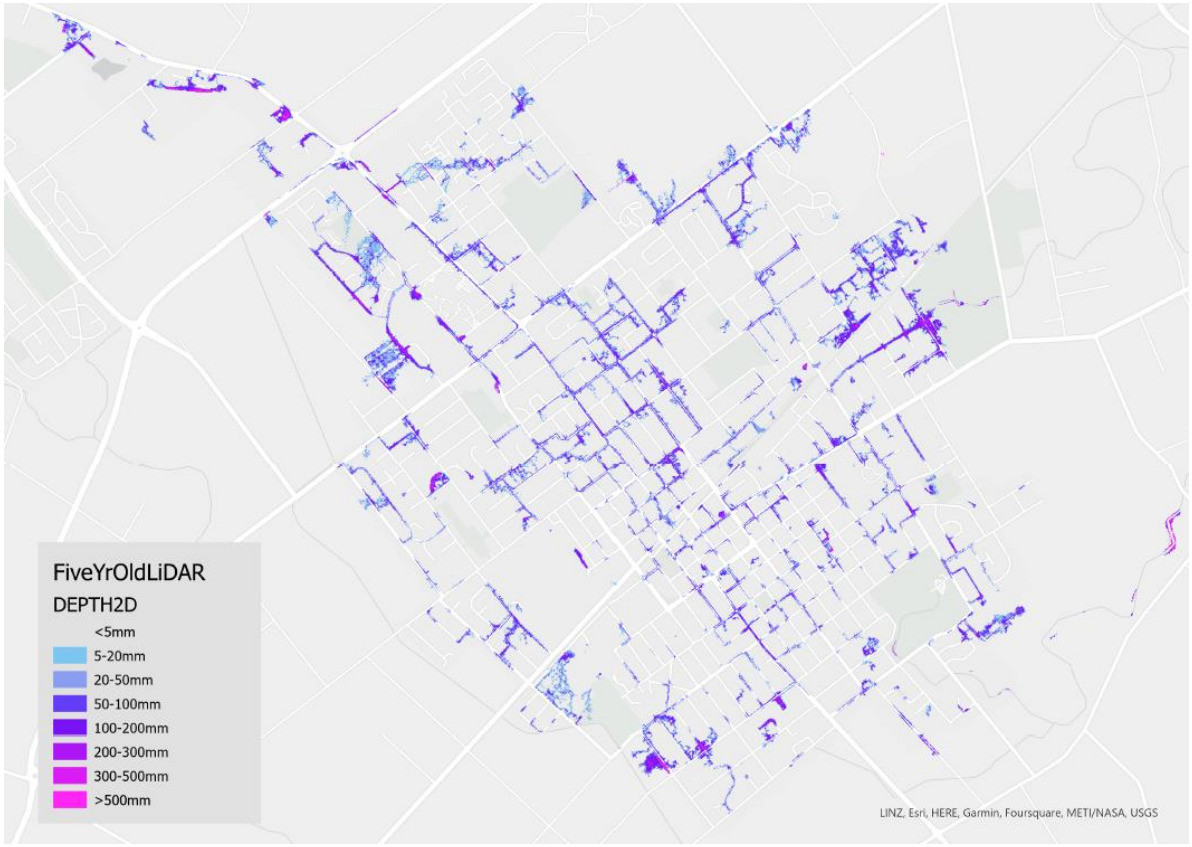
Havelock North is in a similar situation and it is expected that the urban streams in Havelock North will come under increasing pressure to carry increased flood flows. Ponding in private property is also an ongoing issue due to topography and stormwater that is trapped onsite can enter the wastewater system through direct inflows from gully traps.

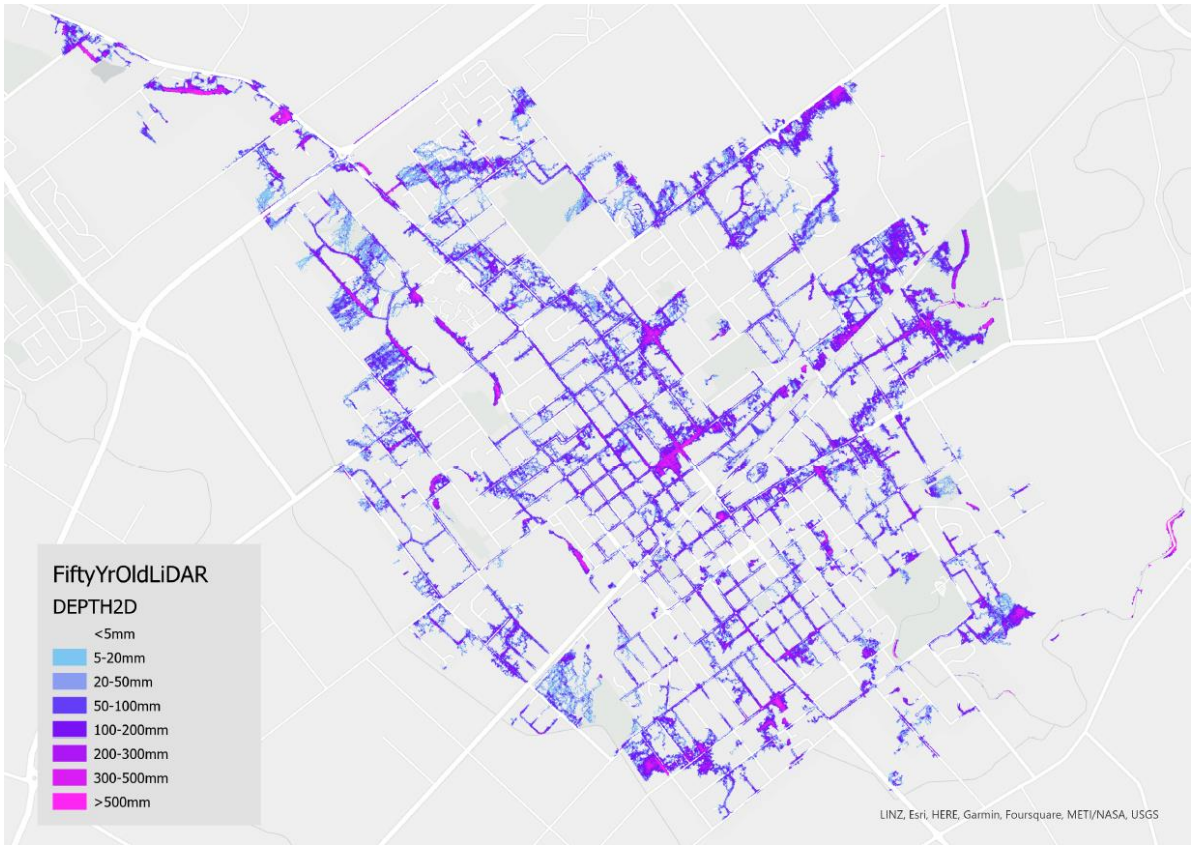
Secondary System – Overland flow occurs when rainfall exceeds the primary pipe system capacity and stormwater then exits the system. The secondary system is intended to manage overland flow within corridors (road carriageways, open spaces, parks etc.) so that as much as possible, people and properties are not adversely affected or inundated.

Modelling utilising terrain data shows where stormwater overland flows will most likely occur and there are a number of breakout points where inundation, ponding and some flooding is expected in higher intensity storms. Some of this happens in low lying land on private property and stormwater can enter the wastewater system at these locations.

Further work is necessary to develop solutions for these low lying areas and to quantify the extent of works required to define better overland flow paths, contain flooding and minimise impacts to property and the wastewater system. As re-development of the urban area progresses, this will provide opportunities to reduce or eliminate existing problems using a mix of onsite and community based solutions.

Current & Future Design Principles – The suite of stormwater modelling is based on the 5 year rain event for the primary pipe system and the 50 year storm event to determine overland flows and flooding that will occur. As we continue to see the impacts of climate change affecting rainfall patterns with more intensive storms, we need to consider the impact of larger scale events within the urban area and in the wider stormwater catchment of the Heretaunga Plains. The following two diagrams show predicted surface flooding in a 5 year and 50 year rain event based on high resolution ground contours. There is further work required to improve the stormwater models and improve the accuracy and extent of flood areas but this initial work provides guidance on potential priority areas.





Work is underway with the HB Regional Council to integrate our stormwater models and to understand how the future urban environment will affect the drains and streams that convey stormwater into the Karamū catchment. This work includes exploring opportunities to utilise rural land to capture and contain flood flows in large scale events and to inform the long-term plans for managing growth and in reducing the impacts of climate change in an integrated and sustainable way.

Alongside these approaches, the use of low impact stormwater solutions within developments are being implemented to mitigate increased run-off as part of the suite of stormwater management techniques being deployed.

Stormwater Quality – There has been significant progress over the last 10 years as Council has sought to quantify the effects of urban stormwater in the receiving environment and to understand the risks associated with urban and industrial run-off.

A detailed investigation in 2014 [34] (described in the current resource consent application) of the water quality in the Ruahāpia Stream, Wellwood Drain and Irongate Stream indicated that the water quality was negatively impacted by the stormwater discharges. High nutrient levels, dissolved heavy metals and suspended sediment were observed at all streams. *E.coli* sampling of the water of a variety of drains and streams (2019, 2020) indicated that concentrations at several sites were elevated above the alert or action level of the Microbial Quality Guidelines for Marine and Freshwater Recreational Areas.

[34] WAT-18-8-14-158 HDC Urban Stormwater Quality Assessment – Water Quality Report

The greatest risk of contamination to urban stormwater is run-off from industrial sites and Council has undertaken site surveys and implemented a multi-barrier approach in these areas to ensure that high and medium risk sites are capturing and treating (where required) contaminants prior to discharge to the urban network. Road run-off is another source of contamination, in particular around high traffic areas and industrial activities. Treatment options are being trialled (sumps and catchpit inserts) to capture gross pollutants and finer materials, and to evaluate cost effective ways for improving stormwater quality.

Based on the sediment and water concentrations however, it is possible that not all contaminants originate from the urban stormwater discharge. In Ruahāpia Stream for example, contamination, atypical for urban stormwater but typical for industrial stormwater has been measured at high concentrations indicating that there may be discharges to the stormwater system that are not rain derived. HDC undertakes individual industrial site audits of high and medium risk sites to help identify and address issues related to stormwater quality. This project is ongoing and HDC are working with industrial sites to mitigate any risks to stormwater.

This notwithstanding, there is an expectation that stormwater system design and management will be required to improve over the next twenty years to achieve the receiving water quality standards required to be met under the TANK Plan Change. Industrial and urban growth and intensification will exert additional pressures on the stormwater system requiring a greater focus on both quantity control and minimising urban stormwater pollution.

4.2. Description of the Current System

The stormwater system consists of a primary and secondary network. The primary network is generally the built stormwater assets (pipes, manholes, culverts etc.) that provides conveyance and (in some cases) treatment for smaller rainfall events. The secondary system provides for conveyance of stormwater in larger events to reduce the potential for land and buildings to be flooded and for people to be threatened. Secondary flow paths (such as roadways) act to control overland flow when the pipe system is overloaded and to contain excess stormwater within defined areas including parks and reserves.

The piped stormwater network dates back to the 1950s and comprises sumps, pipes, culverts, a few small pump stations and constructed open channels including some discharges to land that can subsequently enter the waterways and the non-confined groundwater aquifers[35].

Prior to the introduction of a piped system, the entire urban area relied on open street channels and drains which were inadequate to keep up with expansion of the city at that time.

4.3. Stormwater Catchment

The historic boundaries of the stormwater catchments have been recently re-established to incorporate land changes in the last 10 years, to account for expansion of residential, commercial, and industrial areas that has already occurred and in preparation for anticipated population growth. The changes also reflect an improved level of understanding of the physical characteristics of the stormwater network and behaviour of freshwater bodies based on stormwater modelling however more modelling work is needed to understand the interaction between the Hastings discharges and the HBRC drainage network and how these two systems function collectively.

[35] Hastings District Stormwater Network Resource Consent Application (2022)

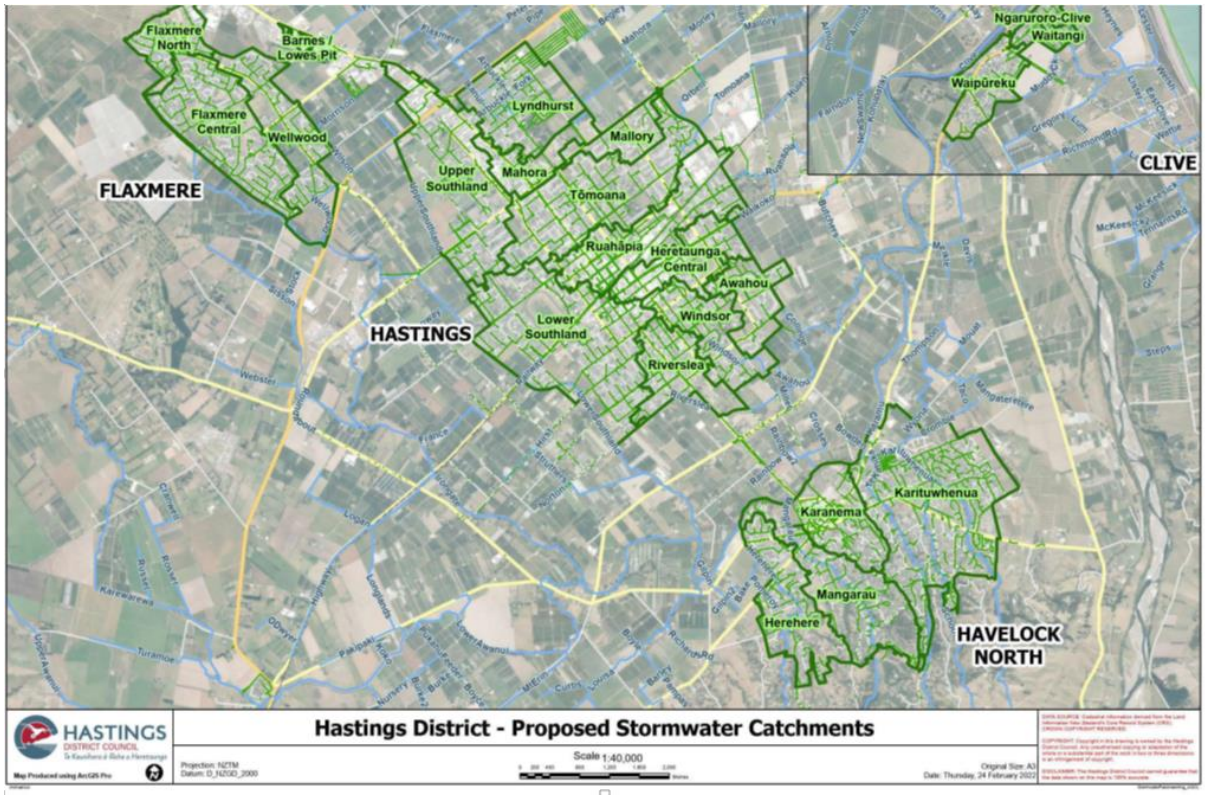
The overall catchment / serviced area is shown in Figure 4.3.1. Within the overall catchment, there are 19 sub-catchments or individual catchments in the areas of Flaxmere, Hastings and Havelock North (Clive is not included in this report).

Our stormwater approach adopts standards and limits that are broadly targeted across the entire urban area. Individual catchments may have varying characteristics and risks within them that may necessitate bespoke solutions to lessen impacts where the risks are greatest. For example:

- Built-up areas with impervious surfaces prevent stormwater from soaking into the ground, resulting in a higher reliance on stormwater infrastructure to prevent flooding;
- A flat topography that reduces our capacity to manage discharges via gravity alone;
- Industries can sometimes be linked to specific chemical contamination which are not found in urban stormwater or are found at higher than expected concentrations. Urban stormwater often contains copper, PAHs, zinc from cars (brake and tyre "dust") or buildings (e.g. zinc from roofs);
- Industries or land uses (e.g. large scale ploughing or logging) with a high risk of dust and sedimentation can increase turbidity in the stormwater and receiving environment;

Understanding the different levels of risk and the associated challenges of a catchment contributes to more effective stormwater management. The individual catchment size varies between 0.02 km^2 at Barnes Place and the Karitūwhenua Stream at 3.89 km^2. Relative land coverage and land use is highly variable between catchments. Built-up areas vary between 50 and 100% of the individual catchment areas. As a result, the more pervious land uses (cultivated crops/pasture, and urban parkland/open spaces) that enable ground soakage vary highly between catchments affecting run-off rates and rain associated issues (e.g flooding). Some catchments are highly industrialised, are fully impervious and include verified hazardous activities and processes, industrial activities, on-site chemical storage or a heavy traffic environment (e.g. the Lowes Pit catchment area where Council is currently implementing a multi-barrier approach to address potential contaminants).

Figure 4.3.1 Stormwater Catchments, Discharge Locations and Monitoring Sites (Resource Consent Application, 2022)



The Urban Stormwater Discharge consent held by the Hastings District Council (HDC) was granted in May 2010 and expired on 31 May 2022 (AUTH-118324-0336) with a new global consent lodged in February 2022. This application encompasses the more area-specific consents held for areas such as Barnes Place, James Rochfort Place, Lowes, Omahu North Industrial, Whakatu West Industrial stormwater and others which have also expired. In accordance with s124 of the RMA, the discharges authorised under the expired consents are able to legally continue under the expired consents until such time as the new consent application is determined.

4.4. Consolidated Bylaw 2021 (Chapter 7)

Under the Resource Management Act 1991 (RMA), the Council has no direct enforcement role regarding the discharges from individual sites into the Council stormwater network, nor any misuse of the public stormwater network. The Stormwater Bylaw (Chapter 7 Water Services of the Consolidated Bylaw, 2021)[37] creates a legal framework under the Local Government Act that requires approval for individual site stormwater that is classified as 'controlled' before it can be discharged into the network. Controlled stormwater includes stormwater from sites with large impervious areas, flow rates that exceed the Code of Practice standard, and / or sites with hazardous substances or other factors which may impact on the performance of the stormwater network.

The bylaw is a key mechanism to achieve the intent of the network consent(s) as well as enabling Council to manage individual site connection to the stormwater network where they may affect the level of service.

[36] Resource Consent Discharge Permit (DP090355Wb) 2018

[37] HDC Consolidated Bylaw 2021 (hastingsdc.govt.nz)

4.5. Engineering Code of Practice

Hastings District Council has adopted the Engineering Code of Practice 2020 (ECoP) [38]which is based on the NZS4404:2010 Land Development and Subdivision Engineering Standard. The document provides minimum compliance on the engineering standards for the management of urban stormwater. The District Plan requires compliance with the Engineering Code of Practice.

The ECoP includes some changes and additions to NZS4404 standard which are detailed in Schedule D of the ECOP [(39)]. This document sets out the performance criteria for the reticulation layout, materials and capacity as well as minimum design standards for a range of low impact design solutions.

4.6. Design Standards for Quantity of Stormwater

A stormwater system is expected to include provisions for an acceptable level of service, minimised adverse environmental impacts (including the aquatic ecosystem) and community impacts while complying with relevant requirements. During development a whole catchment approach, service life (including maintenance and life-cycle costs) and low impact design solutions are required to be considered.

Council's standards (as specified in the ECoP) are:

- The primary stormwater drainage system of pipes and open water courses is required to have sufficient capacity to convey a 5 year rainstorm event without surcharging on the roads. This is an amendment to the NZS4404 standard which requires primary systems in residential, commercial and industrial areas to be designed for a 10 year event, unless the local council specifies an alternative design standard.
- For rainfall in excess of a 5 year storm and up to a 50 year rainstorm, the secondary storm water system shall have sufficient capacity to prevent stormwater entry into existing habitable buildings and inundation of household gully traps.
- An assessment of the effects of a 100 year storm is required, albeit that the system is not required to be designed for a 100-year storm.

Specifically for secondary systems, climate change considerations are added. The requirements are:

- that no existing habitable floors are flooded for all events up to a 1 in 50 year ARI storm event (or 2% Annual Exceedance Probability or AEP)
- Residents should be safe to enter and exit the flooded site up to at least a 1 in 50 ARI storm event (or 2% AEP) inclusive of climate change up to 2090.

The Asset Management Plan also references the 1 in 100 years ARI storm event (or 1% AEP) for new developments inclusive of climate change up to 2090 are included.

4.7. Attenuation using Low Impact Design

Council seeks, via the ECoP, to promote low impact design including the utilisation and enhancement of natural systems for stormwater treatment and integration into the environment through subdivision and land development design. Climate change impacts, such as increased intensity and frequency of heavy rainfall events are also required to be taken into consideration.

[38] HDC Engineering Code of Practice 2020 Document without Appendices (hastingsdc.govt.nz)

[39] SCHEDULE D - HASTINGS DISTRICT COUNCIL ALTERED REQUIREMENTS TO SECTION 4 NZS 4404:2010 - STORMWATER DRAINAGE

Management activities are undertaken to manage the quantity and quality of stormwater from developments and industrial areas [40].

4.8. Stormwater Quantity Level of Service

The Stormwater Asset Management Plan (Final Draft January 2021), ECoP and Long-Term Plan (LTP) 2021 - 2031 set out the expected Level of Service for stormwater infrastructure. This includes specific details on network capacity for 5 and 50 year rain events (protect buildings etc. from inundation including overland flow management and climate change), resource consent compliance and the overall expectations in terms of providing a reliable service with minimal service interruptions. The LTP introduced additional provisions for increasing resilience of the system for climate change impacts.

The LoS in the Stormwater Asset Management Plan specifically indicates that the network capacity should cater for future climate change and associated flood protection.

4.9. Stormwater Quality - PPC 9 (TANK Plan Change) Targets [41]

Hawke's Bay Regional Council has proposed a new policy approach and rules to the Regional Resource Management Plan in order to manage water quality and quantity for the Tūtaekurī, Ahuriri, Ngaruroro and Karamū (TANK) catchments. This proposal is being referred to as the 'Proposed TANK Plan Change' or 'Proposed Plan Change 9'.

In general, the TANK provisions provide for discharges from local authority systems to be assessed as a Controlled Activity (Rule TANK 23) giving certainty that the Council can obtain consent subject to specific criteria being met. These criteria include that there is an Integrated Catchment Management Plan in place. As noted above, the Council has recently lodged an application to renew its resource consents for discharges from the stormwater network and this is being assessed under the new rules and policies.

Discharges from sites which do not connect to the Council's stormwater network are regulated directly by the HBRC under the Regional Plan (including new rules under the TANK Plan Change).

