Hamilton City Council
Te kaunihera o Kirikiriroa

District Plan Committee
Komiti Ture-aa-takiwaa
OPEN MINUTES

Minutes of a meeting of the District Plan Committee held in Council Chamber, Municipal Building, Garden Place, Hamilton and via Audio Visual link on Thursday 16 June 2022 at 1.02pm.

PRESENT

Chairperson *Heamana*	Cr R Hamilton
Members	Deputy Mayor G Taylor (exclusively via Audio Visual link) Cr S Thomson Cr R Pascoe Cr M Gallagher
In Attendance	Cr Ewan Wilson Cr Mark Donovan Blair Bowcott – General Manager Growth Mark Davey - City Planning Manager Jamie Sirl - Team Leader City Planning Martin Street - Senior Communication and Engagement Advisor Katherine Hu - Intermediate Planner Lachlan Muldowney – Barrister for Hamilton City Council
Governance Team	Carmen Fookes – Senior Governance Advisor Narelle Waite and Tyler Gaukrodger – Governance Advisors

1. Apologies – *Tono aroha*

Resolved: (Cr Hamilton/Cr Thomson)

That the apologies for absence from Mayor Southgate, Cr O'Leary and Maangai Whetu are accepted.

2. Confirmation of Agenda – *Whakatau raarangi take*

Resolved: (Cr Hamilton/Cr Thomson)

That the agenda is confirmed.

3. Declarations of Interest – *Tauaakii whaipaanga*

Cr Gallagher declared interest in Item 7 (Plan Change 9: Historic Heritage & Natural Environments - approval to notify). He noted he was not conflicted and would participate in discussion and vote on the matter.

4. Public Forum – *Aatea koorero*

No members of the public wished to speak.

5. Confirmation of the District Plan Open Minutes of 3 May 2022

Resolved: (Cr Hamilton/Cr Thomson)

That the District Plan Committee confirm the Open Minutes of the District Plan Committee meeting held on 3 May 2022 as a true and correct record.

6. Chair's Report

The Chair introduced the report, noting communication plan undertaken with the public on Plan Change 9. The Senior Communication and Engagement Advisor further outlined the consultation that had occurred. The Chair and staff responded to questions from Members concerning further consultation and how feedback would be triaged.

Resolved: (Cr Hamilton/Cr Gallagher)

That the District Plan Committee receives the report.

7. Plan Change 9: Historic Heritage & Natural Environments - approval to notify - *Recommendation to the Council*

The Team Leader City Planning and City Planning Manager spoke to the report, noting the process to notify Plan Change 9, the Plan Change 9 background, archaeological sites identified, built heritage, Historic Heritage Areas, special character zones, notable trees, significant natural areas, stakeholder engagement and communication, and the next steps in the process. Staff responded to questions from Members concerning District Plan iteration process, National Policy Statement changes, earthworks resource consenting, notable trees restrictions, enforcement of Plan Change 9, Council compliance with Plan Change 9, significant natural area feedback, identification of heritage areas, effect on renewals, other local authority approaches to heritage sites, development within heritage areas, support of heritage owners, the plan change hearing process and scope, and engagement with property owners.

Resolved: (Cr Hamilton/Cr Thomson)

That the District Plan Committee:

a) receives the report;

b) approves the final direction of Plan Change 9 notification as outlined in the report;

c) notes that Commissioners for the Hearing Panel for Plan Change 9 were appointed by Council at the 17 March 2022 meeting and the 14 April 2022 meeting and are David Hill (Chair), Nigel Mark-Brown, Dave Serjeant, Vicki Morrison-Shaw, and Cr Ewan Wilson; and

d) recommends that the Council:

   i. approves public notification of Proposed Plan Change 9 – Historic Heritage & Natural Environments pursuant to clause 5 of Schedule 1 to the Resource Management Act 1991 ('RMA'), subject to the Plan Change 9 documentation being circulated alongside the recommendation to Council on 30 June 2022; and

   ii. delegates its powers to hear, determine, and make decisions on all submissions and matters relating to Proposed Plan Change 9 – Historic Heritage and Natural Environment to a panel of five hearing commissioners.

The meeting was adjourned from 2.25pm to 2.35pm.

8. General Manager's Report

The General Manager Growth spoke to the report noting the workload pressures that staff were under, the engagement plan, and the staff recommendation to change the scope of work to include the Connections Policy workstream. He responded to questions from Members concerning District Plan delivery risks and Connections Policy resourcing.

Resolved: (Cr Pascoe/Cr Thomson)

That the District Plan Committee:

a) receives the report; and

b) approves the change in scope of the District Plan Programme to include the Connections Policy workstream, as outlined in paragraphs 35 to 38 of the staff report.

9. Resolution to Exclude the Public

Resolved: (Cr Pascoe/Cr Gallagher)

Section 48, Local Government Official Information and Meetings Act 1987

The following motion is submitted for consideration:

That the public be excluded from the following parts of the proceedings of this meeting, namely consideration of the public excluded agenda.

The general subject of each matter to be considered while the public is excluded, the reason for passing this resolution in relation to each matter, and the specific grounds under section 48(1) of the Local Government Official Information and Meetings Act 1987 for the passing of this resolution follows.

General subject of each matter to be considered	Reasons for passing this resolution in relation to each matter	Ground(s) under section 48(1) for the passing of this resolution
C1. Confirmation of the District Plan Public Excluded Minutes of 3 May 2022 C2. Update on the District Plan Change Programme	) Good reason to withhold) information exists under) Section 7 Local Government) Official Information and) Meetings Act 1987)	Section 48(1)(a)

This resolution is made in reliance on section 48(1)(a) of the Local Government Official Information and Meetings Act 1987 and the particular interest or interests protected by Section 6 or Section 7 of that Act which would be prejudiced by the holding of the whole or relevant part of the proceedings of the meeting in public, as follows:

Item C1.	to prevent the disclosure or use of official information for improper gain or improper advantage	Section 7 (2) (j)
Item C2.	to maintain the effective conduct of public affairs through protecting persons from improper pressure or harassment to prevent the disclosure or use of official information for improper gain or improper advantage	Section 7 (2) (f) (ii) Section 7 (2) (j)

The meeting went into a Public Excluded session at 2.43pm.

The meeting was declared Closed at 4.05pm.

Minute Note 17/08/2022:

On 17/08/2022 the following report and resolutions were determined to be released to the public via these minutes and the quarterly update. The report is attached as ***Appendix 1*** *of these minutes.*

Update on the District Plan Change Programme

Resolved:

That the District Plan Committee:

a) *receives the report;*

b) *approves the direction of the planning provisions for Plan Change 12 – Intensification Planning Instrument (IPI) as outlined in Paragraphs 21-54 of the staff report;*

c) *notes that staff will seek a recommendation to Council at the 4 August 2022 District Plan meeting to approve public notification of Plan Change 12; and*

d) *notes that the decision and information in relation to this matter be released at the appropriate time, to be determined by the Chief Executive.*

Council Report

Item C2

Committee: District Plan Committee **Date:** 16 June 2022

Author: Mark Davey **Authoriser:** Blair Bowcott

Position: City Planning Manager **Position:** General Manager Growth

Report Name: Update on the District Plan Change Programme

Report Status	*This report is taken as a publicly excluded item to maintain the effective conduct of public affairs through protecting persons from improper pressure or harassment; AND to prevent the disclosure or use of official information for improper gain or improper advantage.*

Purpose - *Take*

1. To inform the District Plan Committee on the latest direction of the planning provisions for Plan Change 12 – Intensification Planning Instrument (IPI) and to seek the Committee's approval of that direction.

2. To inform the Committee on progress with other PC12-related matters including the review of the Financial Contributions Policy workstream.

Staff Recommendation - *Tuutohu-aa-kaimahi*

3. That the District Plan Committee:

    a) receives the report;

    b) approves the direction of the planning provisions for Plan Change 12 – Intensification Planning Instrument (IPI) as outlined in Paragraphs 21-54 of the staff report;

    c) notes that staff will seek a recommendation to Council at the 4 August 2022 District Plan meeting to approve public notification of Plan Change 12; and

    d) notes that the decision and information in relation to this matter be released at the appropriate time, to be determined by the Chief Executive.

Executive Summary - *Whakaraapopototanga matua*

4. This report covers the direction of the planning provisions for Plan Change 12 (PC12) – Intensification Planning Instrument (IPI).

5. In summary, the general planning direction remains as presented on 3 May 2022, with the additions highlighted in bold:

    i. **The use of a citywide infrastructure capacity overlay to control developments of more than 4 units on a site;**

    ii. No increase in densities across brownfield/infill areas in existing residential zones but with some changes to existing duplex rules;

    iii. Increased densities in greenfield areas where infrastructure can respond;

iv. Increased densities in the area **now identified as Stage 1** which includes CBD walkable catchment which will extend across to part of Hamilton East, and up into Whitiora/Te Rapa/CBD north; and

v. A connections policy that will safeguard against unacceptable effects on a site-by-site basis.

6. It also provides an update on the proposed planning response to the infrastructure 'Traffic Light Assessment' (TLA) that has been undertaken by the City Development team. In summary, the TLA is an assessment of the existing performance of the city's existing 3-waters infrastructure using criteria that align with Te Ture Whaimana.

7. The TLA will inform how and to what extent the IPI policies, as part of PC12, are to be modified to accommodate Te Ture Whaimana – the Vision & Strategy for the Waikato River requirements. This will include those area-specific planning responses identified through application of an 'overlay'.

8. There is also an update on the Financial Contributions Policy Review work, which aligns with Plan Change 12, as it will assist Council in managing the effects of growth on the network.

9. This report also outlines next steps in terms of statutory pre-notification consultation requirements and the process by which elected members can provide further feedback on the plan provisions via Share Point over the next 2 weeks, given there are no further meetings between now and the final District Plan Committee meeting on 4 August 2022.

10. Given the statutory requirement to consult, staff have not considered the key considerations under the Significance and Engagement Policy to assess the significance of the matter(s) in this report and staff note that the recommendations comply with the Council's legal requirements.

Background - *Koorero whaimaarama*

11. The Resource Management (Enabling Housing Supply and Other Matters) Amendment Act (2021) (Amendment Act) combined with the National Policy Statement - Urban Development (2020) (NPS-UD) requires that Tier 1 councils (including Hamilton) notify changes to their district plans by 20 August 2022 that:

    i. Apply Medium Density Residential standards (MDRS) across existing residential zones. These standards enable, as a permitted activity, up to 3 storeys and 3 dwellings on existing sites, provided specific bulk and location requirements are met. They do not include any minimum density controls; and

    ii. Intensify residential zoning around neighbourhood, local and town centre zones commensurate with the size of that centre.

12. Together, these required changes to the District Plan are referred to as the Intensification Planning Instruments (IPIs). PC12 addresses IPIs.

13. The Amendment Act provides for Te Ture Whaimana as a Qualifying Matter (QM). Staff have prepared a TLA which demonstrates the infrastructure challenges in delivering densities enabled by the current district plan.

14. Existing and planned infrastructure (both funded and unfunded in the 2021-2031 LTP) will be insufficient to support the realisation of current planned enabled densities. The additional densities proposed by the Amendment Act will further exacerbate the infrastructure challenges and exacerbate existing negative effects of growth on the Waikato River.

15. To maintain Te Ture Whaimana outcomes, staff propose the use of an 'Infrastructure Capacity Overlay' zone. **Attachment 1** to this report shows where the overlay applies. The overlay creates trigger points for resource consent requirements. These will apply regardless of the base zoning that sits underneath the overlay zone.

16. In addition to the overlay, this report details the priority Stage 1 area that is *outside* the overlay and will become the priority enablement area for intensifications and future integrated infrastructure investment by Council.

17. In summary, in neither the overlay area nor Stage 1 area are existing infrastructure planning and investment commitments sufficient to support the densities proposed. However, the delineation of Stage 1 enables a more focused response to infrastructure investment commensurate with density. In areas covered by the overlay, a more precautionary approach to enabling additional density will be required.

Discussion - *Matapaki*

Plan Change 12 – IPI

Background

18. As elected members consider staff recommendations regarding the city's approach to the Amendment Act and the MDRS provisions, it is important to keep in mind that the city has had a form of MDRS, called the duplex policy, since 2015. This has allowed intensification to occur citywide down to 200m^2, subject to design criteria; rarely have any applications ever been declined.

19. The duplex policy has helped the city achieve a 50% intensification rate, delivering approximately 2,234 infill duplex dwellings since 2015 (the equivalent of 23% of new housing growth). This demand would have otherwise materialised in greenfield growth cells or outlying towns and villages. The duplex typology has also led to better land use in greenfield areas with 837 duplexes consented since 2015. Combined, this typology accounts for 32% of new house construction in the city since 2015 (total of 9,746; 2015-2021).

20. One of the reasons for the less enabling approach proposed citywide in response to the Amendment Act is the existence of the duplex provisions already in place in the operative plan which are delivering housing land supply. This baseline – notwithstanding the infrastructure challenges to even maintain this level of plan enablement – is proposed to be retained inside an 'overlay' which is detailed below. We note again the existing infrastructure challenges and that existing, and currently planned infrastructure does not support the full realisation of duplex densities currently enabled by the ODP.

Proposed zoning changes

21. The previous Committee report presented on 3 May 2022 outlined the findings of the infrastructure Traffic Light Assessment (TLA) which detailed the relatively low capability of 3-waters infrastructure city-wide in brownfield areas to cater to increased growth. This leads us away from being able to simply saying area "xx" has capacity and can be turned on/have its densities increased from their current levels and be confident that it will not have detrimental impact on the river. Instead, the findings point to a planning-led response to intensification which looks at various factors, such as wider strategic drivers and objectives, not just infrastructure capacity alone.

22. We must not lose sight of the fact that Council is required, by law, to increase density enablement in the District Plan. The Amendment Act requires that densities must be increased – the question is by how much and where, subject to qualifying matters.

23. Permitting ad hoc growth citywide to the densities envisaged under the Amendment Act will hinder the ability for the Council to invest commensurately to support the growth. The Council is fiscally constrained and cannot invest in upgrading networks on a citywide basis to support further intensification.

24. Council must ensure networks are not overwhelmed, creating an adverse knock-on effect to the river, as this would equate to a breach of the Council's obligations under Te Ture Whaimana (hence triggering this QM). Investment must occur to support growth, but the Council can only afford this if it is undertaken in a targeted and judicious manner – focused in certain areas.

25. With this in mind, the planning response set out in this report has now confirmed a Stage 1 Priority focus area (see **Attachment 1**) to be staged and prioritised for intensification first in response the requirements of both the Amendment Act and the NPS-UD.

26. This Stage 1 Area will fall outside the area covered by an infrastructure overlay. All other parts of the city will be subject to more stringent plan provisions that moderate density and will have the requirement of an infrastructure capacity assessment first. This will need to demonstrate that development can be accommodated at both local infrastructure and strategic network levels.

27. It is important to make clear that whether in or outside the overlay, development is still enabled and can occur – it is just that plan provisions are less enabling than those proposed in the Amendment Act.

28. The next section of the report explains what it means to be inside or outside the overlay and where the overlay applies as shown in **Attachment 1**.

29. In summary, the general planning direction remains as presented on 3 May 2022, with the additions highlighted in bold:

    i. **The use of a citywide infrastructure capacity overlay to control developments of more than 4 units on a site;**
    ii. No increase in densities across brownfield/infill areas in existing residential zones but with some changes to existing duplex rules;
    iii. Increased densities in greenfield areas where infrastructure can respond;
    iv. Increased densities in the area **now identified as Stage 1** which includes CBD walkable catchment which will extend across to part of Hamilton East, and up into Whitiora/Te Rapa/CBD north; and
    v. A connections policy that will safeguard against unacceptable effects on a site-by-site basis.

Proposed infrastructure capacity overlay

30. Staff are proposing the use of an 'overlay' in order to manage densities across parts of the city and to introduce additional controls where required (brownfields in particular).

31. Staff have now confirmed the CBD, the 800m walkable catchment and Central City North that have already been investigated through the Area Plan work where development rights could be more permissive, aligned to the Amendment Act and MDRS. The reasons for prioritising this area are described in paragraph 53.

32. The benefit of an overlay approach is that it means controls can be lifted in certain areas aligned to infrastructure investment. It is proposed that this is reviewed three-yearly, aligned to LTP decision-making and the timing involved in implementing infrastructure investment decisions. It is important to note that if 3-waters reforms occur in line with the current draft government timeline, 3-waters infrastructure investment will fall outside of Council's LTP processes, and so it will be important to ensure there is a clear linkage between Council's land use planning priorities and a Water Services Entities investment plans.

33.

34. The overlay is needed to manage consequential adverse effects on the health and wellbeing of River from:

    i. increased wastewater overflows (including volume, locations, frequency);

    ii. increased discharge of untreated stormwater;

    iii. increased stormwater runoff volumes and peak flows; and

    iv. unsustainable potable water use.

What it means to be inside the overlay

35. Generally, for those properties which fall inside the overlay, the consenting pathway will be more onerous, additional planning provisions will apply which control density, and require stronger 3-waters mitigation.

36. For properties in the **General Residential Zone** that are **inside** the Infrastructure Capacity Overlay the following applies:

Permitted Activity not requiring a Resource Consent	Develop up to 3 residential units with an average of at least 200m^2 per unit on a site and comply with water efficiency standards.
Restricted Discretionary Activity requiring a Resource Consent	Develop 4 or more units and/or develop any number of units on an average of less than 200m^2 per unit on a site, and/or do not comply with water efficiency standards.
Matters for discretion	Council's discretion in assessing a Restricted Discretionary Activity will include an infrastructure capacity assessment along with urban design and other related matters. Without sufficient capacity in the relevant infrastructure networks an application may be declined.

37. For properties in the **Medium Residential Zone** that are **inside** the Infrastructure Capacity Overlay the following applies:

Permitted Activity not requiring a Resource Consent	Develop up to 3 residential units with an average of at least 150m2 per unit on a site and comply with water efficiency standards.
Restricted Discretionary Activity requiring a Resource Consent	Develop 4 or more units and/or develop any number of units on an average of less than 150m2 per unit on a site. If not complying with the water efficiency standards.
Matters for discretion	Council's discretion in assessing a Restricted Discretionary Activity will include an infrastructure capacity assessment along with urban design and other related matters. Without sufficient capacity in the relevant infrastructure networks an application may be declined.

38. In Business zones, new buildings are already Restricted Discretionary Activity requiring a resource consent and this will not change.

What it means to be outside the overlay (Stage 1 Area)

39. Generally, outside of the overlay, a more streamlined consenting pathway will exist and greater density will be permitted.

40. For properties in the **General Residential Zone** that are **outside** the Infrastructure Capacity Overlay the following applies:

Permitted Activity not requiring a Resource Consent	Develop up to 3 residential units and comply with water efficiency standards (no density restrictions)
Restricted Discretionary Activity requiring a Resource Consent	Develop 4 or more units and/or do not comply with the water efficiency standards.
Matters for discretion	Council's discretion in assessing a Restricted Discretionary Activity will include an infrastructure design assessment. The infrastructure assessment will not consider strategic network capacity. Council cannot refuse an application if there is insufficient strategic network capacity. Discretion will also relate to urban design and other related matters.

41. For properties in the **Medium Density Residential Zon**e that area **outside** the Infrastructure Capacity Overlay the following applies:

Permitted Activity not requiring a Resource Consent	Develop up to 3 residential units and comply with water efficiency standards (no density restrictions)
Restricted Discretionary Activity requiring a Resource Consent	Develop 4 or more units and/or do not comply with the water efficiency standards.
Matters for discretion	Council's discretion in assessing a Restricted Discretionary Activity will include an infrastructure design assessment. The infrastructure assessment will not consider strategic network capacity. Council cannot refuse an application if there is insufficient strategic network capacity. Discretion will also relate to urban design and other related matters.

42. For properties in the High-Density Residential Zone that are outside of the Infrastructure Capacity Overlay (the area marked as Stage 1, in **Attachment 1** covering the CBD, walkable catchment and CBD north) the following applies:

    i. All developments are Restricted Discretionary Activities and require a resource consent;
    ii. Council's matters of discretion will be the same as in the Medium Density Residential Zone; and
    iii. Council cannot refuse an application if there is insufficient strategic network capacity.

43. Staff are currently working on the details of a lower-level infrastructure design assessment required as part of a resource consent for developments outside the overlay.

44. In Business zones, as for inside the overlay, new buildings are already Restricted Discretionary Activities requiring a resource consent and this will not change.

Where the overlay applies

45. Areas affected by the Infrastructure Capacity Overlay generally include the following:

    i. Business Zones: in and adjacent to centres like Chartwell, Dinsdale, Five Cross-Roads etc);
    ii. General, Medium and High-Density Residential zones; and
    iii. Greenfield locations (where consented).

46. The overlay does not apply to the following locations as these areas are not affected by the MDRS and still require a resource consent for residential activities as well as having density controls:

    i. Industrial Zones;
    ii. Large institutional sites (University, hospital etc.);
    iii. Large Lot Residential Zone;
    iv. Future Urban Zone; and
    v. Undeveloped greenfield areas.

47. Included within the overlay are those greenfield areas where development has already occurred (Rotokauri, Rototuna and Ruakura / Greenhill Park). The reasoning is that infrastructure has already been provided to service a consented level of development and any new development directed under the Amendment Act could have an impact on the existing infrastructure.

48. Undeveloped greenfield areas are excluded from the overlay, for example Peacocke and Rotokauri. These areas will require a subdivision consent which will require the development to demonstrate that it can be appropriately serviced.

49. It is anticipated that the greenfield areas excluded by the overlay will have new objectives and policies in PC12 that align with the minimum target densities for these areas identified in the draft Future Proof Strategy.

50. The Stage 1 priority area is excluded from the Infrastructure Capacity Overlay for strategic reasons. This includes the Central City Zone, High Density Residential Zone (e.g. city centre fringe 800m catchment), and the North of Central City Area Plan location.

51. This Stage 1 Area north of central city closely mirrors the long-term land use zone recommendations that come from the North of Central City Area Plan work from 2021. Importantly, some of the key moves for this area required high-density housing typologies along the Victoria Street/ Te-Rapa roading corridor to maximise future public transport (PT) services and a shift towards more medium-density housing either side of this corridor in the vicinity of Forest Lake, Maeroa and Beerescourt.

52. A large part of this Stage 1 area north either side of Ulster Street and south of Edgecumbe Park is already zoned for residential intensification in the Operative District Plan.

53. A more detailed Area Plan for the CBD North part of Stage 1 is attached as **Attachment 2.**

54. The Stage 1 area was prioritised over others due to the following factors:

    i. Alignment with well-functioning Urban Environment policies of the NPS-UD. This area is located in an area of high current and future PT service, nearby to the largest commercial centre in the central city, and most of the employment in the city;

    ii. Improved housing choice by providing a larger area outside of the overlay to increase likelihood of redevelopment in different forms and densities;

    iii. The need to focus on a single location to simplify alignment of infrastructure investments commensurate with intensification;

    iv. Central city catchment is prioritised to continue improving vitality of the central city and productivity. Potential for Infrastructure Acceleration Fund (IAF) investment to improve infrastructure conditions;

    v. It supports the Hamilton-Waikato Metro Spatial Plan (MSP) Transport Business Case RT1 – North corridor. Greater areas of high and medium density residential zones are enabled in this location to promote intensification in an area of high mode shift potential, and to maximise Council's future MSP infrastructure investments in this area;

vi. Mode shift outcomes will support lower greenhouse gas emissions and reduce contaminant loading in stormwater from motor vehicle use;

vii. The North of Central City Area Plan work means that we have deep understanding of the existing built form environment in this area and the interventions required to promote and ensure quality urban intensification and amenity outcomes;

viii. This area already offers proximity to key employment areas and access to employment by PT. It provides access to 75% of employment in the city by PT on a 20-minute journey on a 15-minute frequency bus services;

ix. HUGS multi-criteria analysis indicates central city and walkable catchment have high potential benefits to continued growth;

x. Strategic alignment with the Central City Transformation Plan, Climate Change Plan, and noting the Central City is a focus of the Long-Term Plan 2021-2031; and

xi. The area in Hamilton East is mostly within an 800m walk of the central city or part of an existing Residential Intensification Zone.

55. The proposed draft zoning map which identifies the physical extent of Stage 1 and those greenfield areas outside of the infrastructure overlay is attached in **Attachment 1**.

Traffic Light Assessment – Final Peer Review

56. As reported at the 3 May 2022 District Plan Committee meeting, the City Development Unit prepared a Traffic Light Assessment report (TLA); the high-level findings were presented at that meeting.

57. In summary, the TLA is an assessment of the existing performance of the city's existing 3-waters infrastructure using criteria that align with Te Ture Whaimana.

58. Given the time constraints, the TLA is based upon existing information and strategic planning that has been completed for the city. The TLA does focus on network capacity challenges whilst acknowledging the system wide challenges facing the city including:

i. water allocation constraints;

ii. stormwater and wastewater contaminant load limitation; and

iii. climate change impacts on urban land-use, water resources, water systems and natural hazards.

59. The TLA report provides an evidence base that demonstrates that Hamilton's existing 3-waters systems have performance challenges with respect to meeting the obligations under Te Ture Whaimana to varying degrees across the city already. These challenges will be exacerbated by continued infill development in accordance with the city's current duplexing policy, and further compounded by the densities contemplated by NPS-UD and MDRS.

60. The TLA report highlights that the city's 3-waters systems were designed and constructed to provide levels of service considered appropriate when they were developed and to respond to densities planned for at that time. These levels of service and densities do not reflect current requirements or those anticipated through NPS-UD and MDRS.