The TANK Plan Change signals a new phase of stormwater management and sets objectives and policies for stormwater management which require the environmental performance of those systems to improve over the next 20 years. There are two key dates and milestones to be met under the TANK provisions:

- 2030 being the date in Policy 29 whereby the Councils (HBRC, HDC, NCC) will have worked together to implement similar stormwater performance standards and management approach.
- 2040 being the date in Policy 28 by which the stormwater discharges are expected to meet the target attribute states of Schedule 26 after reasonable mixing.

[40] Stormwater Asset Management Plan (Draft 2021) (Internal document)

[41] PPC9-Commissioners-Decisions-Clean-Version-Aug22 (hbrc.govt.nz)

The 2040 target attribute states are stated in Schedule 26 of the TANK Plan Change. It includes targets to be met by 2040 as well as long term targets (albeit that long term is not defined but considered to be post-2040). For attributes not specified in Schedule 26, the ANZECC [42] guidelines 80th percentile level are required to be met by 1 January 2025 and the 95th percentile level are required to be met by 31 December 2040.

As further described below this target is currently unlikely to be met in some of the receiving environments (particularly given that it is a new requirement for stormwater management) and it should be noted that stormwater is not the only contributing factor to these standards not being met in several of the receiving water bodies.

4.10. Current System Performance

Current system performance in terms of stormwater quantity is assessed by modelling of the stormwater network and identifying areas which are known to experience flooding in heavy rainfall events. Separate base stormwater models have been constructed for the each of the urban areas (Hastings, Flaxmere and Havelock North) and encompass all stormwater catchments in the respective urban area. The models are at a preliminary level of development but are considered suitable to be used for high level assessments to identify general areas where surface flooding may be expected and associated network capacity constraints.

The models for Hastings and Flaxmere are validated for the 5-year Annual Recurrence Interval (ARI) events however the model for Havelock North has not been calibrated due to insufficient data. None of the models have been validated for the 50-year ARI events and this impacts the reliability of the results and therefore results should only be used for general guidance purposes.

The designed storm event for Hastings included in the models does not include climate change, while the Flaxmere model takes climate change factors into account (RCP 6.0). The HDC stormwater models are at a relatively basic level but will need to be upgraded (data improvements, calibration and refinement) to enable more detailed analysis of the pipe networks, overland flow path assessments and integration with the HBRC drainage model.

The modelling assessments have been undertaken based on the impacts of a nested 24-hour rainfall event (using NIWA HIRDS V4 tool), as per general modelling practice. This means that the simulation event represents combinations of duration and intensity in the system however can generate an overestimate of the short-term rainfall intensity.

While each of the models have limitations, constraints in the network system can be identified, as well as locations where ponding is expected to occur. The higher intensity events (e.g. 50-year ARI) are especially useful to identify where overland flow paths are activated and areas at greater risk of flooding in more significant rain events that exceed a 50 year ARI.

4.11. Level of Service Performance Assessment

Based on the models and performance assessments undertaken to date, stormwater catchments have been categorised on their respective performance against the design standards in the ECoP and our knowledge of where flooding typically occurs across the urban area. It should be noted that the modelled flooding risk is based on a range of assumptions that are not currently validated and should be viewed with a degree of uncertainty as far as predicted flooding risk.

[42] Australian and New Zealand Environment and Conservation Council

4.12. Primary System

Modelling of the pipe network for a 5 year ARI event (including factors for climate change) indicates that many parts of the urban area are susceptible to overflows and flooding due to increased rainfall intensities and run-off that exceeds the capacity that the pipes were originally designed for. This is not unexpected given that today's built environment and the types and intensity of storm events have increased the rates and volumes of stormwater that need to be managed. As we move into a more intensive asset renewals phase it will be important to consider the future impacts of climate change and community expectations to minimise flooding.

The conservative outputs indicate that the current Level of Service described for the primary system is not being met and stormwater is predicted to surcharge into roads, overland flowpaths and detention areas potentially impacting properties are identified as being at risk of flooding.

Havelock North is in a similar situation and it is expected that the urban streams in Havelock North will come under increasing pressure to carry increased flood flows. Ponding in private property is also an ongoing issue due to the topography and many small sub-catchments which impacts the wastewater system through direct inflows from gully traps.

Some initial upgrade assessments were undertaken to determine what improvements on the current system would be beneficial in improving performance of the piped network. In some cases, the upgrades would reduce all flooding, while in most cases flooding was still observed in the model results. This raises questions about the level of investment required to upgrade pipes in the network versus our ability to manage overland flows more efficiently through designated overland flowpaths, storage and stormwater detention while minimising the impacts to people and property.

4.13. Secondary System

For rainfall in excess of a 5 year storm and up to a 50 year rainstorm, the secondary storm water system is required to have sufficient capacity to prevent stormwater entering into homes and buildings and to avoid inundation of household gully traps. The aim is to ensure that habitable dwellings are above flood levels and people are safe however they may be unable to leave their properties where roadways are flooded.

The presented maps at 4.10.1 and 4.10.2 (without climate change scenarios included) indicate ponding areas and depths up to and above 0.5m across the Hastings urban area.

4.14. Climate Change & Infill Development Implications

Climate change and infill development will exacerbate existing issues and place additional pressure on the stormwater system. Detailed modelling and sub-catchment analysis is required to ensure proposed solutions will be fit for purpose and this will require our stormwater models to be improved so that predictions of future impacts are fully understood. A summary of our initial findings can be found in Table 4.17.2.

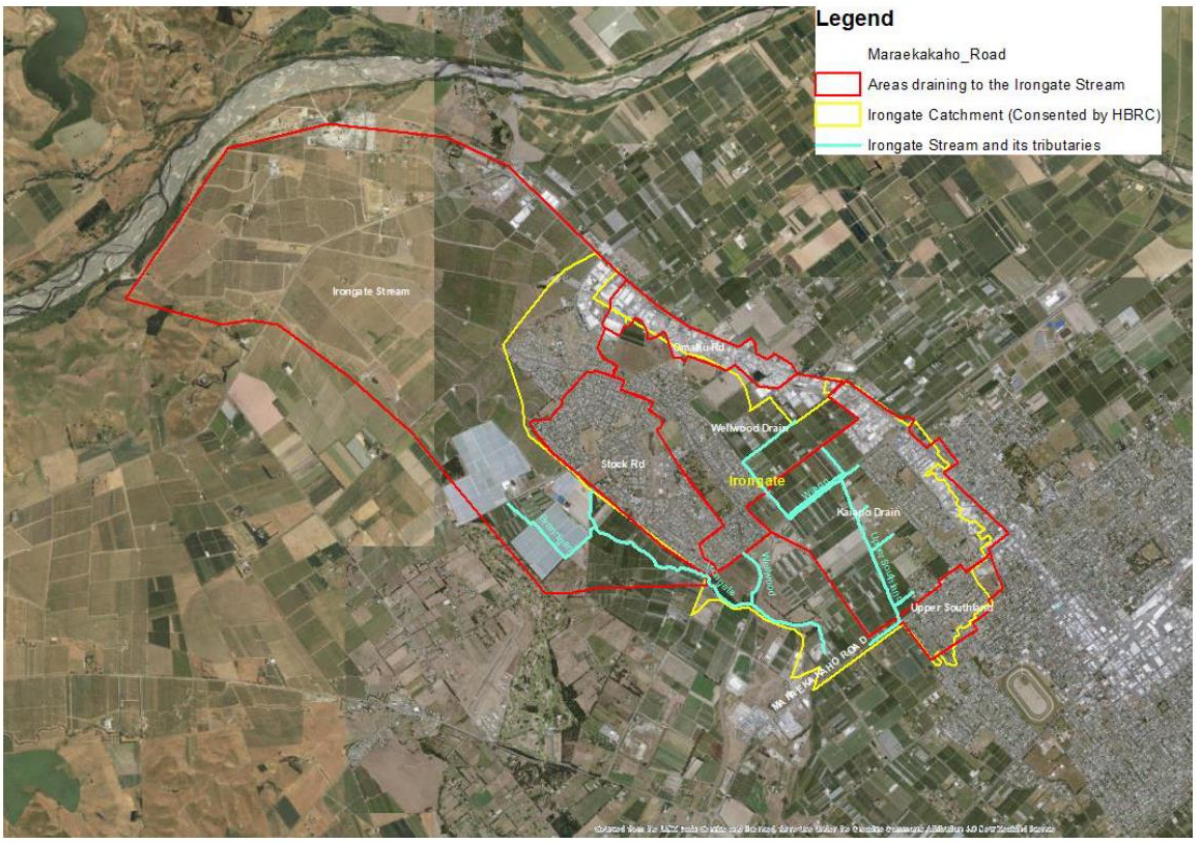
4.15. Flaxmere

Primary System (1 in 5 year rain event)

Stantec was engaged by HDC in March 2018 to develop a coupled 1D/2D stormwater model for the area covering Flaxmere and part of the Hastings urban area discharging via the Upper Southland Drain and piped along Maraekakaho Rd to Irongate Stream.[43] The majority of Flaxmere falls under the Irongate Catchment however, the runoff generated by the large rural catchments (orchards/ farmland) located to the north and west of Flaxmere contribute to smaller streams that ultimately converge to form the Irongate Stream.

The Flaxmere urban area and associated stormwater catchments are shown in Figure 4.15.1 below.

Figure 4.15.1 Stormwater Areas of the Upper Irongate Catchment



Modelling of the Flaxmere system indicates that 46% of the pipe network is under capacity to convey the runoff from a 5-year ARI storm event. 50% of pipes are hydraulically restricted due to the Irongate Stream creating backwater effects that reduce pipe efficiency, increasing the likelihood of overland flow. The flat nature of Flaxmere and Hastings terrain makes water levels at HDC network outlets an important consideration as small differences in water level can restrict the network's ability to discharge. This, in turn, can contribute to surface flooding which may result in significant problems.

Parts of the stormwater network are therefore not meeting the minimum 5 year ARI criteria within the primary system due to the hydraulic nature of pipes, grades and the effects of high levels in the Irongate Stream. Flooding during the 5-year ARI storm is predicted to be mostly limited to within the road corridors with minor impact (partial property inundation) in the residential areas on parts of Flaxmere Avenue and Swansea Road.

[43] WAT-18-9-20-243 System Performance Assessment of Flaxmere Stormwater Network (stage 5) (2020)

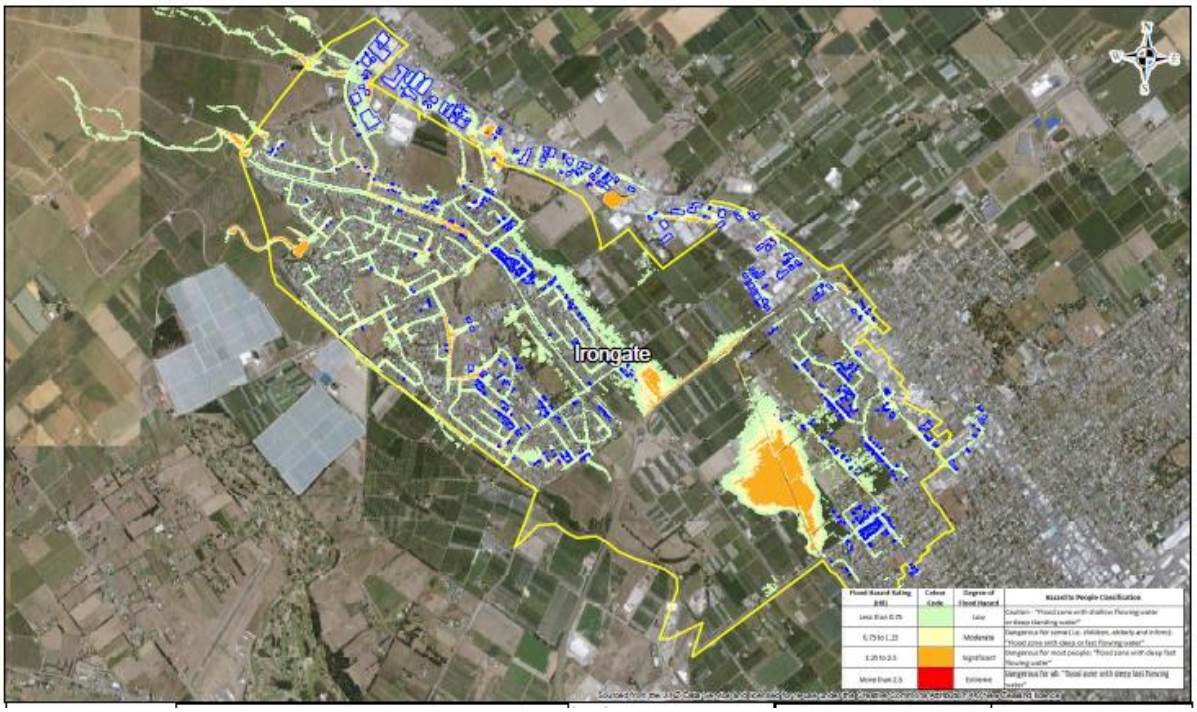
Drainage in the Wellwood catchment and the Upper Southland Drain (and tributaries) exhibit overtopping during the 5 year ARI storm at various locations. Most of this flooding is considered to have a low to moderate risk to adjacent urban properties but areas of increased risk are also identified on rural land alongside the urban fringe and in the Kaiapo area.

Work is underway to prioritise areas of the pipe network for upgrades alongside our growth planning scenarios to ensure that infrastructure solutions address deficiencies and provide future capacity for growth and climate change.

Secondary Flow Assessment (1 in 50 year rain event)

The Stantec report includes analysis of the Flaxmere urban area in a 50 year rain event with flooding depicted in Figure 4.15.2. Overland flow is mostly contained within urban roadways with some flooding spilling into properties where flood levels encroach onto lower lying land. Flooding is also identified in low lying rural land adjacent to the expressway and in Upper Southland Drain in the Kaiapo basin.

Figure 14.5.2 Flaxmere 50 Year ARI Flooding



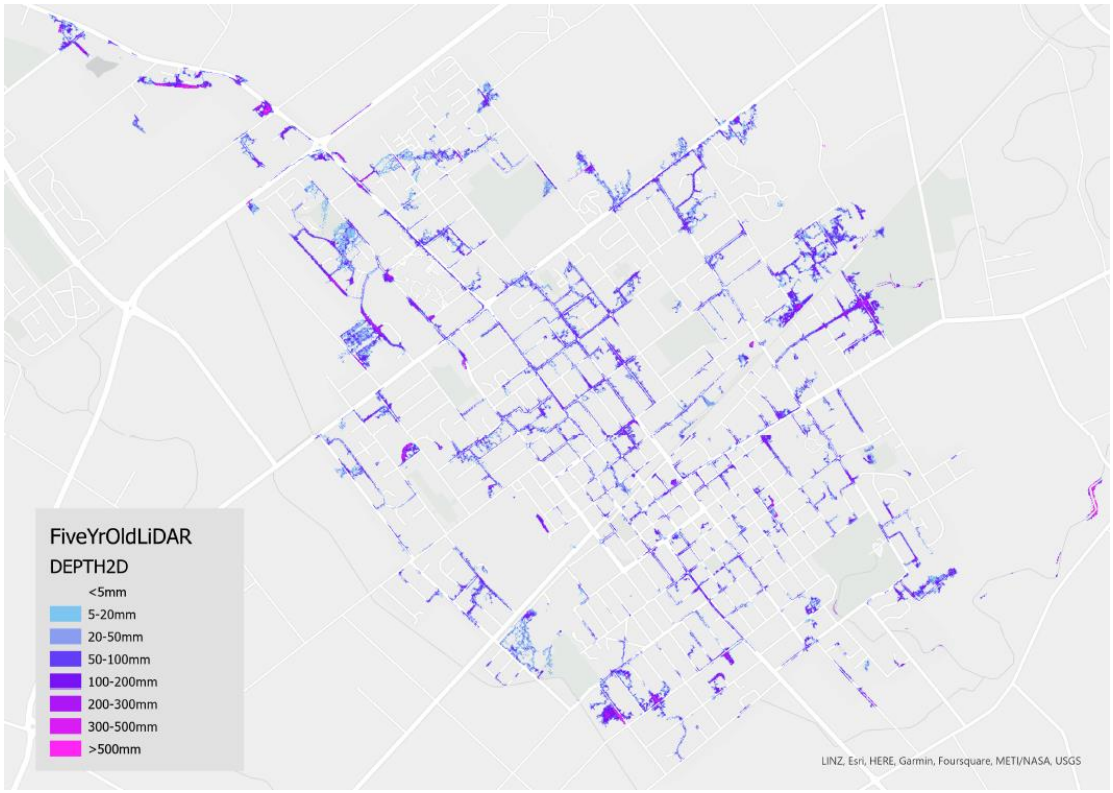
4.16. Hastings

Primary system (1 in 5 year rain event)

Modelling of the Hastings urban area indicates that approximately 50% or more of the primary pipe system is under capacity and operating under surcharged conditions during a 5-year ARI storm event. These assessments are primarily based on a "free outflow" assuming there are no downstream constraints from the HBRC drainage network however we expect that some backwater effects will be present in the 5 year rain event. Further analysis was performed by adding a downstream backwater influence which indicates that the flood volume is underestimated under "free outflow" conditions in most catchments.

Figure 4.16.1 below shows where flooding is predicted to occur across Hastings in the 5 year rain event.

Figure 4.16.1 - Modelled 5 Year Rain Event - Hastings



There are several areas of inundation and ponding throughout Hastings including Nelson Street South, Nelson Street North, Tōmoana Road and Caroline Rd adjacent to the Tōmoana showgrounds. These areas where flooding is predicted to occur are generally limited to road corridors and watercourses but there will be instances where ponding occurs to low lying residential properties.

Maintaining capacity within pipes during a 5 year rain event will require a combination of upsizing pipes, where it is practical and cost effective to implement infrastructure upgrades, and improved management of overland flows and flooding to ensure that the urban areas of Hastings are not adversely affected by flooding and that access on roads is not unreasonably restricted.

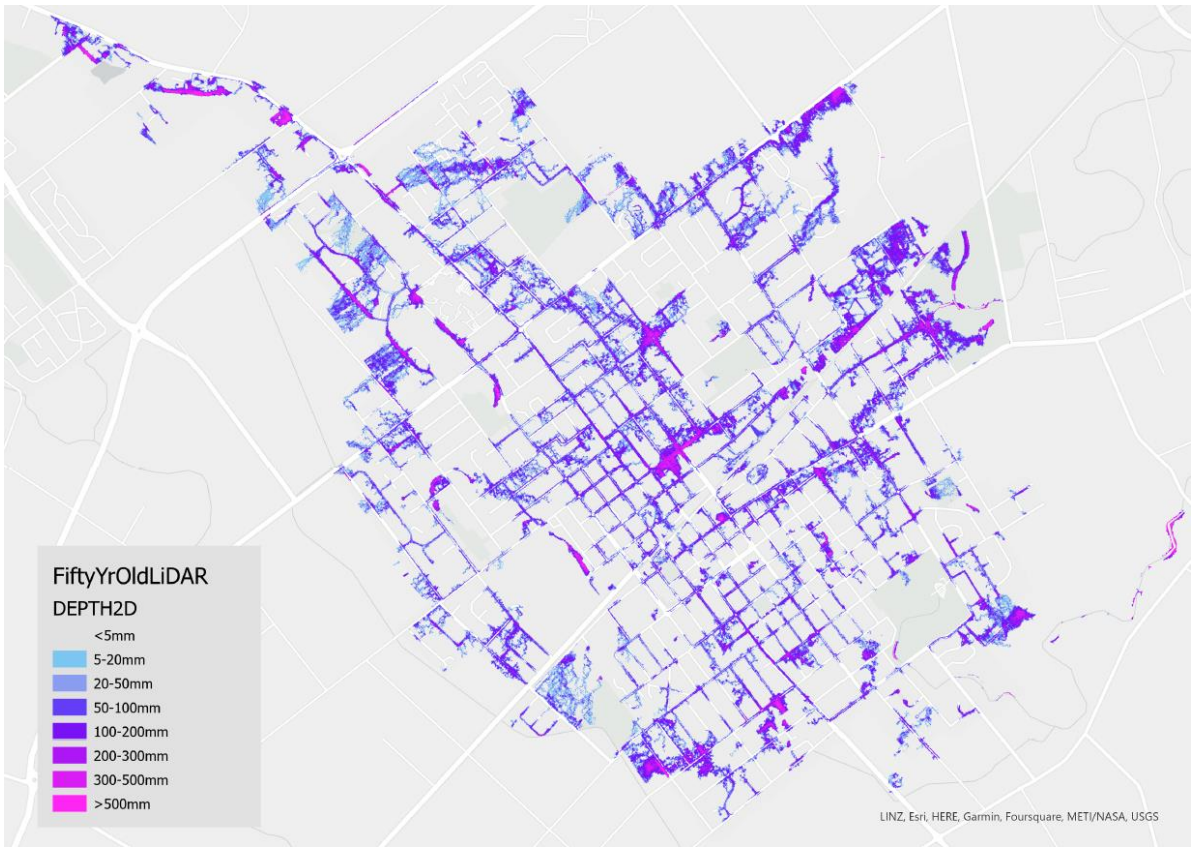
Secondary Flow Assessment (1 in 50 year rain event)

Analysis of the secondary overland flow regime across the Hastings urban area shows where residential areas are more directly affected by flooding and overland flow. As can be seen in Figure 4.16.2, there is an upscaling of impacts across a much wider area of Hastings with the depth of ponding in the worst areas predicted to be up to 500mm or more.

The lower lying areas of Hastings include parts of Akina, Mahora, Nelson St, Karamū Rd North and Caroline Rd which are more likely to see flooding on properties and roadways in conjunction with hindered wastewater services due to stormwater entering into sewers from flooded gully traps.

The limitations of the current stormwater model have a bearing on this analysis and work is underway to improve our ability to more accurately define flooding extents during large scale events and to assist in developing long-term solutions.

Figure 4.16.2 - Modelled 50 Year Rain Event - Hastings



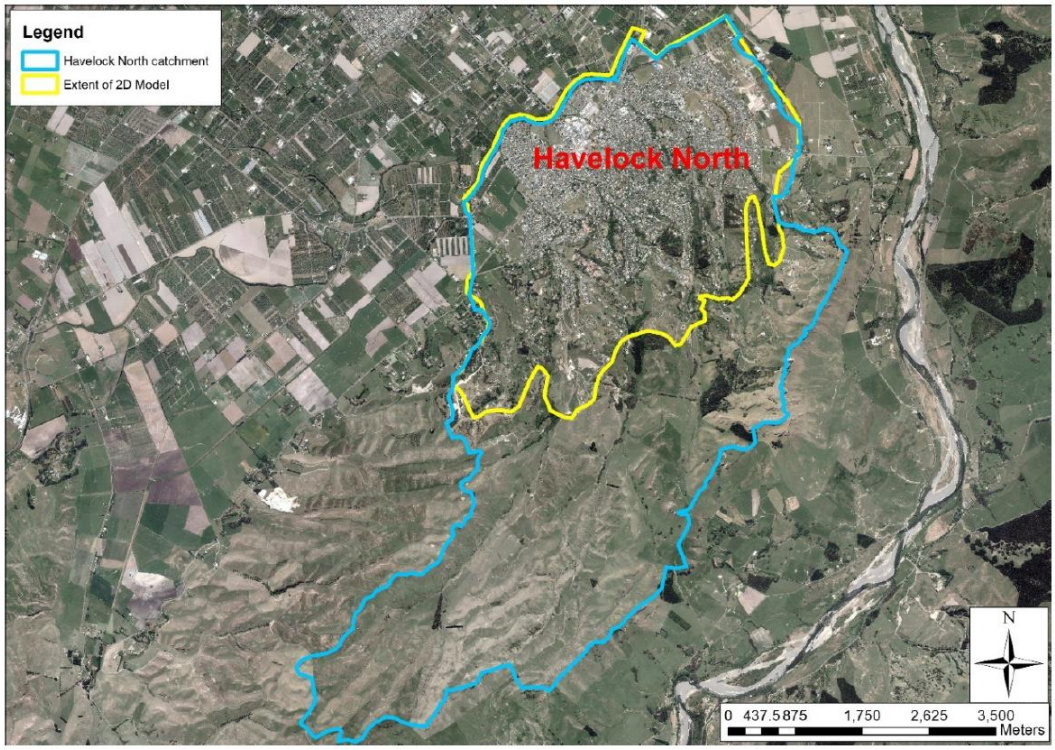
4.17. Havelock North

Preliminary analysis in Havelock North [44] using a base stormwater model first developed in 2019, follows a similar direction as Flaxmere and Hastings where 20% of the pipe system is under capacity in the 5 year rain event and 40% of the outlets are under backwater conditions due to high levels in the Karamū Stream.

The Havelock North Catchment (Figure 4.17.1) comprises the land draining to and through Havelock North. The Havelock North catchment extends across 2960 ha from the Heretaunga Plains at an elevation of approximately 8m above sea level, up to Te Mata Peak at an elevation of 399m. Havelock North is bound in the northwest by the Karamū Stream. A number of smaller gullies and streams/creeks drain the catchment, many of these incised deeply into the terrain. The township comprises five main administrative areas including Anderson Park, Havelock North Central, Iona, Te Mata, and Te Mata Hills and is predominantly residential and rural residential with a relatively small and compact industrial and commercial centre.

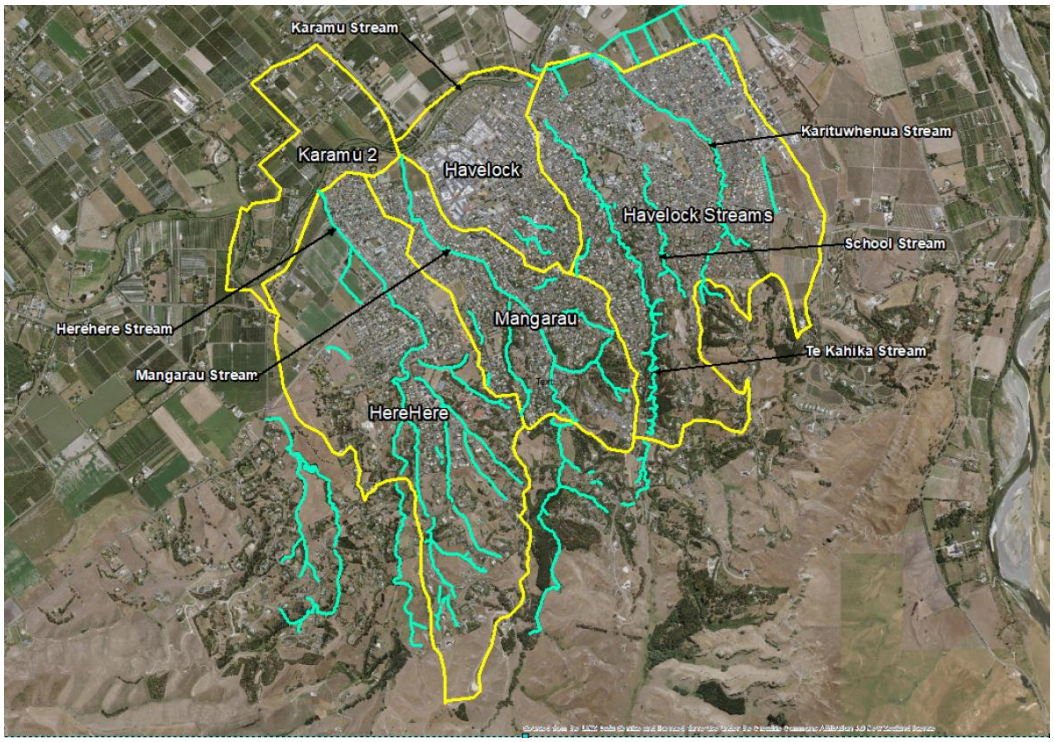
[44] WAT-18-9-20-242 System Performance Assessment of Havelock North September (2020)

Figure 4.17.1 Havelock North Stormwater Catchment



The Havelock North area is divided into five hydrological catchments including the Here Here Stream, Mangarau Stream, Te Kahika Stream, School Stream and the Karituwhenua Stream. Most of the urban areas in Havelock North discharge at various locations into these streams which then flow into the Karamū Stream to the north.

Figure 4.17.2 Havelock North Streams



Since the catchment drains directly to the Karamū Stream, it is heavily dependent on the performance of the primary network and levels within the Karamū Stream. The performance of the primary network is significantly affected due to the high flood levels in the Karamū Stream which impede a free discharge from the catchment's primary network. The ponding depths and extents are exacerbated due to surplus overland flow from the neighbouring catchments and limitations of the primary network.

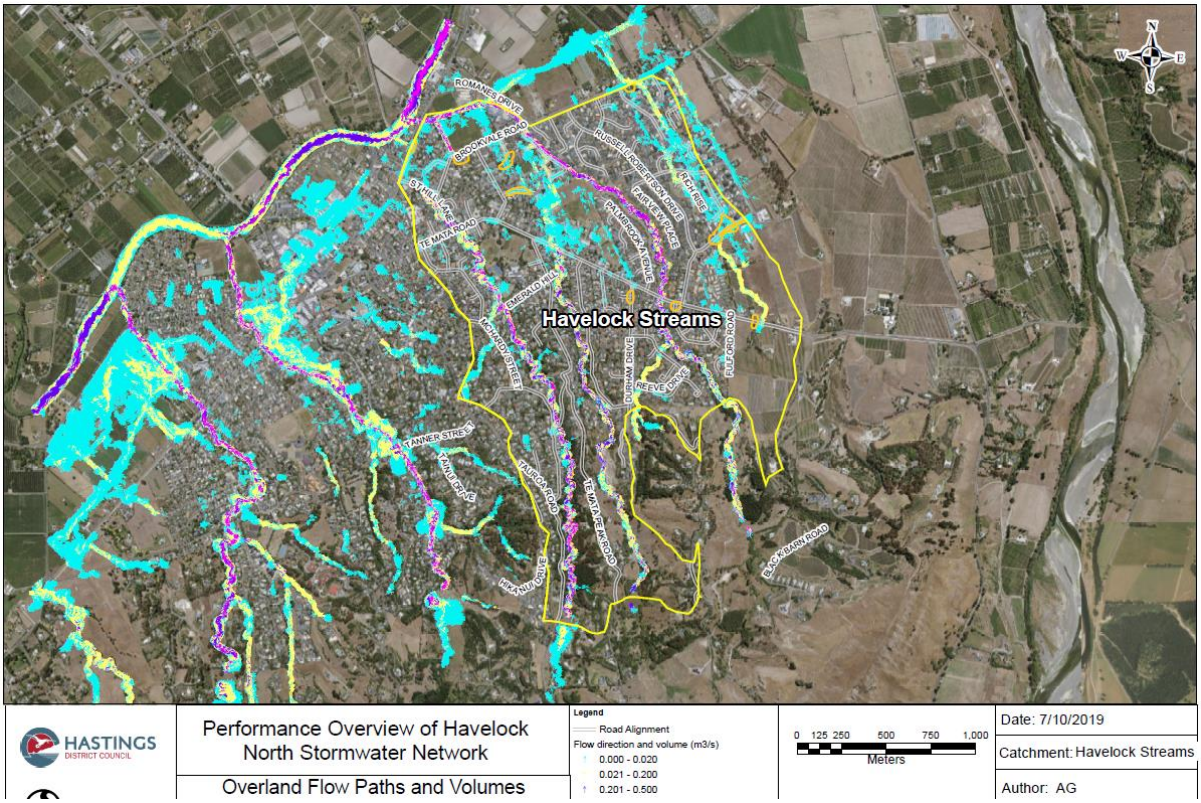
Approximately 40% of the reticulated stormwater network in Havelock North has downstream restrictions i.e. the network remains under backwater condition. Approximately 20% of the network does not have sufficient capacity to carry the runoff from a 5-year ARI storm event and is therefore likely to result in overland flows.

The Mangarau catchment shows the largest flooding volume but most of the flood water is carried downstream by the Mangarau Stream where it overtops the stream banks at several locations to enter the Havelock catchment.

Modelling shows that all streams in the Havelock North area are at risk of overtopping by flood water at various locations for both 5 year and 50 year ARI storm events. Karituwhenua Stream appears to have sufficient capacity in most of its reaches to carry the runoff while Mangarau Stream appears the most undersized as the runoff overtops its banks at several locations.

No significant flooding is predicted from the Karamū Stream, although the backwater levels do impact the primary network. This assessment is reliant on 50-year ARI levels in the Karamū Stream calculated by HBRC.

Figure 4.17.3 Havelock North Streams – Overland Flow



Detention Dams

While this assessment only considers the urban stormwater network, it does take into account the large detention dams that sit in the upper catchments of the 5 Havelock North Streams. These large scale dams were constructed in the late 1970s to provide major flood protection to Havelock North following the 1974 flood event.

The review of the performance of the detention dams indicates no spilling for the 50-year ARI storm event. The dams are constructed to attenuate the runoff from a 100-year ARI storm event therefore it can be concluded that though the dams' hydrology is simplistic in the model, the results are reasonable and reliable considering the scale and objective of this initial study.

Table 4.17.4 Relative Performance of Stormwater Infrastructure

Level of Service met for 5 year ARI event			
Level of Service can be met for 5 year ARI event with reasonable upgrades (defined as modelled < 35% network upgrade and/or <100 m^3 spill after upgrades)			
Level of Service cannot be met for 5 year ARI event unknown impact of upgrades (no model available)			
Level of Service cannot be met for 5 year ARI event even with reasonable upgrades (modelled) or upgrades were considered significant (>35% network and/or >100m^3 spill after upgrade)			
	Catchment name	**5-year ARI- event**	**50-year ARI-event**
Flaxmere	Irongate Catchment	Flood risk: mostly classified as low to moderate in residential areas but is more significant in some areas (mostly in road corridors) Backwater conditions: 50% of network length Insufficient capacity: 46% of network length Flooded manholes: 441 Properties affected: 273 with some level of ponding	Flooding predicted (a range of impacts to 777 properties) and up to 0.5m in areas
		Impact of potential upgrades: Unknown	
Hastings	Collinge	Flooding predicted (including on property) Flooding has been reported after recent upgrades (report date 2018) There are several significant ponding locations identified in the catchment draining to Collinge Drain. HDC historical flooding records are consistent with modelling predictions.	Flooding/ponding predicted (including on property) and >0.5m in areas
		Most flooding could be prevented with upgrades. Network Upgrade needed: 36% (replace and new pipework) in a smaller catchment (76 Ha) Reduction of spills with upgrade: 99% Flood volume after upgrade: 29 m^3 Impact HBRC drains: yes, Flood volume (m3) after upgrade with HBRC drains constraints: <100 m^3	

	Catchment name	5-year ARI- event	50-year ARI-event
	Kaiapo	Flooding predicted (to rural property)	Flooding predicted and >0.5m in some areas
		Most flooding could be prevented with upgrades. Network Upgrade needed: 70% (replace and new pipework) Reduction of spills with upgrade: 95% Flood volume after upgrade: 573 m^3 Impact HBRC drains: not applicable	
	Lower Southland	Flooding predicted Flooding has been reported after recent upgrades (report date 2018) HDC historical flooding records indicate major drainage problems in this area prior to upgrades in the 90s. The Copeland Rd pump station has been constructed to ensure that high downstream water levels do not prevent effective management of stormwater runoff in the area which appears to have significantly improved catchment drainage. Flooding still occurs within Akina, some areas are low laying and flat which can make it difficult to drain and obtain suitable connectivity with the pump station	Flooding predicted (including on property) and >0.5m in areas
		Most flooding could be prevented with upgrades. Network Upgrade needed: 8% (replace existing pipework) Reduction of spills with upgrade: 97% Flood volume after upgrade: 82 m^3 Impact HBRC drains: yes Flood volume (m^3) after upgrade with HBRC drains constraints: 1861 m^3	
	Mahora	Most of the flooding locations predicted by the model could not be validated by HDC historical flooding records.	Flooding/ponding predicted (including on property) and < 0.5m

	Catchment name	5-year ARI- event	50-year ARI-event
		Most flooding could be prevented with upgrades. Network Upgrade needed: 16% (replace existing pipework) Reduction of spills with upgrade: 99% Flood volume after upgrade: 8 m^3 Impact HBRC drains: limited Flood volume (m^3) after upgrade with HBRC drains constraints: 12 m^3	
	Mallory	Several flooding locations have been identified (and some confirmed with historical data).	Flooding predicted (including on rural property) and >0.5m in areas
		Most flooding could be prevented with upgrades. Network Upgrade needed: 33% (replace and new pipework) Reduction of spills with upgrade: 99% Flood volume after upgrade: 7 m^3 Impact HBRC drains: limited Flood volume (m^3) after upgrade with HBRC drains constraints: no increase in volume	
	Omahu Rd (independent of Hastings network, not included in any maps?)	Not all flooding could be prevented with upgrades. Network Upgrade needed: 31% (replace existing pipework) Reduction of spills with upgrade: 87% Flood volume after upgrade: 524 m^3 Impact HBRC drains: not applicable	Not included in 50 year ARI-assessment
	Railway	Flooding predicted (including on property). There are many HDC flooding records for this area which the model also predicts. HDC have decided and are currently implementing significant upgrade works to connect this problem area to the Railway drain.	Flooding predicted (including on property) and >0.5m in areas

	Catchment name	5-year ARI- event	50-year ARI-event
		Most flooding could be prevented with model upgrades, some remain (however, volume is small). Network Upgrade needed: 29% (replace and new pipework) Reduction of spills with upgrade: 99% Flood volume after upgrade: 19 m^3 Impact HBRC drains: unknown (model limitations)	
	Riverslea	Flooding predicted (including on property). HDC historical flooding records are generally consistent with model predictions.	Flooding predicted (including on property) and >0.5m in areas
		Most flooding could be prevented with upgrades. Network Upgrade needed: 15% (replace and new pipework) Reduction of spills with upgrade: 98% Flood volume after upgrade: 4 m^3 Impact HBRC drains: yes Flood volume (m^3) after upgrade with HBRC drains constraints: 88 m^3	
	Ruahapia	Flooding predicted (including on property) There are number of flooding locations predicted to occur which in many instances are consistent with HDC flooding records for the area.	Flooding predicted (including on property) and >0.5m in areas
		Most flooding could be prevented with upgrades, but some areas remain at risk for flooding. Network Upgrade needed: 28% (replace and new pipework) Reduction of spills with upgrade: 92% Flood volume after upgrade: 808 m^3 Impact HBRC drains: yes Flood volume (m^3) after upgrade with HBRC drains constraints: 1955 m^3	

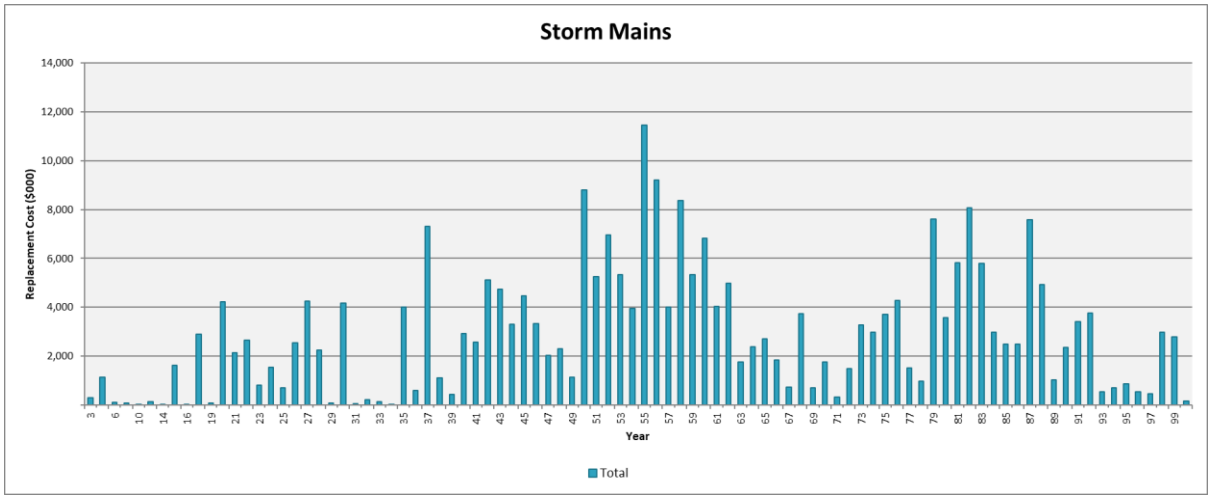
	Catchment name	5-year ARI- event	50-year ARI-event
	Southland	Significant flooding predicted (including on property). Flooding has been reported after recent upgrades (report date 2018)	Flooding predicted (including on property) and >0.5m in areas
		Most flooding could be prevented with upgrades. Network Upgrade needed: 12% (replace pipework) Reduction of spills with upgrade: 98% Flood volume after upgrade: 90 m^3 Impact HBRC drains: unknown, model limitations	
	Mareakakaho/Upper Southland (part of Southland catchment)	Significant flooding predicted. Flooding has been reported after recent upgrades (report date 2018) Most flooding could be prevented with upgrades	Flooding predicted (including on property) and >0.5m in areas
		Most flooding could be prevented with upgrades. Network Upgrade needed: 33% (replace and new pipework) Reduction of spills with upgrade: 99% Flood volume after upgrade: 20 m^3 Remaining flooding seems mostly on roads. Impact HBRC drains: not applicable	
	Tōmoana	Flooding predicted (seems not to be on property) Several flooding locations predicted to occur which in general are consistent with HDC flooding records for the area.	
		Most flooding could be prevented with upgrades. Network Upgrade needed: 26% (replace and new pipework) Reduction of spills with upgrade: 99% Flood volume after upgrade: 12 m^3 Impact HBRC drains: yes Flood volume (m^3) after upgrade with HBRC drains constraints: 191 m^3	

	Catchment name	5-year ARI- event	50-year ARI-event
	Windsor	There are several significant flooding locations identified which are also consistent with HDC historical flooding records for this area.	Flooding predicted (including on property) and >0.5m in areas
		Most flooding could be prevented with upgrades, but some flooded areas still remain. Network Upgrade needed: 17% (replace and new pipework) Reduction of spills with upgrade: 93% Flood volume after upgrade: 101 m^3 Impact HBRC drains: yes Flood volume (m^3) after upgrade with HBRC drains constraints: 127 m^3	
Havelock North	Herehere	No performance reports available	
	Mangarau		
	Karanema		
	Karitūwhenua		
Barnes	Barnes	No performance reports available	
Lowes Pit	Lowes Pit	No performance reports available	

4.18. Network Age & Condition

The Resource Consent Application (2022) and Long-Term Plan 2021-2031 describes that the stormwater system is expected to be in good condition considering the age of most assets (majority constructed in the 1950s and 60s). First replacements are expected within the next 10 years and will increase over the next 30 years, with significant investment required. The graph below shows the expected upgrades for the various assets, year zero is 2022. Condition assessments have not been completed and therefore the projected stormwater renewals shown in the graph is based on known asset age only. The renewal profile below shows that the majority of stormwater renewals are due in the 10+ year timeframe. Pipe renewal timing provides an opportunity to increase capacity of the stormwater network as there is only an incremental cost incurred to renew the pipes with a larger pipe size.

4.18.1 Stormwater Asset Replacement Schedule (based on age)



4.19. Identified Risks

A report focussing attention on identifying risks and critical infrastructure was included as part of the renewal application for the global stormwater consent in 2020 [45].

Identified risks for stormwater pathways include:

- Flat topography of most of the district means the Heretaunga Plains are slow to drain and therefore at greater risk of flooding. In addition, minor changes in the topography can significantly affect runoff flows and increase flooding.
- The pipe system is predicated on stormwater from private property discharging to the road kerb and channel. However there are areas where properties are below road level and are unable to gravitate and the pipe network does not extend to these low lying areas. This results in ponding and flooding of properties that are disconnected or rely on pumping to discharge on property stormwater.
- Dam safety - flood detention dams on the main catchments south of Havelock North and potential impacts of overtopping in a major rain event.
- Reliance on stormwater pump stations where gravity solutions are not available and the risk of pump failure during a flood event.

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- Erosion and scour in open flow paths and property flooding via secondary overland flow paths which are expected to increase with climate change.
- Trunk Railway line which is slightly elevated creating a physical barrier (SW-NE of Hastings CBD) that creates a boundary between catchments but does not seem to present a significant increase in flood risk.
- Overland flow paths within private property that are built in, filled or obstructed i.e. fences, garages etc.
- Difficulty in establishing existing and new overland flow paths within urban areas (easements, compensation and ongoing management).
- Upgrades in road corridors may cause some disruption. Such disruptions can be mitigated by aligning stormwater upgrades when road upgrades are scheduled to be undertaken.

4.20. Critical Assets

- Pipes considered extremely critical or moderately critical are mostly located under the main trunk railway, under or parallel to high use roads (e.g. SH), under or close to buildings and within the CBD zone. Several aspects have been considered including disruption to third parties, property damage, public health, costs, complexity of repair etc. Pipe failure could result in ponding, land stability issues and overland flow. Inundation of the wastewater system could also occur that could lead to contamination of stormwater, freshwater bodies, and land.