61. Today's environmental, social and cultural expectations and regulatory obligations require levels of service and performance that are significantly higher than delivered historically. Te Ture Whaimana sets out an obligation to deliver 'betterment' to the Waikato River, and not simply to avoid, remedy or mitigate environmental effects.

62. In addition to these regulatory drivers, the anticipated impacts of climate change are now better understood; land use planning and development that provides for more resilient communities through land use decisions that avoid creating or exacerbating flood hazards should be embedded in our catchment and land use planning and in our infrastructure responses.

63. More detailed work will be needed to comprehensively assess the implications of different land use and growth scenarios, including the proposed planning responses to NPS-UD and MDRS. Following this, infrastructure investment programmes will need to be developed to respond to those increased demands.

64. The report notes that solutions are available to address the infrastructure challenges and improve the health and wellbeing of the river from the current baseline. Supporting densification will require significant investment on top of what has previously been identified in master plans and LTP funding requests in order to uphold Te Te Ture Whaimana. A step change in development densities will require a step change in infrastructure investment. The level of investment needed to implement the necessary solutions everywhere, all at once, is unaffordable. Just adopting MDRS as per the Amendment Act without a clear and committed investment programme increases risk of network failure and adverse effects on Awa and communities. Accordingly, a targeted approach to increased densities is required.

65. It is important to note that the TLA report is not directly transferable into district plan provisions and does not highlight 'go' and 'no-go' areas of the city – developing planning provisions in response to the findings of this assessment necessary to give effect to Te Ture Whaimana is a task that is only informed by the TLA.

66. The proposed overlay approach and provisions in this report is the planning response to the TLA.

67. In short, the report highlights that there are existing network capacity constraints across the city, but the greenfield areas are slightly better positioned in the short to mid-term to accommodate increased densities compared to the brownfield/infill areas.

68. The report highlights that allowing higher densities of growth to proceed in an ad hoc manner citywide will result in infrastructure failure and adverse knock-on effects on the river. Accordingly, a targeted approach to increased densities is required.

69. Although the TLA does not identify specific areas of the city to intensify, it confirms the need to prioritise where MDRS and higher-density residential development is enabled to deliver on Te Ture Whaimana and Council's strategic objectives to enable planned infrastructure investment strategies. The Stage 1 Area shown in **Attachment 1** is the recommended prioritised area.

70. Further work by the City Development Unit will be required that considers updated growth projections for the city that reflect changing trends in development typology, location and uptake within both brownfields and greenfield areas, and the impact on infrastructure capacity. It is expected that this further work will be undertaken to align with timing of the PC12 hearing to provide further support to the Council's approach. Updated 3-waters master plans will also be delivered in the coming 12 months and recommend infrastructure investment programmes necessary to support the updated growth projections for consideration through the relevant funding request processes. These will then need to be reflected in either the Councils Long Term Plan or the water services entities investment plans.

71. The second draft TLA as peer reviewed is attached to this report as **Attachment 3.**

PC12 – other matters

Climate Change

72. PC12 addresses climate change through enabling the creation of a more compact city, particularly with increased intensification walkable from the city centre. The approach will assist in reducing greenhouse gas emissions and contribute to greater resilience to climate change through land use planning which promotes:

    i. Less reliance on cars and improved access to public transport;
    ii. Reduction in urban sprawl and expansion into greenfield areas;
    iii. More efficient use of infrastructure; and
    iv. The implementation of green policies listed below.

73. 'Green Policies' currently proposed in PC12 require new developments to:

    i. provide trees or retain existing trees;
    ii. retain minimum permeable surfaces and enhance landscaping; and
    iii. require rainwater re-use tanks and soakage to ensure stormwater retention requirements are met.

Financial Contributions Policy

74. Staff are proposing charging Financial Contributions (FCs) for residential developments that result in increased residential development densities. The amended plan provisions will articulate the purpose of FCs and how and when they will be charged.

75. The original purpose of charging FCs to recover the costs of providing, improving and upgrading local network infrastructure is retained and two new purposes are proposed to be added:

    i. These are to offset any adverse effects of increased built form on the public realm in residential areas by requiring a financial contribution to be made to improve the streetscape amenity (street trees, wayfinding, park benches etc) and public realm as residential areas intensify over time; and
    ii. to mitigate the adverse effects of increased urban densities and built form on the Waikato River and its tributaries which will assist in giving effect to Te Ture Whaimana.

76. Charging FCs is a complex process; the next step is to come up with a per dwelling unit or bedroom rate that is fairly and reasonably related to the development being charged.

77. Current thinking on how FCs will be applied is on a citywide basis rather than by specific areas, as citywide assessment makes calculation or formula application substantially simpler and more defendable.

78. Staff are currently developing an evidence base, drawing on project costings under previous Infrastructure Acceleration Fund work that could be recovered to fund local system investments necessary to contribute toward achieving Te Ture Whaimana obligations.

79. The final draft FC Policy, with charges, will be reported at the District Plan Committee meeting on 4 August 2022.

80. Other funding mechanisms (e.g. Development Contributions, rates and other new funding tools under things such as the Infrastructure Funding and Finance Act) will continue to be necessary to fund strategic infrastructure upgrade investments, renewals and OPEX.

PC12 – Kāinga Ora Partnership Area

81. The proposed planning overlay response outlined in this report will mean that the Kāinga Ora partnership area for Enderley-Fairfield falls *inside* the proposed infrastructure capacity overlay.

82. This will mean that development is still permissible up to three storeys within the entire partnership area, subject to the density controls outlined in paragraphs 34-43 above. Furthermore, development within the overlay, as for other parts of the city, does not preclude development from occurring as a Restricted Discretionary activity subject to demonstrating that infrastructure capacity is in place and can be adequately serviced from a 3-waters perspective.

83. In the case of the Kāinga Ora Partnership area, the ability to lead and meet any future infrastructure capacity requirements is still very much open to them through various funding and financing mechanisms such as Specified Development Projects (SDPs).

84. In the spirit of the partnership agreement, Council staff are continuing to work closely with Kāinga Ora staff as part of PC12 formulation and have already shared Council's Area Plans since January 2022. HCC staff are working alongside Kāinga Ora staff to understand these opportunities such as Specified Development Areas under the Urban Development Act.

85. Staff have recently received a draft Area Plan from Kāinga Ora which sets out their high-level land use aspirations for this area over time and will provide a verbal report on any key messages at this meeting.

Connections Policy update

86. Council staff have determined that the Connections Review and Plan Change 12 are not directly dependent on each other and can run as independent projects.

87. However, the key is for Council to be able to manage connections to the 3-waters network regardless of the outcomes of the Plan Change 12; therefore, implementing the Connections Review needs to align with the timing of Plan Change 12 hearings and decisions.

88. Plan Change 12 will explicitly note the need for connection approvals in addition to compliance with the District Plan. The Connection Policy outlines what matters Council will consider when determining an application to allow a service connection, as well as the matters for consideration for high water user agreement applications.

89. The project teams will continue to engage to ensure that strategic outcomes of each project continue to align. The Infrastructure Operations Committee will have oversight of the Connection Policy Review.

Next steps

90. In order to meet statutory requirements, staff will provide the draft PC12 provisions and the opportunity for feedback to Waikato-Tainui, the Minister for the Environment, other affected Ministers of the Crown, Waikato Regional Council, Waipā District Council and Waikato District Council.

91. Additionally, staff will provide the draft provisions to Kāinga Ora, Tainui Group Holdings and the Property Council, given they are stakeholders with whom Council is collaborating on some projects and/or we engage on a regular basis through partnership agreements.

92. The opportunity for pre-notification feedback on PC12 closes mid-July 2022. Staff will consider the feedback and incorporate changes where appropriate prior to seeking a recommendation from Council to publicly notify the plan change in August 2022.

93. An 'inform and educate' approach is being taken with all other stakeholders and the wider community to ensure they have a good understanding of PC12 and its implications ahead of notification. The primary channel for this will be through a webpage providing high-level information and media outreach.

94. Given the tight timeframes, we are unable to provide the opportunity for individual feedback from those stakeholders and the wider community ahead of notification. The opportunity for them to provide feedback will come through the formal submission process.

95. Draft PC12 will be available for Council to view on **SharePoint by 20 June 2022**. This will include a summary of the plan change, the evaluation reports, and several appendices with evidence to support the recommendations. This will be elected members' opportunity to provide final feedback on the draft plan change before staff seek a recommendation to notify in August 2022.

Joint Hearings Collaboration on IPI

96. Collaboration and hearings preparation planning has commenced between Waikato and Waipa district councils to achieve optimal alignment between the three IPI plan changes, including the sharing of evidence where appropriate.

97. The programme schedule is currently being worked on with staff from partner councils and the Chair of the Independent Hearings Panel. HCC will need to consider timing and resourcing of hearings given the hearing programme commitments on Plan Change 9 – Historic Heritage and Natural Environments and Plan Chance 5 – Peacocke Plan change in 2022/23.

98. Staff will update the Committee on the joint hearing's preparation in the next General Manager's report to the 4 August 2022 District Plan Committee.

Financial Considerations - *Whaiwhakaaro Puutea*

99. The District Plan Programme is funded through the 2021-31 Long Term Plan. Finances are reported quarterly in the General Manager's report to this Committee.

100. Implementing the Infrastructure Capacity Assessment provisions of PC12 will likely require additional internal resources, systems and tools which are currently unfunded in the LTP and need to be understood to inform future funding requests.

Legal and Policy Considerations - *Whaiwhakaaro-aa-ture*

101. Staff confirm that the staff recommendation complies with the Council's legal and policy requirements.

102. Staff are taking ongoing legal advice with respect to PC12, the requirements on Hamilton City Council as set out in the Amendment Act, and the Hamilton City Council Intensification Planning Instrument Proposed Approach

Wellbeing Considerations - *Whaiwhakaaro-aa-oranga tonutanga*

103. The purpose of Local Government changed on 14 May 2019 to include promotion of the social, economic, environmental and cultural wellbeing of communities in the present and for the future ('the 4 wellbeings').

104. The subject matter of this report has been evaluated in terms of the 4 wellbeings during the process of developing this report as outlined below.

105. The recommendations set out in this report are consistent with that purpose.

Social

106. Social wellbeing is defined as the capacity of individuals, their families, whaanau, iwi, haapu and a range of communities to set goals and achieve them.

107. The proposed approach aligns with 'Our vision for Hamilton Kirikiriroa', which provides direction for shaping a city that's easy to live in, where people love to be, a central city where people love to be, and a fun city with lots to do.

108. A healthy and well Waikato River forms part of this vision, and so the approach to give effect to Te Ture Whaimana aligns with social well-being outcomes.

Economic

109. Economic wellbeing is defined as the capacity of the economy to generate employment and wealth necessary for present and future financial security.

110. The NPS-UD recognises the national significance of providing sufficient development capacity to meet the different needs of people and communities and adequate opportunities for land to be developed to meet community business and housing needs.

111. The NPS-UD and the Resource Management (Enabling Housing Supply and Other Matters) Amendment Act require that district plans make room for growth both 'up' and 'out', and that rules are not unnecessarily constraining growth. The intensification directed by Central Government will have a direct impact on housing pressure in Hamilton.

112. Significant investment in infrastructure to support the ongoing growth and development of the city will be required. Decisions which confer additional development rights and enable growth must not be made in isolation from the investment decisions necessary to support this growth.

113. The infrastructure investment needed to support the prioritised development areas will be significantly greater than currently planned, which in turn may impact on the commercial feasibility of development across the city.

Environmental

114. Factors that make our cities more liveable (e.g. accessible public transport, great walking and cycling opportunities, ample green spaces and housing with access to services and amenities) can also help reduce our carbon footprint, increase resilience to the effects of climate change and protect ecosystems.

115. Members have agreed the vision to shape Hamilton as a green city. The approach to PC12 puts the health and wellbeing of the Waikato River at its centre. Prioritising investment in 3 Waters infrastructure (including "green infrastructure") in these areas and across the city will actively contribute toward this vision.

116. The increases in intensification directed through the Amendment Act will place greater pressure on the city's 3-waters networks, which in turn will necessitate increased investment. Without commensurate levels of investment to support intensification, adverse effects on the River are likely, which will conflict with the city's obligations under Te Ture Whaimana.

Cultural

117. The NPS-UD and Amendment Act require councils to plan well for growth and ensure a well-functioning urban environment for all people, communities, and future generations.

118. This includes ensuring urban development occurs in a way that considers the principles of the Treaty of Waitangi (te Tiriti o Waitangi) and issues of concern to hapū and iwi e.g. Te Ture Whaimana – the Vision & Strategy for the Waikato river.

Risks - *Tuuraru*

119. Risks are currently tracked at project and programme level and are reported in the General Manager's report in the open agenda of the meeting. The programme utilises the Council's risk management framework.

120. Through this work, staff have gained a more in-depth understanding of the effects of growth on the river. While some of these adverse effects can be overcome with investment, others are more systemic and associated with the carrying capacity of the environment, namely the river, to support ongoing growth of the city. Not all the associated risks and challenges can be addressed through the district plan. These carrying capacity limits include:

    i. the ability to source water to sustain the growing city, particularly in light of water scarcity risks associated with the impacts of climate change;
    ii. the ability of our waterways to assimilate contaminant loads arising from urban development both through stormwater runoff and wastewater discharges; and
    iii. the ability to manage rainfall events of increasing intensity and frequency coupled with increased imperviousness and associated increased stormwater runoff volumes velocities increasing flood hazard risks, and impacting on receiving water ways through increased erosion and contaminant loads.

Significance & Engagement Policy - *Kaupapa here whakahira/anganui*

Significance

121. Given the statutory requirement to consult, staff have not considered the key considerations under the Significance and Engagement Policy to assess the significance of the matter(s) in this report.

Engagement

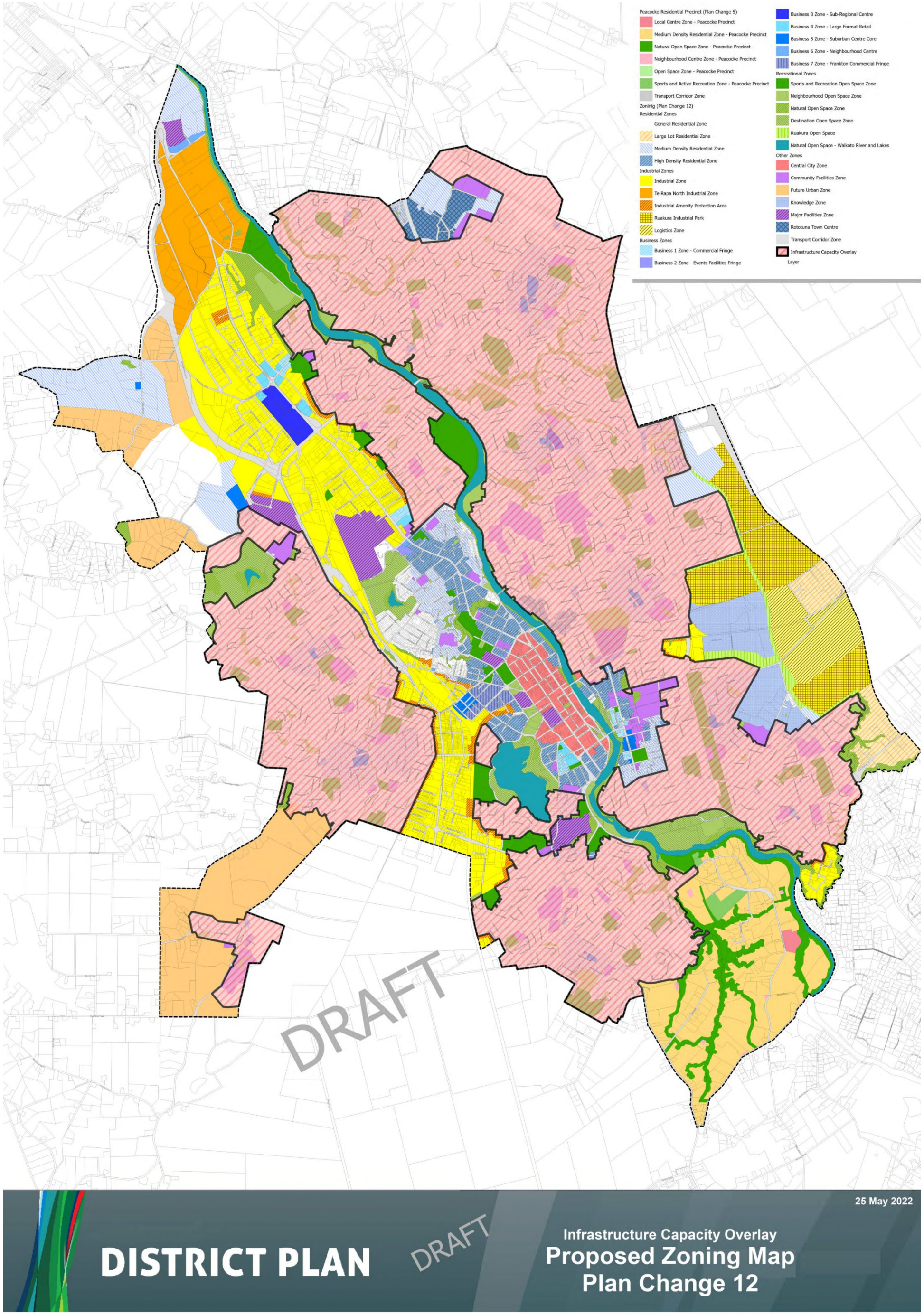
121. A communications and engagement update is provided in the General Manager's report in the open session of this meeting.

Attachments - *Ngaa taapirihanga*

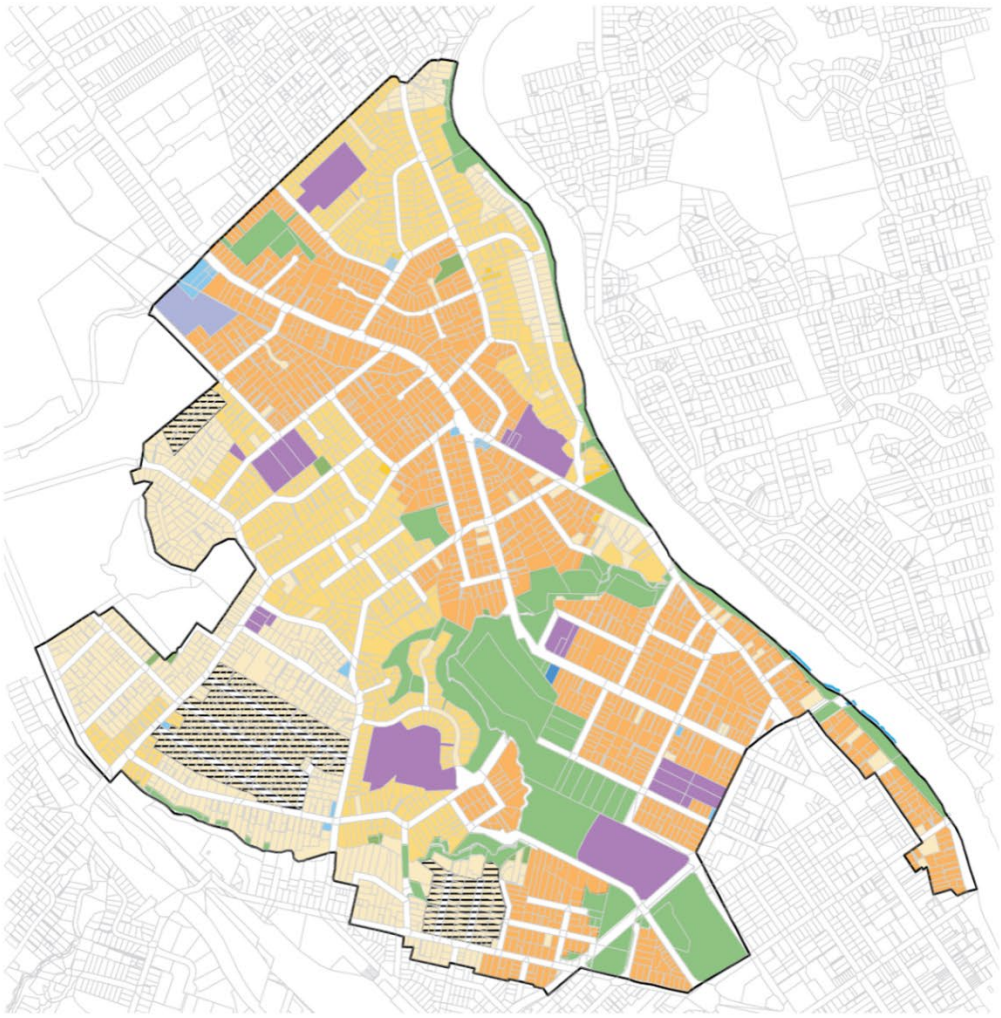
Attachment 1 - Citywide zone map

Attachment 2 - Stage 1 Central City North Area Plan

Attachment 3 - Draft Traffic Light Assessment (Draft V2)

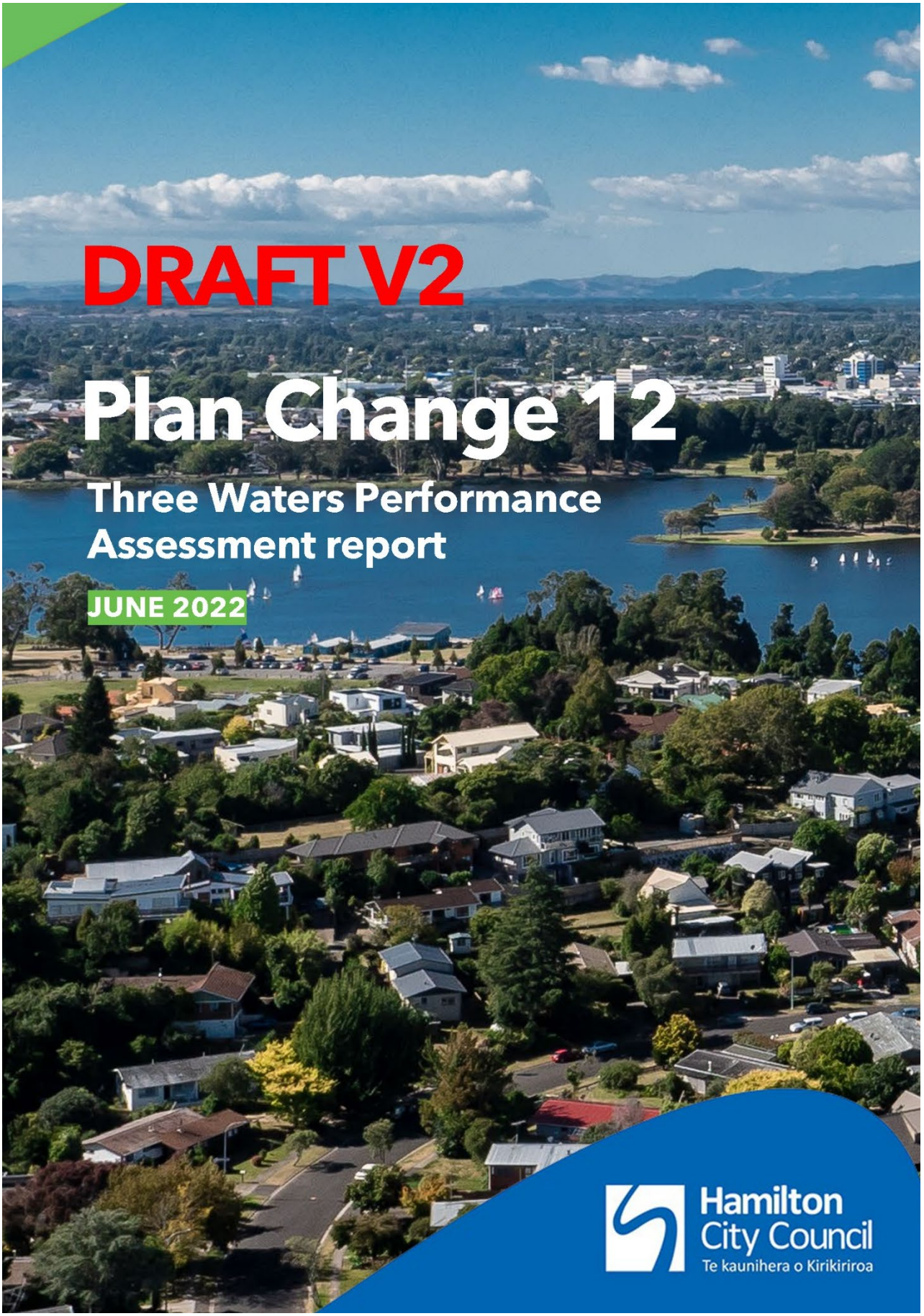

Peacocke Residential Precinct (Plan Change 5)
Local Centre Zone - Peacocke Precinct
Medium Density Residential Zone - Peacocke Precinct
Natural Open Space Zone - Peacocke Precinct
Neighbourhood Centre Zone - Peacocke Precinct
Open Space Zone - Peacocke Precinct
Sports and Active Recreation Zone - Peacocke Precinct
Transport Corridor Zone
Zoninig (Plan Change 12)
Residential Zones
General Residential Zone
Large Lot Residential Zone
Medium Density Residential Zone
High Density Residential Zone
Industrial Zones
Industrial Zone
Te Rapa North Industrial Zone
Industrial Amenity Protection Area
Ruakura Industrial Park
Logistics Zone
Business Zones
Business 1 Zone - Commercial Fringe
Business 2 Zone - Events Facilities Fringe
Business 3 Zone - Sub-Regional Centre
Business 4 Zone - Large Format Retail
Business 5 Zone - Suburban Centre Core
Business 6 Zone - Neighbourhood Centre
Business 7 Zone - Frankton Commercial Fringe
Recreational Zones
Sports and Recreation Open Space Zone
Neighbourhood Open Space Zone
Natural Open Space Zone
Destination Open Space Zone
Ruakura Open Space
Natural Open Space - Waikato River and Lakes
Other Zones
Central City Zone
Community Facilities Zone
Future Urban Zone
Knowledge Zone
Major Facilities Zone
Rototuna Town Centre
Transport Corridor Zone
Infrastructure Capacity Overlay
Layer
DRAFT
DISTRICT PLAN
DRAFT
25 May 2022
Infrastructure Capacity Overlay
Proposed Zoning Map
Plan Change 12

Stage 1 - Central City North Area Plan - Proposed long term land use zoning



Legend

- Low density
- Medium density
- High density
- HHA
- Parks and open spaces
- Centres
- Proposed Neighbourhood Centre
- Community facilities
- Events Facilities Fringe


DRAFT V2
Plan Change 12
Three Waters Performance Assessment report
JUNE 2022
Hamilton City Council
Te kaunihera o Kirikiriroa

Part 1 - TABLE OF CONTENTS

Issue	Reason for Issue	Author	Reviewer	Date
1	Draft for Peer Review	JK,, JC, GB, AC, MM	WSP	March 2022
2	Draft 2 - Update to respond to peer review and provide further	JK,, JC, GB, AC, MM	WSP	June 2022

PART 2 - EXECUTIVE SUMMARY

2.1.1 The purpose of this report is to support Hamilton City Council's response to the requirements of the Resource Management (Enabling Housing Supply and Other Matters) Amendment Act 2021 (the Act) and the National Policy Statement on Urban Development (NPS-UD). In particular, this report considers the implications of more intensive residential development across Hamilton city on our three waters networks and, in turn, on our ability to give effect to Te Ture Whaimana o te Awa o Waikato (TTWM), the Vision and Strategy for the Waikato River.