- The Ngaruroro River: Built to a 1 in 50 year level of protection, the river and floodway are considered to be capable of coping under the current conditions. Management and maintenance is the responsibility of the Hawkes Bay Regional Council.

- Stormwater Sumps, Entry Cages, Pipe Barrier Grilles and Manholes: Sumps, entry cages and grills are identified as being prone to blockage, which can result in surface flooding and associated damage. "Popping" of manhole lids because of a rain event can indicate the system at that point is under capacity.

4.21. Stormwater Quality

The ultimate receiving environments for the stormwater network are the Ngaruroro River and the coastal / marine environment of Hawke's Bay which are under the jurisdiction of the Hawke's Bay Regional Council. The Waitangi Regional Park encompasses the common mouth of three major river systems including the Ngaruroro, Tutaekuri and the Clive River.

Prior to reaching these environments, the catchments predominantly drain to Te Karamū Awa catchment via several streams and watercourses, then the Karamū-Clive system which flows into the Waitangi Estuary and Hawke Bay. Stormwater discharges over the unconfined areas of the Heretaunga aquifer may also contribute to a deterioration of groundwater quality if not properly managed.

Benthic macroinvertebrates can be important indicators of water quality. Based on available data, the benthic macroinvertebrate community in Te Karamū and other environments receiving urban stormwater reflect ecosystems in a "poor" state. Benthic macroinvertebrates are aquatic animals without backbones that are large enough to see without a microscope. They include worms, crustaceans, and immature forms of aquatic insects such as stonefly and mayfly nymphs.

The observed species are considered to be tolerant to pollution and the portion of "EPT" species (Ephemeroptera, Plecoptera and Trichoptera), which are sensitive to pollution, was low. It should be noted that two sites, known not to receive stormwater discharges had a similar quality and that

stormwater discharges are only one of several contributing factors to the receiving environment's water quality. As noted, the TANK Plan Change has introduced an RMA objective, policy and rule framework focused on improving water quality which the new stormwater rules and requirements are contributing to.

4.22. Stormwater Consent Monitoring

As part of the stormwater discharge consent, sediment quality sampling for several substances (metals and hydrocarbons), water samples for *E.coli*, as well as visual assessment are undertaken every second or every fourth year depending on the site. The findings below are based on the most recent Annual Stormwater Monitoring and Compliance Report - Network Consent AUTH-118324-03 (2021) [46].

The stormwater consent for James Rochfort Place (AUTH-119173-01), Barnes Place (AUTH-119174-01) and Lowes Pit (AUTH-119172-01) require monitoring prior and after pre-treatment device(s) as well as prior to discharge. The sampling frequency of these high-risk locations varies between 2 and 4 times per year.

- **Sediment**: The most recent sediment and water samples for consent AUTH-118324-03 have been taken in March 2021, throughout the district. Samples were analysed for metals, PAHs and *E.coli* (as an indicator for pathogens). Sample locations generally represented the receiving environment of one of the main catchments (i.e. Flaxmere, Havelock North or Hastings) except for KAR2 which received discharges from the three catchments combined.

  The sediments in all catchments receiving stormwater have contaminant concentrations above the Australian and New Zealand guidelines for fresh and marine water quality. This means there is a potential of environmental effects from these discharges. The concentrations of some substances seem to be accumulating in the sediments of certain locations (visual assessment), for example in the streams receiving the stormwater discharge from Flaxmere. This increased concentration in the sediment indicates a "chronic" inflow of contaminants in the system that has the potential to contribute to poor receiving water quality. Typical contaminants for urban environments were found to be above the guideline values in most sites with zinc, lead, copper and PAHs identified as the primary contaminants of concern in the resource consent application [47]. Similar conclusions could be drawn for Lowes Pit, James Rochfort Place and Barnes Place (based on information in the resource consent application).

- **Receiving Water Quality:** A detailed investigation in 2012, described in the resource consent application, of the water quality in the Ruahāpia Stream, Wellwood Drain and Irongate Stream indicated that the water quality was negatively impacted by the stormwater discharges. High nutrient levels, dissolved heavy metals and suspended sediment were observed at all streams. *E.coli* sampling of the water of a variety of drains and streams (2019, 2020) indicated that concentrations at several sites were elevated above the alert or action level of the Microbial Quality Guidelines for Marine and Freshwater Recreational Areas.

HDC undertakes individual industrial site audits of high and medium risk sites to help identify and address issues related to stormwater quality. This project is ongoing and HDC are working with industrial sites to mitigate any risks to stormwater.

46 Annual Stormwater Monitoring and Compliance Report - Network Consent AUTH - 118324-03, 2020/2021

47 Hastings District Stormwater Network Resource Consent Application (2022)

4.23. Conclusions on Stormwater Quality

The resource consent application for the stormwater discharges currently being processed by HBRC states:

> *"HDC maintains that the existing and proposed stormwater discharges are not (and will not be) the predominant cause of the current degraded state of the receiving environments ; namely Te Karamū and its tributaries. […], there are existing activities, including diffuse run-off, outside the control of HDC's urban stormwater network (and under the proposed consent for discharges from that network) [48] which contribute to pollution and changes in hydrologic regime within the receiving environments, and have done for decades in some cases."* [49]

This notwithstanding, there is an expectation that stormwater system design and management will be required to improve over the next twenty years to achieve the receiving water quality standards required to be met under the TANK Plan Change.

4.24. Hastings District Council is Implementing Mitigation Measures - Multi-Barrier Approach

HDC is implementing a multi barrier approach to improve the quality of the stormwater. The approach consists of onsite pollution management as well as first flush spill event diversion and end of pipe treatment systems. This approach is currently being implemented in high risk areas with an intent to roll-out the approach across the network.

A multi-barrier approach is required to ensure an appropriate level of pollution mitigation occurs in higher risk catchments at high-risk discharges. The three main barriers imposed are as follows:

- Barrier 1: Working collaboratively with industrial/commercial property owners to minimise the risk of pollution entering the public storm drainage system.
- Barrier 2: Implementing treatment interventions within HDC's urban stormwater network.
- Barrier 3: End-of-pipe treatment systems which are designed to treat contaminants that pass-through catchpit filters and exceed the capacity of the first flush systems.

This approach will initially be implemented in high-risk areas and finally in the entire urban stormwater network with prioritised application. Modelling shows that the combination of first flush and Bioscape treatment systems will address 90% to 95% of the average stormwater runoff volume, significantly improving the quality [50].

4.25. Source Control: Reduction of Run-Off & Contaminants from Buildings and Sites

HDC is also implementing a strategy of managing stormwater quantity at source through District Plan and other controls. The District Plan sets policies and rules to reduce stormwater from industrial properties to enter the urban stormwater system and to limit stormwater contamination. This includes, but is not limited to, rules limiting impervious surface area and requiring on-site attenuation, landscaping requirements for parking areas and requirements for the handling of hazardous substance (e.g. Rule CSR9 refers to7.3.5 and 7.3.6 General Performance Standards and Terms),

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48 For example: Upstream takes, industrial discharged consents, illegal and accidental discharges, public state highway run off.

49 Hastings District Stormwater Network Resource Consent Application (2022)

50 Hastings District Stormwater Network Resource Consent Application (2022)

Buildings are required to have roof surfaces constructed from inert materials or should be painted with non-metal based paints (and maintained in good order). This will reduce run-off of copper and zinc from buildings, reducing the amounts of these contaminants in the stormwater in the Hastings Commercial Environment, Havelock North Village Centre, Flaxmere Village Centre and Industrial zones. [51].

51 Hastings District Plan

5. Transport

5.1. Executive Summary

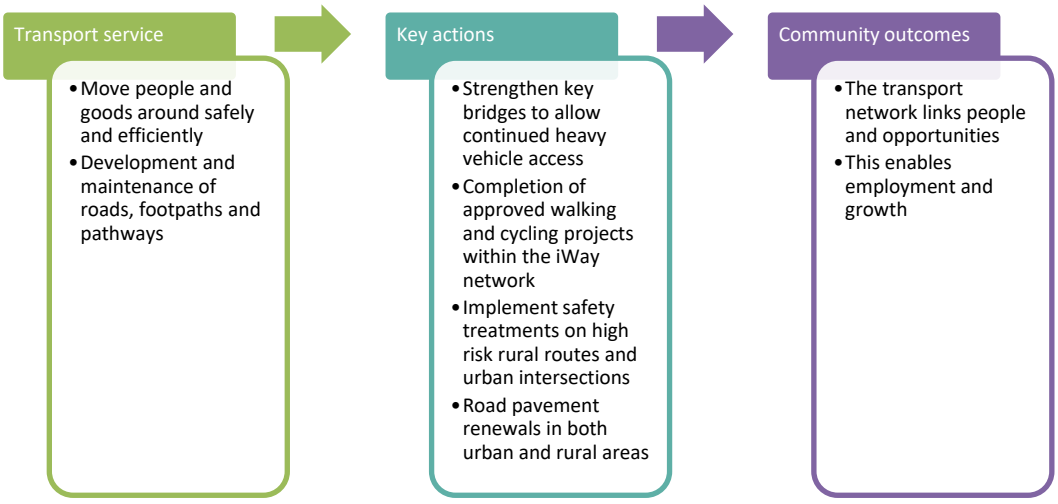
An effective transportation network is a key element in the efficient functioning of the Hastings District and its economy. The District is a major producer of primary produce and manufactured goods and linkages to domestic and international markets are crucial in maintaining a healthy economic sector. However, the transport network can also generate negative environmental effects. For road and rail these are commonly noise and exhaust pollution. These effects are increasingly compounded by the continued growth of traffic, particularly on routes that were not designed to handle present or predicted levels, or by the inappropriate use of local access roads as arterial or primary collector routes, or de facto bypasses.

Public transport is also a major consideration and is an important component in transport planning and services. Regional plans aim to promote increased numbers of trips being undertaken on public transport thereby lessening the reliance on private motor vehicle travel and contributing to reduced congestion and carbon emissions on the road network.

There are a number of regional and local plans and strategies with objectives to improve the safe and efficient movement of people and goods across the district while enhancing our social and cultural fabric and delivering improved environmental outcomes. Key themes include creating safe multifunctional urban centres with accessibility to a range of transport options, providing safe walking and cycling facilities and incentivising the improved use and integration of environmentally sustainable transportation forms.

A summary of the Council's transportation strategy is depicted in Figure 5.1.1 below.

Figure 5.1.1: Summary of the Key Actions and Outcomes for the LTP Transport Strategy



5.1.1. How Are We Performing?

Getting Around – The open grid pattern of central Hastings has resulted in a large number of suburban roads becoming used as de facto traffic bypasses, and as Collector or Arterial routes. This generates unnecessary and undesirable levels of traffic on Access roads and has safety and environmental consequences for the community, particularly in terms of noise, vibration and impact on the amenity of residential areas.

Transport models and field observations are used to understanding how our urban network is performing and to identify key locations that are under pressure or could become congested in the future. At present, congestion is not considered to be a significant issue in the network[52] however, observations indicate pinch points where congestion is observed including the St Aubyn Street / Karamū Road Intersection, Stoneycroft Street / Omahu Road Intersection, Railway Road / Southampton Street Intersection. All intersections indicated queuing during peak times and risk taking behaviours due to traffic flow issues at the Stoneycroft Street / Omahu Road Intersection were also observed.

Road Safety – The Hastings District has a poor road safety record when compared against national averages and peer groups. Roughly half of the crashes in the district occur on urban roads (51% of all crashes) with intersections playing a relatively large role in crashes in urban areas (54% of crashes in urban areas). Vulnerable road users are involved in 34% of the fatal or serious injury crashes (cyclist 9% of fatal or serious injury crashes, pedestrians 8% of fatal or serious injury crashes, motorcyclists 17% of fatal or serious injury crashes) in the period of 2014-2019.

Roughly half of the crashes in the district occur on urban roads with a posted speed limit of less than 70 km/hr (51% of all crashes) with intersections playing a relatively large role in crashes in urban areas (54% of crashes in urban areas). A growing population might result in a higher rate of overtaking crashes when there are potentially more people on the road and different driving speeds, driver ability and higher levels of congestion could also lead to frustration and higher risk taking behaviour in future.

Public Transport - Long run census data of people travelling to work (2001 to 2018) indicates a continued high reliance on private and commercial vehicle use (80 - 85%). The public bus was only used by 1% of commuters and 6 - 10% of commuters used another mode of sustainable transport (bicycle, walk or jog).

While this data is prior to the Covid-19-pandemic where we have seen an increased proportion of people who work from home on a regular basis, based on historic census data for work related commuting, the relative fraction of sustainable transport use (public transport, bicycling, walking, or jogging) has not increased in the period and bicycling appears to have been reduced (5% to 2%).

Sustainable transport does not appear to be an appealing mode of transport for people to commute to and from work. In order to meet current long term targets, public transport and other sustainable transport mode initiatives will need to be more strongly promoted and supported by the community.

Sustainable Transport - The long-term plan (2021 2031) has prioritised "getting around" to connect people with each other and places. One of the main focusses is to develop sustainable transport alternatives in the long term, promoting walkability in new subdivisions and there has been significant investment in sustainable transport infrastructure in the last 11 years via the iWay initiative.

52 Infrastructure strategy part of the long term plan 2021-2031

Projects include closing gaps, improving intersection connectivity, targeting short journeys to schools and for work. Renewal of pavement is budgeted for which provides an opportunity to make paths more appealing to walk on. A walking and cycling network development strategy is part of the work-program ensuring future prioritisation of sustainable transport and to promote walking and cycling as alternatives to the currently high use of private vehicles for getting around.

Parking – The current long-term plan includes increased parking opportunities in Hastings and Havelock North, noting that when sustainable transport is established the locations can be used for other purposes. The proposed implementation of parking sensor technology is expected to reduce the time spent looking for an available space thereby reducing emissions and improving traffic flows and providing valuable data to inform future growth planning.

Changes to the National Policy Statement - Urban Development (2020) that are already in effect, mean that district plans no longer require developments (residential, commercial) to provide for parking areas (except for accessible parking). Predicted housing intensification will therefore increase the need for on-street and inbuilt carparks to cater for the additional demand.

5.1.2. Regulations and Guidelines

Developments that do not adequately account for transport needs can have a significant impact on access, connectivity, efficiency and road safety. Alongside existing regulations, the Hastings District Council has developed several guides to help developers understand and contribute to Council's transport objectives and outcomes.

The Subdivision and Infrastructure Development Best Practice Design Guide (2009) provides guidance on designing subdivisions that deliver high quality places for people to live and Council's vision is to create connected and resilient neighbourhoods where transport choice is maximised reducing the reliance of residents on private vehicles for short trips.

5.2. Level of Service Statement

An effective transportation network is a key element in the efficient functioning of the Hastings District and its economy. On a local scale the transportation networks are critical in the daily functioning of the District. Journey times across the urban area are a maximum of 10 minutes and 20 minutes for inter-district travel to Napier. While the Hastings District is a large area the majority of trips, particularly within the urban area, are short distances with many rural areas connected to the main city in 15 minutes driving time. The longest trips within the district from northern to southern extent are approximately 2 hours driving time.

The District is a major producer of primary produce and manufactured goods and linkages to both domestic and international markets are therefore crucial in maintaining a healthy economic sector. However, the transport network can also generate negative environmental effects. For road and rail these are commonly noise and exhaust pollution. These effects are increasingly compounded by the continued growth of traffic, particularly on routes that were not designed to handle present or predicted levels, or by the inappropriate use of local access roads as arterial or primary collector routes, or de facto bypasses.

Establishing clear environmental criteria for the transport network, and promoting its safe and efficient use, is important for the community. This can be achieved by traffic management on the network, and the control of land use activities alongside the network. It is also achieved by long term network planning, and the development of a strong hierarchical transportation network.

Public transport is also a major consideration and is an important component in transport planning and services. The Hawke's Bay Regional Council is responsible [53] for public transport as part of their Regional Public Transport Plan which links to the Regional Land Transport Strategy. The Regional plans aim to promote increased numbers of trips being undertaken on public transport, lessening the reliance on private motor vehicle travel and contributing to reduced congestion and carbon emissions on the road network. For parts of the community, public transport is an essential component of their actual mobility and the Council will work with the Hawke's Bay Regional Council to investigate ways of encouraging greater levels of usage of public transport.

This section therefore excludes public transport, and focusses on the roading, walking and cycling networks. Performance measures for this infrastructure network focus on safety, maintenance of roading surfaces etc.

5.3. District Plan and Engineering Code of Practice

Roading patterns on the Heretaunga Plains are largely unstructured, and this has led to undesirable environmental consequences on residential and rural areas associated with inappropriate traffic patterns. The adoption of a roading hierarchy, consistent with the New Zealand Transport Agency's One Network Roads Classification (ONRC) hierarchy, which identifies a tiered roading system based on road function and planned levels of service is important to enable the effective management of traffic and to control the environmental effects associated with different traffic patterns.

53 Under the Land Transport Amendment Act 2008/Land Transport Act 1998

The Transport Strategy in the Hastings District Plan [54][55] (updated via Plan Change 2 to align with the Engineering Code of Practice 2020) aims to manage transport (excl. public transport) provision to achieve the outcomes listed below and Table 5.3.1 summarises the objectives and policies set out to achieve these outcomes.

- The reduced intrusion of unnecessary vehicular traffic into residential streets.
- The establishment of an effective arterial and collector roading system to manage vehicle flows and provide attractive routes for heavy vehicles and inter-District/inter-region traffic.
- The establishment of long term design and environmental standards for roads, and for activities adjoining different types of roads in the network.
- The improved use and integration of environmentally sustainable transportation forms throughout the urban area, and across the Heretaunga Plains.

Table 5.3.1: Objectives and Policies from the Transport Strategy in the District Plan (including Plan Change 2)

Transport Strategy Objective	Policies
TSO1: To establish and maintain a safe, efficient, and environmentally appropriate roading network which mitigates the adverse effects on the community.	**TSP1:** Ensure that when land use activities require to join or leave the roading network the efficiency or operation of the roading network is not adversely affected. **TSP2:** Minimise the exposure of the community to environmental effects of inappropriate or unnecessary traffic on different parts of the District's
TSO2: To protect the efficient operation of the roading network from the adverse effects of land uses, and any adverse traffic impacts associated with land use activities on the District's roads.	**TSP3:** Progressively introduce environmental limits within the roading hierarchy to define the environmental standards that the roading hierarchy will be required to meet. **TSP4:** Allow identified land activities to establish on certain routes within the roading hierarchy.
TSO3: To promote the effective co-ordination and integration of roading development as well as other transportation networks in the region.	**TSP5:** Work collaboratively with other agencies with transport responsibilities to achieve the integrated management of the effects of transportation networks.
TSO4: To provide for the effective, safe, and convenient use of alternative transport modes on the Heretaunga Plains.	**TSP6:** Encourage the opportunity to utilise alternative transportation modes throughout the District.
TSO5: To promote the continued use and development of Bridge Pa Aerodrome in a manner that remains sensitive to the environmental and amenity values of adjoining communities.	**TSP7:** In conjunction with the Hawke's Bay Aero Club and the wider Bridge Pa community, review future development opportunities, constraints and environmental consequences associated with the continued growth and development of the Bridge Pa Aerodrome. **TSP8:** Manage the effects associated with the operation of the Bridge Pa Aerodrome on adjoining activities.
TSO6: To protect the environment from the adverse effects and risks from facilities and activities involving the transportation of hazardous substances.	**TSP9:** The transportation of hazardous substances will be considered in the planning and management of transportation networks and their relationship to land use activities so as to avoid, remedy or mitigate the adverse effects and unacceptable risks to the environment.
TSO7: To provide for adequate levels of public car parking in the commercial areas of Hastings and Havelock North.	**TSP10:** Review the provision of public car parking in the Central Commercial Zones as required.

54 Hastings District Plan

55 Plan Change 2 Engineering Code of Practice 2020

Transport Strategy Objective	Policies
TSO8: To minimise the risk of biosecurity incursions of an unwanted organism in the district and enable response to any such biosecurity incursions.	**TSP11:** To participate in an integrated approach towards the management of biosecurity issues by assessing potential risks from new activities and adopting methods to enable the response to any biosecurity incursions.
TSO9: To protect the safe and efficient operation of the rail network from inappropriate development adjacent to that network	**TSP12:** Greenfield residential development should be located in such a way that avoids or manages reverse sensitivity effects arising from the use of the rail network.

The roading network is classified in a hierarchy. Prior to this the roading patterns on the Heretaunga Plains were largely unstructured leading to undesirable environmental consequences on residential and rural areas associated with inappropriate traffic patterns. The roading hierarchy is based on road function and planned levels of service as described in Table 5.3.2. Table 5.3.3 displays the classification system and length of different road types across the District and Figures 5.3.4 and 5.3.5 show the roading hierarchy in a plan view across the Hastings urban areas and Hastings District.

Table 5.3.2 Roading Hierarchy Classifications for Hastings District

HASTINGS DISTRICT ROADING HIERARCHY (adapted from the New Zealand Transport Agency's One Network Road Classification)		
CLASSIFICATION	**DESCRIPTION**	**ROAD TYPES INCLUDED**
Arterial	Roads of strategic regional importance and contributing significantly to the regional economy. Linking regionally significant places, industries, ports or airports. Additionally, arterial roads may perform a 'lifeline' function.	State Highways (not managed by Council) and major local roads that are of an inter-regional nature and provide links between significant areas of population and other inter-urban links.
Primary Collector	Roads of strategic importance which provide significant links within the local economy. Links to arterials or state highways.	Links between areas of activity within a community, providing alternative links between centres of population and contributing significantly to the movement of goods or produce.
Secondary Collector	These roads link population and economic sites. Locally preferred routes or within areas of population and activities.	Road giving connectivity between local populations areas and places of interest. Most roads within an industrial area would be collector roads.
Access Roads (includes Low Volume roads)	These roads provide access and connectivity. Roads whose primary function is a street for people, public space, meeting, gathering as well as accessing property. These also provide access to the wider network.	All Council roads not categorised in the above hierarchies and servicing land use activities including cul-de-sacs.