2.1.2 The Resource Management (Enabling Housing Supply and Other Matters) Amendment Act (the Act) came into law in December 2021, requiring Hamilton City Council to implement a Medium Density Residential Standard (MDRS) across all residential zones in the city.

2.1.3 These standard permits 3 storeys and three units on all sites, regardless of lot size provided certain bulk and location requirements are met. Alongside the Act is also the National Policy Statement on Urban Development. The latter requires Council to up-zone around town centres commensurate with the level of demand.

2.1.4 The Act includes 'qualifying matters' (QM). Where these exist, the territorial authority may moderate the zoning response to accommodate the qualifying matter.

2.1.5 For Hamilton City Council, a key qualifying matter is Te Ture Whaimana o Te Awa o Waikato, the Vision and Strategy for the Waikato River, (Te Ture Whaimana). Te Ture Whaimana is the primary direction and has pre-eminence over the NPS-UD.

2.1.6 This three waters performance assessment work to understand Te Ture Whaimana as a qualifying matter in the context of intensification and 3-waters network capacity. The work highlights that without significant investment, the city's infrastructure cannot accommodate higher levels of urban intensification as required through the Act. To deliver the intensification contemplated without significant investment would result in worsening the effects on the Waikato River and its tributaries which is not in line with Te Ture Whaimana.

2.1.7 The scope of this report includes analysis and commentary regarding the infrastructure for the city's 'three waters' – stormwater, wastewater and water supply – to provide for growth and to give effect to Te Ture Whaimana . Due to the tight timeframes associated with producing this report, the analyses carried out have relied on existing data, information, assessments, and

strategies associated with Hamilton's three waters networks.

2.1.8 To assist interpretation, Council has produced 'traffic light assessments' to show the current state and capacity of each of the three waters' infrastructure. For each of the three waters, 19 areas across the city have been assessed against weighted criteria and then three temporal scenarios to produce traffic light assessments.

2.1.9 The traffic light colours represent the current state and capacity of the city's infrastructure using 2017 to 2019 population figures that Council has used to complete its most recent modelling assessments and three waters master plans. These figures currently exclude NPS-UD requirements and plan-enabled development.

2.1.10 The performance assessments focus on network capacity challenges whilst acknowledging the system wide challenges facing the city including:

- Water allocation constraints
- Stormwater and wastewater contaminant load limitation
- Climate change impacts on urban land-use, water resources, water systems and natural hazards

2.1.11 This report provides an evidence base that demonstrates that Hamilton City's existing 3 waters systems have performance challenges with respect to meeting the obligations under Te Ture Whaimana to varying degrees across the city already. These challenges will be exacerbated by continued infill development in accordance with the City's current duplexing policy, and further compounded by the densities contemplated by NPS-UD and MDRS.

2.1.12 This report highlights that the City's 3-waters systems were designed and constructed to provide levels of service considered appropriate when they were developed and to respond to densities planned for at that time. These levels of service and densities do not reflect current requirements or those anticipated through NPS-UD and MDRS.

2.1.13 Today's environmental, social and cultural expectations and regulatory obligations require levels of service and performance that are significantly higher than delivered historically. Te Ture Whaimana sets out an obligation to deliver 'betterment' to the Waikato River, and not simply to avoid, remedy or mitigate environmental effects.

2.1.14 In addition to these regulatory drivers, the anticipated impacts of Climate Change are now better understood, and land use planning and development that provides for more resilient communities through land use decisions that avoid creating or exacerbating flood hazards should be embedded in our catchment and land-use planning and in our infrastructure responses.

2.1.15 More detailed work will be needed to assess the implications of different land use and growth scenarios, including the proposed planning responses to NPS-UD and MDRS, and develop subsequent infrastructure investment programmes needed to respond to those increased demands.

2.1.16 This report notes that solutions are available to address the infrastructure challenges and improve the health and wellbeing of the Awa from current baseline. Supporting densification will require significant investment on top of what has previously been identified in master plans and LTP funding requests in order to uphold Te Ture Whaimana .

2.1.17 A step change in development densities, will require a step change in infrastructure investment. The level of investment needed to implement the necessary solutions everywhere, all at once is unaffordable. Just adopting MDRS as per the Enabling Act without a clear and committed investment programme increases risk of network failure and adverse effects on Awa and communities. Accordingly, a targeted approach to increased densities is required.

2.1.18 It is important to note that the traffic light colours in this report is not directly transferable into District Plan planning provisions. "Green " does not highlight 'go' areas of the city.

2.1.19 Although this report does not identify specific areas of the city to intensify, it highlights that the costs to provide infrastructure necessary to respond to MDRS everywhere all at once is prohibitive and confirms the need to prioritise where MDRS and higher-density residential development is enabled.

2.1.20 Further work is needed to consider updated growth projections for the city that reflect changing trends in development typology, location and uptake within both brownfields and greenfield areas, and the impact on infrastructure capacity, identify the potential infrastructure investment and other responses necessary to respond to projected growth while meeting the obligations set out in Te Ture Whaimana and other planning and regulatory instruments.

PART 3 - GLOSSARY

Council	Hamilton City Council
District Plan	Hamilton City District Plan
HAF	Housing Acceleration Fund
HCC	Hamilton City Council
ICMP	Integrated Catchment Management Plan
LTP	2021-31 Long Term Plan
MDRS	Medium Density Residential Standards
NPS-UD	National Policy Statement on Urban Development
QM	Qualifying matter (Section 77I and 77O of the Act)
REEP	Regulatory Effectiveness and Efficiency Programme
RITS	Regional Infrastructure Technical SpecificationsSWMPv2 Stormwater Management Plan, version 2
The Act	Resource Management (Enabling Housing Supply and Other Matters) Amendment Act 2021
TLA	Traffic light assessment/s
WWTP	Wastewater Treatment Plant
TTWM	Te Ture Whaimana o te Awa o Waikato - Vision and Strategy for the Waikato River

PART 4 - PURPOSE

4.1.1 The purpose of this report is to provide information in regard to the provision of water supply, wastewater and stormwater services as they relate to urban growth in Hamilton City.

4.1.2 In particular, this report considers the likely implications of more intensive residential development across the city on our three waters networks and in turn on our ability to give effect to Te Ture Whaimana o te Awa o Waikato, the primary direction setting document for activities that impact on the Waikato River.

4.1.3 The report achieves this purpose through assessing existing data, information, assessments and strategic plans based on servicing population and growth projections developed prior to the NPS-UD 2020 and the Resource Management (Enabling Housing Supply and Other Matters) Amendment Act (the Act)

4.1.4 The data documented in this assessment will be used as evidence to inform Hamilton City Council's approach related to the implementation of the Intensification Planning Instrument (IPSs) as required under the Act and NPS-UD.

4.1.5 This data will be likely used in hearings to support Hamilton City Council's position regarding planning provisions.

PART 5 - BACKGROUND

5.1 Context

5.1.1 The Resource Management (Enabling Housing Supply and Other Matters) Amendment Act (the Act) came into law in December 2021, requiring Hamilton City Council to implement a Medium Density Residential Standard (MDRS) across all residential zones in the city.

5.1.2 This standard permits 3 storeys and three units on all sites, regardless of lot size provided certain bulk and location requirements are met. Alongside the Act is also the National Policy Statement on Urban Development. The latter requires Council to up-zone around town centres commensurate with the level of demand.

5.1.3 The Act includes 'qualifying matters' (QM). Where these exist, the territorial authority may moderate the zoning response to accommodate the qualifying matter.

5.1.4 For Hamilton City Council, a key qualifying matter is Te Ture Whaimana o Te Awa o Waikato, the Vision and Strategy for the Waikato River, (Te Ture Whaimana). Te Ture Whaimana is the primary direction and has pre-eminence over the NPS-UD.

5.1.5 This three waters performance assessment work helps to understand Te Ture Whaimana as a qualifying matter in the context of intensification and 3-waters network capacity.

5.1.6 Without significant investment, the city's infrastructure cannot accommodate higher levels of urban intensification as required through the Act without worsening the effects on the Waikato River and its tributaries. The impact of enabling further intensification as the Act and NPS-UD without the funding and implementation plan required for the necessary infrastructure to service it will mean that Hamilton City Council is not giving effect to the Te Ture Whaimana .

5.2 Waikato-Tainui Raupatu Claims (Waikato River) Settlement Act 2010

5.2.1 The Waikato-Tainui Waikato River claim arose from the Crown's Raupatu (confiscation) in the 1860s which denied the rights and interests of Waikato-Tainui in the Waikato River. The river claim was excluded from the 1995 land settlement with Waikato-Tainui and was set aside for future negotiation.

5.2.2 In 2009, Waikato-Tainui entered into a deed of settlement in response of the Raupatu claims over the Waikato River. The Waikato-Tainui Raupatu Claims (Waikato River) Settlement Act 2010 (the Waikato-Tainui Act) gave effect to

the 2009 deed of settlement. The overarching purpose of the settlement is to restore and protect the health and wellbeing of the river for future generations.

5.2.3 The purpose of the Waikato-Tainui Act, as set out in Section 4 is to:

1. give effect to the settlement of raupatu claims under the 2009 deed:
2. recognise the significance of the Waikato River to Waikato-Tainui:
3. recognise the vision and strategy for the Waikato River:
4. establish and grant functions and powers to the Waikato River Authority:
5. establish the Waikato River Clean-up Trust:
6. recognise certain customary activities of Waikato-Tainui:
7. provide co-management arrangements for the Waikato River:
8. provide redress to Waikato-Tainui relating to certain assets:
9. recognise redress to Waikato-Tainui of the Kiingitanga Accord and other accords provided for in the schedule of the Kiingitanga Accord.

5.2.4 Additionally, the Ngaati Tuuwhareetoa, Raukawa, Te Arawa River Iwi Waikato River Act 2010 and the Ngā Wai o Maniapoto (Waipa River) Act 2012 are important pieces of legislation that give effect to Te Ture Whaimana.

5.3 Te Ture Whaimana o Te Awa o Waikato: Vision and Strategy for the Waikato River

5.3.1 Through the Waikato River settlement process between Waikato-Tainui and the Crown, the Guardians Establishment Committee was formed, with the support of other river iwi (Ngati Tuwharetoa, Raukawa, Te Arawa river iwi and Maniapoto). In 2009, this committee finalised Te Ture Whaimana o te awa o Waikato – the Vision and Strategy for the Waikato River (Te Ture Whaimana). Te Ture Whaimana is set out in schedules to the above Acts.

5.3.2 Te Ture Whaimana is the primary direction-setting document for the Waikato and Waipa Rivers and their catchments which include the lower reaches of the Waipa and responds to four fundamental issues:

a. The degradation of the Waikato River and its catchment has severely compromised Waikato River iwi in their ability to exercise mana whakahaere of conduct their tikanga and kawa.

b. Over time, human activities along the Waikato River and land uses through its catchments have degraded the Waikato River and reduced the relationships and aspirations of communities with the Waikato River.

c. The natural processes of the Waikato River have been altered over time by physical intervention, land use and sub-surface hydrological changes. The cumulative effects of these uses have degraded the Waikato River.

d. It will take commitment and time to restore and protect the health and well-being of the Waikato River.

5.3.3 Te Ture Whaimana takes a holistic approach and aims for the restoration and protection of the economic, social, cultural and spiritual relationships that Waikato and Waipā River Iwi have with the Waikato and Waipā Rivers.

5.3.4 Te Ture Whaimana states the vision for the Waikato River as follows:

"Tooku awa koiora me oona pikonga he kura tangihia o te maataamuri.

The river of life, each curve more beautiful than the last

Our Vision is for a future where a healthy Waikato River sustains abundant life and prosperous communities who, in turn, are all responsible for restoring and protecting the health and wellbeing of the Waikato River, and all it embraces, for generations to come."

5.3.5 Te Ture Whaimana includes 13 objectives that were developed to support achieving the vision:

a. The restoration and protection of the health and wellbeing of the Waikato River

b. The restoration and protection of the relationship of Waikato-Tainui with the Waikato River, including their economic, social, cultural and spiritual relationships

c. The restoration and protection of the relationship of Waikato River iwi, according to their tikanga and kawa, with the Waikato River, including their economic, social, cultural and spiritual relationships

d. The restoration and protection of the relationship of the Waikato region's communities with the Waikato River including their economic, social, cultural and spiritual relationships

e. The integrated, holistic and coordinated approach to management of the natural, physical, cultural and historic resources of the Waikato River

f. The adoption of a precautionary approach towards decisions that may result in significant adverse effects on the Waikato River

g. The recognition and avoidance of adverse cumulative effects, and potential cumulative effects, of activities undertaken both on the Waikato River and within its catchments

h. The recognition that the Waikato River is degraded and should not be required to absorb further degradation as a result of human activities

i. The protection and enhancement of significant sites, fisheries, flora and fauna

j. The recognition that the strategic importance of the Waikato River to New Zealand's social, cultural, environmental and economic wellbeing is subject to the restoration and protection of the health and wellbeing of the Waikato River

k. The restoration of water quality within the Waikato River so that it is safe for people to swim in and take food from over its entire length

l. The promotion of improved access to the Waikato River to better enable sporting, recreational, and cultural opportunities.

m. The application of both maatauranga Māori (body of Māori knowledge originating from ancestors) and latest available scientific methods.

5.3.6 Te Ture Whaimana includes 12 strategies to support achieving the objectives and vision.

5.3.7 Te Ture Whaimana has status through at least 20 enactments which influence the management and use of the Waikato and Waipa Rivers and their catchments.

5.3.8 Importantly, if there is any inconsistent provision in an RMA planning document, including any national policy statement (e.g., NPS-UD), Te Ture Whaimana prevails.

5.4 National Policy Statement on Urban Development 2020 (NPS-UD)

5.4.1 The NPS-UD directs Hamilton City Council to remove overly restrictive planning rules that make it more difficult to build homes. It requires Council to respond to changes in demand by enabling greater housing density within walkable distances of areas such as the city centre, local amenity nodes and rapid transit stops.

5.5 Resource Management (Enabling Housing Supply and Other Matters) Amendment Act 2021

5.5.1 This amendment to the Resource Management Act requires tier 1 councils,

including Hamilton, to adopt Medium Density Residential Standards (MDRS). The MDRS' will enable landowners to build up to three houses of up to three storeys on their site as of right on most sites.

5.5.2 The RMA (Housing Supply) Amendment Act, provides for a territorial authority may make the MDRS and the relevant building height or density requirements under policy 3 less enabling of development in relation to an area within a relevant residential zone only to the extent necessary to accommodate 1 or more of the following qualifying matters that are present:

a. a matter of national importance that decision makers are required to recognise and provide for under section 6:
b. a matter required in order to give effect to a national policy statement (other than the NPS-UD) or the New Zealand Coastal Policy Statement 2010:
c. a matter required to give effect to Te Ture Whaimana o Te Awa o Waikato–the Vision and Strategy for the Waikato River:
d. a matter required to give effect to the Hauraki Gulf Marine Park Act 2000 or the Waitakere Ranges Heritage Area Act 2008:
e. a matter required for the purpose of ensuring the safe or efficient operation of nationally significant infrastructure:
f. open space provided for public use, but only in relation to land that is open space:
g. the need to give effect to a designation or heritage order, but only in relation to land that is subject to the designation or heritage order:
h. a matter necessary to implement, or to ensure consistency with, iwi participation legislation:
i. the requirement in the NPS-UD to provide sufficient business land suitable for low density uses to meet expected demand:
j. any other matter that makes higher density, as provided for by the MDRS or policy 3, inappropriate in an area, but only if section 77L is satisfied.

5.6 Te Ture Whaimana as a Qualifying Matter

5.6.1 The Resource Management (Enabling Housing Supply and Other Matters) Amendment Act 2021 specifically identifies Te Ture Whaimana as a Qualifying Matter under the NPS-UD.

5.6.2 This three waters system performance assessment is focussed primarily on Te Ture Whaimana as a qualifying matter. As such, the criteria developed for the assessment are considered to have direct linkages with Te Ture Whaimana. It is important to note that the assessment does not include all of

the criteria that would typically be utilised for a comprehensive infrastructure performance assessment, as infrastructure performance in and off itself is not a qualifying matter defined in the Act.

5.7 Hamilton City District Plan

5.7.1 The purpose of the Hamilton City District Plan (the District Plan) is to enable the Council to carry out its functions under the Resource Management Act 1991, the purpose of which is to promote the sustainable management of natural and physical resources.

5.7.2 **Area Plans**

(a) Area Plans are being developed for four areas in the city: North of the Central City, Eastern Hamilton, Five Cross Roads and Chartwell. The locations of these Area Plans were chosen based on the high levels of accessibility in these areas to the Central City or to suburban/subregional centres, per the requirements of the NPS-UD, and considering the potential for these areas to transform into denser well-functioning urban environments. The Area Plans review the natural, infrastructure, social, and environmental constraints, and opportunities of each of these areas. These considerations inform key moves and recommendations intended to help these places become well-functioning urban environments as they intensify over time. The Area Plans also set out recommendations for the NPS-UD Plan Change with respect to the four areas (including rezoning) and actions for relating to other processes and projects, including the Long Term Plan and future Business Cases.

5.8 2021-31 Long Term Plan and 2021-51 Infrastructure Strategy

5.8.1 Hamilton City Council's 2021-31 Long Term Plan outlines Council's plans, budgets, and priorities for the next decade, with a focus on the next three years.

5.8.2 The purpose of the 2021 – 2051 Infrastructure Strategy is to identify significant infrastructure challenges for Hamilton City Council over the next 30 years, and to identify the principal options for managing those challenges and the implications of those options.

5.8.3 Council currently manages a $4.5 billion portfolio of assets, and this is expected to grow significantly over the next 30 years. This is a significant investment in our city and Council is focussed on optimising this investment

to improve the wellbeing of Hamiltonians.

5.8.4 The Infrastructure Strategy outlines a number of specific issues:

(a) Increasing compliance, capacity, and resilience of water network

(b) Enabling growth

(c) Increasing requirements and expectations for transport mode shift

(d) Affordability

(e) Increasing requirements and expectations relating to climate change and natural hazards

5.8.5 Current funded projects do not provide for current plan enabled capacity. Even if unfunded projects were included in the LTP, there would still be significant infrastructure funding deficit to deliver the density expectations of the NPS-UD.

5.9 Wellington Water Three Waters Assessment report

5.9.1 In 2021, Wellington Water used a traffic light system to indicate the state and capacity of three waters infrastructure in its "Wellington City Council - Spatial Plan Three Waters Assessment – Growth Catchments Mahi Table and Cost Estimates" report.

5.9.2 The assessment summarised the existing three waters network constraints, infrastructure upgrades and environmental considerations to support growth.

5.9.3 Wellington was divided up into 22 areas for the purpose of their report; a similar approach has been taken by Hamilton City Council in producing this report.

5.9.4 The Wellington Water report used 'mahi tables' to "demonstrate the level of network constraint or the effort/work (mahi) required in each suburb, for each of the three waters to support growth information from previous assessments combined with updates". The 'mahi tables' utilised a traffic light assessment approach, with mahi categorised as low (green), medium (yellow) or high (red). This simple, visual, broad categorisation has also been utilised in this report prepared by Hamilton City Council.

PART 6 - THREE WATERS INFRASTRUCTURE DESCRIPTIONS

6.1 Water Supply

6.1.1 Council provides Hamilton's residents and businesses with a safe, high-quality, reliable and sustainable service, through treatment, distribution and management of Hamilton's water supply.

6.1.2 Raw water is drawn from the Waikato River into the water treatment plant, where it is treated to provide a high standard of drinking water. Council also strives to provide water at the appropriate pressure for its intended use and firefighting.

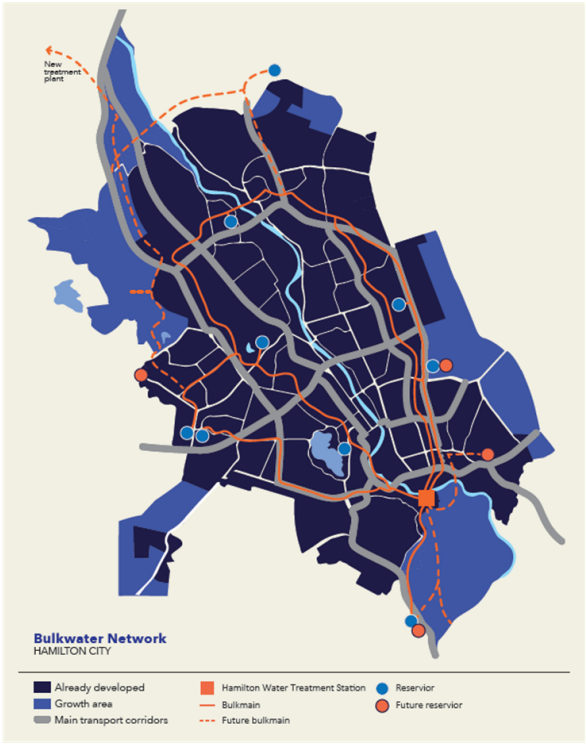


Figure 1- Hamilton City Bulk Water Supply Network

6.1.3 The City's water supply system is made up of a single treatment plant, nine reservoirs and over 1,250km of associated pipe network.

6.1.4 Figure 1 diagrammatically shows the key strategic elements of the current and planned water networks (based on the recommendations in the 2020 Water Master Plan).

Water Allocation Consent

6.1.5 Hamilton is wholly dependent on the Waikato River for its water supply, as are many other Waikato towns.

6.1.6 In 2009, WRC granted HCC a 35-year consent to extract water from the Waikato River (HCC consent) which expires in 2044. The HCC consent provides for increases in maximum daily take volumes starting from 105,000 cubic metres per day in 2009 to 146,000 cubic metres per day from December 2038.

6.1.7 The consent provides for increases in maximum daily take volumes, and HCC can apply to Waikato Regional Council every 6 years to move to the next step and increase the maximum daily take volume approved for that step. This stepped approach ensures that, as the city grows, so does the amount of water HCC can take from the river to meet increased demand. It also allows other users of the Waikato River access to the water on a short to medium-term until such time as the population within Hamilton grows to necessitate the additional take authorised by the consent.

6.1.8 The 'stepped' take volumes authorised in the HCC consent were based on growth forecasted at the time of consent. These forecasts did not include for rate of growth being experienced in HCC in recent times for both residential and non-residential land use activities.

Water treatment

6.1.9 The treatment plant relies on the Waikato River as a single water source. The plant is capable of drawing up to 105 million litres of water per day from the river. Between 2.5 and 5.0% of all water is returned to the river as part of the treatment process. The sustainable peak treatment capability of the plant is about 78 million litres per day. During summer, peak demand has reached up to 90 million litres per day and in the evenings a large portion of the demand for water is met from reservoir storage.

Water storage

6.1.10 The City has nine reservoirs, providing a total of 112 million litres storage. Water storage equivalent to peak demand per day is required for emergency purposes. However, as the city grows, additional reservoir storage will be required for emergency purposes and water supply during peak periods.

Water distribution

6.1.11 Treated water is pumped from the treatment plant to the reservoirs and users through approximately 1,250km of pipe network. As is expected in any urban centre, the network is made up of various pipe materials of different ages, which results in some water loss through leakages. The leakage in Hamilton is estimated to currently be about 16% of water that is treated.

Water Supply Master Plan

6.1.12 The Water Supply Master Plan 2020 for the Hamilton Water Network has been prepared to provide Hamilton City Council with a blueprint that addresses the current technical requirements needed to meet current and future demand from growth.

6.1.13 The Master Plan is a technical, strategic infrastructure-based document, summarising the high-level assumptions, objectives and recommendations.

6.1.14 The Master Plan captures Hamilton's proposed growth across Hamilton for seven design horizons: 2021 to 2061, RITS densities and City Full. The increased consumption is based on the 2017 Population Model developed by AECOM.

6.1.15 The level of service targets that are used to assess and determine infrastructure needs across the city are described in the Water Master Plan 2020 and summarised below.

Table 1 - Water Supply Target Levels of Service (Water Master Plan 2020)

Parameter	Target	Source
Minimum Pressure	20m	Regional Infrastructure Technical Specifications (RITS)
Maximum Pressure	80m	Desirable operating level for this Master Plan based on observed/modelled maximum pressure
Fire Fighting	Conform to NZ Code of Practice	NZ Fire Fighting Water Supplies Code of Practice (SNZ PAS 4509).
Reservoir Minimum Storage Volume	24 hour of 1.15 peak day demand for each zone and across the whole water network	Desirable operating level for this Master Plan based on operational needs and emergency strategy
Reservoir Turnover	• 50% turnover once a day whilst maintaining: • Volume equivalent to the maximum fire class required in the zone • 4 hours peak day storage	Desirable operating level for this Master Plan in line with WTP requirements
Maximum Head Losses	• 5m/km for 50mm to 249mm diameter pipes • 3m/km for 250mm to 599mm diameter pipes • 2m/km for ≥600mm diameter pipes	Desirable operating level for this Master Plan based on modelled maximum head losses for new infrastructure

6.1.16 The Water Master Plan provides a detailed infrastructure programme of works to respond to the projected growth and development, meet the target levels of service, reduce water demand (through reduced leakage, reduced per capital consumption and alternative water sources) and recognise the limitations on the existing Water Treatment Plant.

6.1.17 The Water Master Plan future operating strategy has been developed to increase network resilience, energy efficiency, optimise investment and simply operations across the network to deliver consistent levels of service. Key elements of the recommended investment programme include:

- Creation of new demand management zones
- New and upgraded bulk mains, ring mains and booster pump stations
- New reservoirs
- New service mains
- Universal metering
- Brownfield network upsizing
- Capacity and quality upgrades of the Waiora WTP
- New Northern WTP

6.1.18 Currently, Hamilton's water network is subdivided into four pressures zones,

three single-reservoir zones (Red, Orange and Rototuna) and one large zone (Blue Zone). The Blue Zone is serviced from 4 reservoirs and associated pump stations. Several (21) supply points distribute water through the Blue Zone local reticulation.

6.1.19 Isolating all the reservoirs into water supply zones is the recommended approach for future operation. This means that the existing bulk ring main will be used as a dedicated reservoir filling line. Some sections of the existing bulk ring main will also be used as strategic bulk supply mains so that each reservoir will have both a dedicated fill line from the bulk ring main and supply line into the distribution network.

6.1.20 Isolating each reservoir will simplify network operation for each zone and help with identifying and prioritising network water loss. Reservoir isolation also allows the reduction of peak flows in the network with storage; it provides a much more consistent level of service in each zone and minimises flow fluctuations out of the water treatment plant (WTP), while increasing reservoir turnover. This then reduces the need for WTP upgrades and overall power costs.

6.1.21 Investment in asset renewals and strategic planning tools (including water network models) are also integral components maintaining and operating the water supply system.

6.2 Wastewater System

6.2.1 Council provides Hamilton's residents and businesses with a sustainable, reliable and cost-effective service which includes collection, conveyance and treatment of wastewater and trade wastes discharges.

6.2.2 The City's wastewater system is comprised of a single centralised wastewater treatment plant, 132 pump stations and over 800km of connecting pipework. The system services over 50,000 households and provides trade waste services to over 5,000 commercial and industrial premises.

6.2.3 Figure 2 diagrammatically shows the key strategic elements of the current and planned wastewater networks (based on the recommendations in the 2020 Wastewater Master Plan).

Wastewater reticulation and pump stations

6.2.4 Wastewater is removed from commercial, industrial and residential properties via various pumping station and pipe networks to the wastewater treatment plant. As is expected in any urban centre, the network is made up of various pipe materials and ages, which results in some water infiltration.

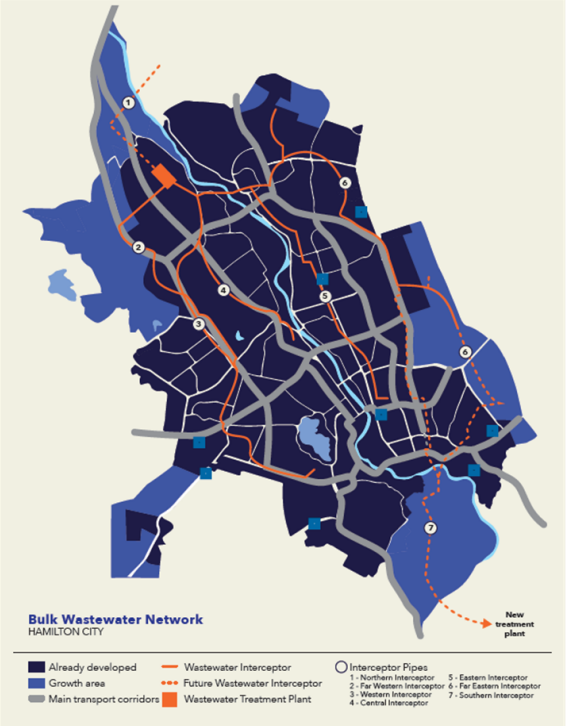


Figure 2- Strategic Wastewater Network

6.2.5 Hamilton is served by five wastewater interceptors (Western, Far Western, Central, Eastern, Far eastern). All interceptors operate by gravity except for the Western Interceptor which has two on-line pump stations (Dinsdale and Lorne Street). Interceptors receive wastewater from local gravity trunk pipelines and satellite pump stations within the trunk network.

6.2.6 The city has over 130 pump stations which are controlled through a centralised computer system. The Council has commenced an upgrade programme to achieve a six-hour storage standard for all wastewater pump stations to provide improved environmental performance in the event of power or pump failure.

6.2.7 The HCC wastewater network is subject to overflows. Overflows occur for a variety of reasons including stormwater infiltration during wet weather, wastewater flows in excess of design capacity, and blockages. Overflow discharges of wastewater from the HCC wastewater network are not currently authorised by a resource consent.

Wastewater treatment

6.2.8 Hamilton City is currently serviced through a single wastewater treatment plant at Pukete. The treatment plant is a biological plant that can receive and provide primary treatment for up to 2,000 litres per second of wastewater and up to 600 litres per second for secondary treatment (nitrogen removal

etc.).

6.2.9 Our wastewater treatment plant relies on the Waikato River as the receiving environment for final treated effluent. The quality of final discharge has improved over time as capital improvements have occurred on site, however ongoing investment in system upgrades is necessary to maintain compliance with relevant discharge limits year-round and to ensure adequate treatment capacity is available to service growth.

6.2.10 The existing Pukete WWTP site has limited space for future expansion and an additional treatment plant will be needed to meet the long term needs of Hamilton. In addition, given that Pukete WWTP is located at the northern end of Hamilton, the cost of strategic network upgrades to convey wastewater from the southern areas to the Pukete WWTP is likely to be cost prohibitive.

6.2.11 The Hamilton-Waikato Metro Wastewater Detailed Business Case project has investigated and recommends a preferred servicing solution for the Metro Area to overcome these challenges.

Wastewater Discharge Consents

6.2.12 The existing resource consent to discharge treated wastewater from Pukete to the Waikato River expires in 2027.

6.2.13 Given the primacy of Te Ture Whaimana and the requirements of the NPS-FM a high focus on discharge quality is expected to authorise continued discharge from the Pukete WWTP.

6.2.14 The existing resource consent for the wastewater treatment plant expires in 2027 and a high focus on discharge quality is expected in order to give effect to Te Ture Whaimana and other relevant policies and plans.

6.2.15 As is typical for urban wastewater networks, the Hamilton City wastewater network experiences overflow discharges during storm events and as a result of network blockages. These overflows currently occur as unauthorised discharges.

Wastewater Master Plan

6.2.16 The Wastewater Master Plan 2020 for the Hamilton Wastewater Network provides Hamilton City Council with a blueprint that addresses the current technical requirements needed to meet current and future demand from growth.

6.2.17 The Master Plan is a technical, strategic infrastructure-based document, summarising the high-level assumptions, objectives and recommendations.

6.2.18 The Master Plan captures Hamilton's proposed growth across Hamilton for seven design horizons: 2021 to 2061, RITS densities and City Full. The

increased demand, network performance assessments and recommended network upgrades are based on the 2017 Population Model developed by AECOM.

6.2.19 The level of service targets that are used to assess and determine infrastructure needs across the city are described in the Wastewater Master Plan 2020 and include:

(a) Recommending upgrades to avoid capacity related dry-weather wastewater overflows

(b) Reducing the frequency, location and scale of wet weather wastewater overflows in 5% Average Exceedance Probability (AEP) rainfall events (equivalent to 2-year average recurrence interval rainfall events)

6.2.20 The Wastewater Master Plan provides a detailed infrastructure programme of works to respond to the projected growth and development and meet the target levels of service. Key elements of the recommended investment programme include:

- Wastewater interceptor network upgrades
- Bulk wastewater storage facilities across the city
- Trunk pump station and pipeline upgrades and diversions
- Local network upgrades in brownfield areas
- Continued investment to reduce water use, inflow and infiltration
- Treatment plant upgrades

6.2.21 Options for treatment of wet weather overflows prior to discharge to the receiving environment and for authorising the discharge of wastewater from the network under wet weather conditions were also recommended for further investigation.

6.2.22 Investment in asset renewals and strategic planning tools (including wastewater network monitoring systems and models) are also integral components of maintaining and operating the wastewater supply system.

6.2.23 The Wastewater Master Plan notes that as aged pipelines are renewed that it is important that growth related demands are also considered and that the opportunity to provide for future flows is taken up.

Hamilton-Waikato Metro Wastewater Detailed Business Case

6.2.24 The Waikato - Hamilton – Waipā Southern and Northern Metro Wastewater Detailed Business Cases are being jointly delivered through strong collaboration between the Iwi, mana whenua and Waikato, Hamilton and Waipā Councils.

6.2.25 The Waikato region has seen tremendous growth and development in

commercial, industrial, and residential areas, placing pressure on existing wastewater services and creating further demand for wastewater treatment and management services.

6.2.26 The collaborative relationships established to deliver this project represents the era of co-management in respect of the Waikato River and activities within its catchment and joint recognition of the benefits of "boundaryless" planning to restore and protect the health and wellbeing of the Waikato River and meet the current and future needs of the Metro Area.

6.2.27 Te Ture Whaimana o Te Awa o Waikato – the Vision and Strategy for the Waikato River (Te Ture Whaimana) is the primary direction setting document for the Waikato River and for activities within its catchment and forms the foundation for this project.

6.2.28 The recommendations in the DBC seek to actively contribute to achieving the vision and objectives set out in Te Ture Whaimana by delivering "best for river" wastewater management solutions, recognising and providing for the unique relationship that taangata whenua have with the awa as well as contribute to the social and cultural wellbeing of the community.

6.2.29 Through the DBC, the parties have identified preferred servicing solutions for wastewater infrastructure and have worked through how these might be planned for, constructed, and funded. The preferred servicing solution for Hamilton (and the broader Metro Area) involves:

i. The adoption of minimum treatment performance standards across all WWTPs, over time
ii. A new Southern Sub-Regional WWTP to service the airport area and environs (including Mātangi/ Tamahere commercial area) and southern Hamilton.
iii. Retaining and upgrading the Tauwhare Pā WWTP and land discharge to service local growth with the potential to be reticulated to the SS WWTP or HCC network in the future.
iv. Upgrading the Pukete WWTP to service the majority of Hamilton City, and the reticulated communities north of Hamilton to Taupiri.

6.2.30 The minimum performance standards adopted for the WWTPs support a significant reduction in the nutrient contaminant loading rates to the Waikato River from the current baseline, thus contributing toward Te Ture Whaimana.

6.2.31 The draft P50 capital cost estimates to upgrade Pukete WWTP only (excluding conveyance network upgrades and assuming a continued discharge to water) to these standards and provide for growth to 2061 (based on 2017 projections) is approx. $771 million (in $2022). The draft P95 capital cost estimates is approx. $1.3 billion (in $2022)

6.3 Stormwater System

6.3.1 Council provides services to Hamilton's residents and businesses that protects the health of people and to prevent habitable building inundation from flooding and minimises the pollution of the city's streams, lakes and the Waikato River.

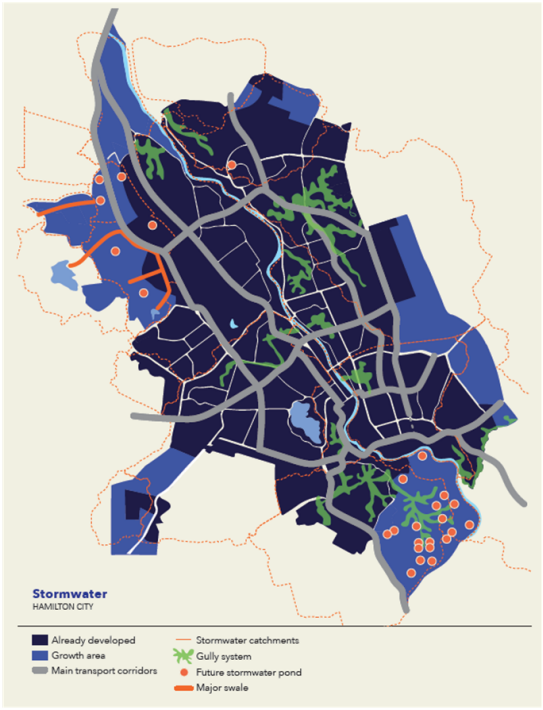


Figure 3 - Stormwater Elements

6.3.2 The stormwater system collects, diverts, conveys, treats and discharges rainwater to land or surface water. It comprises the piped network, including inlets and outfalls, artificial drains, stormwater treatment devices such as ground soakage, raingardens and constructed wetlands, and natural features such as streams, the Waikato River or lakes to which the stormwater is discharged. The stormwater system also includes overland flow paths, which may lie anywhere - on roads, parks or private property.

6.3.3 The system drains an urban catchment of approximately 9,000ha however the total catchment area draining to the city reach of the Waikato River is much larger at approximately 30,000ha.

6.3.4 Figure 3 diagrammatically shows the key strategic elements of the stormwater system including catchment boundaries, significant transport routes, gullies and planned significant stormwater management devices based on the recommendations in the 2020 Stormwater Master Plan).

6.3.5 Hamilton's stormwater network services a variety of land uses including:

- Residential land uses (e.g., Private homes and driveways).
- Industrial and commercial land uses (e.g., Wholesale and retail outlets, depots, manufacturing sites, warehouses, workshops).
- Roads and car parks.

- Community facilities (e.g., Hamilton Lake, Claudelands Event Centre, parks and sports areas, Waikato Hospital, schools, and tertiary educational institutions).
- Runoff from undeveloped catchments.

6.3.6 The stormwater network is also used to dispose of potable water during the maintenance of reservoirs, and from flushing and testing of fire hydrants.

Comprehensive Stormwater Discharge Consent

6.3.7 Stormwater discharge activities require assessment under the Waikato Regional Plan. The Council has a 'City-wide' comprehensive stormwater discharge consent from Waikato Regional Council to divert and discharge stormwater to receiving environments from its existing urban network.

6.3.8 The consent was granted in 2011 and will expire on 30 June 2036. It authorises discharges existing at that time in the City and new discharges, subject to conditions requiring mitigation of effects on the receiving environment, water quality improvements and compliance with Catchment Management Plans (CMPs). The CSDC shifted Council's focus from managing only flooding effects to a more holistic environmental-outcomes approach using CMPs.

6.3.9 Integrated catchment management plans are being developed for each of the city's stormwater catchments to make sure stormwater infrastructure is planned, developed and managed in the most efficient and practicable way for the specific catchment. There are different options for dealing with stormwater and the most efficient approach depends on the specific catchment.

6.3.10 The Council has consent from Waikato Regional Council for its stormwater discharges into the Waikato River. This consent is for the urban catchments within Hamilton and authorises the discharge of stormwater from 'existing' developed areas. Any new discharges will only be approved if they are supported by an approved catchment management plan.

6.3.11 The purpose of these plans in relation to stormwater is to:

- Provide guidance to developers and regulatory bodies on how stormwater from new developments will be managed and integrated with other water services and proposed future land uses.
- Minimise the need for stormwater treatment and detention devices.
- Propose opportunities for the reuse of stormwater to reduce water demand.
- Minimise stormwater and the effects of urbanisation on river and streams.
- Lessen flood hazards on private property

- Involve other stakeholders (such as taangata whenua, recreational and local interest groups) who may wish to contribute to the management of the catchment's waterbodies.

Stormwater Master Plan

6.3.12 The Stormwater Masterplan is underpinned by the strategic stormwater modules. The purpose of the Stormwater Modules is to provide best practice guidance and a consistent methodology around the collection, delivery and use of data for the management of stormwater.

6.3.13 Figure 4 shows how the modules make up the technical delivery framework and the delivery workflow developed as part of this Masterplan to generate consistent outcomes.

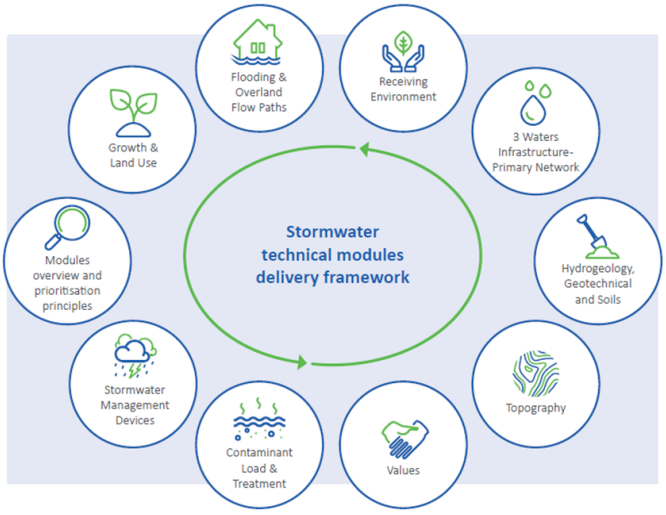


Figure 4 - Stormwater Masterplan technical modules and delivery framework

6.3.14 The key issues identified (based on data analysis where available) in the Stormwater Master Plan are:

Flooding and OLFP
• A total of 16,600 building footprints were intersected by a flood hazard in a 100-year flood event based on available data. • More than 1,500 building footprints are within areas designated 'high hazard' (>1.5m depth of water). However, 90% of these were identified from the rapid flood hazard results • Nearly 9,000 building footprints were intersected by an OLFP.
Receiving Environment
• 238 high watercourse reaches were identified as high susceptibility to erosion and have nearly 1,000 building footprints within 6m. • 700 ha of potential restoration within the current city boundary. This needs to be refined by removing completed areas (including community planting). • 55 fish passage barriers.
Devices
• Approximately 5,000 ha greenfields area (including some areas outside HUGS)

• Approximately 5,000 ha untreated brownfield, which requires treatment to restore the Waikato River and its tributaries. Retrofit is significantly more expensive.

6.3.15 The Stormwater Master Plan recommends a number of mega programmes and associated programmes to address the identified issues. These programmes include:

- Watercourse Restoration and protection
  - Erosion control
  - Watercourse restoration
  - Investments for compliance with comprehensive consent (e.g., fish passage)
- Stormwater Management Device needs for greenfield development areas and for brownfield area improvements
- Stormwater Network improvements
- Flood Management and overland flow path management.

6.3.16 In addition to the capital works programmes, a key outcome of each module is the identification of opportunities to improve processes, recommend regulatory change or fill key data gaps. A summary of key opportunities identified as part of the SMPv2 is given below.

Flooding and Overland Flowpaths (OLFP)
• Development and implementation of a capital works programme targeted at flooding and OLFP mitigation works. • The flooding module identified a number of building footprints with potentially significant impacts, which needs to be effectively communicated. • Update the current modelling specification to align with current industry best-practices and focus on the delivery of outputs in a way that maximises usefulness for HCC. • Update the current suite of flood risk modelling outputs city-wide. The majority of current flood modelling outputs were generated 7-8 years' ago using 2008 terrain data. The latest LiDAR capture offers an opportunity to update flood risk information across the city.
Primary Network
• Existing stormwater modelling may have network capacity data that can be processed into useful outputs for HCC. • More network capacity information is required city-wide to understand network constraints. This can be captured through the updated modelling methodology. • Maintenance access to brownfield primary network systems (watercourses and open channels) needs to be improved and current access points collated into a useful tool for the operations team.
Values
• Development and implementation of a programme to implement identified values projects. • The 'Te Mana O Te Wai' layer developed as part of SMPv2 is a powerful geospatial tool. An appropriate communications platform should be identified.
Receiving Environment

• Continued refinement of the data update, issue prioritisation and project scoping processes – incorporation of resilience and business continuity. • Refinement of the issue prioritisation, including refining a biodiversity/restoration prioritisation indicator, and increasing the weighting of values. • The receiving environment module identified a number of waterway reaches with significant erosion impacts. This could have effects beyond waterway stability (i.e., properties/infrastructure) and needs to be effectively communicated.
Contaminant Load Model
• Stormwater management for all redevelopment needs to be implemented through a District Plan change. • Some form of water quality management on all new lots, requires a District Plan change. • Industry is moving towards more sophisticated approaches to estimating containment loads, resulting in more efficient management outcomes. An example of this is a continuous simulation approach, combining a baseline hydrology, water quality model and a stormwater management model to simulate the effectiveness of performance of stormwater management devices and non-structural measures.
Devices
• Hundreds of millions will be invested in green infrastructure (best practice stormwater management devices). This is a relatively new, and very specific area that crosses many disciplines and Council units. Investment into the design, auditing, vestment and maintenance aspects is critical. It is recommended that Council creates a 'green infrastructure' role to ensure optimal outcomes, educate business owners, ensure certification of contractors, oversee maintenance programmes, update design guidance and hold educational workshops with internal and external stakeholders. • Life Cycle cost comparison shows small scale bioretention devices (raingardens) are significantly more expensive. An update to the RITS for device hierarchy is recommended to lower the acceptability of these outcomes. • Stormwater Management usually involves a 'treatment train', starting at source, which is often at the road or on private lots. Recording of all devices is critical to understanding the overall effect on protection of, the receiving environment. A system to record devices, and educate owners, is required to be refined and implemented. • Enhancement of the existing brownfield device works program.
General
• Completion of the current update to the Stormwater Modules document. • Internal access and education of the available datasets, with a move towards public availability. • Regular (6-monthly) meetings between Strategic Unit and Business Owners to support updates of data (to GIS) and issue prioritisation on registers to improve business resilience, continuity and transparency.

PART 7 - INFRASTRUCTURE INVESTMENT TO SUPPORT GROWTH

7.1 Unfunded infrastructure in the 2021-51 Infrastructure Strategy

7.1.1 Hamilton City Council has over $1 billion of unfunded infrastructure projects in the first ten years of the 30-year Infrastructure Strategy. For the three waters asset classes, these unfunded projects total $399 million:

(a) Water $145 million

(b) Wastewater $204 million

(c) Stormwater $ 49 million

7.1.2 The Infrastructure Strategy indicates significant future funding challenges and estimates a requirement for $12.8 billion of capital investment over the next 30 years to meet the city's current needs. While this includes investment in sub-regional infrastructure to service growth outside our boundaries, such as our anticipated share of $244 million for a new wastewater treatment plant and $336 million for a new water treatment plant, it has not fully captured the needs of infill and intensification plan-enabled capacity, expanding growth areas outside our current city boundary nor the potential full extent of the recent NPS-UD changes and its intensification expectations.

7.2 Stormwater

7.2.1 Council's Stormwater Master Plan has identified there is a significant investment in stormwater infrastructure required to deliver on the Vision of enhancing the health of the Waikato River. To improve stormwater treatment in the existing city, Council has budgeted $1.68 billion from 2032-2051 in the 2021-51 Infrastructure Strategy.

7.3 Wastewater

7.3.1 Two major upgrades to Hamilton's wastewater treatment plant are funded in the 2021-31 Long Term Plan. $172 million has been budgeted to carry out these upgrades, with the first tranche of work taking place in 2024.

7.3.2 The Subregional 3 Waters Strategy has identified the opportunity to improve the subregion's quantity, quality, and treatment of wastewater. Over the next few years Council has the opportunity to partner with other Councils in the subregion to create a multi-plant subregional wastewater system. $9.3 million of budget is included in the 2021-31 Long Term Plan for Council's share of design and to secure the future option. Over $120 million remains unfunded from 2028/29 to 2030/31 for substantive construction with

additional construction costs outside the 10 years. In total, $244 million has been included in the 2021-51 Infrastructure Strategy to support the additional wastewater treatment plant.

7.4 Water supply

7.4.1 $336 million is in the 2021-51 Infrastructure Strategy to construct an additional water treatment plant. This is in years 2031/32 to 2034/35. A second treatment plant could increase treatment capacity for the subregion and, depending on the water source and associated reticulation, significantly improve resilience for water supply. The opportunity would need to be progressed with partnership from other subregional partners.

7.4.2 As part of any water take consent the Council needs to demonstrate that it is a responsible manager of the limited water resource. The Council has a range of initiatives and tools to help manage the increase in demand for water as the city grows. However, by 2029 the need for a further significant demand management intervention is forecasted. The nature of this intervention is yet to be determined. The intervention included is forecasted at $53 million – this includes installation of meters throughout the city.

7.5 Proactive intensification - Infrastructure to support future District Plan changes

7.5.1 A multi-decade programme with three packages of investments in three waters and transport infrastructure to support changes in land use for intensification precincts within the existing city.