Table 5.3.3 Road classification, length and % of network for Hastings District

Road Classification	Network Length (km)	% of Network Length
Arterial	47.96	2.25%
Primary Collector	161.98	7.59%
Secondary Collector	448.15	21.00%
Access	472.43	22.14%
Low Volume	515.94	24.18%
TOTAL	1646.46	100%

Figure 5.3.4 Roading Hierarchy for Hastings urban areas

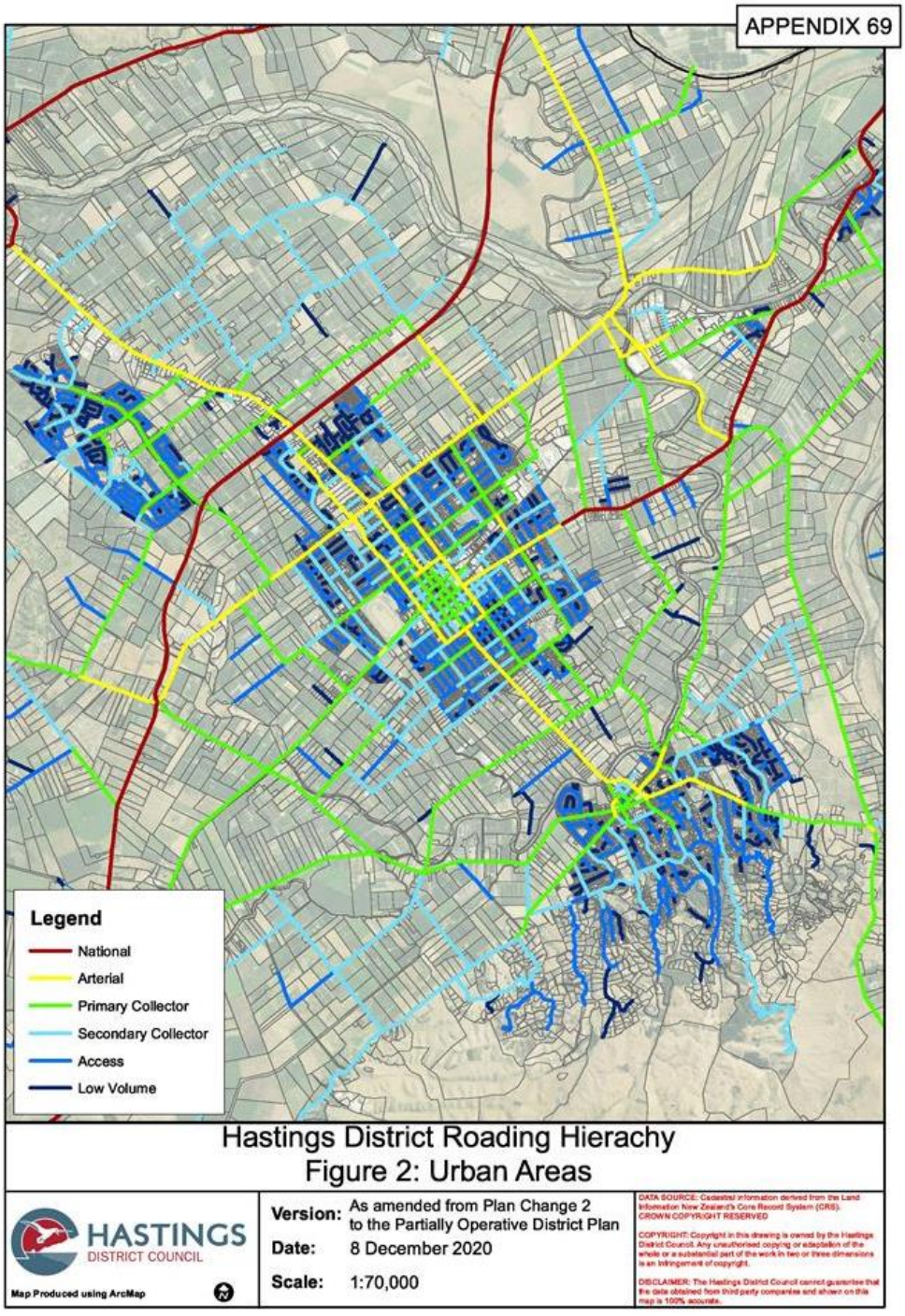
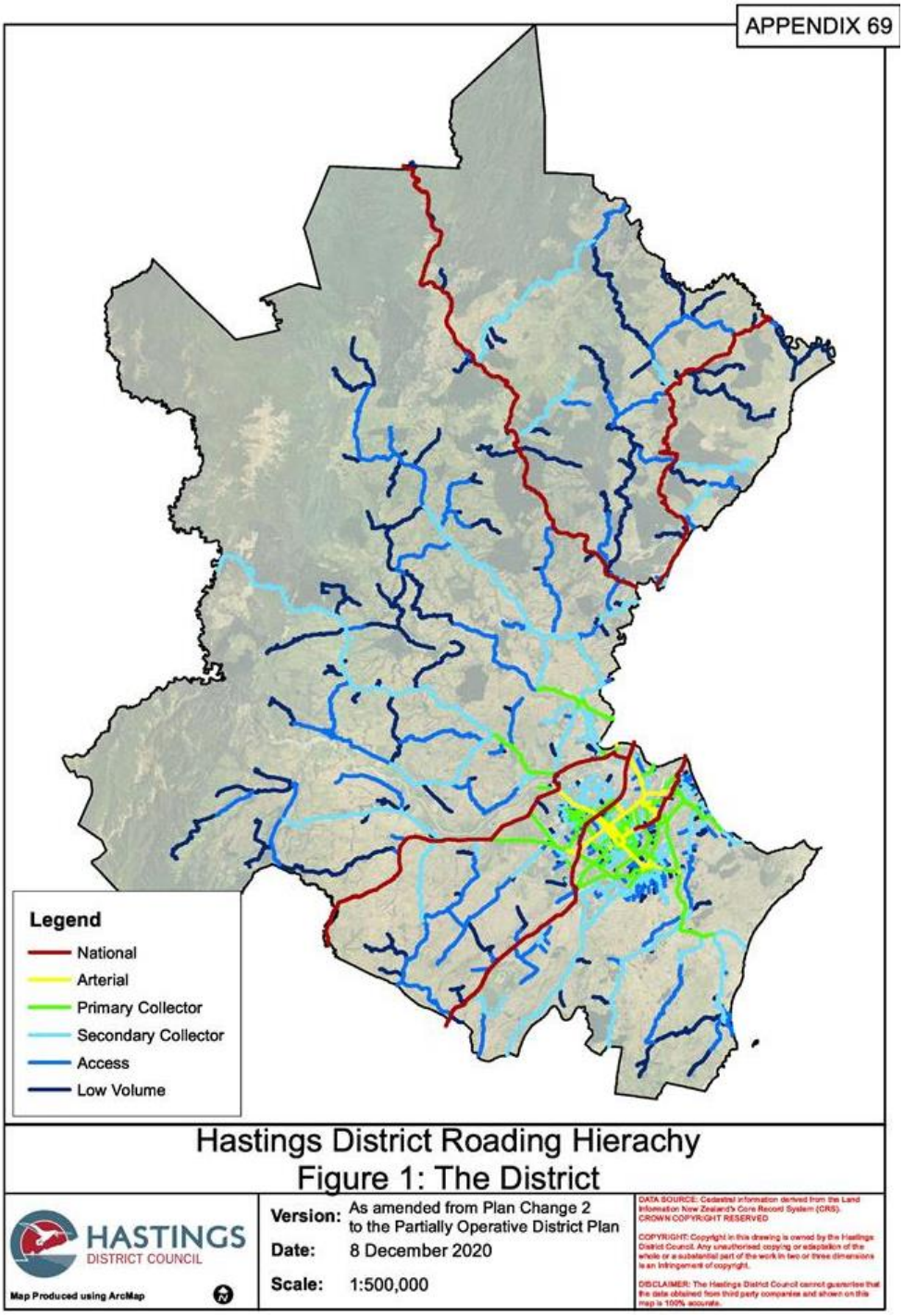


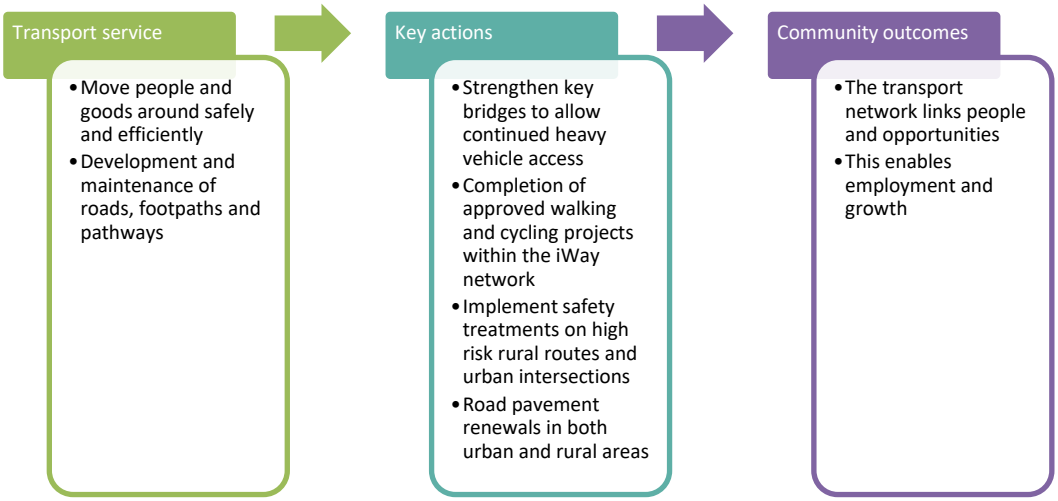
Figure 5.3.5 Roading Hierarchy for Hastings District



5.4. Long Term Plan

The Council's Long Term Plan states that council is responsible for ensuring that people and goods are "getting around" safely and efficiently by developing and maintaining roads. How this relates to community outcomes, as summarised in the figure below [56]:

Figure 5.4.1: Summary of the Key Actions and Outcomes for the LTP Transport Strategy



The Long Term Plan 2021-2031 has set performance targets in areas like road accessibility and transport choice. The draft development contribution policy (2022/2023) [57] has defined long term community outcomes for transport:

- Less than 5% of roads exceed national rough ride limits
- Less than 3% of roads with condition classified poor or worse
- Less than 1km of footpaths classified poor or worse
- All property will be accessible by vehicles meeting maximum as of right mass and dimensions, except by special agreement

5.5. Heretaunga Plains Transportation Study [58]

The Heretaunga Plains Transportation Study is a joint project between Hawkes Bay Regional Council, Waka Kotahi, Hastings District Council and Napier City Council, with the aim to understand the most efficient ways for people and goods to be moved around the study area while enhancing the social and cultural fabric, and environmental condition of the area. This study was completed and integrated existing development strategies for Hastings and Napier in the Heretaunga Plains Urban Development Strategy. [59]

56 Long-Term-Plan-2021-2031

57 Annual Plan 2022-2023 Development Contributions Policy-2022-2023

58 Heretaunga Plains Transportation Study Report

59 Heretaunga Plains Urban Development Strategy incl Maps Aug 17

As part of this work, engagement with stakeholders via a questionnaire identified community opinions on a number of issues, including an urgent need to increase mode share for both public transport (e.g. buses) and active transport (e.g. cycling). Recommendations from the study included household and origin destinations to provide more detailed information on community movements as well as specific investigations of network areas or transport types to support further assessment and planning.

Due to the high inter-connectivity between Hastings and Napier, The HDC transport model uses the same base model from the HPTS to assess performance of the current system and future growth planning.

5.6. Current Service Level Performance Assessment

At this point no performance results appear to have been published. The targets set by the Department of Internal Affairs (DIA) are mandatory and are included in the Long-Term Plan 2021 - 2031. Targets are set about road safety, condition of the sealed road, conditions of footpaths within the local roads, maintenance of sealed road network as well as response time to service requests. The performance targets set by DIA have been achieved in 2020-2021 [60],[61]

All assets (sealed pavement, surface bridges etc.) are currently considered reliable to highly reliable but require continued maintenance. [62] The age and forecast performance of the roading network signals that escalation in pavement and related renewals investments are required to retain current levels of service. It is highlighted that performance in the future for at least one of the targets is uncertain (road maintenance). Potential funding issues are identified in the Long-Term Plan 2021-2031, the maintenance of the roads will require NZTA funding which at this point is potentially insufficient. [63]

Several different targets and measures are summarised in Table 5.6.1, including an assessment of the current performance of the network against these measures.

Table 5.6.1: Performance Measures and Targets

	2021-2021 and LTP year 4-10 (2025-2031) target achieved
	2021-2021 target achieved and LTP year 4-10 (2025-2031) will likely be achieved
	2021-2021 target achieved and LTP year 4-10 (2025-2031) requires interventions to be met
	Information insufficient

60 Long-Term-Plan-2021-2031

61 2020-2021-Annual-Report

62 Infrastructure strategy part of the long term plan 2021-2031

63 Long-Term-Plan-2021-2031

Performance measure	Baseline	2021-2022 target	2021-2022 result	LTP year 4-10 (2025-2031) target
DIA Non-Financial Performance Measures				
Road Safety - reduction in number of fatalities and serious injury crashes	39	Reduction	Achieved (36)	24
Condition of the sealed road - The average quality of ride on a sealed local road network, measured by smooth travel exposure.	91%	>90% smooth travel	Achieved (93%)	>90%
Maintenance of a sealed local road network - The percentage of the sealed local road network that is resurfaced.	3.23%	>5.5%	Achieved (6.5%)	>8.0%
Condition of footpaths within the local road network - as set out by the territorials relevant documents	1.93%[64]	<1.5%	Achieved (0.33%, 2020 survey)	<1.5%
Response to Service Requests - Response within the time set in the Long Term Plan (28 days)	94.7%	>95%	Achieved (99%)	>95%
Additional Targets set in LTP 2021- 2031				
% of network inaccessible to Class 1 and 50 Max vehicles	11.18%	3.21%		0.4
% of network available to HPMV vehicles	17.5%	22.9%		30.9
Journeys affected due to unplanned road closures not more than 500,000 per annum	tbd	<500,000		<500,000
10% annual increase in walking and cycling trips	5,500	>6,000		>15,000
7% annual increase in walking and cycling mode share	11%	>12%		>20%
Greenhouse gas emissions from transport [(65)]	313,500 tonnes CO2 eqv	<295,800		<204.000
DRAFT 2022/2023 Development Contribution Policy				
< 5% of roads exceed national rough ride limits				
< 3% of roads with condition classified poor or worse				
< 1km of footpaths classified poor or worse				
All property will be accessible by vehicles meeting maximum as of right mass and dimensions, except by special agreement				

5.7. Overview - Census Data

According to the Long Term Plan 2021-2031 the population in the Hastings District is aging which will change the way the population uses the transport options.

64 of footpaths classified poor or worse as measured by Council's condition rating system

65 Note: This measure is not under direct Council control but acknowledges Councils contribution to this overall goal

The census data of 2001 till 2018 of people travelling to work (people working from home or not working on census day are excluded) indicate a high reliance of private and commercial vehicles (80 - 85%). The public bus was only used by 1% of commuters and 6 - 10% of commuters used another mode of sustainable transport (bicycle, walk or jog). Note that this data is prior to the Covid-19-pandemic and associated societal changes which is likely to have increased the proportion of people who work from home on a regular basis.

Based on historic census data for work related commuting, the relative fraction of sustainable transport use (public transport, bicycling, walking, or jogging) has not increased in the period of 2001 till 2018 and bicycling appears to have been reduced (5% to 2%). This does not necessarily mean the use of private, or company vehicles is overrepresented during other transport occasions as well (e.g. shopping, school drop offs). However, sustainable transport appears not to be an appealing mode of transport for work commute. To meet the additional long term targets set, public transport and other sustainable transport modes should be promoted.

5.8. Road Safety

Hastings road safety record, unfortunately, performs poorly against the national averages. Investments have been escalated forward perform a "safer system approach" using the Safer Journeys Strategy, which evaluated the entire transport system. The aim is to deliver greater levels of safety on the HDC roads. [66]

The Hastings District Council 2020 Road Safety Strategy, describes how road safety should be managed on Council maintained roads within Hastings District. It sets out the priorities and key focus areas from 2020 onwards and outlines the current safety statistics. The Councils Road Safety objective is a 40% reduction in fatal and serious injuries (to 24 per year by 2030). In 2020, Hastings District Council has worked with NZTA, through the safe network pipeline tool, to determine road safety concerns as well as to develop a 10 year safety improvement program. The first 3 years of this programme have been endorsed by NZTA. The long term plan indicated there is a potential funding short fall for general maintenance of the roads, this could negatively impact the safety of the Hastings network.

The Council want to create safe multifunctional urban centres, ensure accessibility of a range of transport options and ensure safe walking and cycling facilities. In the whole district there have been 17 fatal and 152 serious injury crashes over a period of 5 years (2014-2019) that resulted in 18 fatalities and 177 serious injuries. The associated costs of crashed in the district is estimated to be $36.6M per annum of which 90% is attributed to fatal and serious injury crashes.

Roughly half of the crashes in the district occur on urban road [67] (51% of all crashes) with intersections playing a relatively large role in crashes in urban areas (54% of crashes in urban areas). Vulnerable road users are involved in 34% of the fatal or serious injury crashes (cyclist 9% of fatal or serious injury crashes, pedestrians 8% of fatal or serious injury crashes, motorcyclists 17% of fatal or serious injury crashes) in the period of 2014-2019. The IWay initiative has and is proposed to make improvements in road safety for cyclists, focussing on connectivity and intersections. More recent data might show an improving trend.

66 Infrastructure strategy part of the long term plan 2021-2031

67 70km/hr or less posted speed limit

On the Hastings Roads (urban and rural combined) fatigue and overtaking are a relatively high contributor (Table 5.8.1, below) to the fatal and serious injury crashes (relatively twice compared to the peer-group). Fatigue crashes might increase with increasing industries and/or primary production as truck drivers are known to travel large distances, it is unlikely to increase with increased housing density. A growing population might result in a higher rate of overtaking crashes with more people participating in traffic. Different driving speeds, ability and higher levels of congestion could lead to frustration and higher risk taking behaviour.

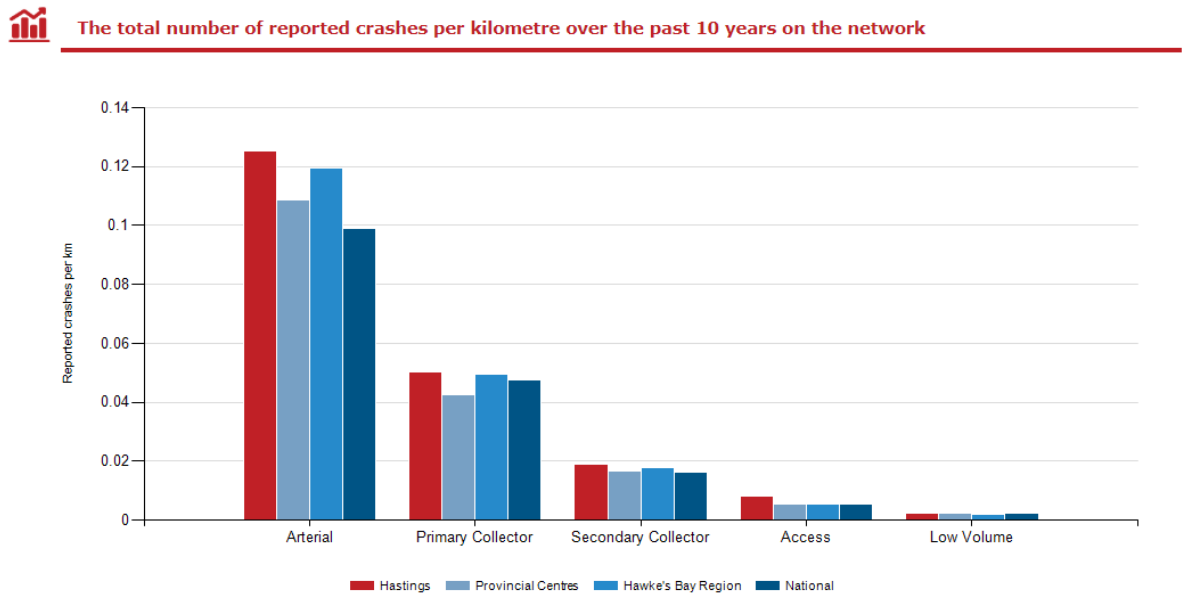
Table 5.8.1 HDC DSI Crash Comparison by Crash Type and Factor

Crash Type/Factor	HDC	All NZ (non-SH)	Peer Group	Ratio peer group
Run-off Road	48%	34%	65%	
Intersection	31%	35%	28%	1.1
Head-on	9%	8%	15%	
Rear-End	2%	3%	3%	
Alcohol*	30%	25%	27%	1.1
Overtaking	4%	1%	2%	2
Fatigue	6%	4%	3%	2
Dark/Twilight	34%	34%	32%	1.1
Wet	16%	19%	19%	

*NZTA is advising at this stage that crash data involving alcohol should be used with caution

Collective risk, also known as crash density, is a measure of the total number of serious injuries and fatalities (DSI) per km over a section of road. Figure 5.8.2, below, shows the collective risk for Hastings and Hawke's Bay against other provincial centres and national rates.

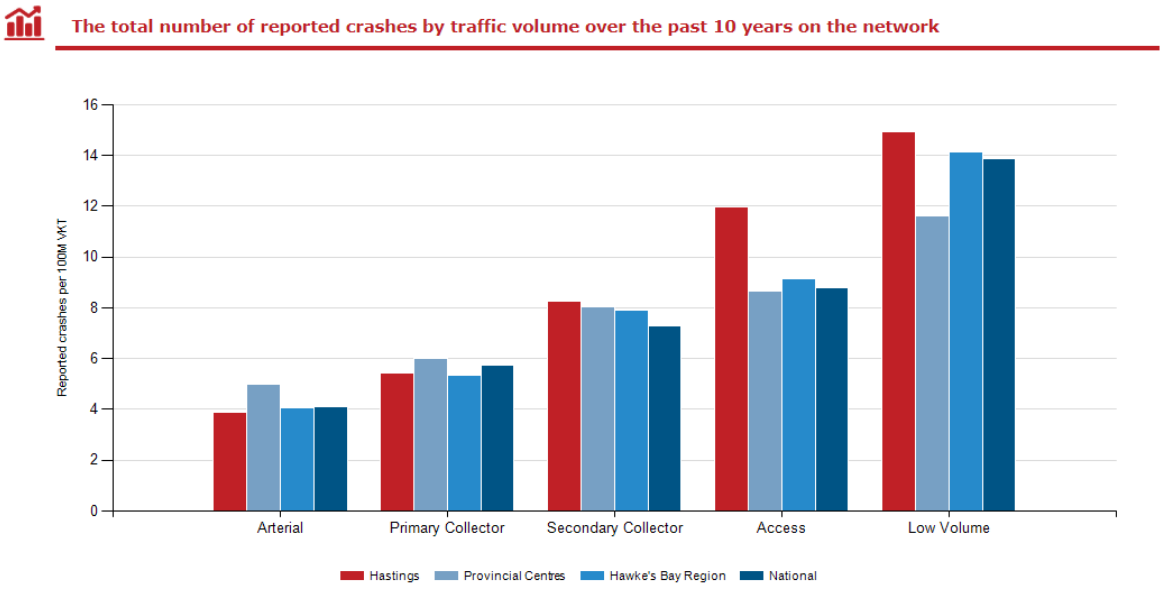
Figure 5.8.2 Collective risk comparison



Personal risk is a measure of the danger to each individual using the roads. It shows the likelihood on average of being involved in a fatal or serious crash. Low volume and access roads in the district have a high personal risk profile compared to national average and peer group.

Figure 5.8.3 below shows the personal risk for Hastings and Hawke's Bay against other provincial centres and national rates.

Figure 5.8.3 – Personal risk comparison



The following urban routes were identified as a concern:

- Te Mata Road - Havelock North - high collective risk
- St Aubyn Street - Hastings - high collective risk
- Karamū Road - Hastings - medium high collective risk
- Heretaunga Street - Hastings - medium high collective risk

The following urban intersections were identified as a concern:

- Karamū Road North / Grove Road - medium high collective risk
- Hastings Street North / St Aubyn Street East - medium collective risk
- Maraekakaho Road / York Road - medium collective risk
- Southland Road / Eastbourne Street West - medium collective risk

Figure 5.8.4, below, shows the identified high-risk corridors in red, and high risk curves in yellow, across the Hastings District [68]

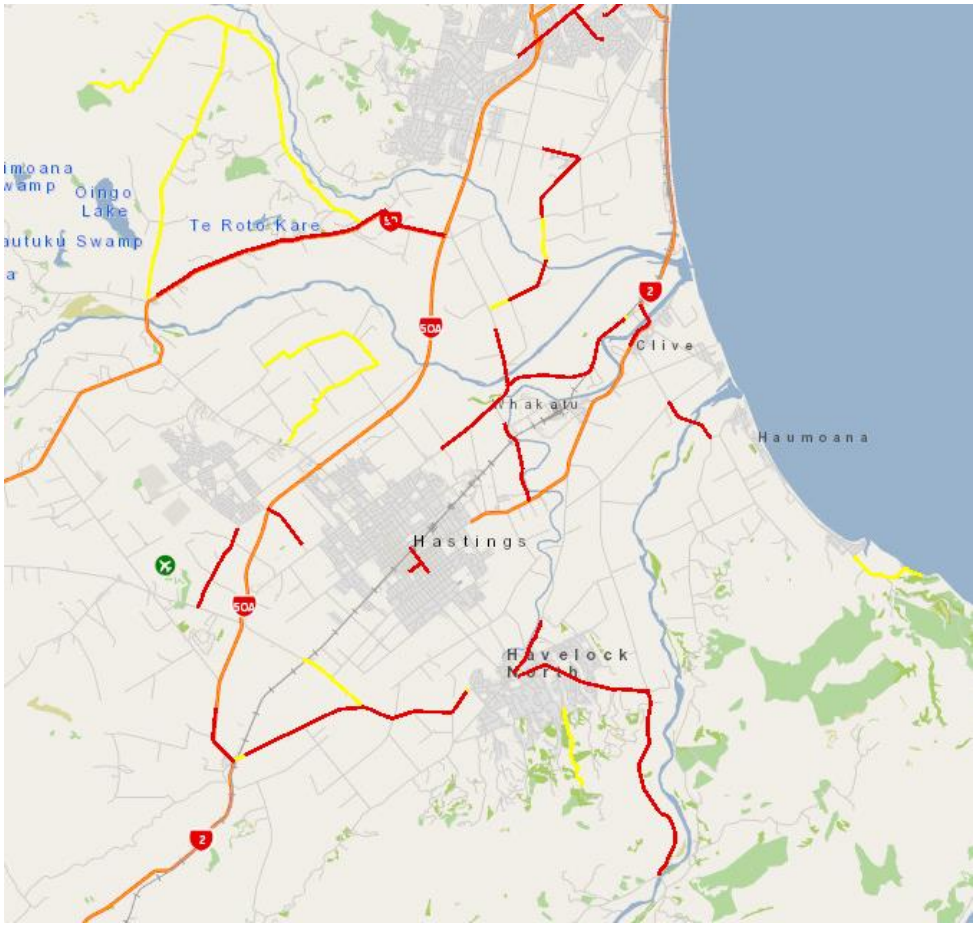


Figure 5.8.4 High risk corridors in Hastings District

St Aubyn Street and Karamū Road are identified in the traffic model, and noted during field observations as being congested. At this stage it is unclear if this contributes to the crashes.

For some areas (e.g. Te Mata Road) safety measures were implemented and future crash information will determine if this was sufficient. For the other routes and intersections, a treatment philosophy was formulated to address the concerns in the future.

In addition to high risk corridors and intersections the Hastings District Council 2020 Road Safety Strategy has identified some other areas that require investment in the urban areas:

- Investment in pedestrian safety and access in the urban area through new and improved facilities
- Cycle safety around intersections
- Implementation of a district wide speed limit review (In line with the Speed Management Guide)
- Network-wide delineation review and improvements
- Traffic calming to ensure speeds on local roads are safe and appropriate for road users and the community.

[68] Hastings District Council, 2020, Road Safety Strategy

Future data will indicate if the implemented measures have been successful.

5.9. Parking

The current Long Term Plan includes increased parking opportunities in Hastings and Havelock North, noting that when sustainable transport is established the locations can be used for other purposes.

Parking sensor technology is proposed to be implemented in the Hastings Central Business District, this technology could be used to present available parks to end-users via a mobile application which could reduce the time drivers spend finding a carpark, subsequently reducing emissions (including CO_2), improving air quality. Another benefit of reducing distance travelled to find a carpark, in particular during peak traffic hours, is reducing traffic-flow. This technology would also provide HDC with yield data on use of parking spaces (including by area and time), occupancy duration and turnover etc. which would be useful to assess performance of the current system and future growth planning.

Because of the predicted housing intensification additional on-street and inbuild carparks are likely to be in higher demand. Changes to the National Policy Statement - Urban Development (2020) that are already in effect, mean that district plans no longer require developments (residential, commercial) to provide for parking areas (except for accessible parking).

5.10. Sustainable Transport

The long-term plan [69] has prioritised "getting around" to connect people with each other and places. One of the main focusses is to develop sustainable transport alternatives in the long term, promoting walkability in new subdivisions (more below). There has been significant investment in sustainable transport infrastructure in the last 11 years via the iWay initiative.

5.11. Walking and Bicycling

Hastings District Council envisaged to become New Zealand's first "Model Community" – an initiative designed to demonstrate that carefully planned, sustained investment in walking and cycling can have a positive impact on a community. Hastings was awarded $4m of central government funding (NZTA) and with a local contribution of $2.4m more than 100km of new pathways were constructed, including four key "arterial" routes that link the communities of Flaxmere, Hastings, Havelock North and Clive. After this initial step further funding has been awarded and Napier City Council joined the project [70].

This current long-term plan also contains some on-going funding to address network gaps and safety priorities, details are not available at this point. Some projects promoting sustainable transport sit within the iWay Network and should be completed in the next 10 years. Projects include closing gaps, improving intersection connectivity, targeting short journeys to schools and for work. Renewal of pavement is budgeted for which provides an opportunity to make paths more appealing to walk on. A walking and cycling network development strategy is part of the work-program ensuring future prioritisation of sustainable transport.

A 10% annual increase in walking and biking trips and a 7% annual increase in walking and cycling mode share are included as performance measure in the long-term plan, equating to >12-14% journeys walking or cycling in LTP years 1-3, and >20% of trips in LTP years 4 - 10. Greenhouse gas emissions from transport are aimed to be reduced from 315,500 to less than 204,000 tonnes CO_2 equivalent. Considering the growing population the greenhouse gas reduction might be harder to

69 Long-Term-Plan-2021-2031

70 https://www.iway.org.nz/about-iway/

achieve, when more people use automotive transport the proportion of sustainable transport trips (walking, cycling) from the existing population should increase as well to compensate.

The transport model (described) has been calculated on the assumption that there will be a significant increase in the use of bicycles in the next 28 years. This includes "peak traffic" hours in the morning and evening. By 2048, the highest increase in bicycle journeys of 67.4% (compared with 2020) is observed in the afternoon. To meet this demand additional well-designed infrastructure is likely required, especially based on the current use of cycling as a mode of transport in the city from the census data which shows a declining trend.

5.12. Public Transport

According to the census 2018 information only 1% of the work commuters used public transport. Traffic flow issues are observed and predicted (see section on transport model) and increasing public transport participation could reduce the future traffic flow. It should be noted that the census data is from 2018 and further efforts have been made to promote sustainable transport options and therefore potentially more work commuters use public transport.

Initiatives include the MyWayHB [71] transport option (which only commenced June 2022), which is an "on call" public transport system within Hastings, replacing specific bus routes. The "mini-bus" can be requested using a mobile application. Operation of this system can be challenging for people with limited access or experience with technology and the bookable nature might make "ad hoc" trips more challenging. In addition it is unclear how this system can handle increased capacity with tourism and how tourists will be informed about the specific way this public transport model is operating. Between 2018 and now the public transport system service delivery most likely has been changed. Most bus services appear to be available during peak work commuting times but are mostly limited to the central areas of the towns.

For parts of the community, public transport is an essential component of their actual mobility and Council will work with the Hawke's Bay Regional Council to investigate ways of encouraging greater levels of usage of public transport.

5.13. HDC Transport Model [72], [73]

HDC commissioned Stantec to create a basic traffic flow model for Hastings, mainly focussing on the Hastings urban area with some consideration to connecting routes. The limitations of this model are that:

- Traffic flow in and out of the study area does not always add up.
- There is a point in the model where queueing traffic builds up and blocks the rest of the model from functioning.
- The model does not always predict driver behaviour accurately in relation to observations of drivers at pinch point locations during peak traffic.
- The model assumes an uptake in active commuting that does not correlate with current census data and predictions.

71 MyWay | New Zealand (mywayhb.nz)

72 210629 Hastings DoMin Forecast Model Development Report

73 210629 Hastings DoMin Forecast Model Development Report

5.14. Field Observations Regarding Current Performance

Based on model projections several locations in the network that would be under pressure in the future, field observations were made to validate the model and evaluate the current status of the network flow. At present, congestion is not considered to be a significant issue in the network [74], however, observations during the validation of the model indicate pinch points where congestion is observed. Observations were made at the St Aubyn Street / Karamū Road Stoneycroft Street / Omahu Road and Railway Road / Southampton Street Intersection. All intersections showed queuing during peak times. Risk taking behaviours due to traffic flow issues at the Stoneycroft Street/Omahu Road Intersection were also observed.

5.15. Modelling of Travel Flows

The model incorporated a projected increase in traffic of 11.6-12.2% in 2028 compared with the 2020 base year, depending on the time of day and vehicle type. This increased to 29.7 - 34.5% by 2048. The growth expectation for 2038 was assumed to be linear between 2028 and 2048, namely 20.9 - 23.3%.

The model works using an assumption that there will be a significant increase in walking and cycling resulting in a projected increase in bicycle journeys by 2048 of 23 - 25% (from 2020) and of 42 - 67% by 2048 (from 2020). It should be noted that this increase is not consistent with the current trend of cycling in the current census data.

The model has been further updated with speed limit changes, the Thompson Road Connection and other committed projects.

5.16. Projections for 2028

The 2028 model projections indicate that no significant upgrades are required to maintain an acceptable level of travel flow. However, the Stantec report on the model does not appear to define what an acceptable level of travel flow is.

5.17. Projections for 2038

It was predicted that between 2020 and 2038 the average travel time increased by 14% with 5 intersections being classified as congested. When the model is adjusted with speed limit changes and some other committed projects travel time increased only up to 8% during peak periods (<1 minute). The highest increase in corridor travel time appears to be most pronounced in the afternoon peak.

Average queue lengths show there are areas of the network under pressure in the future for both the AM and PM peak periods. Congestion on key arterial roads is expected but with the forecasted growth is expected to be tolerable. The stress in most areas is mostly due to flow increases in the central Havelock North, Hastings CBD and Frimley area.

Congested / Delayed intersections are:

1. Raupare Road / Omahu Road
2. Flaxmere Ave / Wilson Road
3. St Aubyn Street / Karamū Road
4. Railway Road / Southampton Street
5. Karanema Drive / Napier Road

[74] Infrastructure strategy part of the long term plan 2021-2031

Some minor adjustments at Raupare Road / Omahu Road intersection (upgrade to a signal), St Aubyn Street / Karamū Road intersection (adjust timing) and Karanema Drive / Napier Road intersection (upgrade to a signal) would improve traffic flow. The implementation of these improvements does not completely get rid of congestion but does reduce it.

Higher than average queuing is expected in these areas as well with queuing observed on the following streets:

- Omahu Road (between SH 2 and Pakowhai Road intersections)
- St Aubyn Street (between Tōmoana Road and Hastings Street intersections)
- Karamū Road (between Eastbourne Street and Frederick Street intersections)
- Roads within the Hastings CBD in general (such as Southampton Street, Lyndon Road and Eastbourne Street, as well as St Aubyn Street and Karamū Rad mentioned above)
- Karanema Drive / Napier Road
- Pakowhai Road (between Frimley Road and Orchard Road intersections)

5.18. Further Projections (2048)

The significant projected high travel demand conditions of the network by 2048 resulted in heavy congestion and areas of the modelled network to be blocked. This resulted in unreliable predictions for this respective year.

5.19. New Developments and Growth

The increased demand for infrastructure is mostly determined by the population growth and industrial growth. The Council's growth nodes are well defined along with the infrastructural investments required to service those new development areas and future growth planning should revisit these to ensure new development is adequately accounting for increased demand on the infrastructure in these areas, including promotion and facilitation of more sustainable transport methods. The transport study identified a number of key areas of new infrastructure development to accommodate the projected growth [(75)].

5.20. Key Developments and Upgrades

In the workplan key routes are identified as being a priority to upgrade, this includes the Karamū Rd corridor, Omahu Road Corridor, St Aubyn and Pakowhai corridors. The North Eastern Connector and other projects associated with Irongate Industrial area, Havelock Road Development (potential 2 lanes) are on a longer-term programs. Most of the roads were built in the 1950's with a high level of road renewal being expected in the next 10 years.

5.21. Development Guides

Developments with inappropriate consideration for transport can have a significant impact on access, connectivity, efficiency and road safety. The Council has developed, besides regulations, several guides to help developers understand and contribute to the council's objectives regarding transport. The most influence at this stage, will most likely be the subdivision and infrastructure design Guide [(76)]

By providing guidance on the ambitions as well as expectations, the Council can influence and inspire designers to design subdivisions that deliver high quality places for people to live. Hastings District Council vision is to create connected and resilient neighbourhoods where transport choice is maximised reducing the reliance of residents on private vehicles for short trips by infrastructure design

75 Infrastructure strategy part of the long term plan 2021-2031

76 Subdivision and Infrastructure Development in Hastings District 2009

and public transport options. The Hastings urban area has a short travel-time from one side to the other (10 mins), so reducing reliance on vehicles for these trips would have immediate benefit to environmental and air quality impacts in the urban area, and the shared use and safety of the space.

The open grid pattern of central Hastings has resulted in a large number of suburban (Access) roads becoming used as de facto traffic bypasses, and as Collector or Arterial routes. This generates unnecessary and undesirable levels of traffic on Access roads and has safety and environmental consequences for the community, particularly in terms of noise, vibration and impact on the amenity of residential areas.

However, the development guide promotes the increase of (grid structured) streets that increases the choice of transport by reducing the journeys distance would increase community interactions and increase the safety, vibrancy and success of commercial/mixed use developments. Based on observations, these streets should be made less desirable to drive through by traffic calming measures to achieve these outcomes.

6. Parks and Open Spaces

6.1. Executive Summary

Open Space is the publicly owned land that is set aside primarily for recreation, nature conservation, passive outdoor enjoyment, and public gatherings. They are vital for the social, cultural, environmental and economic wellbeing of the community and improve our quality of life, enhance the natural environment, act as ecological corridors and habitats for wildlife as well as providing for active and passive recreation (places to play), and relief from the built environment.

There are a range of Acts that set out the core regulatory functions, and management responsibilities for councils. The Reserves Act 1977 requires councils to prepare reserve management plans and the Long Term Plan outlines the activities and services Council is planning to undertake that contribute to our stated community outcomes including the likely costs of Council providing those services and activities over the next 10 years.

The District Plan defines open space categories and describes their purpose and includes a range of objectives and policies to ensure that there is sufficient open space to meet the present and likely future recreational, conservation and visual amenity needs of the District and to give effect to Council's Reserve Strategy. Where housing density increases, it is likely that there will be a correlating reduction in the provision/availability of private open space and greater need and demand for public open space.

In terms of growth, the vision for the Hastings District has been informed by HPUDS 2017 and the Medium Density Housing Strategy to articulate how Council will ensure an appropriate level of urban amenity through the inclusion of reserve areas and public open spaces. This vision states:

> *'The needs of the community for open space and recreation opportunities are met through the provision of a variety of open space, which includes high quality gardens and active recreation uses; coastal and river access and protection; and local neighbourhood and amenity areas'.*

An assessment of performance against the current levels of service shows that at a district wide level, the target of **8.7ha/1000 residents** is largely being met however the Hastings Urban area (3.94ha/1000 residents), Flaxmere (5.82ha/1000 people) and urban areas overall (6.32ha/1000 people) are significantly below the target. When broken into reserve categories Hastings City has a low reserve distribution for community, natural and community parks spaces. It should be noted that while the park categories assist in defining the mix of activities and functions, they are seldom discrete and can overlap. In many cases, parks could fulfil a range of functions that cross over a number of the categories.

The 'ha/1000' level of service provides guidance to Council on the existing provision of public open space however there are a number of limitations in this approach. It is a somewhat crude measure that does not take into account distribution, function, quality and usability of areas of public open space. It would be recommended that this is developed further into ha/1000 per category of reserve space to assist in a more cohesive parks assessment to support the future growth strategy.

An alternative catchment based approach considers a 500m 'walking circle' around 'local useable' reserve and playgrounds, i.e. every resident should have a good level of 'local' reserve and open space provision within 500m walking distance of their residence. Analysis of the number of dwellings within 500m of a Local Area Park or playground shows that Flaxmere is well serviced for both playground and local area park targets while Hastings, Havelock North and the Urban Total fail to meet the 500m LTP target for local area parks or playgrounds.

As these urban areas will be under increasing demand from growth, the strategy will need to address improving both the current service level to the targeted aims and those required for intensification.

Parks are critical to housing intensification and city growth to maintain positive community outcomes. Park features such as community facilities (bbqs, picnic areas) will be in higher demand in urban intensification areas and a more cohesive assessment is needed to ensure parks and reserves are fit for purpose for our existing and future growth community. At a high level, the current service level for urban areas is not being met and if these areas are to be intensified these facilities will need to be at a higher level than the current urban needs.

6.2. Statement on Parks and Open Spaces LoS

Open Space is the publicly owned land that is set aside primarily for recreation, nature conservation, passive outdoor enjoyment, and public gatherings. Throughout this document both 'parks and reserves' and 'open space' refer to general public open space covered within the Hastings parks and reserves strategy and policies.

The Hastings District Plan sets out policies for the provision of easily accessible public open spaces and recreational facilities stating that they are vital for the social, cultural, environmental and economic wellbeing of the community. Their availability is key to:

- improve quality of life is achieved for all members of the community.
- enhancement and protection of the natural environment, and provision of ecological corridors and habitats for wildlife.
- enhance the character and amenity of the District.
- provide places for active and passive recreation.
- provide open space within urban areas and provide relief from the built environment.
- provide spaces for children's play and development.

The Reserves Strategy [77] (Draft, non-statutory) provides further detail on these benefits of open space to the Hastings district, summarised in Figure 6.2.1, below.

Figure 6.2.1 Benefits from Public Open Spaces to the Community

The District Plan and this report refer to parks, reserves and open spaces that are owned, managed or controlled by the Hastings District Council, in addition to recreation spaces and community facilities in

77 Reserves Strategy End November 2019

public ownership of the Hawke's Bay Regional Council and land managed by the Department of Conservation. There are private ownership recreation spaces in the region (e.g., Te Mata Peak) that are considered separately. Other land such as school playing fields may also provide open space values and public recreation access, but access to and provision of these areas is not guaranteed, therefore these areas are not included in reserve provision calculations.

A number of these parks, reserves and open spaces have also been vested or gazetted under the Reserves Act 1977, which will specify an additional classification, and require that reserve to be managed in accordance with the provision of the Act relating to that classification.

6.3. Relevant Policies (National)

A key function of the Local Government Act 2002 is to meet the current and future needs of communities for good-quality local infrastructure, local public services, and performance of regulatory functions in a way that is most cost-effective for the community. The Reserves Act, the Local Government Act (LGA) and Resource Management Act (RMA) set out the core regulatory functions of local authorities and apply to all aspects of reserve land management - from financial planning and funding of assets and services, to governing land use and planning matters. The LGA enables and directs administrative processes generally, while the Reserves Act provides specific powers for the administration of reserves. The relevant statutory provisions under which decisions will be made about the reserve will most likely be found in the Reserves Act.

The Long Term Plan (LTP) is Council's method for outlining the activities and services it is planning to provide over the coming 10 years. It states the vision for the District, the Community Outcomes, the service and activities Council is planning to undertake to contribute to those Outcomes, and the likely costs of Council providing those services and activities over the next 10 years. Community outcomes are the outcomes Council aims to achieve in meeting the current and future needs of the Hastings District community for good quality local infrastructure, local public services and performance of regulatory functions.

The majority of parks and reserves in the District are managed under the Reserves Act 1977, which requires Reserve Management Plans to be prepared for all parks held under this Act. Council has prepared a District Wide Reserve Management Plan adopted in 2008 which meets this legislative requirement. The Resource Management Act 1991 applies to all public open space areas in the District, which are managed within the provisions of the Hastings District Plan. This includes provision for subdivision which often result in the creation of esplanade reserves that contribute to Council's open space network.

6.4. District Wide Reserve Management Plan

The Reserves Act envisages that a Reserve Management Plan will be prepared for each reserve within the District. With over 160 reserves within the Hastings District, this would be a costly and time consuming process, with a duplication of information as a result of the majority of reserves sharing common management issues. There are also a large number of areas of open space and land, referred to in the District as reserve, which do not hold formal reserve status. If not held under the Reserves Act, management plans are not required to be prepared for them.