7.5.2 In years 2024-2031 in the 2021-31 Long Term Plan, $114 million has been allocated. A further $262 million has been budgeted for 2031-2041, with the final package of investments totalling $64 million for 2041-2051. The three packages of work total $440 million.

Note: refer to Appendix B for an infographic from the 2021-51 Hamilton City Infrastructure Strategy

PART 8 - SYSTEM-WIDE INFRASTRUCTURE / SERVICING CHALLENGES

This section provides a high-level overview of the system wide servicing challenges affecting all of Hamilton city wide irrespective of the geographic location of growth within the city. These matters include but are not limited to:

- Water resource availability and limits (e.g., allocation for water supply, and contaminant load assimilative capacity of receiving waterways)
- Impacts of climate change of waters infrastructure and natural hazards
- Impacts of intensification on local network capacity performance.

As these matters impact are independent of specific development areas, they are not included in the area-based traffic light assessments. However, they are extremely relevant to the ability for Hamilton City to provide for growth in a manner that contributes toward achieving Te Ture Whaimana. In most cases, solutions are available to these challenges, however, the costs may render the solutions to be unfeasible.

8.1 Water allocation

8.1.1 Hamilton City Council is responsible for supplying water to the residents of Hamilton City.

8.1.2 As noted in Part 6, Hamilton is wholly dependent on the Waikato River for its water supply, as are many other Waikato towns. The regional consent provides for increases in maximum daily take volumes starting from 105,000 cubic metres per day in 2009 to 146,000 cubic metres per day from December 2038. The 'stepped' takes were based on municipal growth forecasted at the time of consent.

8.1.3 Substantial growth is predicted for the Hamilton-Waikato Metropolitan area, (note projection numbers). Recent assessments completed to support HCC position on the Watercare Board of Inquiry process predicted that providing for the population growth in Hamilton alone means would exceed its existing Waikato River water take consent (146 MLD) before the current water take consent expires in 2044. The water demand is projected to reach between 159 MLD and 184 MLD by 2065 – an increase of up to 38 MLD. Importantly, municipal water demand will continue to increase into the future as cities and towns continue to grow placing even further pressure on the river.

8.1.4 HCC is concerned to avoid over-allocation of the Waikato River which may have a profound negative impact on the flow of the river and, as a consequence, the whole ecology of the Waikato River itself.

8.1.5 The Waikato River is not an unlimited supply and is under pressure from

growth in the Waikato and Auckland. These challenges will be exacerbated by the impacts of climate change. It is inappropriate to assume that Hamilton can simply take more from the Waikato River to meet its ongoing needs.

8.1.6 Methods to reduce HCC demand and reliance on the Waikato River (such as water metering, leakage reduction, large scale storage and supplementary water sources) will need to be implemented in order to contribute to Te Ture Whaimana and meet the future needs of Hamilton City.

8.2 Wastewater discharge

8.2.1 All of Hamilton City's wastewater is currently conveyed to and treated at the Pukete Wastewater Treatment Plant (WWTP), at the northern end of the city.

8.2.2 Network capacity constraints and declining condition, coupled with population growth may result in increased overflow events and contamination of receiving waters with consequent social and cultural effects and risk to public health.

8.2.3 Significant investment in network upgrades will be necessary to reduce the number and frequency of overflows from the network to the receiving environment, and to minimise the potential for adverse impacts in the event that overflows do occur.

8.2.4 In addition to network capacity constraints and necessary interventions, significant investment will be required to upgrade the Pukete WWTP to manage the additional flows and loads from the city. Significant investment will be necessary to improve the levels of treatment from the plant which will be one element of demonstrating betterment to the Waikato River as required by Te Ture Whaimana.

8.2.5 A step change in treatment standards (i.e., higher levels of water quality) and processes will be necessary to provide for growth while also reducing the contaminant loading to the receiving environment. Alternative or supplementary discharge methods and re-use opportunities may also be needed to improve the health and wellbeing of the Waikato River. Indicative costs to achieve the step change in treatment standards are described in Part 6.

8.3 Climate change

8.3.1 Our climate is changing and New Zealand, like all countries will be affected by climate change.

8.3.2 The effects of climate change are already beginning to be felt in the Waikato region and in Hamilton City. Changing weather patterns are predicted to cause more frequent and severe rainfall events, windier weather and drier

summers. T

8.3.3 The Ministry for the Environment (2018) predicts that by 2090, the Waikato will likely spend more time in drought, which will lead to water shortages and increased fire risk.[1] More frequent heavy rainfall events will increase the risk of flooding, which can damage homes and infrastructure, as well as increasing the likelihood of landslides and accelerated erosion.

8.3.4 Heavy rainfall events also have the potential to overwhelm Council's stormwater and wastewater infrastructure, with risks of wastewater overflows which are hazardous to human health and the environment.

Water Supply

8.3.5 Whilst the design of HCC stormwater systems uses climate-change adjusted rainfall data for stormwater flows, there has been no allowance made when designing strategic infrastructure in the most recent Water Master Plan.

8.3.6 The anticipated extreme weather conditions will impact on our current, single water intake structure from the Waikato River, which is likely to be lower in summer and higher in winter.

8.3.7 Those lower river flows in summer will raise water temperatures that contribute to elevated water quality problems such as increased algae growth.

8.3.8 Regional droughts and changing rainfall patterns may result in shortages in water supply and greater demand over the summer period. This has implications for the cities future water supply, which already requires a second Water Treatment Plant supplied from the Waipa River by 2052 based on current demand projections.

8.3.9 This planned timing could significantly shift forward if climate change impacts are not fully assessed along with potential mitigation measures (e.g., reuse tanks) to manage consumer demands.

Wastewater System

8.3.10 The wastewater master plan process tested the existing and planned system performance by modelling the network using flow monitoring from a 1 in 10-year return period rainfall event as a proxy for testing the impacts of climate change on the network.

8.3.11 More consideration is required to gain an improved understanding of the potential impacts of climate change on the extent, frequency and volume of wastewater overflows from the wastewater network.

[1] (Ministry for the Environment, 2018)

8.3.12 The wastewater master plan process tested the existing and planned system performance by modelling the network using flow monitoring from a 1 in 10-year return period rainfall event as a proxy for testing the impacts of climate change on the network.

8.3.13 Projected climate change conditions suggest receiving water bodies may be less able to assimilate the effects of contaminants to water bodies due to warmer water temperatures and lower water flows which will in turn require higher levels of wastewater treatment and other investments to contribute to the restoration and protection of the river.

Stormwater System

8.3.14 The anticipate increase in extreme rainfall intensity and frequency will potentially:

- Increase the burden on existing stormwater networks, resulting in more frequent 'nuisance' flooding of roading networks.
- Increase flooding risks to private properties, particularly those in older brownfield urban areas where overland flow paths have not been allowed for.
- Increase levels of erosion in watercourses which have urbanised catchments.
- Increase the volume of contaminants and increase the temperature in stormwater runoff discharging to streams; and
- Exacerbate inflow and infiltration of stormwater into the wastewater network resulting in discharge of untreated wastewater into the receiving environment. This could affect human health, ecology, cultural and recreational spaces, and water supply for drinking[2],[3].

8.3.15 The projected increase in drought conditions could result in loss, or decline in the quality, of urban green spaces and a consequential reduction in the City's amenity and liveability.

8.3.16 In the future, Council will face significant additional costs to address these issues in order to respond to mana whenua and community expectations and regulations.

8.4 Local network capacity

8.4.1 Growing areas need appropriate infrastructure to be in place to create a well-

[2] https://www.deepsouthchallenge.co.nz/sites/default/files/2017-11/Climate%20Change%20Stormwater%20Wastewater%20Systems%20Exec%20Summary.pdf

[3] [1] According to *District Plan - Section 32 Analysis* (Hamilton City Council, 2017, p.22-28), rainfall data was based on *Analysis of High Intensity Rainfall for Hamilton City* (NIWA, 2008) D-196476.

functioning urban environment and avoid unacceptable risks to, and adverse effects on, people and the environment. Incremental patching of existing networks in response to individual ad-hoc development proposals will likely result in reduced performance of our 3 waters network, which is counter to the objectives of Te Ture Whaimana. Furthermore, this approach will not create the step-change needed to ensure an infrastructure network capable of efficiently and effectively servicing the needs of existing and future generations, while supporting the restoration and protection of the Waikato River and its catchment.

8.4.2 For much of the existing (brownfield) parts of the city, the local infrastructure is decades old and constructed for much lower density than enabled in the current HCC District Plan or proposed through the NPS-UD and MDRS. The local networks for relatively new residential development areas have also been designed to service 16 dwelling /ha densities.

8.4.3 Providing for the intensification requirements set out in the NPS-UD and MDRS requires a significant step-change in local network design standards and will require extensive upgrade and replacement of the existing local networks.

8.4.4 The 2021-2031 Long Term Plan does not provide for any substantive funding to upgrade the local networks to cater for future intensification (or even upsizing existing networks to accommodate growth at the same time as planned asset renewals and replacement).

8.4.5 Providing for intensification across all residential areas as proposed in the Housing Supply Amendment Act without prioritising the areas to be serviced will require city wide local network upgrades (which are currently unfunded and will be cost prohibitive) or acceptance of a reduced level of system performance and associated impacts on the Waikato River.

8.4.6 Examples of adverse environmental effects and risks that arise from allowing growth without adequate infrastructure include:

(a) Increased contaminated stormwater run-off

(b) Erosion from unmanaged stormwater

(c) Increased number, locations, and volume of wastewater overflows

(d) Reduced water pressure compromising fire-fighting capacity

(e) Increased risk to people, property, and the environment from flood hazards

(f) Compromised pedestrian and cyclist safety from inadequate transportation facilities

8.4.7 Some of the effects of inadequate infrastructure are in direct conflict with the requirement to give effect to Te Ture Whaimana o Te Awa o Waikato. As Te Ture Whaimana is a higher-order requirement to the NPS-UD and a qualifying matter, this will mean the infrastructure planning, funding, and implementation to support increased plan-enabled capacity will be a fundamental influence on where, when and what additional intensification opportunities will be provided.

PART 9 - PERFORMANCE ASSESSMENT METHODOLOGY, ASSUMPTIONS AND LIMITATIONS

9.1 Methodology

9.1.1 The performance assessment provides analysis and commentary on the ability of Hamilton's three waters systems to provide for growth and give effect to Te Ture Whaimana o te Awa o Waikato.

9.1.2 This assessment has been prepared in a short timeframe, and as such relies of existing data, information, assessments, strategies associated with Hamilton's three waters networks.

9.1.3 No new capacity assessments, network modelling, options assessments, or pre-feasibility solution development has been completed to inform this assessment.

9.1.4 The overall approach to the three waters infrastructure performance assessments comprises three key parts:

(a) Developing and confirming appropriate assessment criteria that aligns with Te Ture Whaimana o Te Awa o Waikato.

(b) Completing the performance assessments for residential zones around key town centres.

(c) Recommending further investments and assessments to fill significant gaps in existing information.

9.1.5 The key steps taken to develop and confirm the assessment criteria are shown in Figure 5.

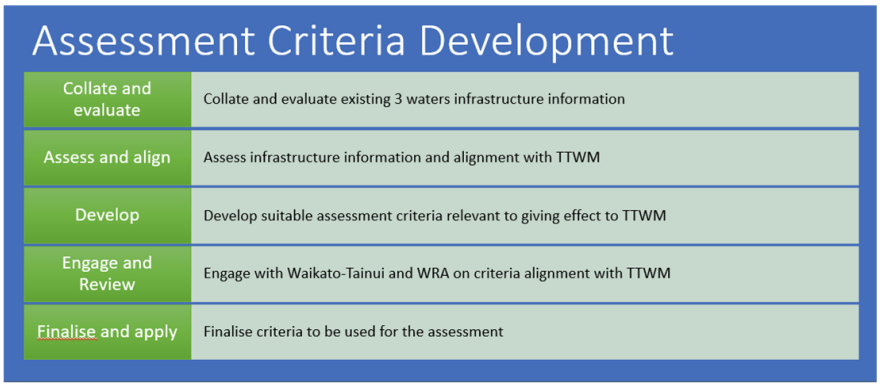


Figure 5: Key steps taken to develop Three Waters Infrastructure Assessment Criteria

9.1.6 Engagement with representatives of Waikato Tainui and other key stakeholders, including the Waikato River Authority, was integral to

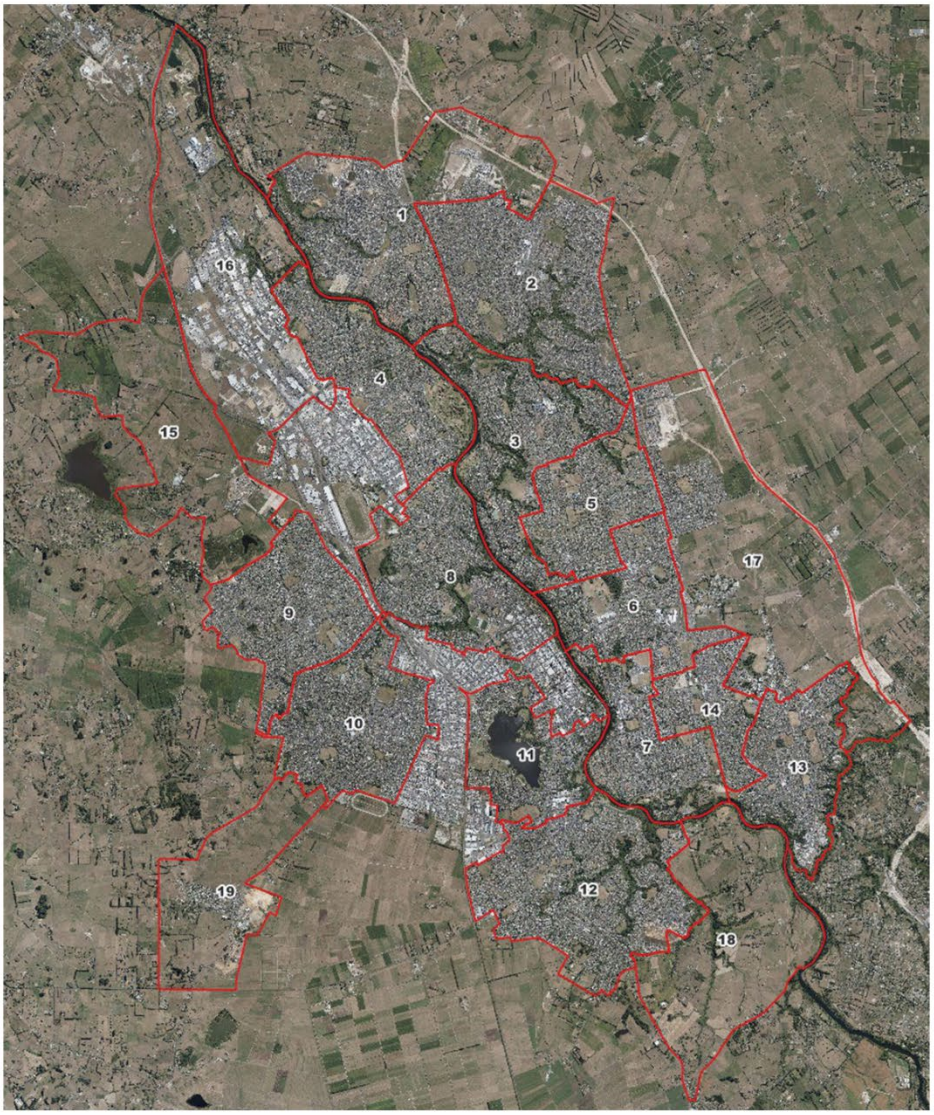


Figure 6 - Traffic Light Assessment Areas

development and confirmation of the assessment criteria.

9.1.7 Independent technical peer review of the assessments has also been used to test and improve the veracity of the assessments and identify areas for further development and investigation.

9.1.8 Key information sources used to develop the assessment criteria and to complete the assessments include:

(a) **Te Ture Whaimana o te Awa o Waikato**

(b) Disaggregation of the residential zones and key centres within the city into **19 discrete areas** for the purpose of the assessment (Refer to Figure 6)

(c) Current and previous Water, Wastewater and Stormwater **Master Plans and associated data**, including hydraulic modelling results.

Hamilton City Council (HCC) has a programme of developing Master Plans for water, wastewater and storm water infrastructure which in turn informs funding requests through the Long-Term Planning process. These Master Plans provide roadmaps for future investments in Hamilton's 3-Waters infrastructure. They are keystone documents for short and long-term funding decisions. They are prepared on a 3-yearly cycle to support long-term planning processes and to reflect changes to population projections.

The most recent master plans were completed in late 2020/early 2021 to inform the current 2021-2031 long term plan. The water and wastewater master plans rely on growth forecasts and population projections and network models to assess the impacts of growth on these networks, and to identify and prioritise interventions and investments needed to maintain or improve levels of service.

In addition, while the investment programmes in the master plans do not reflect the infrastructure needed to service the growth contemplated in through the Act and NPS-UD, they provide an indication of the scale of investment currently identified to meet the most recent growth projections.

(d) **2021-2031 Long Term Plan** specifically the recommended three waters investment projects and programmes funded in the LTP. Note that not all of the recommended investment in the master plan documents are funded in the LTP and so there is an existing funding deficit to maintain and improve levels of service for current growth projections. The infrastructure investment deficit will be exacerbated by further intensification.

(e) Available information used to evaluate investment needed to support "Step Change" in growth contemplated through the Act and NPS-UD:

(i) High level assessments completed to assess the impact on REEP Plan Change 11 on infrastructure (2019)

(ii) Investigations completed to inform recent Housing Acceleration Fund (HAF) applications (2021) and to inform Area Plans produced for Chartwell, Five Crossroads, Hamilton East,

North City and Enderley/Fairfield.

(f) The stormwater system assessment has generally taken a long-term risk approach. The key information sources used for the assessment include:

(i) Integrated catchment management plans: Mangakotukutuku, Rotokauri, Te Awa o Katapaki, Mangaheka

(ii) Available flood hazard information.

(iii) Most recent stormwater master plan and underlying data layers including watercourse condition assessments and ecological monitoring.

(iv) 2021-2031 Long Term Plan specifically the recommended stormwater projects and programmes that are currently funded in the LTP.

9.1.9 To inform the water and wastewater assessment of each area, three temporal bands were considered and evaluated using available information:

(a) Band 1: Near term: based on 2031 modelling results in the 2021-31 Long Term Plan.

(b) Band 2: Medium term: based on 2061 modelling results and the scale of investment identified in masterplans in the past 10 years.

(c) Band 3: What is needed to service the proposed scale of intensity.

9.2 Assumptions & Key Inputs

9.2.1 The following assumptions and key inputs have been used to complete this assessment and prepare this report:

9.2.2 **Base Population Information**

(a) Population projections are a key input to the water and wastewater network models and to assessing future upgrades of the water and wastewater treatment plants.

(b) The population projections used to inform the current master plans and associated network models were developed in 2017. The population projections collated for each of the 19 areas used in this traffic light assessment are summarised below.

Table 2 - Population projections informing this Three Waters Performance Assessment

		POPULATION PROJECTIONS (2017)					
NAME	AREA	2021	2031	2041	2051	2061	% CHANGE BETWEEN 2061-2021
Flagstaff East	1	15098	17902	17002	16440	16176	7%
Huntington	2	17150	16033	15260	14769	14595	-18%
Chartwell	3	11104	11354	11405	11294	11203	1%
Pukete East	4	10306	10434	10526	10479	10653	3%
Enderley North	5	9425	9897	10602	11763	11824	20%
Claudelands	6	9585	10531	10509	10308	10205	6%
Hamilton East	7	7598	7890	7611	7424	7348	-3%
Beerescourt	8	10374	10033	11297	12486	13637	24%
Crawshae	9	14285	14144	14259	14337	14268	0%
Dinsdale North	10	14766	16551	16847	16653	16448	10%
Hamilton Lake	11	5412	5979	6089	5996	5933	9%
Bader	12	17634	18301	18887	19840	19632	10%
Hillcrest Easte	13	8860	9549	10895	10922	10804	18%
Greensboro	14	9341	9448	9391	9160	9074	-3%
Rotokauri - Waiwhakareke	15	738	5849	11560	14362	14239	95%
Te Rapa North	16	301	294	296	301	315	4%
Fairview Downs	17	5680	7626	9327	9246	9143	38%
Peacockes	18	535	6849	12389	17386	18053	97%
Temple View	19	1365	1404	1436	2809	8538	84%

(c) **Note that the population projections that inform the investigations used for this assessment do not:** reflect the current plan enabled capacity (i.e., Duplexing policy), the scale of intensification being contemplated in the NPS-UD or the MDRS. Also note that in the brownfield's areas, future populations were projected to be largely static and, in some cases, decline over time.

(d) The water and wastewater model includes projections for both brownfield and greenfield development areas.

(e) Population and demand projections for greenfield development areas utilise the development densities (dwellings/ha) and occupancy rates (people /dwelling) detailed in the Regional Infrastructure Technical Standards (RITS). The expected timing of development is based on population projections.

(f) Population and demand projections for brownfield areas used for water and wastewater modelling are based solely on the growth modelling provided at the time

(g) The population projections include for some education and medical facilities as a population equivalent, but most business and business land uses are captured separately in the models. Existing large trade

waste and high-water users are also captured separately in the models and are included in the following sub-sections.

(h) The considerations for the residential dwelling growth projections include population estimates, land use zoning, historical patterns of development based on an allocation of growth for brownfield and greenfield areas.

(i) The population projections consider a range of factors including:

- Dwelling projections
- District plan land use zoning
- Rating valuation
- Spatial distribution of unique address points
- Education
- Health

The approach is to establish point features for actual population locations based initially on address points. The address points are an effective way of identifying population dwelling locations.

(j) In addition to the residential population projections, assessments of employment numbers are also produced to inform an estimation of the total number of people at any given location in the city. Employment numbers are taken from Stats NZ. The non-residential employment projections do not fully cover health and education sites, which are important for wastewater population modelling. The projections count the workers but not the patients or students. Specific areas will have population figures adjusted to address the presence of schools and/or hospitals where necessary.

(a) A major update of residential dwelling and population projections is done every three years to inform the Long-Term Plan workstream and is augmented annually for other council models. The workstream for the next LTP commences in July 2022 and will be completed in early 2023. HCC are currently undertaking an update of the growth models and population projections. These will consider updated capacity information and are expected to be delivered in the dwelling demand data.

9.2.3 **Water supply**

(a) High level assessment on the hydraulic and capacity constraints in the water infrastructure utilized the 2020 Water Master Plan, system performance results. These results are based upon, proposed (funded

or unfunded) infrastructure upgrades such as the creation of reservoir zones. The reason for not using the baseline 2019 Hydraulic water model for this analysis largely relates to the baseline not capturing recent upgrades completed or in progress that has improved the hydraulic performance since 2019.

(b) Hydraulic modelling with future population projections has not been undertaken to identify or optimisation future infrastructure needs.

(c) The infrastructure requirements identified in Hamilton City Council's Water Master Plan version 3 were used for the assessment.

(d) The potential additional costs for upgrades that may be needed to service the additional development were taken directly from the Housing Acceleration Fund (HAF) Water Assessment Report which assumed a dwelling density of 50 dwellings/ha. All the assumptions for estimating costs for upgrades have been described in the HAF water assessment report.

(e) No out of district development areas were considered in this assessment. However, servicing these areas only further impact on network performance issues and increase the level of investment needed to deliver appropriate servicing solutions and LOS.

(f) The impact on water network capacity by proposed capacity upgrades in the 2031 and 2061 horizons were based on system performance as part of the 2020 Water Master Plan, system performance results.

(g) The conditions of existing infrastructure and its renewal cost for brownfield areas were not considered as this information was not available at the time of writing this report.

9.2.4 **Wastewater Conveyance Network**

(a) The results from the Wastewater Network hydraulic model have been used as a basis for identifying existing constraints in network capacity. The 2031 modelling results were used as a proxy for "existing" to short-term (1 – 3 years) performance. This approach is considered reasonable, because the population data (over all time horizons) used in the existing modelling does not include for significant growth or infill development in brownfields areas.

(b) The level of service for the wastewater system to accommodate urban growth was assessed based on the existing hydraulic capacity of the wastewater conveyance network during a 2-year Average Recurrence

Interval (ARI) rainfall event.

(c) Hydraulic modelling with updated population projections produced after 2019 has not been undertaken to identify or optimise future infrastructure needs to respond to changing demand.

(d) The infrastructure requirements identified in Hamilton City Council's Wastewater Master Plan version 3 were used in the assessment.

(e) The potential additional costs for upgrades that may be needed to service the additional development were taken directly from the Housing Acceleration Fund (HAF) Wastewater Assessment Report which assumed a dwelling density of 50 dwellings/ha. All the assumptions for estimating costs for upgrades have been described in the HAF wastewater assessment report.

(f) For new greenfield areas which were not considered for HAF wastewater infrastructure assessment, a rough cost estimation was done based on the same assumptions as in HAF assessment.

(g) The existing modelling and investigations that inform this assessment exclude out of district development areas. Servicing these areas would compound network performance issues and increase the level of investment needed to deliver appropriate servicing solutions.