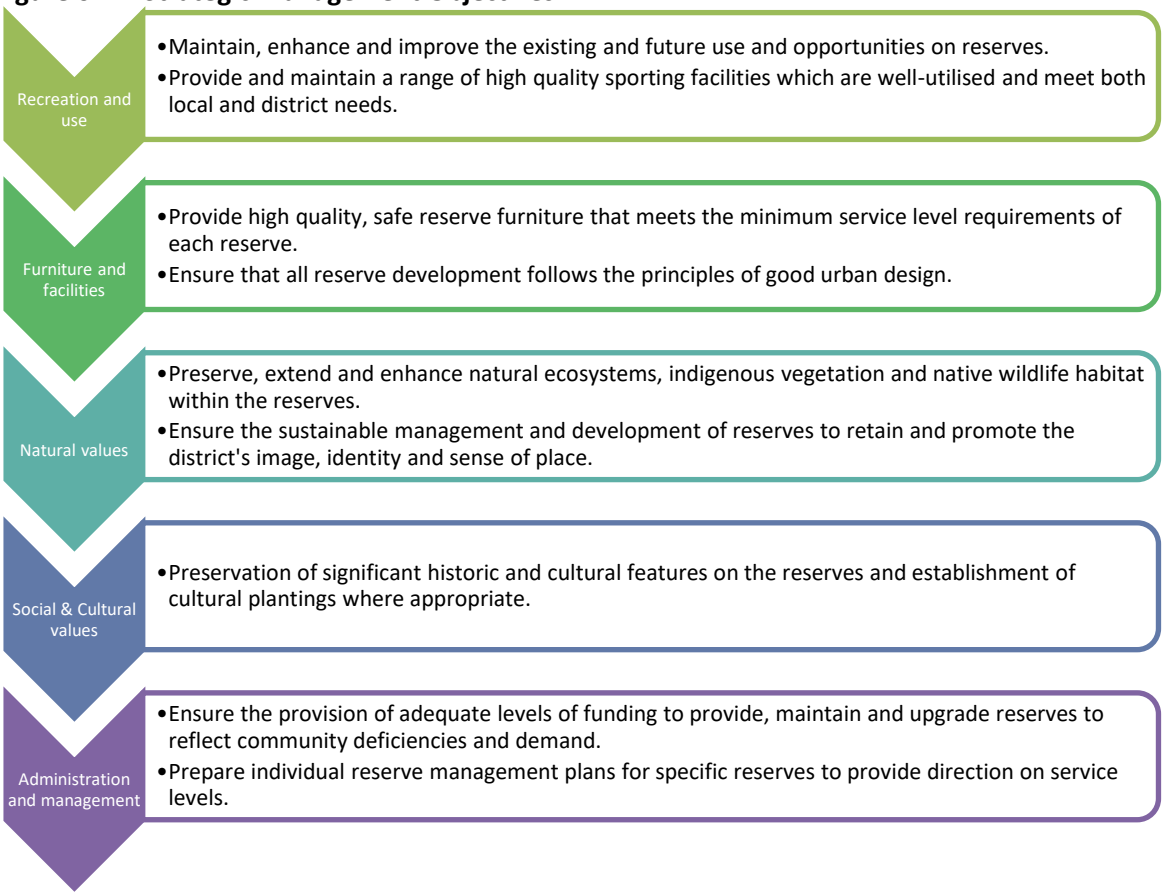
However, HDC considers that guidance on the maintenance and future development of all reserves, regardless of their status, is imperative to ensure consistency in reserve planning across the District. HDC has therefore prepared a 'District Wide Reserve Management Plan [78] to provide objectives and policies which apply to all reserves and open spaces throughout the Hastings District, including those not vested or classified as reserves under the Reserves Act. This will ensure consistency, transparency and enable

78 District Wide Reserve Management Plan

greater community awareness of Council's intentions for all reserves throughout the District. Individual Reserve Management Plans can then be prepared for specific reserves, where needed, for those where unique issues or opportunities require more detailed specific information.

The strategic management objectives of the DWRMP are shown in the figure below.

Figure 6.4.1 Strategic Management Objectives



6.5. District Plan

The Open Space Zone of the District Plan is divided into 8 open space categories that reflect the characteristics and functions of the open spaces. The Open Space categories recognise the effects activities may have upon the surrounding environment and are categorised in line with guidance from the New Zealand Recreation Association (in consultation with the New Zealand parks sector). These are outlined in Table 6.4.2, below.

Table 6.4.2 Summary of Open Space Categories and their Purpose

Open Space Category	Purpose
OS 1 (Sport and Recreation) Area	Provides larger areas of open space which cater for organised sports and active recreation i.e. sports grounds, tennis courts, netball courts and bowling greens as well as a range of community activities. Although the Zone is designed to provide primarily for outdoor recreation and associated buildings such as clubhouses and other structures, it also permits indoor recreation and community facilities such as leisure centres and swimming pools
OS 2 (Community) Area	Provides for informal leisure social opportunities and may provide general amenities e.g. green space or picnic areas i.e. playgrounds, skate parks, walkways cycle paths and community buildings.
OS 3 (Public Gardens) Area	Provides for the display of high-quality horticultural collections and/or landscaping for relaxation and contemplation i.e. botanical and public gardens.
OS 4 (Open Space) Area	Provides for large outdoor areas; either maintained or natural. Maintained areas focus on the provision of space where a range of informal recreation activity can take place (e.g. picnicking, visiting beach, dog exercise, kicking a ball, flying a kite, etc.). Natural open spaces focus for the provision of opportunities to experience nature with visual amenity, physical landscape values, and/or address protection of biodiversity, conservation or restoration.
OS 5 (Cultural Heritage) Area	Provides for the protection, conservation and restoration of cultural and natural heritage features i.e. cemeteries, archaeological sites, historic monuments / buildings and heritage plantings.
OS 6 (Civic Space) Area	Provides for high quality well designed urban spaces suitable for a variety of community uses i.e. in town centres, urban seating areas, water features, community buildings and rural halls, memorials and art.
OS7 (Linkages: Urban or Ecological) Area	Provides for either the urban linkage: a maintained urban corridor for active transport connection and /or small green space e.g. open spaces set aside with walkways or cycleways and road verges/reserves within Hastings District Council's Parks management (typically linear or less than 0.3 hectare) or the ecological linkages that are minimally maintained that serve as biodiversity linkages and/or water margins e.g. Rural esplanades and stream corridors.
OS8 (HBRC and DoC) Area	Covers all land owned by Hawke's Bay Regional Council or the Department of Conservation and public open space. Note: Other sections of the District Plan contain provisions which relate to activities in the above Zones, (see Rules section below)

The District Plan has the following objectives and policies to achieve these outcomes, summarised in the table below.

Table 6.4.3 Summary of Objectives and Policies Relating to Open Spaces in the District Plan

References	Objectives and policies
OSEO1 (Objective)	To provide sufficient open space to meet the present and likely future recreational, conservation and visual amenity needs of the District.
OSEP1 (Policy)	To ensure reserves are vested upon urban subdivision, where appropriate, to serve the needs of residents in the area and to give effect to Council's Reserves Strategy. Explanation Reserve land contributions will be taken via the provisions of the subdivision section of this Plan, from subdividers and developers, to meet the adopted reserve targets. Financial contributions for reserve development will be taken under the Local Government Act. The Reserves Strategy identifies land to be acquired for reserves together with reserves and facilities requiring expansion as a result of increased population or demand. Structure plans for urban growth areas are also produced as part of the District Plan.
OSEO2 (Objective)	To ensure that open space is used and developed in a manner which is compatible with its function and character and to ensure any adverse effects on surrounding activities, particularly residential, are avoided or mitigated.

References	Objectives and policies
OSEP2 (Policy)	Manage the scale, size, design and location of buildings so as to avoid, remedy or mitigate any adverse effects on the amenity of surrounding areas and the function and character of the open space. Explanation The Council as landowner needs to ensure that buildings are designed and sited to complement the function and character of the reserve and minimise any nuisance to neighbouring properties.
OSEP3 (Policy)	Manage activities on open spaces to ensure that adverse effects of activities on the surrounding environment is minimal and/or temporary. Explanation Open spaces provide numerous benefits to communities, and are available for a range of recreational activities. There are however some activities that can generate noise, disturbance and traffic congestion and have the potential to be detrimental to the wellbeing of the surrounding community.

6.6. Long Term Plan

Parks and open spaces are described as strategic assets in the Long Term Plan [79] i.e. they are strategic assets where a decision affects the whole of the asset group, not just some of the asset group. The funding provision is outlined as a combination of:

- General rates and targeted rates which are generally set on a differential basis by location. Differentiating by location reflects the properties' relative location to urban based facilities and ability to use those facilities.
- Subsidies, Grants and Donations
- Minor revenue accrues periodically from donations.
- Development Contributions are applied to new developments to recognise increased capacity requirements.
- (Sports grounds only) Council policy is to recover some of the operational expenditure excluding depreciation and renewals from sportsground expenditure, having regard to the outcomes of affordable access and maximum patronage of sportsgrounds. Note: Capital expenditure relating to growth is funded separately.

In addition, there is some capacity for City Centre vibrancy and parks and public space improvements included in budget under the “Finishing Touches” package to support parks funding.

The level of service performance measure is defined as 'parks user satisfaction' at 95% for the Years 1 - 10. To address changes in population and land use a key response in the long term plan is upgrading and the extension of parks & reserves facilities.

The Council uses various methods to engage with the community ranging from community surveys, stakeholder groups, industry forums, the reserve management planning process and community planning processes for a number of communities within the district. This enables the Council to keep abreast of changing expectations. The key area where level of service expectations continues to grow is for parks and reserves– the Long Term Plan contains funding provision to meet the aspirations from the above planning processes.

79 Long Term Plan 2021-2031

6.7. The Heretaunga Plains Urban Development Strategy 2010 (HPUDS)

The Heretaunga Plains Urban Development Strategy 2017 (HPUDS) [80] was jointly created by Hastings District Council (HDC), Napier City Council (NCC) and Hawke's Bay Regional Council (HBRC) to allow for a collaborative approach to managing growth on the Heretaunga Plains while recognising the value of water and soil as resources for ongoing food production and as a major contributor to the regional economy. The preferred long-term approach to growth in the region strategy is compact development gradually restricted to urban development boundaries.

This strategy, planned to cover growth through to 2045, relies on Napier and Hastings having defined growth areas and urban limits, with a need to balance increased intensification and higher densities closer to the commercial nodes and higher amenity areas in the districts. Defined growth areas are a key element of the settlement pattern. They are more efficient and cost effective from an infrastructure and servicing point of view, and ensure land use and infrastructure can be co-ordinated, development well planned, and growth on the versatile land of the Heretaunga Plains avoided as much as possible. Significant levels of increased density and intensification will occur under the compact development scenario. There are issues relating to public acceptance of moving quickly to more-dense living environments and in some cases potentially higher costs of funding intensification of existing areas and for these reasons a slow transition from the current approach through to a full compact settlement scenario was adopted.

The 2016 review of the HPUDS 2010 (now HPUDS 2017), found that the updated projections showed a significant population increase over the 30-year period and an associated 30% increase in dwelling growth, largely as a result of adopting a medium to high projection scenario. The review confirmed this increase is generally still able to be accommodated within the HPUDS identified growth areas and the infill growth projections, albeit with the inclusion of some expansion of greenfield growth options and the inclusion of reserve areas to accommodate immediate greenfields supply issues.

To facilitate appropriate intensification, the Medium Density Housing Strategy provides and articulates a comprehensive and coherent strategy for the development of Medium Density Housing within the existing urban areas to meet the intensification targets of HPUDS.

The provision of sufficient and quality open space (both private and public) is a key requirement of ensuring an appropriate level of urban amenity. Insufficient provision or access to open spaces can lead to both negative perceptions of an area and poor amenity values.

Where housing density increases, it is likely that there will be a correlating reduction in the provision/availability of private open space and greater need and demand for public open space. Residential Intensification can have a number of implications including:

- Increased pressure on existing public open spaces and their facilities and range of facilities/uses.
- Demand for a greater quantity of public open spaces which can be difficult to provide in fully developed urban centres if only utilising existing open space land.
- Demand for improved quality of public open spaces and their facilities
- The provision of good quality and quantity public open space is necessary to ensure the achievement of appropriate levels of amenity and positive community and development outcomes.
- With regards to the provision of public open space, the vision for Hastings District is that:

  'The needs of the community for open space and recreation opportunities are met through the provision of a variety of open space, which includes high quality gardens and active

80 Heretaunga Plains Urban Development Strategy 2017

recreation uses; coastal and river access and protection; and local neighbourhood and amenity areas'.

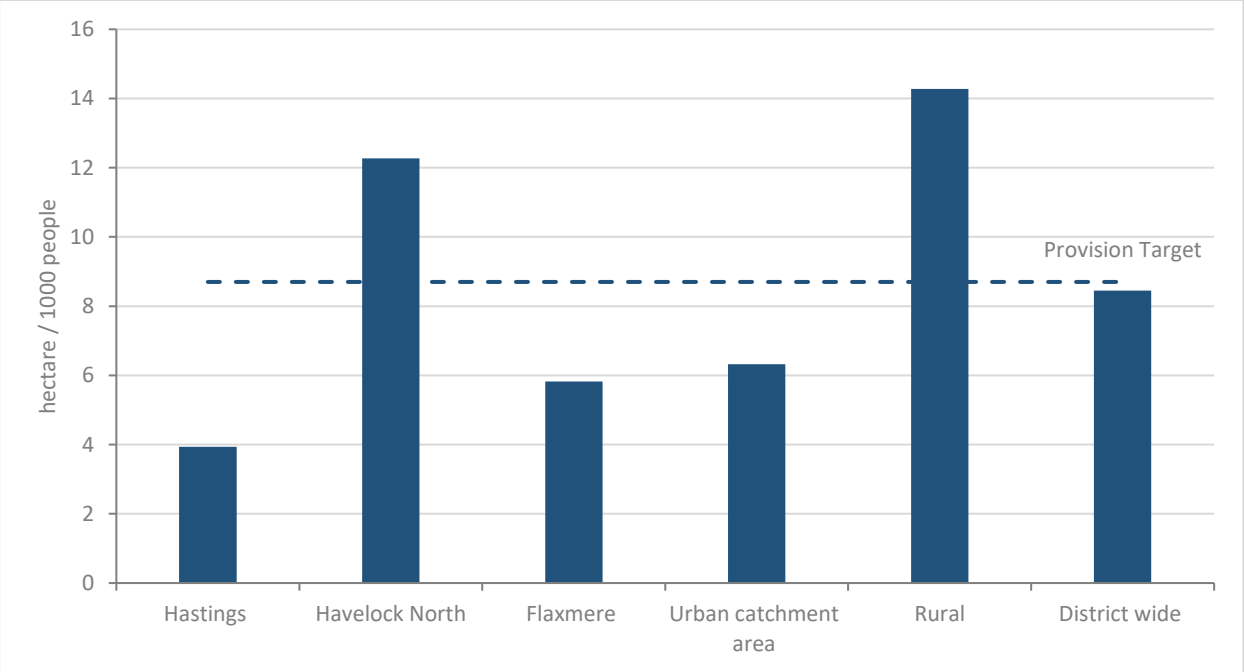
To provide the amenity, healthy living opportunities and green open space needed to encourage and support higher density living in the urban centres, including:

- Provision of open space in higher density areas as relief from and contrast with built form and hard surfacing
- Adequate space for large trees, amenity planting, children's play and exercise opportunities
- To compensate for loss of private garden space for recreation activities as urban infill progresses and residential density objectives promote higher residential density.
- To provide open space nodes of sufficient size to fulfil neighbourhood recreation needs in greenfield and brownfield areas.

6.8. Overview of current provision – Service Level Based on Reserve Contribution (Area)

The Reserves Strategy [81] provides a recommended minimum District reserve provision target of **8.7ha/1000 residents.** The 184 reserves totalling 689 ha, equate to a 2018 [82] level of service provision of 8.45ha/1000 residents, while the Hastings Urban area includes a total of 41 reserves, with an area of 131 ha, equating to a level of service provision of 3.94ha/1000 residents (Figure 6.8.1 below), i.e only half of the reserve provision target. While the District-wide reserve provision is close to the target (8.45ha/1000 people) the Hastings Urban area, Flaxmere (5.82ha/1000 people) and urban areas overall (6.32ha/1000 people) are significantly below the target. This is a whole reserve area assessment. When broken into reserve categories Hastings City has a low reserve distribution for community, natural and community parks spaces.

Figure 6.8.1 Total Area (ha) of Open Spaces per 1000 People of Population



These figures are indicative only and actual reserve provision should be determined by local structure plans, other reserve provision in the area, and a check of other variables, i.e., types of reserve space

81 Reserves Strategy End November 2019

82 Assessment uses the 2018 census population data and latest reserve area data

available. It should be noted that while the park categories assist in defining the mix of activities and functions, they are seldom discrete and can overlap. In many cases, parks could fulfil a range of functions that cross over a number of the categories.

Figure 6.8.2 and 6.8.3, below shows the current distribution between reserve categories in Hastings Urban area and for the whole district, noticeably sports and recreation are a greater proportion for the urban area than district wide, with a significant decrease in the proportion of Open Space from the Hastings District to Urban area only. Table 6.8.4 overleaf shows the area per category and per population from the latest available data.

Figure 6.8.2: Hastings Urban Area Reserve Category Distribution

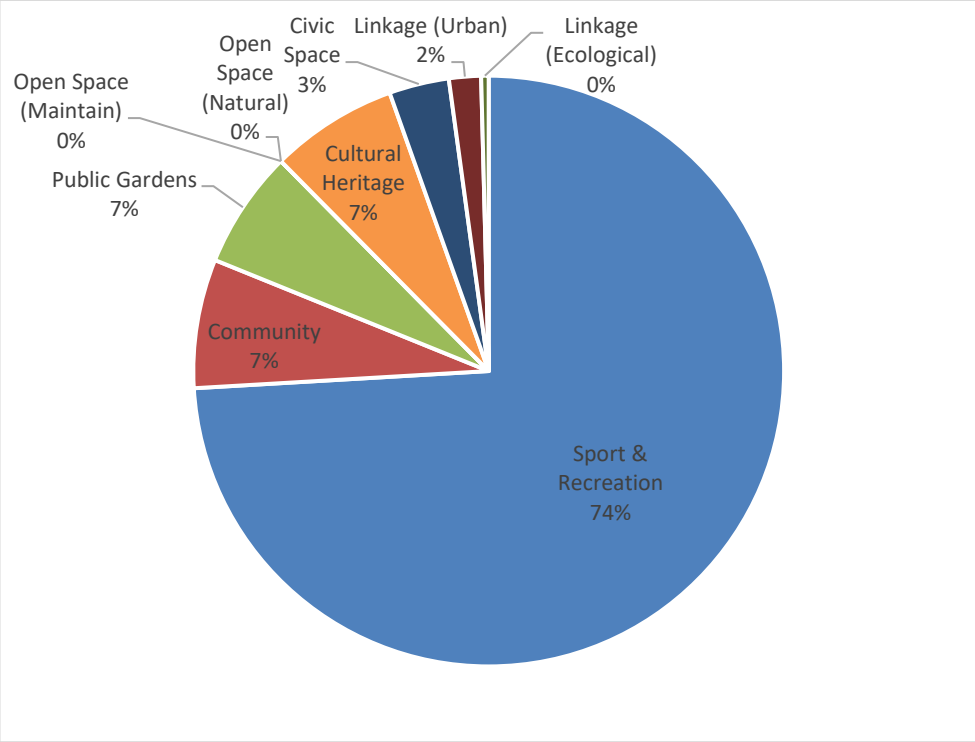


Figure 6.8.3: Hastings District-Wide Reserve Category Distribution

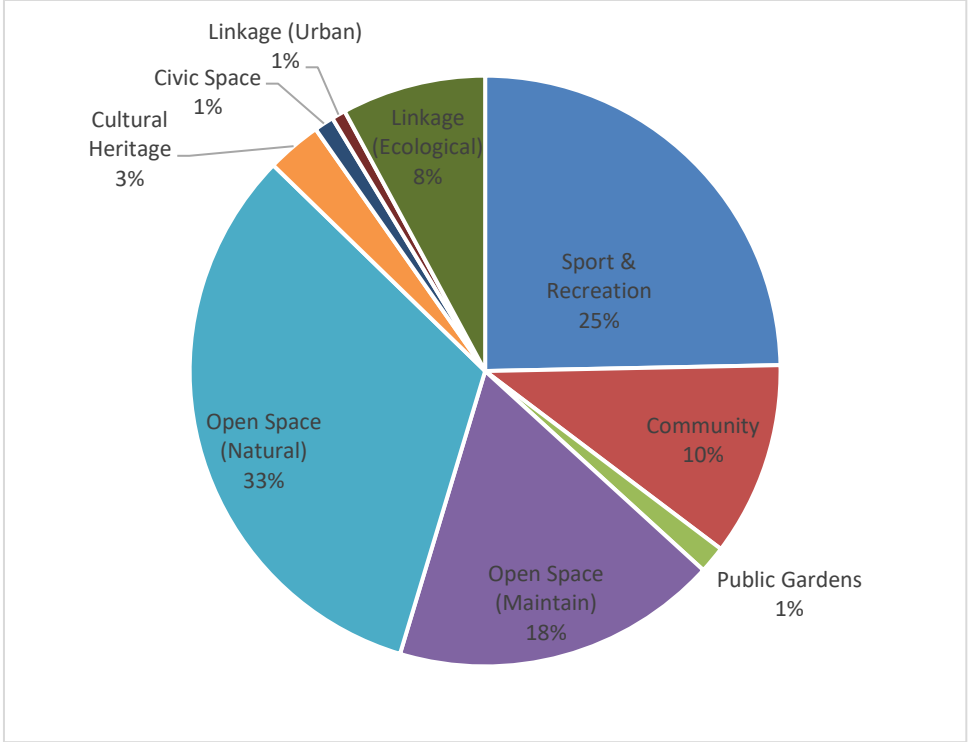


Table 6.8.4: Area (ha) per Reserve Category and per Population (red denotes where the target reserve area has not been met, green for where it is met)