(h) The potential additional costs for upgrades that may be needed to service the additional development were taken directly from the Housing Acceleration Fund (HAF) Wastewater Assessment Report which assumed a dwelling density of 50 dwellings/ha. All the assumptions for estimating costs for upgrades have been described in the HAF wastewater assessment report. For new greenfield areas which were not considered for HAF wastewater infrastructure assessment, a rough cost estimation was done based on the same assumptions as in HAF assessment. The existing modelling and investigations that inform this assessment do not include out of district development areas. Servicing these areas would compound network performance issues and increase the level of investment needed to deliver appropriate servicing solutions. The impact on overall wastewater network capacity by proposed capacity upgrades in the 2031 and 2061 horizons were undertaken based on the existing hydraulic modelling data and some operational input. For greenfield areas where there is no infrastructure or modelling data, Integrated Catchment Management Plans (ICMPs) or any other available information were used.

(i) The future performance assessment was done based on the outcome of the HAF Wastewater Infrastructure Assessment for Chartwell. For greenfield areas, it is assumed that the network will have:

(i) No wastewater overflows during a wet weather event or the wet weather overflows comply with future consent conditions related to wastewater overflows.

(ii) The peak dry weather pipe utilisation is <50% in all the sewer mains.

(iii) No dry weather overflows.

(iv) No inflow and infiltration (I&I) as the pipelines will be new.

(j) The conditions of existing wastewater infrastructure and its renewal cost for the brownfield areas were not taken into consideration as this information was not available at the time of writing this report.

(k) A detailed assessment of infrastructure requirements needed to service greenfield areas was not done. However, an assessment similar to the "HAF Wastewater Infrastructure Assessment" was undertaken to inform the infrastructure needs.

(l) Other limitations associated with pre-feasibility level options include the lack of site investigation to confirm GIS data, optimisation of options, performance testing, and the timing orstaging of options.

9.2.5 **Stormwater**

(a) City-wide rapid flood hazard modelling data (AECOM, 2013) has been used where detailed flooding data is not available.

(b) The dataset identifying buildings impacted by flooding was created for the Stormwater Masterplan Version 2 (SWMPv2) and does not include all currently available detailed flood hazard data (i.e., data created since SWMPv2).

(c) Minimal stormwater network capacity data is available. Where frequent event flood hazard data (2y and 10y ARI) is available, this has been used to infer network capacity. No additional stormwater network modelling was undertaken as part of this work.

(d) The traffic light system of sediment quality and macroinvertebrate index ratings (WQ1, WQ2, WQ3) developed by Tonkin & Taylor as part of the SWMPv2 have used to classify sediment quality data. This system uses a red, orange & green colour rating to rank monitoring based on whether they exceed national guideline limits.

(e) It has been assumed that public realm-open space can be used to integrate stormwater treatment elements.

(f) A detailed assessment of infrastructure requirements or constructability of new stormwater assets required to service redevelopment areas has not been undertaken. Where high-level assessments such as the "HAF Stormwater Infrastructure Assessment" were available, these have been used. Otherwise, a similar level of assessment has been adopted.

(g) A number of the assessment areas span multiple stormwater catchments which would potentially have different assessment results if considered separately. Best-judgement has been applied to estimate a combined or overall assessment score in these situations.

9.3 Limitations

9.3.1 Limitations:

(a) Data quality and availability differs between asset classes and by area across the city. The data contained in this report is based on what Council has available and has been interpreted to the best of our ability.

(b) **The outcomes of this report are not directly transferable into District Plan planning provisions, and do not highlight 'go' and 'no-go' areas of the city**. Population and growth data used to inform existing strategic three waters infrastructure assessments, modelling and master plans relied on for this assessment do not reflect current plan enabled capacity in the District Plan, MDRS or the densities proposed under the NPS-UD. The data that underpins the wastewater and water supply models are the population projections provided in 2017. HCC are currently undertaking an update of the growth models and population projections. These will consider updated capacity information and are expected to be delivered for the next LTP

(c) If there are 'gaps' in the data for an area or asset class, this is acceptable.

9.3.2 The following assessments are outside of the scope of this assessment:

(a) Updated growth projections for the city that reflect changing trends in development typology, location and uptake within both brownfields and greenfield areas.

(b) Updated growth projections for the city that reflect the proposed changes to land-use associated with MDRS and NPS-UD.

(c) Three waters system modelling to assess the impacts of changing development trends (density, rate of uptake), or MDRS on network performance in the short, medium or long-term.

(d) Detailed analysis of the impacts of MDRS and NPS-UD on Councils water and wastewater treatment facilities and associated regional council consents (water abstraction and wastewater discharge).

(e) Development of potential servicing solutions required to respond specifically to accelerated and more extensive growth including those associated with the MDRS and NPS-UD.

(f) Detailed cost estimates of servicing solutions required to respond to accelerated and more extensive growth.

(g) Assessment of transport asset state.

(h) Granular analysis of network performance

(i) Planning provisions/policies/rules in response to the findings of this assessment necessary to give effect to Te Ture Whaimana

PART 10 - TRAFFIC LIGHT ASSESSMENTS

10.1 Traffic Light Assessments

10.1.1 The city was divided into 19 discrete areas in order to complete the traffic light performance assessment (Figure 7). The areas were defined by the Hamilton Planning team based generally on consolidating adjacent Stats New Zealand *Statistical areas based on land use zoning*.

10.1.2 This approach was considered appropriate given that the purpose of this assessment is to support the development of new planning provisions and given that defining the areas based on hydrologic catchment, water demand management area, or wastewater servicing catchments would result in different areas for each water.

10.1.3 In addition, to the 19 areas identified in the map, an assessment of "Area 20" has also been undertaken for completeness. Area 20 is located between Areas 8, 10 and 11 and includes a significant portion of the CBD.

10.1.4 Summaries of the key findings of the assessments are included in the body of this report. Individual area reports for each of the waters are appended and provide some of the evidence used to inform the assessments.

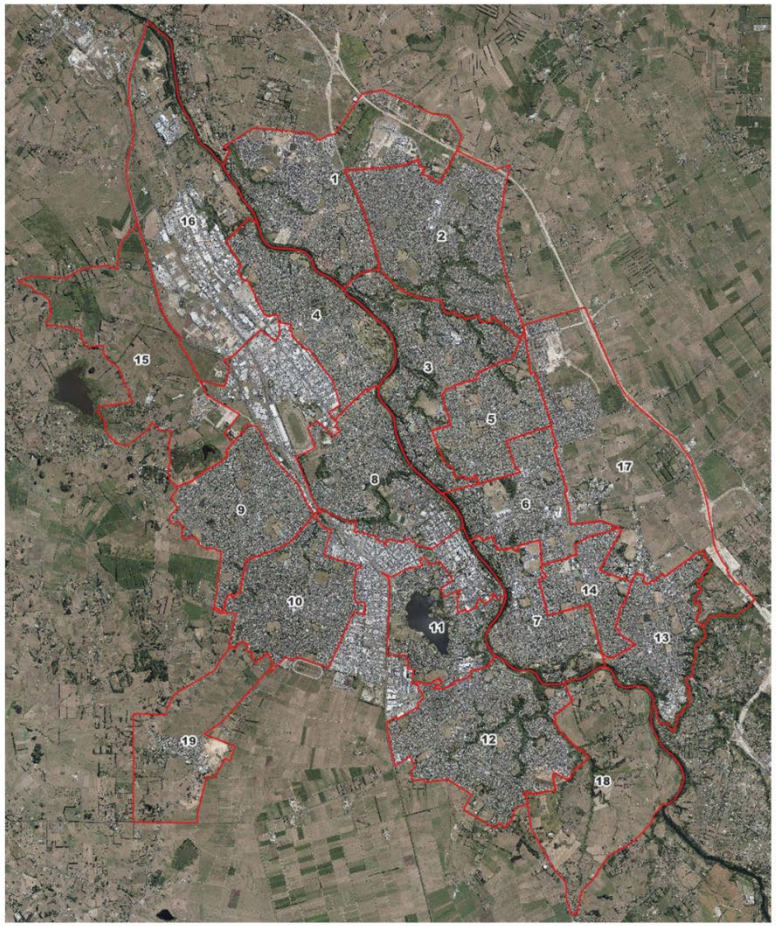
10.2 Scoring and scenarios

10.2.1 Three scenarios have been developed which utilise the three temporal bands to produce an overall score for each water and each area:

(a) Scenario 1: Even scenario. Equal weighting is applied to all three temporal bands.

(b) Scenario 2: Near term. More weighting is applied to near term but other two are still included.

(c) Scenario 3: Excluding long term. No weighting is applied to long term.



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Temple View	19	1404	8538	84%

Figure 7 - Traffic Light Assessment Areas and Population Projections

10.3 Overall traffic light assessment

#	Area	Stormwater	Wastewater	Water supply
1	**Flagstaff East**	*Scenario 1*	*Scenario 1*	*Scenario 1*
		Scenario 2	*Scenario 2*	*Scenario 2*
		Scenario 3	*Scenario 3*	*Scenario 3*
2	**Huntington**	*Scenario 1*	*Scenario 1*	*Scenario 1*
		Scenario 2	*Scenario 2*	*Scenario 2*
		Scenario 3	*Scenario 3*	*Scenario 3*
3	**Chartwell**	*Scenario 1*	*Scenario 1*	*Scenario 1*
		Scenario 2	*Scenario 2*	*Scenario 2*
		Scenario 3	*Scenario 3*	*Scenario 3*
4	**Pukete East**	*Scenario 1*	*Scenario 1*	*Scenario 1*
		Scenario 2	*Scenario 2*	*Scenario 2*
		Scenario 3	*Scenario 3*	*Scenario 3*
5	**Enderley North**	*Scenario 1*	*Scenario 1*	*Scenario 1*
		Scenario 2	*Scenario 2*	*Scenario 2*
		Scenario 3	*Scenario 3*	*Scenario 3*
6	**Claudelands**	*Scenario 1*	*Scenario 1*	*Scenario 1*
		Scenario 2	*Scenario 2*	*Scenario 2*

		Scenario 3	*Scenario 3*	*Scenario 3*
7	**Hamilton East**	*Scenario 1*	*Scenario 1*	*Scenario 1*
		Scenario 2	*Scenario 2*	*Scenario 2*
		Scenario 3	*Scenario 3*	*Scenario 3*
8	**Beerescourt**	*Scenario 1*	*Scenario 1*	*Scenario 1*
		Scenario 2	*Scenario 2*	*Scenario 2*
		Scenario 3	*Scenario 3*	*Scenario 3*
9	**Crawshaw**	*Scenario 1*	*Scenario 1*	*Scenario 1*
		Scenario 2	*Scenario 2*	*Scenario 2*
		Scenario 3	*Scenario 3*	*Scenario 3*
10	**Dinsdale North**	*Scenario 1*	*Scenario 1*	*Scenario 1*
		Scenario 2	*Scenario 2*	*Scenario 2*
		Scenario 3	*Scenario 3*	*Scenario 3*
11	**Hamilton Lake**	*Scenario 1*	*Scenario 1*	*Scenario 1*
		Scenario 2	*Scenario 2*	*Scenario 2*
		Scenario 3	*Scenario 3*	*Scenario 3*
12	**Mangakootukutuku / Bader**	*Scenario 1*	*Scenario 1*	*Scenario 1*
		Scenario 2	*Scenario 2*	*Scenario 2*
		Scenario 3	*Scenario 3*	*Scenario 3*

13	**Hillcrest East**	*Scenario 1*	*Scenario 1*	*Scenario 1*
		Scenario 2	*Scenario 2*	*Scenario 2*
		Scenario 3	*Scenario 3*	*Scenario 3*
14	**Greensboro**	*Scenario 1*	*Scenario 1*	*Scenario 1*
		Scenario 2	*Scenario 2*	*Scenario 2*
		Scenario 3	*Scenario 3*	*Scenario 3*
15	**Rotokauri**	*Scenario 1*	*Scenario 1*	*Scenario 1*
		Scenario 2	*Scenario 2*	*Scenario 2*
		Scenario 3	*Scenario 3*	*Scenario 3*
16	**Te Rapa**	*Scenario 1*	*Scenario 1*	*Scenario 1*
		Scenario 2	*Scenario 2*	*Scenario 2*
		Scenario 3	*Scenario 3*	*Scenario 3*
17	**Ruakura**	*Scenario 1*	*Scenario 1*	*Scenario 1*
		Scenario 2	*Scenario 2*	*Scenario 2*
		Scenario 3	*Scenario 3*	*Scenario 3*
18	**Peacocke**	*Scenario 1*	*Scenario 1*	*Scenario 1*
		Scenario 2	*Scenario 2*	*Scenario 2*
		Scenario 3	*Scenario 3*	*Scenario 3*
19	**Temple View**	*Scenario 1*	*Scenario 1*	*Scenario 1*

		Scenario 2	Scenario 2	Scenario 2
		Scenario 3	Scenario 3	Scenario 3

10.4 Water Supply Traffic Light Assessment

Please note that to maintain legibility, the table has been split in two, with the final three criteria traffic light assessments found on page 64.

# on map	Area	Predicted local and trunk (250mm only) network capacity at 2031			Predicted strategic network (trunkmains >250mm & bulkmains) capacity at 2031		Scale (cost) of funded upgrades that will improve network performance
		Network pressure	*Pipe headloss*	*Fire hydrant performance (General Residential Zones only)*	*Pipe Headloss (251mm - 599mm Diam Pipe)*	*Pipe Headloss (600mm Diam and above)*	*2021-2031 Long Term Plan and 2020 Master Plan*
1	Flagstaff East	1 pressure point between 10-20m	98% of all pipes have headloss of 5m/km or less	1 Hydrant Fails FW2 classification	88% of all pipes have head loss of 3m/km or less	100% of all pipes have head loss of 2m/km or less	Funding mostly for upsizing local pipes to 250mm trunkmains within development or roading projects $22M
2	Huntington	3 pressure points between 10-20m	97% of all pipes have head loss of 5m/km or less	3 Hydrants Fail FW2 classification	100% of all pipes have head loss of 3m/km or less	100% of all pipes have head loss of 2m/km or less	
3	Chartwell	No Design Pressure Issues, 20m or less	97% of all pipes have head loss of 5m/km or less	5 Hydrants Fail FW2 classification	100% of all pipes have head loss of 3m/km or less	87% of all pipes have head loss of 2m/km or less	Only partial funding provided for 2nd reservoir. Also timing was pushed back, not matching intended operational date. Proposed Fairfield reservoir pump station upgrade was not funded in LTP
4	Pukete East	5 pressure points less than 10m	95% of all pipes have head loss of 5m/km or less	3 Hydrants Fail FW2 classification	89% of all pipes have head loss of 3m/km or less	94% of all pipes have head loss of 2m/km or less	Proposed Pukete pump station upgrade to create reservoir Zone, along with other strategic pipelines are unfunded.

5	Enderley North	3 pressure points less than 10m & 1 between 10-20m	94% of all pipes have head loss of 5m/km or less	2 Hydrants Fail FW2 classification	42% of all pipes have head loss of 3m/km or less	84% of all pipes have head loss of 2m/km or less	Only partial funding provided for 2nd reservoir. Also timing was pushed back, not matching intended operational date $13.5M
6	Claudelands	No Design Pressure Issues, 20m or less	98% of all pipes have head loss of 5m/km or less	1 Hydrant Fails FW2 classification	100% of all pipes have head loss of 3m/km or less	100% of all pipes have head loss of 2m/km or less	
7	Hamilton East	No Design Pressure Issues, 20m or less	97% of all pipes have head loss of 5m/km or less	No hydrant less than FW2 Classification	81% of all pipes have head loss of 3m/km or less	100% of all pipes have head loss of 2m/km or less	
8	Beerescourt	3 pressure points less than 10m & 9 between 10-20m	97% of all pipes have head loss of 5m/km or less	1 Hydrant Fails FW2 classification	93% of all pipes have head loss of 3m/km or less	100% of all pipes have head loss of 2m/km or less	Proposed Pukete pump station upgrade to create reservoir Zone, Maeroa pump station upgrade and new Ruakiwi reservoir and pump station are unfunded.
9	Crawshaw	7 pressure points less than 10m & 7 between 10-20m	97% of all pipes have head loss of 5m/km or less	3 Hydrants Fail FW2 classification	97% of all pipes have head loss of 3m/km or less	100% of all pipes have head loss of 2m/km or less	Significant Capacity upgrades (Strategic and Trunk) have been funded which is appropriate for the proposed population growth projections and LOS at that time.
10	Dinsdale North	3 pressure points less than 10m & 67 between 10-20m	93% of all pipes have head loss of 5m/km or less	7 Hydrants Fail FW2 classification	97% of all pipes have head loss of 3m/km or less	93% of all pipes have head loss of 2m/km or less	
11	Hamilton Lake	7 pressure points less than 10m & 3 between 10-20m	95% of all pipes have head loss of 5m/km or less	5 Hydrants Fail FW2 classification	27% of all pipes have head loss greater than 3m/km	100% of all pipes have head loss of 2m/km or less	Minor upgrades have been funded but not sufficient to serve for the proposed population growth projections and LOS at that time.
12	Mangakootukutuku / Bader	1 pressure point less than 10m & 2 between 10-20m	90% of all pipes have head loss of 5m/km or less	7 Hydrants Fail FW2 classification	88% of all pipes have head loss of 3m/km or less	92% of all pipes have head loss of 2m/km or less	
13	Hillcrest East	3 pressure points less than 10m	90% of all pipes have head loss of 5m/km or less	5 Hydrants Fail FW2 classification	100% of all pipes have head loss of 3m/km or less	100% of all pipes have head loss of 2m/km or less	Significant upgrades recommended in order to service proposed population growth projections and LOS at that time but not funded or deferred beyond 10 year plan.

14	Greensboro	No Design Pressure Issues, 20m or less	97% of all pipes have head loss of 5m/km or less	No hydrant less than FW2 Classification	100% of all pipes have head loss of 3m/km or less	32% of all pipes have head loss greater than 2m/km	Only partial funding provided for 2nd reservoir. Also, timing was pushed back, not matching intended operational date $13.5M
15	Rotokauri	3 pressure points between 10-20m	100% of all pipes have head loss of 5m/km or less	1 Hydrant Fails FW2 classification *Must be noted area is only partially developed in this timeline*	100% of all pipes have head loss of 3m/km or less	No pipes in this Diam Category	Proposed Pukete pump station upgrade to create reservoir Zone, along with other strategic pipelines were unfunded in the LTP.
16	Te Rapa	No Design Pressure Issues, 20m or less	99% of all pipes have head loss of 5m/km or less	No hydrant less than FW2 Classification *Must be noted some areas are only partially developed in this timeline.*	100% of all pipes have head loss of 3m/km or less	No pipes in this Diam Category	
17	Ruakura	6 pressure points less than 10m & 2 between 10-20m	97% of all pipes have head loss of 5m/km or less	No hydrant less than FW2 Classification	100% of all pipes have head loss of 3m/km or less	94% of all pipes have head loss of 2 metres or less	Only partial funding provided for 2nd reservoir. Also timing was pushed back, not matching intended operational date $13.5M Strategic pipes along the spine road keep getting pushed back $25M
18	Peacocke	1 pressure point less than 10m & 3 between 10-20m	100% of all pipes have head loss of 5m/km or less	No hydrant less than FW2 Classification *Must be noted some areas are only partially developed in this timeline.*	100% of all pipes have head loss of 3m/km or less	100% of all pipes have head loss of 2m/km or less	Significant Capacity upgrades (Strategic and Trunk) have been funded which is appropriate for the proposed population growth projections and LOS at that time.
19	Temple View	No Design Pressure Issues, 20m or less	100% of all pipes have head loss of 5m/km or less	No hydrant less than FW2 Classification	100% of all pipes have head loss of 3m/km or less	No pipes in this Diam Category	

# on map	Area	Scale (cost) of already planned upgrades 2061. What's the scale of investment needed to service the area.	Step change growth: Future possible performance with "extra" unplanned growth (e.g. NPS-UD)	Step change growth: Potential (un-modelled) additional cost of upgrades - unplanned and unfunded system upgrade costs.

		Network Pressure	*2032-2061 (30yr) Long Term Plan and 2020 Master Plan*	*Assessment of 2031 fire cover, changing from existing General Residential to proposed High Density Housing*	**HAF Investigations** **RITS - Comparing design standards for general residential versus high density (NPS-UD)** **REEP results - investigations** **City full scenarios**	
1	**Flagstaff East**	1 pressure point between 10-20m	Some capacity upgrades have been planned till 2061 based on 2019 population growth projections. $8.5M	Assessment of 2031 fire cover, changing from FW2 to FW3 has 11 Fail FW3 (also insufficient hydrants to meet spacing requirements)	Wide spread network LOS issues across the area of interest and/ impacts across other areas. Widespread locations below design LOS in local and trunkmains including bulk supply mains. Local infrastructure layout only meeting general Residential housing specifications. Significant local upgrades and additional pipes required to support density level demands above "Residential". Insufficient reservoir storage and/or pumping capacity for Rototuna Zones for the unplanned growth. Demand exceeds bulk ring main capacity including reservoir filling mains.	Significant local and strategic infrastructure upgrades and renewals are required. Complete replacement of local infrastructure is likely in some areas. Additional reservoir storage required with bigger pumps. Additional cost for upgrade would be (renewals not considered) greater than $100M.
2	**Huntington**	1 pressure point between 10-20m	Some capacity upgrades have been planned till 2061 based on 2019 population growth projections. $8.5M	Assessment of 2031 fire cover, changing from FW2 to FW3 has 51 Fail FW3 (also insufficient hydrants to meet spacing requirements)	Wide spread network LOS issues across the area of interest and/ impacts across other areas. Widespread locations below design LOS in local and trunkmains including bulk supply mains. Local infrastructure layout only meeting general Residential housing specifications. Significant local upgrades and additional pipes required to support density level demands above "Residential". Insufficient reservoir storage and/or pumping capacity for Rototuna Zones for the unplanned growth. Demand exceeds bulk ring main capacity including reservoir filling mains.	Significant local and strategic infrastructure upgrades and renewals are required. Complete replacement of local infrastructure is likely in some areas. Additional reservoir storage required with bigger pumps. Additional cost for upgrade would be (renewals not considered) greater than $100M.

3	**Chartwell**	No Design Pressure Issues, 20m or less	No major capacity upgrades were planned till 2061 based on 2019 population growth projections. However timing of the 2nd Ruakura reservoir is currently later than desired.	Assessment of 2031 fire cover, changing from FW2 to FW3 has 259 Failing FW3 performance (also insufficient hydrants to meet spacing requirements)	Wide spread network LOS issues across the area of interest and/ impacts across other areas. Widespread locations below design LOS in local and trunkmains including bulk supply mains. Local infrastructure layout only meeting general Residential housing specifications. Significant local upgrades and additional pipes required to support density level demands above "Residential". Insufficient reservoir storage and/or pumping capacity for Fairfield and Ruakura Zones in particular for the unplanned growth. Demand exceeds bulk ring main capacity including reservoir filling mains.	Significant local and strategic infrastructure upgrades and renewals are required. Complete replacement of local infrastructure is likely in some areas. Additional reservoir storage required with bigger pumps. Additional cost for upgrade would be (renewals not considered) greater than $100M.
4	**Puketē East**	5 pressure points less than 10m	Some capacity upgrades have been planned till 2061 based on 2019 population growth projections. (Roading Projects)	Assessment of 2031 fire cover, changing from FW2 to FW3 has 101 Fail FW3 (also insufficient hydrants to meet spacing requirements)	Wide spread network LOS issues across the area of interest and/ impacts across other areas Widespread locations below design LOS in local and trunkmains including bulk supply mains Local infrastructure layout only meeting general Residential housing specifications. Significant local upgrades and additional pipes required to support density level demands above "Residential". Insufficient reservoir storage and/or pumping capacity Demand exceeds existing treatment capacity and/or bulk ring main capacity including reservoir filling mains. Demand exceeds water allocation (maxed at 2051)	The existing local and strategic infrastructure capacity has "significant deficit" and the infrastructure condition is "poor". Significant local and strategic infrastructure upgrades and renewals are required (complete replacement of local infrastructure is likely). Additional cost for upgrade would be (renewals not considered) more greater than $100M.
5	**Enderley North**	3 pressure points less than 10m & 1 between 10-20m	Major capacity upgrades have been planned till 2061 based on 2019	Assessment of 2031 fire cover, changing from FW2 to FW3 has 140 Fail FW3	Wide spread network LOS issues across the area of interest and/ impacts across other areas	The existing local and strategic infrastructure capacity has "significant deficit" and the infrastructure condition is "poor".

			population growth projections. $13.5M	(also insufficient hydrants to meet spacing requirements)	Widespread locations below design LOS in local and trunkmains including bulk supply mains Local infrastructure layout only meeting general Residential housing specifications. Significant local upgrades and additional pipes required to support density level demands above "Residential". Insufficient reservoir storage and/or pumping capacity Demand exceeds existing treatment capacity and/or bulk ring main capacity including reservoir filling mains. Demand exceeds water allocation (maxed at 2051)	Significant local and strategic infrastructure upgrades and renewals are required (complete replacement of local infrastructure is likely). Additional cost for upgrade would be (renewals not considered) more greater than $100M.
6	**Claudelands**	No Design Pressure Issues, 20m or less	Major capacity upgrades have been planned till 2061 based on 2019 population growth projections. $13.5M	Assessment of 2031 fire cover, changing from FW2 to FW3 has 33 Fail FW3 (also, insufficient hydrants to meet spacing requirements)	Wide spread network LOS issues across the area of interest and/ impacts across other areas Widespread locations below design LOS in local and trunkmains including bulk supply mains Local infrastructure layout only meeting general Residential housing specifications. Significant local upgrades and additional pipes required to support density level demands above "Residential". Insufficient reservoir storage and/or pumping capacity Demand exceeds existing treatment capacity and/or bulk ring main capacity including reservoir filling mains. Demand exceeds water allocation (maxed at 2051)	The existing local and strategic infrastructure capacity has "significant deficit" and the infrastructure condition is "poor". Significant local and strategic infrastructure upgrades and renewals are required (complete replacement of local infrastructure is likely). Additional cost for upgrade would be (renewals not considered) greater than $100M.
7	**Hamilton East**	No Design Pressure Issues, 20m or less	Major capacity upgrades have been planned till 2061 based on 2019 population growth projections. $13.5M	Assessment of 2031 fire cover, changing from FW2 to FW3 has 22 Fail FW3 (also, insufficient hydrants to meet spacing requirements)	Wide spread network LOS issues across the area of interest and/ impacts across other areas Widespread locations below design LOS in local and trunkmains including bulk supply mains	The existing local and strategic infrastructure capacity has "significant deficit" and the infrastructure condition is "poor". Significant local and strategic infrastructure upgrades and renewals are required

					Local infrastructure layout only meeting general Residential housing specifications. Significant local upgrades and additional pipes required to support density level demands above "Residential". Insufficient reservoir storage and/or pumping capacity Demand exceeds existing treatment capacity and/or bulk ring main capacity including reservoir filling mains. Demand exceeds water allocation (maxed at 2051)	(complete replacement of local infrastructure is likely). Additional cost for upgrade would be (renewals not considered) greater than $100M.
8	**Beerescourt**	3 pressure points less than 10m & 18 between 10-20m	No capacity upgrades were planned till 2061 based on 2019 population growth projections.	Assessment of 2031 fire cover, changing from FW2 to FW3 has 59 Fail FW3 (also, insufficient hydrants to meet spacing requirements)	Wide spread network LOS issues across the area of interest and/ impacts across other areas Widespread locations below design LOS in local and trunkmains including bulk supply mains Local infrastructure layout only meeting general Residential housing specifications. Significant local upgrades and additional pipes required to support density level demands above "Residential". Insufficient reservoir storage and/or pumping capacity Demand exceeds existing treatment capacity and/or bulk ring main capacity including reservoir filling mains. Demand exceeds water allocation (maxed at 2051)	Refer to HAF Phase 1 work by Mott MacDonald
9	**Crawshaw**	10 pressure points less than 10m & 4 between 10-20m	Major capacity upgrades have been planned till 2061 based on 2019 population growth projections. $25M	Assessment of 2031 fire cover, changing from FW2 to FW3 has 165 Fail FW3 (also, insufficient hydrants to meet spacing requirements)	Wide spread network LOS issues across the area of interest and/ impacts across other areas Widespread locations below design LOS in local and trunkmains including bulk supply mains Local infrastructure layout only meeting general Residential housing specifications. Significant local upgrades and additional	Refer to HAF Phase 1 work by Mott MacDonald

					pipes required to support density level demands above "Residential". Insufficient reservoir storage and/or pumping capacity Demand exceeds existing treatment capacity and/or bulk ring main capacity including reservoir filling mains. Demand exceeds water allocation (maxed at 2051)	
10	**Dinsdale North**	3 pressure points less than 10m & 47 between 10-20m	Major capacity upgrades have been planned till 2061 based on 2019 population growth projections. $25M	Assessment of 2031 fire cover, changing from FW2 to FW3 has 249 Fail FW3 (also, insufficient hydrants to meet spacing requirements)	Wide spread network LOS issues across the area of interest and/ impacts across other areas Widespread locations below design LOS in local and trunkmains including bulk supply mains Local infrastructure layout only meeting general Residential housing specifications. Significant local upgrades and additional pipes required to support density level demands above "Residential". Insufficient reservoir storage and/or pumping capacity Demand exceeds existing treatment capacity and/or bulk ring main capacity including reservoir filling mains. Demand exceeds water allocation (maxed at 2051)	Refer to HAF Phase 1 work by Mott MacDonald
11	**Hamilton Lake**	6 pressure points less than 10m & 3 between 10-20m	No capacity upgrades were planned till 2061 based on 2019 population growth projections.	Assessment of 2031 fire cover, changing from FW2 to FW3 has 89 Fail FW3 (also, insufficient hydrants to meet spacing requirements)	Wide spread network LOS issues across the area of interest and/ impacts across other areas Widespread locations below design LOS in local and trunkmains including bulk supply mains Local infrastructure layout only meeting general Residential housing specifications. Significant local upgrades and additional pipes required to support density level demands above "Residential".	Refer to HAF Phase 1 work by Mott MacDonald

					Insufficient reservoir storage and/or pumping capacity Demand exceeds existing treatment capacity and/or bulk ring main capacity including reservoir filling mains. Demand exceeds water allocation (maxed at 2051)	
12	**Mangakootukutuku / Bader**	1 pressure point less than 10m & 2 between 10-20m	Significant Capacity upgrade have been planned till 2061 based on 2019 population growth projections. Reservoir $32M	Assessment of 2031 fire cover, changing from FW2 to FW3 has 199 Fail FW3 (also, insufficient hydrants to meet spacing requirements)	Wide spread network LOS issues across the area of interest and/ impacts across other areas Widespread locations below design LOS in local and trunkmains including bulk supply mains Local infrastructure layout only meeting general Residential housing specifications. Significant local upgrades and additional pipes required to support density level demands above "Residential". Insufficient reservoir storage and/or pumping capacity Demand exceeds existing treatment capacity and/or bulk ring main capacity including reservoir filling mains. Demand exceeds water allocation (maxed at 2051)	Refer to HAF Phase 1 work by Mott MacDonald
13	**Hillcrest East**	3 pressure points less than 10m	No capacity upgrades were planned till 2061 based on 2019 population growth projections.	Assessment of 2031 fire cover, changing from FW2 to FW3 has 121 Fail FW3 (also, insufficient hydrants to meet spacing requirements)	Wide spread network LOS issues across the area of interest and/ impacts across other areas Widespread locations below design LOS in local and trunkmains including bulk supply mains Local infrastructure layout only meeting general Residential housing specifications. Significant local upgrades and additional pipes required to support density level demands above "Residential". Insufficient reservoir storage and/or pumping capacity Demand exceeds existing treatment capacity and/or bulk ring main capacity including	Refer to HAF Phase 1 work by Mott MacDonald

					reservoir filling mains. Demand exceeds water allocation (maxed at 2051)	
14	Greensboro	No Design Pressure Issues, 20m or less	$13.5M	Assessment of 2031 fire cover, changing from FW2 to FW3 has 30 Fail FW3 (also, insufficient hydrants to meet spacing requirements)	Wide spread network LOS issues across the area of interest and/ impacts across other areas Widespread locations below design LOS in local and trunkmains including bulk supply mains Local infrastructure layout only meeting general Residential housing specifications. Significant local upgrades and additional pipes required to support density level demands above "Residential". Insufficient reservoir storage and/or pumping capacity Demand exceeds existing treatment capacity and/or bulk ring main capacity including reservoir filling mains. Demand exceeds water allocation (maxed at 2051)	Refer to HAF Phase 1 work by Mott MacDonald
15	Rotokauri	No Design Pressure Issues, 20m or less	Significant Capacity upgrade have been planned till 2061 based on 2019 population growth projections above $50M (plus roading projects)	Assessment of 2031 fire cover, changing from FW2 to FW3 has 1 Failing FW3 performance (also, insufficient hydrants to meet spacing requirements)	Wide spread network LOS issues across the area of interest and/ impacts across other areas. Widespread locations below design LOS in local and trunkmains including bulk supply mains. Local infrastructure layout only meeting general Residential housing specifications. Significant local upgrades and additional pipes required to support density level demands above "Residential" in brownfield areas. Insufficient reservoir storage and/or pumping capacity at the Pukete reservoir for the unplanned growth. Pukete reservoir site is also not well located hydraulically & has no space for more storage. Demand exceeds bulk ring main capacity.	Significant local and strategic infrastructure upgrades and renewals are required in existing brownfield areas. A new reservoir, Pump Station, Bulkmains and Trunkmains are required to create a new Rotokauri zone.. Additional cost for upgrade would be (renewals not considered) greater than $100M.

16	Te Rapa	No Design Pressure Issues, 20m or less	No capacity upgrades were planned till 2061 based on 2019 population growth projections.	Assessment of 2031 fire cover, changing from FW2 to FW3 has 4 Fail FW3 (also insufficient hydrants to meet spacing requirements)	Wide spread network LOS issues across the area of interest and/ impacts across other areas	The existing local and strategic infrastructure capacity has "significant deficit" and the infrastructure condition is "poor". Significant local and strategic infrastructure upgrades and renewals are required (complete replacement of local infrastructure is likely). Additional cost for upgrade would be (renewals not considered) greater than $100M.
17	Ruakura	6 pressure points less than 10m & 2 between 10-20m	Major capacity upgrades have been planned till 2061 based on 2019 population growth projections. $13.5M	Assessment of 2031 fire cover, changing from FW2 to FW3 has24 Fail FW3 (also insufficient hydrants to meet spacing requirements)	Widespread locations below design LOS in local and trunkmains including bulk supply mains Local infrastructure layout only meeting general Residential housing specifications. Significant local upgrades and additional pipes required to support density level demands above "Residential".	Refer to HAF Phase 1 work by Mott MacDonald
18	Peacocke	1 pressure point less than 10m & 2 between 10-20m	Significant Capacity upgrade have been planned till 2061 based on 2019 population growth projections. Strategic Pipes $24M Reservoir $32M	Assessment of 2031 fire cover, changing from FW2 to FW3 has 2 Fail FW3 (also insufficient hydrants to meet spacing requirements)	Insufficient reservoir storage and/or pumping capacity Demand exceeds existing treatment capacity and/or bulk ring main capacity including reservoir filling mains. Demand exceeds water allocation (maxed at 2051)	Refer to HAF Phase 1 work by Mott MacDonald
19	Temple View	3 pressure points less than 10m	Major capacity upgrades have been planned till 2061 based on 2019 population growth projections. $24M	Assessment of 2031 fire cover, changing from FW2 to FW3 has 8 Fail FW3 (also insufficient hydrants to meet spacing requirements)		Refer to HAF Phase 1 work by Mott MacDonald

10.5 Wastewater Traffic Light Assessment

# on map	Area	2031 Modelled Local and Trunk pipeline Utilisation under dry weather flow conditions (winter)	2031 Modelled Local and Trunk Wet weather overflows	2031 Modelled Strategic Interceptor pipeline utilisation under dry weather flow conditions (winter)	Scale of funded interventions in the current LTP	2061 Modelled Local and Trunk pipeline Utilisation under dry weather flow conditions (winter)	2061 Modelled Local and Trunk Wet weather overflows	2061 Modelled Strategic Interceptor pipeline utilisation under dry weather flow conditions (winter)	Scale of investments identified in current Master Plans to service historic 2061 growth	Scale of investment to service "step change" in demand in long term. Excludes treatment plants
1	Flagstaff East	Majority of local and trunk network < 50% pipe full under dry weather conditions.	5 low frequency/low volume overflow locations predicted across the area. Total modelled average annual overflow volume <50m3.	Far Eastern Interceptor flowing through and servicing the area is < 50% pipe full under dry weather conditions	No interventions identified in Master Plan	Majority of local and trunk network < 50% pipe full under dry weather conditions.	Note that the modelled network in this area may not be accurate and needs to be updated to reflect the as-built system. These results should be considered with caution. 9 low frequency/low volume overflow locations predicted across the area. Additional low frequency/med volume overflows upstream of North City PS. Total modelled average annual overflow volume near North City SPS 1,000m3.	Additional flow from overall catchment results in ~400m length of interceptor flowing between 50 - 75% full. However, no overflows in the vicinity of the area created.	No interventions identified in Master Plan	Local and trunk infrastructure replacements required. Increase in bulk storage volume required, duplication of interceptors likely
2	Huntington	Majority of local and trunk network < 50% pipe full under dry weather conditions. ~600m of 300mm dia trunk pipeline along Barrington/ St James Drive between 50-75% full. ~200m section of 600mm dia pipeline	No predicted wastewater overflows	Far Eastern Interceptor flowing through and servicing the area is < 50% pipe full under dry weather conditions	No interventions identified in Master Plan	Majority of local and trunk network < 50% pipe full under dry weather conditions, however ~600m of 300mm dia trunk pipeline along Barrington/ St James Drive between 50-75% full. ~200m section of	No predicted wastewater overflows	Additional flow from overall upstream catchment results in ~600m length of 1050mm dia far eastern interceptor located downstream of Chapel Hill flowing between 50 - 75% full. However, no overflows the area created.	Current master plan recommends a new staged bulk wastewater storage facility to manage additional flows into FEI. ~$16m for Stage 1.	Local and trunk infrastructure replacements required. Increase in bulk storage volume required, duplication of interceptors likely

		through Cranmar Cl between 50-75% full. This 600mm dia section of the trunk main is located between two 675mm dia pipelines.				600 mm dia pipeline through Cranmar Cl also between 50-75% full. This section of the trunk main is constricted as it is located between two 675mm dia pipelines				
3	Chartwell	Majority of local and trunk network < 50% pipe full under dry weather conditions. ~1,000m of 160mm dia service main (installed in 1985) located in Ranfurly Gully 50-75% pipe full under dry weather conditions. This pipeline is on the boundary with Area 5 but flows into Ranfurly SPS so is accounted for in Area 3 assessment.	5 low frequency/low volume overflow locations predicted across the area. Predicted overflow volume where Ranfurly SPS discharges to the local network >1000m3/annum. Overflow from Fairfield SPS ~400m3/annum. There are 3 further overflows on the boundary with Area 5. The overflows are from manholes and spill between 1 - 5 times per year with a total combined overflow volume of >4000m3/annum. Service line through Ranfurly Gully predicted to overflow infrequently with combined volume of <500m3/annum.	Majority of interceptor servicing the area is between 50 - 75% full in dry weather conditions	Current master plan recommends two new staged bulk wastewater storage facilities to alleviate pressure on the Eastern Interceptor. One storage facility is located in Area 3, the other is located upstream of Area 3. Investigation, planning and construction of these bulk storage facilities are funded in the current LTP. The gravity trunk mains immediately downstream of the Ranfurly pump station rising main are predicted to be under-capacity and causing manhole overflows. The preferred capacity upgrade is to upsize approximately 100 m of the downstream trunk main from DN225 to DN300 to reduce overflows. The upgrade is funded in the LTP. These investments will have an	Majority of local and trunk network < 50% pipe full under dry weather conditions. Small isolated pockets of pipelines between 50 - 75% to >100% pipe full under dry weather conditions ~1,000m long service main located in Ranfurly Gully 50-75% pipe full under dry weather conditions. This pipeline is on the boundary with Area 5 but flows into Ranfurly SPS so is accounted for in Area 3 assessment.	6 predicted wet weather overflow locations in the area. All within close proximity to receiving waterways and main stem of the river. Increased frequency and overflow volumes predicted downstream of Ranfurly SPS without infrastructure investment. Increased overflow volume predicted from Fairfield SPS.	Majority of central interceptor servicing the area is between 50 - 75% full in dry weather conditions	Second stage of bulk storage facility identified in current master plan. ~$8m for Stage 2.	Local and trunk infrastructure replacements required. Increase in bulk storage volume required, duplication of interceptors likely

					improvement on the overall network performance.					
4	**Pukete East**	Majority of local network < 50% pipe full under dry weather conditions. ~1500m of dia 300 - 375mm dia trunk main 50 - 75% full, and ~300m of 300mm dia >100% full	6 low frequency/ low volume overflow locations predicted across the area. One high frequency overflow at Sycamore SPS (located on bank of main river stem). Average annual overflow volume ~300m3. One low frequency moderate volume overflow at st Andrews SPS (<200m3)	Interceptors that service the area both <50% full.	No interventions identified in Master Plan	Majority of local network < 50% pipe full under dry weather conditions. ~1500m of dia 300 - 375mm dia trunk main 50 - 75% full, and ~300m of 300mm dia >100% full	7 low frequency/ low volume overflow locations predicted across the area. One high frequency overflow at Sycamore SPS (located on bank of main river stem). Average annual overflow volume ~300m3. One low frequency moderate volume overflow at St Andrews SPS (<200m3)	Interceptors that service the area both <50% full.	No interventions identified in Master Plan	Local and trunk infrastructure replacements required. Increase in bulk storage volume required, duplication of interceptors likely
5	**Enderley North**	Majority of local network < 50% pipe full under dry weather conditions. ~1500 of dia 450mm dia trunk main 50 - 75% full, and ~400m 75% -100% full. ~100m 100% full.	AREA CONSIDERED LOW IMPACT (DESPITE OVERFLOW PERFORMANCE) FOR THE PURPOSE OF THIS ASSESSMENT BECAUSE ALL OF THE RECOMMENDED UPGRADES IN THE CURRENT MASTER PLAN ARE FUNDED. 9 low frequency/ low volume overflow locations predicted across the area. 1 high frequency high volume overflow at receiving manhole	Majority of interceptor servicing the area is between 50 - 75% full in dry weather conditions	Snells SPS funded and under construction. Upstream and downstream bulk storage facilities in design investigation phase. Construction of both storage facilities are funded in current LTP. These investments will have an improvement on the overall network performance. Enderley/Fifth Ave Pipeline Diversion funded. These investments will have an improvement on the	Majority of local network < 50% pipe full under dry weather conditions. ~1500 of dia 450mm dia trunk main 50 - 75% full, and ~400m 75% -100% full. ~100m 100% full.	AREA CONSIDERED LOW IMPACT (DESPITE OVERFLOW PERFORMANCE) FOR THE PURPOSE OF THIS ASSESSMENT BECAUSE ALL OF THE RECOMMENDED UPGRADES IN THE CURRENT MASTER PLAN ARE FUNDED. 11 low frequency/ low volume overflow locations predicted across the area. 1 high frequency high volume location overflows/year. ~8000m/year at	Majority of interceptor servicing the area is between 50 - 75% full in dry weather conditions	Second stage of bulk storage facility identified in current master plan. ~$8m for Stage 2.	Local and trunk infrastructure replacements required. Increase in bulk storage volume required, duplication of interceptors likely

			downstream of Snells SPS discharge (~6,000m3). 1 mod frequency/ mod volume overflow further downstream on same trunk line (~500m3) Works currently underway will alleviate the high frequency, high volume overflow. Refer to comments on Area 3 for discussion on overflows along the eastern area boundary.		overall network performance.		receiving manhole downstream of Snells SPS discharge. 1 mod frequency/ mod volume overflow further downstream on same trunk line (~600m3) Works currently underway will alleviate the high frequency, high volume overflow. Refer to comments on Area 3 for discussion on overflows along the eastern area boundary.			
6	Claudelands	Majority of local network < 50% pipe full under dry weather conditions. ~1300m long 225mm dia trunkmain along Tennyson Rd, through private property to East Street varies. ~400m 100% full, ~800m between 50% - 100% full	AREA CONSIDERED LOW IMPACT (DESPITE OVERFLOW PERFORMANCE) FOR THE PURPOSE OF THIS ASSESSMENT BECAUSE ALL OF THE RECOMMENDED UPGRADES IN THE CURRENT MASTER PLAN ARE FUNDED. Large number (28) of overflow locations throughout the area. Majority are infrequent and low volume overflows from local reticulation as a result of capacity constraints	Majority of interceptor servicing the area is between 50 - 75% full in dry weather conditions	Snells SPS funded and under construction. Upstream and downstream bulk storage facilities in design investigation phase. Construction of both storage facilities are funded in current LTP. These investments will have an improvement on the overall network performance. Enderley/Fifth Ave Pipeline Diversion funded. These investments will have an improvement on the overall network performance.	Local network < 50% pipe full under dry weather conditions. ~1300m long 225mm dia trunkmain along Tennyson Rd, through private property to East Street varies. ~400m 100% full, ~800m between 50% - 100% full	AREA CONSIDERED LOW IMPACT (DESPITE OVERFLOW PERFORMANCE) FOR THE PURPOSE OF THIS ASSESSMENT BECAUSE ALL OF THE RECOMMENDED UPGRADES IN THE CURRENT MASTER PLAN ARE FUNDED. Large number (30) of overflow locations throughout the area. Significant increase in overflow volumes from local reticulation and Tennyson Trunk Main as a result of capacity constraints	Majority of interceptor servicing the area is between 50 - 75% full in dry weather conditions	Second stage of bulk storage facility identified in current master plan. ~$8m for Stage 2.	Local and trunk infrastructure replacements required. Increase in bulk storage volume required, duplication of interceptors likely

			downstream. 13 overflows associated with Tennyson Trunk main with total volume > ~4,000m3/annum ~500m3/annum overflows in the vicinity of Wairere Dr local reticulation.				downstream. 15 overflows associated with Tennyson Trunk main with total volume > ~5500m3/annum ~900m3/annum overflows in the vicinity of Wairere Dr local reticulation.			
7	**Hamilton East**	Majority of local and trunk network < 50% pipe full under dry weather conditions. ~450mm of 300mm dia trunk main along Riverside walk is between 50% - 100% full, however not surcharging. ~200m of local pipeline to Opoia SPS >100% full.	Frequent (>5) and high volume ~1,700m3/annum overflows from manholes on Clyde St and Kelvin Place. Overflows are on the 600mm dia Interceptor. Several low volume/low frequency overflows shown in vicinity of Firth/Albert Street. Bridge St SPS shown as an overflow location, but SPS has been decommissioned and Hillsborough SPS recently upgraded so disregard this location.	Majority of upper Eastern Interceptor flowing through the area is between 50 - 75% full.	Bulk storage facility to be located in this area to alleviate Eastern Interceptor capacity constraints in design investigation phase. Construction of is funded in current LTP. These investments will have an improvement on the overall network performance.	Majority of local and trunk network < 50% pipe full under dry weather conditions. ~450mm of 300mm dia trunk main along Riverside walk is between 50% - 100% full, however not surcharging. ~200m of local pipeline to Opoia SPS >100% full.	Frequent (>5) and high volume ~2900m3/annum overflows from manholes on Clyde St and Kelvin Place. Overflows are on the 600mm dia Interceptor. Several low volume/low frequency overflows shown in vicinity of Firth/Albert Street. Bridge St SPS shown as an overflow location, but SPS has been decommissioned and Hillsborough SPS recently upgraded so disregard this location.	Additional flow from overall catchment increases the length of interceptor flowing between 5. - 75% full. However, not overflows in the vicinity of the area created.	Upgrade to ~700m to 300/375mm trunk main in vicinity of Firth Street identified in the Master Plan.. ~$1.7m	N/A
8	**Beerescourt**	Majority of local network < 50% pipe full under dry weather conditions. ~500m of 300mm-	11 predicted low frequency/low volume overflows throughout the area. All less than 0.2 OF/yr.	~50% (1000m) of 525mm dia central interceptor flowing through and servicing the majority of the	No interventions identified in Master Plan	Majority of local network < 50% pipe full under dry weather conditions. ~500m of 300mm-	11 predicted low frequency/low volume overflows throughout the area. All less than 0.2 OF/yr.	~50% (1000m) of 525mm dia central interceptor between 50 - 75% full.	Seddon SPS Upgrade recommended to accommodate growth $3m	N/A

		375mm dia trunk main upstream of Gwynne SPS >100% full. ~600m of 300mm dia trunk main upstream of Seddon SPS >100% full. ~300m of 225mm dia trunk main on Cunningham 50 - 75% full. ~150m of 150mm local main along Maeroa Rd from Victoria Street to central interceptor >100% ~500m of 150mm local main from Storey Ave, Garnett Ave, Dalgleish Ave to Central interceptor between 50% to >100% full	>5 overflows/annum from Seddon SPS and trunk main with total annual overflow volume of ~2,500m3. 4 overflows/annum from manhole on Forest Lake Rd upstream of western interceptor. With total annual overflow volume ~1500m3. This predicted overflow needs to be verified with connection to recently installed mid- western duplication.	area between 50 - 75% full.		375mm dia trunk main upstream of Gwynne SPS >100% full. ~600m of 300mm dia trunk main upstream of Seddon SPS >100% full. ~300m of 225mm dia trunk main on Cunningham 50 - 75% full. ~350m of 150mm local main along Maeroa Rd from Victoria Street to central interceptor >100% ~500m of 150mm local main from Storey Ave, Garnett Ave, Dalgleish Ave to Central interceptor between 50% to >100% full	>5 overflows/annum from Seddon SPS and trunk main with total annual overflow volume of ~2800m3. >5 overflows/annum from manhole on Forest Lake Rd upstream of western interceptor. With total annual overflow volume ~2700m3. This predicted overflow needs to be verified with connection to recently installed mid- western duplication.			
9	**Crawshaw**	Majority of local network < 50% pipe full under dry weather conditions. ~1,100m long 300/375mm dia trunk main down Grandview Rd is between 50% - >100% full ~500m of 300/375mm dia trunk main along Breckons Ave between 50- 75% full.	7 predicted low frequency/low volume overflows through the area as a result of trunk main constraints.	Area is serviced by the mid-section of the Western Interceptor which has recently been duplicated. The modelling results do not include this new pipeline which was installed to alleviate capacity constraints in the area.	Mid-section western interceptor duplicated in 2020.	Majority of local network < 50% pipe full under dry weather conditions. ~1,100m long 300/375mm dia trunk main down Grandview Rd is between 50% - >100% full ~500m of 300/375mm dia trunk main along Breckons Ave between 50- 75% full.	7 predicted low frequency/low volume overflows through the area as a result of trunk main constraints.	Area is serviced by the mid-section of the Western Interceptor which has recently been duplicated. The modelling results do not include this new pipeline which was installed to alleviate capacity constraints in the area.	Significant investment is required in the upper section of the western interceptor to minimise overflows and accommodate growth upstream of Dinsdale.	N/A