Category	Hastings (popn 33,514)			Havelock North (popn 14,331)			Flaxmere (popn 10,965)			Urban catchment area (pop 58,800)		Rural (popn 22,749)			District wide (81,549)	
	No.	Area (ha)	Area (ha) /1000 people	No.	Area (ha)	Area (ha) /1000 people	No.	Area (ha)	Area (ha) /1000 people	Area	area ha/1000 people	No.	Area (ha)	Area (ha) /1000 people	Area	area ha/1000 people
Sport & Recreation	7	97.71	2.92	3	19.32	1.35	4	41.67	3.8	158.7	2.70	1	11.27	0.5	169.97	2.08
Community	10	9.31	0.28	10	10.09	0.7	13	13.27	1.21	32.67	0.56	15	40.41	1.78	73.08	0.90
Public Gardens	1	8.51	0.25	2	1.7	0.12	0	0	0	10.21	0.17	0	0	0	10.21	0.13
Open Space (Maintain)	0	0	0	3	4.52	0.32	3	6.22	0.57	10.74	0.18	15	112.4	4.94	123.14	1.51
Open Space (Natural)	0	0	0	7	126.6	8.83	0	0	0	126.6	2.15	12	98.02	4.31	224.62	2.75
Cultural Heritage	2	9.2	0.27	2	2.8	0.2	0	0	0	12	0.20	5	8.7	0.38	20.7	0.25
Civic Space	7	4.33	0.13	1	0.82	0.06	1	0.91	0.08	6.06	0.10	5	1.36	0.06	7.42	0.09
Linkage (Urban)	13	2.31	0.07	4	1.16	0.08	5	1.75	0.16	5.22	0.09	0	0	0	5.22	0.06
Linkage (Ecological)	1	0.54	0.02	2	1.07	0.07	0			1.61	0.03	30	52.73	2.32	54.34	0.67
Totals	41	131.91	3.94	34	175.82	12.27	26	63.83	5.82	371.56	6.32	83	324.88	14.28	688.7	8.45

6.9. Alternative Assessment of Current Provision

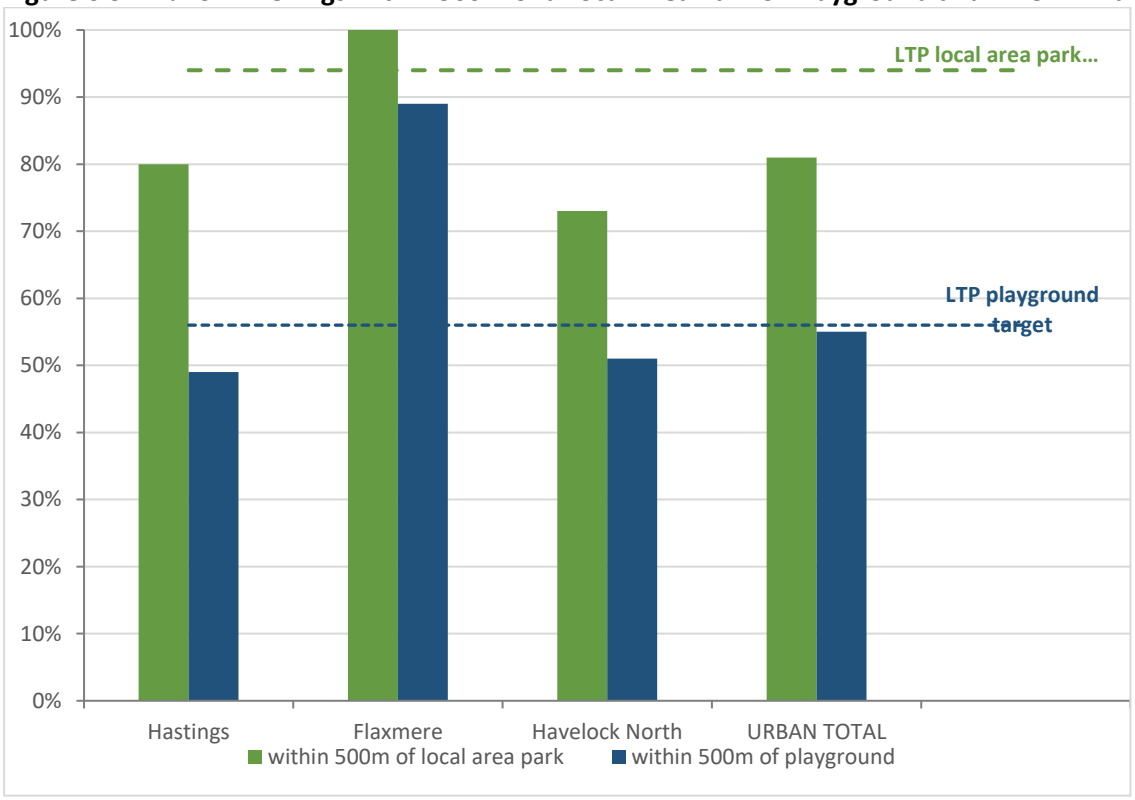
The 'ha/1000' level of service provides guidance to Council on the existing provision of public open space which can be extrapolated to identify future requirements to meet the needs of predicted population growth. This however has a number of limitations in that it is a crude measure that does not take into account distribution, function, quality and usability of areas of public open space. It would be recommended that this is developed further into ha/1000 per category of reserve space to assist in a more cohesive parks assessment to support the future growth strategy.

An alternative measure used by HDC is a catchment based approach which defines a 500m 'walking circle' around 'local useable' reserve and playgrounds, i.e. every resident should have a good level of 'local' reserve and open space provision within 500m walking distance of their residence.

The optimal size of a 'Local Area' park is based on the identified size of a Community Reserve. This size is considered adequate to provide open space for children to kick a ball, and for playground pieces to be located. Smaller sizes may be acceptable, dependent on their location, layout, topography and facilities. In order to provide the necessary amenity, healthy living and recreation opportunities, a 'Local Area' park must have adequate space for large trees, amenity planting, children's play and exercise opportunities, and have flat or undulating grass areas, suitable for small scale ball play. Local Area parks will typically include all open space areas classified as Community Parks, but may also include those with other classifications.

There is a generally accepted reserves planning objective that playgrounds also be provided within walking distance of all residential properties. For Hastings District, this has been defined as a distance of 500 metres. Playgrounds will generally be provided on Community Reserves. They may be located on other reserves where appropriate for the reserves usage and/or where the reserve is fulfilling a neighbourhood function.

Figure 6.9.1 - % of Dwellings within 500m of a Local Area Park or Playground and HDC LTP Targets



As shown by Figure 6.9.1 above and Figures 6.9.2 to 6.9.4 below, Flaxmere is well serviced for both playground and local area park targets while Hastings, Havelock North and the Urban total neither meet

the LTP target for local area park or playgrounds. As these urban areas will be under increasing demand from growth, the strategy will need to address improving both the current service level to the targeted aims and those required for intensification.

Figure 6.9.2 Hastings Dwellings within 500m of Local Area Park and Playground

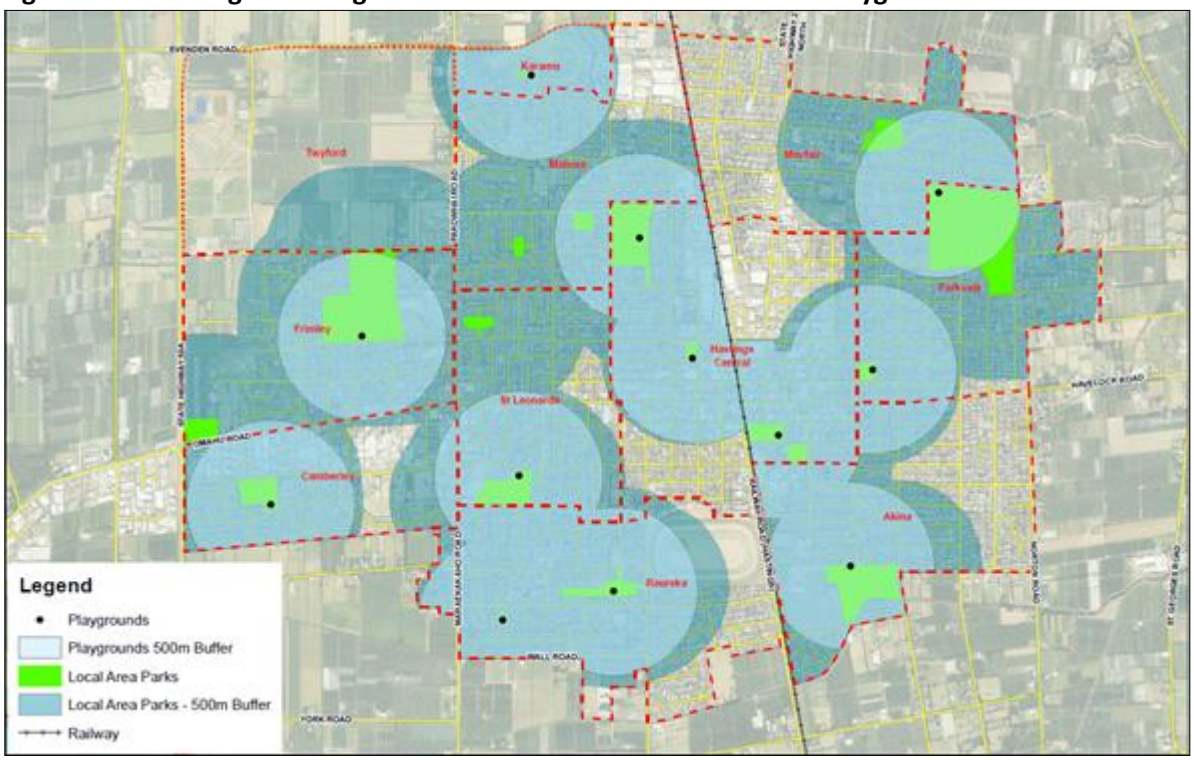


Figure 6.9.3 Havelock North Dwellings within 500m of Local Area Park and Playground

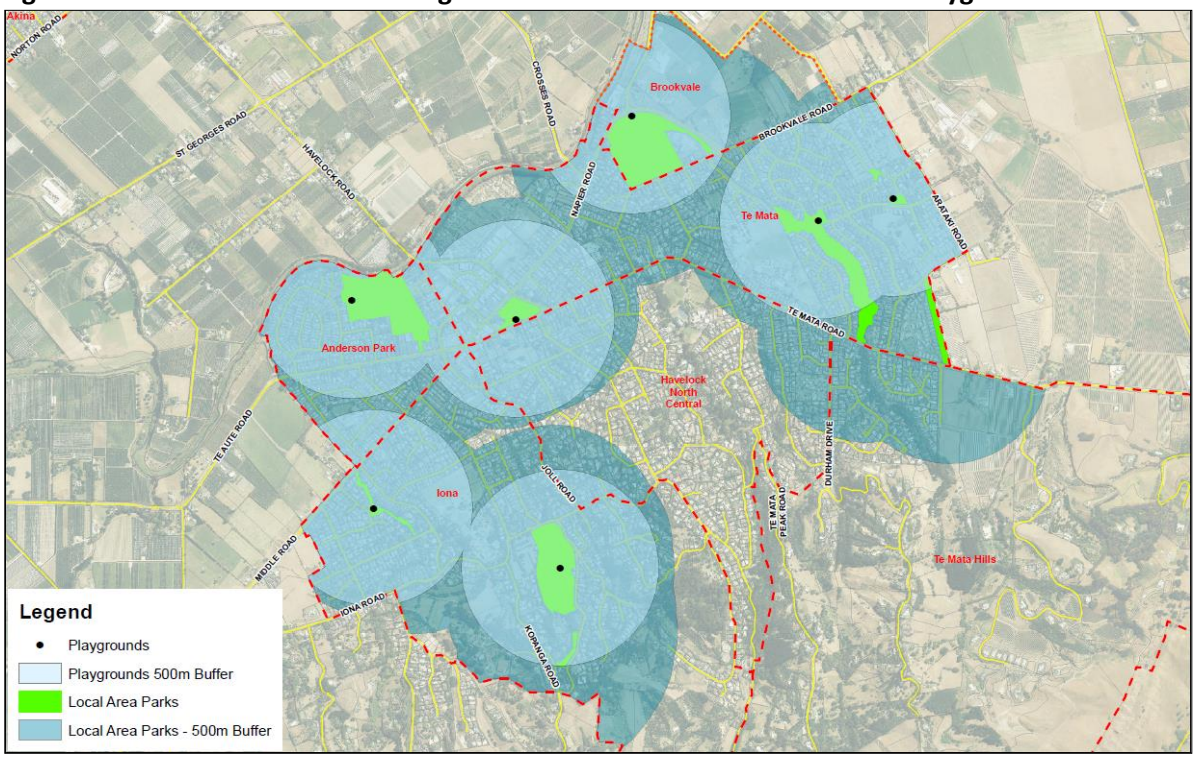
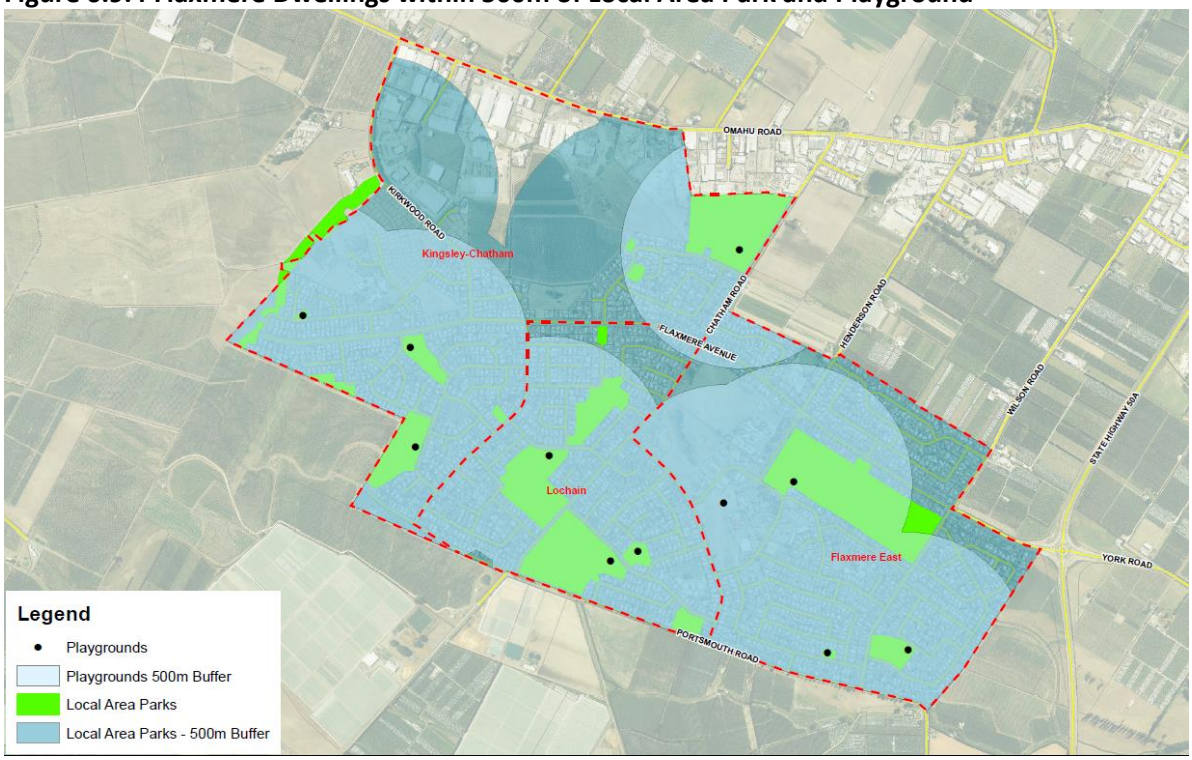


Figure 6.9.4 Flaxmere Dwellings within 500m of Local Area Park and Playground



6.10. Summary of performance measures

In addition to the ha/1000 people assessments of performance presented in Table 6.8.4 earlier in this section, there are three key performance measures available for the parks and open spaces in the District Plan and annual reports:

- a user satisfaction survey with a target of 97% satisfaction, and
- the percent of urban properties within walking distance (500m) of a park
- the percent of urban properties within walking distance (500m) of a or playground.

Performance against these measures is summarised in Table 6.10.1 below, this should be read with the prior ha/1000 people assessment to provide a more comprehensive assessment of the current service level for parks and open spaces.

Table 6.10.1 Summary of Performance Targets for Parks and Open Service Provision in Hastings District from Annual Reporting [83].

Year	% of urban properties within 500m radius of a park.	Target	% of urban properties within 500m radius of a playground.	Target	User satisfaction result	Target	Notes	Scoring on overall service level
2020/21	93%	89%	58%	60%	-	-	User satisfaction not collected	Did not meet targets/did not record data.
2019/20	85%	88%	58%	60%			User satisfaction not collected	Did not meet targets/did not record data.
2018/19	87%	87%	60%	60%	75%	97%	User satisfaction: A change in survey methodology this year meant surveys were deliberately targeted at the poorest reserves to aid in renewal planning and forward investment decisions. A follow-up survey is planned once the identified works have been completed	Achieved lower park radius target and improved on previous years scores. Struggling to meet 97% threshold and declining trend.
2017/18	86%	94%	53.2%	56%	92%	97%		Did not meet targets.
2016/17	86%	94%	60%	56%	97.5%	97%	Walking distance to park: Reduction has occurred as effect of connector reserves now not included. New parks acquisitions in Lyndhurst and Northwood will reverse trend in 17/18	Partially achieved targets.
2015/16	93.5%	94%	56.6%	56%	93.5%	94%	Walking distance to park: Slight reduction recorded as there has been little new park acquisition and more new houses built away from parks. New acquisition in Lyndhurst and Northwood will reverse trend in 16/17	Partially achieved targets.
2014/15	93.5%	94%	56.8%	56%	97%	95%		Achieved targets.
2013/14	93.8%	94%	55.6%	56%	97%	85%		Achieved targets.

83 Hastings Annual Reports

6.11. Limitations of Current Service Level

To summarise the above assessments:

- District wide reserve provision is 8.45ha/1000 people where the target is 8.7 ha/1000 people
- The Hastings central (3.94ha/1000 people), Flaxmere (5.82ha/1000 people) and urban areas overall (6.32ha/1000 people) are significantly below the target. This is a whole reserve area assessment, when broken into reserve categories Hastings city has a low reserve distribution for community, natural and community parks spaces. More detailed category and usage based assessments are recommended to better understand provision.
- Flaxmere is well located for both playground and local area park targets. While Hastings, Havelock North and the Urban total neither meet the LTP target for local area park or playgrounds.
- There is a generally declining trend in both dwellings in a 500m radius of a local area park and in the user satisfaction ratings in annual reports since 2013/14. While percentage of dwellings within a 500m radius of a playground is generally increasing/remaining stable.

The quantitative measure of hectares per 1000 population provides guidance to Council on the existing provision of public open space which can be extrapolated to identify future requirements to meet the needs of predicted population growth and how this compares to Industry Standard. However, this measure has a number of limitations, in that it does not take into account the quality of open space being provided, nor does it recognise the differing uses or functions that open space provides, or relative accessibility and distribution of these reserves.

It would be recommended that a more cohesive assessment is used for the parks and reserves where it relates to future growth. At a high level, the current service level for urban areas is not being met and if these areas are to be intensified these facilities will need to be at a higher level than the current urban needs. Parks are critical to housing intensification and city growth to provide positive community outcomes. Other features of parks such as community facilities (bbqs, picnic areas) that are in higher demand in urban intensification areas, increased pressure on services and maintenance (rubbish collection etc.) and how the connection between playground facilities and dog exercise areas is managed to ensure positive community shared use of spaces are also absent, and it would be recommended these are incorporated into assessments, particularly for central urban areas preferred for intensification.

7. Glossary of Terms

HBRC Hawkes Bay Regional Council

HDC Hastings District Council

NCC Napier City Council

FDS Future Development Strategy

RSS Regional Spatial Strategy

Te Mana o te Wai

Te Mana o te Wai refers to the vital importance of water. When managing freshwater, it ensures the health and well-being of the water is protected and human health needs are provided for before enabling other uses of water. It expresses the special connection all New Zealanders have with freshwater. By protecting the health and well-being of our freshwater we protect the health and well-being of our people and environments. Through engagement and discussion, regional councils, communities and tangata whenua will determine how Te Mana o te Wai is applied locally in freshwater management.

Te Oranga o te Taiao

A te ao Māori phrase that translates to **the health and wellbeing of the environment**. Te Oranga o Te Taiao is defined as an intergenerational ethic for all New Zealanders to support a more responsible and positive relationship with the natural environment.

ESDP Essential Services Development Plan

NAP National Adaptation Plan

Ministry for the Environment 2020. *National Climate Change Risk Assessment for Aotearoa New Zealand: Main report – Arotakenga Tūraru mō te Huringa Āhuarangi o Āotearoa*: *Pūrongo whakatōpū*. Wellington: Ministry for the Environment.

Firefighting	The provision of water at sufficient flow and pressure that meets the NZ Fire Service Firefighting Water Supplies Code of Practice (SNZ PAS 4509:2008)
Taumata Arowai	Taumata Arowai is the new water services regulator for Aotearoa.
TANK Plan Change	Hawke's Bay Regional Council is proposing to add new rules to the Regional Resource Management Plan to manage water quality and quantity for the Tūtaekurī, Ahuriri, Ngaruroro and Karamū (TANK) catchments.
Potable Water	In the **drinking water standards** made under section 47 of the Water Services Act 2021, **potable water** means water that—

(a) is safe to drink; and

(b) complies with the drinking water standards

RMA	Resource Management Act 1991
NPS-UD	National Policy Statement on Urban Development 2020

ILI	**Infrastructure Leakage Index** is a performance indicator of real (physical) water loss from the supply network of water distribution systems. The ILI was developed by the International Water Association (IWA) Water Loss Task Force (WLTF) and first published in 1999.
NRW	**Non-revenue water** is basically produced, cleaned water which is lost somewhere in the water distribution system, never reaching its final destination. This means water not used or paid for.
HTST	Heretaunga Tamatea Settlement Trust
Surcharging	Where flow within a pipe is greater than the full pipe capacity creating a hydraulic head i.e. liquid pressure is above the top of the pipe.
I&I	Inflow and Infiltration – stormwater into wastewater either through a direct connection or through groundwater infiltration into wastewater pipe joints and cracks.
RDI	Rain Dependent Infiltration – the influence of rain on shallow groundwater levels.
ECoP	HDC Engineering Code of Practice 2020
AEP	Annual Exceedance Probability - the probability of a flow of a certain size occurring in any river or stream
ARI	Average Recurrence Interval - the average time period between floods of a certain size
TANK	Tūtaekurī, Ahuriri, Ngaruroro and Karamū (TANK) catchments
ANZECC	Australian and New Zealand Environment and Conservation Council Guidelines

Benthic macroinvertebrates:

Benthic macroinvertebrates are aquatic animals without backbones that are large enough to see without a microscope. They include worms, crustaceans, and immature forms of aquatic insects such as stonefly and mayfly nymphs. Benthic macroinvertebrates can be important indicators of water quality.

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