10	**Dinsdale North**	Majority of local network <50% pipe full under dry weather conditions. Majority of trunk network between 50 - 75% pipe full. These pipelines include 1,000m of 300mm dia trunk main along Bremworth and 1,100m long 225/300mmpipeline from Aberdeen Dr to Aberfoyle and along the Waitaawhiriwhiri Stream. 900m long 225/300mm dia trunk main connecting to Western Interceptor at Karen Cres 50-75% pipe full.	Several overflows in the vicinity of Bremworth Ave trunk main. ~1,600m3/annum. Frequent overflow upstream of Frederick SPS. ~600m3/annum directly adjacent to Waitawhiriwhiri Stream. Cluster of low frequency overflows in vicinity of Karen Cres	The majority of the 600/675mm diameter Western Interceptor is >100% pipe full under dry weather conditions. Dinsdale SPS upgrade has been put on hold, but previously identified as being necessary. The (dual) western interceptor downstream of Dinsdale is shown as between 50-75% full, however the modelling results need to include the recently completed mid -section duplication.	Bulk storage facility to be located in this area to alleviate pressure on Western Interceptor and reduce overflows. The facility is funded in the current LTP.	Majority of local network <50% pipe full under dry weather conditions. Majority of trunk network between 50 - 75% pipe full. These pipelines include 1,000m of 300mm dia trunk main along Bremworth and 1,100m long 225/300mmpipeline from Aberdeen Dr to Aberfoyle and along the Waitaawhiriwhiri Stream. 900m long 225/300mm dia trunk main connecting to Western Interceptor at Karen Cres 50-75% pipe full.	Significant increase in the frequency and volumes of overflows in the area. In particular along the Bremworth trunk mainly, Karen SPS and the trunk network near Karen Cres.	The majority of the 600/675mm diameter Western Interceptor is >100% pipe full under dry weather conditions. Dinsdale SPS upgrade has been put on hold, but previously identified as being necessary. The (dual) western interceptor downstream of Dinsdale is shown as between 50-75% full, however the modelling results need to include the recently completed mid -section duplication.	Upgrade to Frederick SPS is identified in current master plan $2.3m Upgrade of Karen SPS identified in current master plan $2.3m	N/A
11	**Hamilton Lake**	Majority of local and trunk network < 50% pipe full under dry weather conditions. ~300m of 225mm dia is 50-75% pipe full under dry weather conditions	12 low frequency/low volume overflows in vicinity of Lake Rotoroa and Hillsborough. 2 low frequency overflows ~100m3/annum in vicinity of Lake Rotoroa. Low frequency overflows ~500m3/annum on pipeline upstream of Hillsborough SPS. Hillsborough SPS has recently been	Area is serviced by upper western interceptor which is known to have significant capacity constraints. ~50,000m3/annum overflow from the upper western interceptor immediately upstream of Area 11 .	Upper Western Interceptor duplication identified in the most recent Wastewater Master plan but not funded in the current LTP ($50m+)	Majority of local and trunk network < 50% pipe full under dry weather conditions. ~300m of 225mm dia is 50-75% pipe full under dry weather conditions	12 low frequency/low volume overflows in vicinity of Lake Rotoroa and Hillsborough. 2 low frequency overflows ~100m3/annum in vicinity of Lake Rotoroa. Low frequency overflows ~500m3/annum on pipeline upstream of Hillsborough SPS.	Area is serviced by upper western interceptor which is known to have significant capacity constraints. ~7500m3/annum overflow from the upper western interceptor immediately upstream of Area 11 .	Upper Western Interceptor duplication identified in the most recent Wastewater Master plan but not funded in the current LTP. ($50m+) Upgrades to local network near lake identified in current master plan $4.1m	N/A

			upgraded which will alleviate overflows and capacity challenges shown in modelling results.							
12	**Mangakootukutuku / Bader**	Majority of local network <50% pipe full but with several pockets where local network is 50 - >100% pipe full. Around half of the trunk network in the area is 50 - >100% pipe full.	Extensive low frequency/low volume overflows throughout the area. 4 high volume/high frequency overflows locations on trunk main along Collins Rd/Prisk St/Yvonne St ~4,500m³/annum overflow volume. High frequency/high volume (~7, 000 m3/annum) at Fitzroy SPS. High frequency/high volume (~2500 m3/annum) at Normandy SPS. High frequency/high volume (~6500 m3/annum) at Lorne SPS. High frequency/high volume (~2000 m3/annum) at Te Anau SPS.	Area is serviced by upper western interceptor which is known to have significant capacity constraints. ~50,000m3/annum overflow from the upper western interceptor immediately upstream of Area **11**.	Fitzroy SPS upgrade and diversion funded in current LTP ($9m) Colins Rd bulk storage facility funded in current LTP ($13m) Upper western capacity upgrades not funded in the current LTP ($50m +) Other SPS and trunk main upgrades identified in current master plan but not funded ($10m)	Majority of local network <50% pipe full but with several pockets where local network is 50 - >100% pipe full. Around half of the trunk network in the area is 50 - >100% pipe full.	Extensive low frequency/low volume overflows throughout the area. 4 high volume/high frequency overflows locations on trunk main along Collins Rd/Prisk St/Yvonne St ~6200 m3/annum overflow volume. High frequency/high volume (~8300 m3/annum) at Fitzroy SPS. High frequency/high volume (~3300 m3/annum) at Normandy SPS. High frequency/high volume (~7500 m3/annum) at Lorne SPS. High frequency/high volume (~4000 m3/annum) at Te Anau SPS.	Area is serviced by upper western interceptor which is known to have significant capacity constraints. ~5000m3/annum overflow from the upper western interceptor immediately upstream of Area **11**.	Upper Western Interceptor duplication identified in the most recent Wastewater Master plan but not funded in the current LTP.	N/A
13	**Hillcrest East**	Majority of local network <50% pipe full but with several pockets where local network is 50 - >100% pipe full. Around half of the trunk network in the	**16** low frequency/low volume overflows throughout the area. 3 med frequency/volume overflows at Barry Cres, Morris Cres	Area discharges into the upper section of Eastern Interceptor. Majority of upper Eastern Interceptor flowing through the area is between 50 - 75% full.	Stage **1** of Morris and Howell SPS recommended in master plan.	Majority of local network <50% pipe full but with several pockets where local network is 50 - >100% pipe full. Around half of the trunk network in the	**16** low frequency/low volume overflows throughout the area. 3 med frequency/volume overflows at Barry Cres, Morris Cres	Area discharges into the upper section of Eastern Interceptor. Majority of upper Eastern Interceptor flowing through the area is between 50 - 75% full.	Stage 2 of Morris and Howell SPS recommended in master plan.	N/A

		area is 50 - >100% pipe full.	and Howell Ave. Total of ~1700 m3/annum			area is 50 - >100% pipe full.	and Howell Ave. Total of ~3500 m3/annum			
14	**Greensboro**	Majority of local network <50% pipe full but with several pockets where local network is 50 - >100% pipe full. Around half of the trunk network in the area is 50 - >100% pipe full.	20 low frequency/low volume overflows throughout the area. High frequency/high volume overflow near Flynn SPS (~1800 m3/annum) and Somme Cres (2300m3/annum). Low freq/med volume overflows at Edinburgh Rd, Clyde St, Wairere Dr, Beaumont St.	Area discharges into the upper section of Eastern Interceptor. Majority of upper Eastern Interceptor flowing through the area is between 50 - 75% full.	Two bulk storage facilities recommended in master plan ($13m)	Majority of local network <50% pipe full but with several pockets where local network is 50 - >100% pipe full. Around half of the trunk network in the area is 50 - >100% pipe full.	20 low frequency/low volume overflows throughout the area. High frequency/high volume overflow near Flynn SPS (~2800 m3/annum) and Somme Cres (2800m3/annum). Low freq/med volume overflows at Edinburgh Rd, Clyde St, Wairere Dr, Beaumont St.	Area discharges into the upper section of Eastern Interceptor. Majority of upper Eastern Interceptor flowing through the area is between 50 - 75% full.	Flynn SPS upgrade recommended in master plan $2m	N/A
15	**Rotokauri**	Largely undeveloped, so assumption is that area will be developed with future proofed infrastructure.	Largely undeveloped, so assumption is that area will be developed with future proofed infrastructure.	Area is serviced by Far Western Interceptor <50% pipe full.	No strategic interventions identified in Master Plan	Largely undeveloped, so assumption is that area will be developed with future proofed infrastructure.	Largely undeveloped, so assumption is that area will be developed with future proofed infrastructure.	Area is serviced by Far Western Interceptor <50% pipe full.	No strategic interventions identified in Master Plan	N/A
16	**Te Rapa**	Largely undeveloped, so assumption is that area will be developed with future proofed infrastructure.	Largely undeveloped, so assumption is that area will be developed with future proofed infrastructure.	Area is serviced by Far Western Interceptor <50% pipe full. Also, relatively close to the Pukete WWTP	No strategic interventions identified in Master Plan. However strategic and trunk infrastructure needed to service the area. Currently unfunded.	Largely undeveloped, so assumption is that area will be developed with future proofed infrastructure.	Largely undeveloped, so assumption is that area will be developed with future proofed infrastructure.	Area is serviced by Far Western Interceptor <50% pipe full. Also, relatively close to the Pukete WWTP	No strategic interventions identified in Master Plan. However strategic and trunk infrastructure needed to service the area. Currently unfunded.	N/A
17	**Ruakura**	Largely undeveloped, so assumption is that area will be developed with future proofed infrastructure.	Largely undeveloped, so assumption is that area will be developed with future proofed infrastructure. Powells Rd area flows to Eastern Interceptor	Far Eastern Interceptor and infrastructure designed for density proposed in 2018. Pipeline is under construction and is potentially too small	No strategic interventions identified in Master Plan. HCC contribution to Far Eastern Interceptor extension funded in LTP	Largely undeveloped, so assumption is that area will be developed with future proofed infrastructure.	Largely undeveloped, so assumption is that area will be developed with future proofed infrastructure. Powells Rd area flows to Eastern Interceptor	Far Eastern Interceptor and infrastructure designed for density proposed in 2018. Pipeline is under construction and is potentially too small	Current master plan recommends a new staged bulk wastewater storage facility to manage additional flows into FEI. ~$16m for Stage 1.	N/A

			through Area 5. Extensive low frequency/low volume overflows in the Powells Rd area.	for densities being contemplated now. Far Eastern Interceptor has flows <50% pipe full in dry weather conditions. Peacock Rising Mains and Snells SPS will discharge into the Far Eastern Interceptor and trigger the need for Darjon Storage.			through Area 5. Extensive low frequency/low volume overflows in the Powells Rd area.	for densities being contemplated now. Far Eastern Interceptor has flows <50% pipe full in dry weather conditions. Peacock Rising Mains and Snells SPS will discharge into the Far Eastern Interceptor and trigger the need for Darjon Storage.		
18	**Peacocke**	Largely undeveloped, so assumption is that area will be developed with future proofed infrastructure.	Largely undeveloped, so assumption is that area will be developed with future proofed infrastructure.	Largely undeveloped, so assumption is that area will be developed with future proofed infrastructure.	Strategic Infrastructure funded in LTP	Largely undeveloped, so assumption is that area will be developed with future proofed infrastructure.	Largely undeveloped, so assumption is that area will be developed with future proofed infrastructure.	Largely undeveloped, so assumption is that area will be developed with future proofed infrastructure.	Strategic Infrastructure funded in LTP	N/A
19	**Temple View**	Majority of developed area has flows <50% pipe full in dry weather conditions. Remainder is largely undeveloped, so assumption is that area will be developed with future proofed infrastructure.	No modelled overflows	Temple view discharges into constrained western network at Karen SPS	Upper Western Interceptor duplication identified in the most recent Wastewater Master plan but not funded in the current LTP.				Bulk Storage, pump station, rising main from Temple View $20m+	N/A

10.6 Stormwater traffic light assessments

# on map	Area	Supporting Stormwater Investigations	Known flood hazard data	Existing treatment	Watercourse quality risks	Watercourse erosion risk	SW network capacity	Sites of cultural significance

				devices or opportunities				
1	**Flagstaff East**	Te Awa O Katapaki ICMP in final draft. OTAM catchment has ICMP, however is now out of date. 20% of catchment not covered by any ICMP.	Detailed flood hazard modelling available for most of area (~75%). 156 buildings affected by some level of hazard (low hazard or greater). 2 buildings affected by high hazard.	Large percentage of area drains to centralised devices. Most do not meet current SW requirements. Opportunities to implement centralised devices are generally good, mostly through reset of existing devices.	5 available monitoring sites within area. Sediment data is good to fair. MCI data is fair to poor.	Low to moderate erosion susceptibility watercourse. Mix of high-impervious brownfield and greenfield areas. Moderate change in impervious cover expected.	No individual pipe data, however available modelling report that supports the TAOK ICMP suggests minimal capacity issues.	Known cultural sites - not located within watercourse or location not considered to be at risk.
2	**Huntington**	No ICMP currently available for most (75%) of area. Watercourse walkover data available for the majority of stream reaches. Partial coverage of flood hazard modelling.	Detailed flood hazard modelling available for less than 50% of area. 716 buildings affected by some level of hazard (low hazard or greater). 47 buildings affected by high hazard.	Approximately 50% of catchment drains to centralised devices. Most do not meet current SW requirements. Opportunities to implement centralised devices are generally good, mostly through reset of existing devices.	2 available monitoring sites within area. Insufficient data to assess.	Moderate erosion susceptibility watercourse. Mix of high-impervious brownfield and greenfield areas. Moderate change in impervious cover expected.	No SW network capacity data. Approximately 20% of area drains north to TAOK stream and is covered by ICMP modelling which reports minimal capacity issues.	Known cultural sites - not located within watercourse or location not considered to be at risk.
3	**Chartwell**	No ICMP currently undertaken for the Chartwell area. One area specific investigation undertaken to date - watercourse walkover (for Kirikiriroa stream). Some sediment quality and ecological data available through CSDC monitoring, but not	Rapid flood hazard data available for the Chartwell area. 649 buildings affected by some level of hazard (low hazard or greater). 74 buildings affected by high hazard.	Limited existing stormwater devices - will not be meeting current stormwater requirements. Opportunities to implement centralised devices are generally good, with open space aligned with piped networks and adjacent to watercourses.	8 available monitoring sites within area. Sediment quality data is poor. MCI data varies from good to poor. On average data is fair.	High erosion susceptibility watercourse. Some increase in impervious cover expected through redevelopment. Currently brownfield, but typical lot cover is less than allowed for under NPS-UD.	No known SW network capacity data.	Known cultural sites - not located within watercourse or location not considered to be at risk.

		sufficient to support ICMP.						
4	**Pukete East**	No ICMP currently available. No area specific investigations undertaken to date.	Only rapid flood hazard data available for this area. 1327 buildings affected by some level of hazard (low hazard or greater). 291 buildings affected by high hazard.	No know existing central treatment measures. Opportunities to implement centralised devices are limited.	No watercourses within area - short flowpaths discharging directly to river.	No watercourses within area.	No SW network capacity data.	Known cultural sites - not located within watercourse or location not considered to be at risk.
5	**Enderley North**	No ICMP currently available. Partial coverage of one area specific investigation - watercourse walkover.	Only rapid flood hazard data available for this area. 1352 buildings affected by some level of hazard (low hazard or greater). 218 buildings affected by high hazard.	No know existing treatment measures. Opportunities to implement centralised devices are limited. Construction of centralised treatment would require resumption of private properties.	1 available monitoring site within area. Insufficient data to assess.	Drains to three watercourses - Kirikiriroa and 2 Hamilton East gullies. Erosion susceptibility data is high to moderate erosion susceptibility. Moderate change in impervious cover expected.	No SW network capacity data.	Known cultural sites - not located within watercourse or location not considered to be at risk.
6	**Claudelands**	No ICMP currently available. No area specific investigations undertaken to date.	Only rapid flood hazard data available for this area. 1351 buildings affected by some level of hazard (low hazard or greater). 105 buildings affected by high hazard.	No know existing treatment devices. Some opportunity to implement centralised devices - particularly around Claudelands Park.	No data.	No data	No SW network capacity data.	Known cultural sites - not located within watercourse or location not considered to be at risk.
7	**Hamilton East**	No ICMP currently undertaken for the Hamilton East area.	Detailed flood hazard modelling available for approximately 50% of	Minimal existing stormwater devices - will not be meeting current	5 CSDC monitoring sites within area.	No watercourse assessment data available.	No SW network capacity data. Known issues with secondary flowpaths based on rapid	Known cultural sites - not located within watercourse or location

		Some stormwater modelling (hazard modelling only) available for part of area.	area. Remainder covered by rapid. 861 buildings affected by some level of hazard (low hazard or greater). 140 buildings affected by high hazard.	stormwater requirements. Some opportunity to implement centralised devices with open space along watercourse.	Sediment data varies from good to poor. On average data is poor. MCI data varies from good to poor. On average data is fair.		flooding data - i.e., lack of engineered flowpaths causing significant inundation of private properties.	not considered to be at risk.
8	**Beerescourt**	No ICMP currently available. Two investigations available - flood hazard data and watercourse walkover.	Detailed flood hazard modelling available for most of area. 1364 buildings affected by some level of hazard (low hazard or greater). 240 buildings affected by high hazard.	No known existing treatment devices. Opportunities to implement centralised devices are generally good, with open space aligned with piped networks and adjacent to watercourses.	2 CSDC monitoring sites within area. Sediment data is poor. MCI data is poor.	Moderate erosion susceptibility watercourse. Limited change in impervious cover expected as current landuse is highly impervious.	No SW network capacity data. Results of frequent flood events (2y, 10y ARI) from detailed flood study shows impacts on properties in multiple locations. Known lack of engineered secondary flowpaths.	Known cultural sites - PA site appears to be located in gully downstream of Te Rapa Road.
9	**Crawshaw**	No ICMP currently available. Downstream SW investigations undertaken for Rotokauri ICMP or District Plan (flood modelling).	Detailed flood hazard modelling available for most of area. 1890 buildings affected by some level of hazard (low hazard or greater). 67 buildings affected by high hazard.	No know existing treatment measures. Opportunities to implement centralised devices are limited. Construction of centralised treatment would require resumption of private properties.	No watercourses within area. Downstream watercourse is Rotokauri Greenway.	No watercourses within area. Downstream watercourse is Rotokauri Greenway.	No SW network capacity data.	Known cultural sites - not located within watercourse or location not considered to be at risk.
10	**Dinsdale North**	No ICMP currently available. Two investigations available - flood hazard data and watercourse walkover.	Detailed flood hazard modelling available for most of area. 2088 buildings affected by some level of hazard (low hazard or greater).	No know existing treatment devices. Some opportunity to implement centralised devices with open space along watercourse.	3-4 available monitoring sites within area. Sediment data is poor. MCI data is poor.	Low erosion susceptibility watercourse. Limited change in impervious cover expected as catchment is already developed at a high impervious cover level.	No SW network capacity data. Available FHM study (Waitawhiriwhri catchment) indicates limited flooding impacts in frequent events.	Known cultural sites - not located within watercourse or location not considered to be at risk.

			80 buildings affected by high hazard.					
11	**Hamilton Lake**	No ICMP currently available. A number of SW investigations available - flood hazard data, quality/ecology and brownfield stormwater investigation underway.	Detailed flood hazard modelling available for most of area. 405 buildings affected by some level of hazard (low hazard or greater). 26 buildings affected by high hazard.	No know existing treatment devices. Opportunities to implement centralised devices are generally good, with open space aligned with piped networks and adjacent to watercourses.	Several sediment quality available monitoring site within Lake. Issues with SW contaminants identified. No monitoring for catchments draining away from the Lake. No MCI data available.	No data - limited waterways within or downstream of this catchment.	No SW network capacity data. Available FHM study indicates flooding impacts on properties in frequent events, indicating capacity issues.	Known cultural sites - PA site appears to be located adjacent to Graham Park. May be at risk form increased SW flows.
12	**Mangakootukutuku / Bader**	ICMP and supporting investigations practically completed. ICMP focused on greenfield portion of catchment.	Detailed flood hazard modelling available for most of area. 1580 buildings affected by some level of hazard (low hazard or greater). 75 buildings affected by high hazard.	No know existing treatment devices. Some opportunity to implement centralised devices	7 available monitoring sites within area. Sediment data is mostly poor. MCI data varies from good to poor. On average data is good - fair.	Overall moderate erosion susceptibility watercourse. Limited change in impervious cover expected as catchment is already developed at a high impervious cover level.	SW network capacity information available in ICMP. Less than 75% of pipes at or over capacity in 10y event.	Known cultural sites - flour mill and PA site appears to be located adjacent gully/stream. May be at risk form increased SW flows.
13	**Hillcrest East**	No ICMP currently available. No area specific investigations undertaken to date.	Only rapid flood hazard data available for this area. 810 buildings affected by some level of hazard (low hazard or greater). 110 buildings affected by high hazard.	No know existing treatment devices. Opportunities to implement centralised devices are limited. Construction of centralised treatment would require resumption of private properties.	4 available monitoring site within area. Sediment data is poor. MCI data varies from good to poor. On average data is good - fair.	Only partial coverage of walk-over data (approximately 40% of waterway). Where walkover is available, erosion/restoration project underway (Mangonua Gully) Limited change in impervious cover expected	No SW network capacity data.	Known cultural sites - several PA sites appears to be located adjacent gully/stream. May be at risk form increased SW flows.

						as catchment is already developed at a high impervious cover level.		
14	**Greensboro**	No ICMP currently available. Limited area of detailed flood hazard information available.	Detailed flood hazard modelling available for most of area. 1147 buildings affected by some level of hazard (low hazard or greater). 110 buildings affected by high hazard.	Some treatment along Wairere Drive upgrade corridor, none outside of this. Central green corridor provides some opportunity to implement centralised devices.	Discharges to two watercourses south/north. 1-3 monitoring locations at northern outlet of area, none in south. Sediment data varies but is poor immediately at outlet. MCI data is generally good.	No watercourse assessment data.	No SW network capacity data.	Known cultural sites - not located within watercourse or location not considered to be at risk.
15	**Rotokauri**	ICMP and subsequent infrastructure planning undertaken in 2013-15.	Greenfield development area.	Greenfield development area.	4 MCI sites within southern central drainage channel. MCI is fair - poor. Sediment monitoring within Lake Rotokauri. Sediment quality is fair. Three monitoring sites in Rotokauri north. Both sediment quality and MCI are 'good'. Discharges to Lake Rotokauri, which is significantly degraded.	Watercourse is a farm drain and will be re-developed in Greenway project.	Greenfield development area.	Known cultural sites - not located within watercourse or location not considered to be at risk.
16	**Te Rapa**	ICMP and subsequent infrastructure planning drafted (or completed)	Only rapid flood hazard data available for this area (for building footprint assessment).	Mixture of brownfield and greenfield areas. Opportunities to implement centralised	7 available monitoring sites within area.	Area discharges to three streams.	SW network capacity data available for Te Rapa Boulevard, but not other areas.	Known cultural sites - not located within watercourse or location

		for greenfield and most of the brownfield area.	215 buildings affected by some level of hazard (low hazard or greater). 50 buildings affected by high hazard.	devices (in brownfield) are generally good.	Sediment data is mostly poor. MCI data varies from fair to poor.	Te Rapa stream is generally high erosion susceptibility watercourse. Te Otamanui / Mangaheka stream is generally low erosion susceptibility watercourse. No watercourse data for Pukete Stream.	No capacity issues for Te Rapa Boulevard. Significant capacity issues identified for sections of Te Otamanui/Mangaheka.	not considered to be at risk.
17	**Ruakura**	No Council-led ICMP, however developer-led ICMPs in development for all greenfield parts of the study area.	Only rapid flood hazard data available for this area. 806 buildings affected by some level of hazard (low hazard or greater). 32 buildings affected by high hazard.	Mixture of brownfield and greenfield areas. Opportunities to implement centralised devices (in brownfield) are limited, however this represents a small portion of the area.	Limited monitoring available immediately downstream of study area.	Significant proportion of the study area drains into the Kirikiriroa which is highly susceptible to erosion. Significant change in impervious cover expected.	No SW network capacity data. Significant proportion of the area drains to existing Council network which is unlikely to have capacity due to catchment area or low-capacity farm drain network on western side of WEX.	Known cultural sites - not located within watercourse or location not considered to be at risk.
18	**Peacocke**	ICMP and subsequent infrastructure planning undertaken.	Greenfield development area.	Greenfield development area.	7 available monitoring sites within area. Sediment data is good. MCI data varies from good to poor. On average data is good - fair.	Low to Moderate erosion susceptibility watercourse. Significant change in impervious cover expected.	Greenfield development area.	Known cultural sites - several PA sites appears to be located adjacent gully/stream. May be at risk form increased SW flows.
19	**Temple View**	No ICMP. Detailed flood hazard modelling completed. Partial monitoring data available in Waitawhiriwhiri stream.	Only rapid flood hazard data available for this area. 135 buildings affected by some level of hazard (low hazard or greater).	Mixture of brownfield and greenfield areas. Opportunities to implement centralised devices (in brownfield) are generally good - land constraints are minimal.	Limited monitoring available immediately downstream of study area.	Limited data on downstream watercourse condition.	Mostly greenfield. Significant proportion of area drains to farm drain system outside of HCC jurisdiction which is expected to have limited capacity.	Known cultural sites - not located within watercourse or location not considered to be at risk.

			6 buildings affected by high hazard.					
20	City Centre	No ICMP prepared for this area. Detailed flood hazard modelling completed. No receiving environment studies undertaken, however no watercourses within the study area.	Detailed flood modelling undertaken as part of Waitawhiriwhiri catchment. XXX buildings affected by some level of hazard (low hazard or greater). XX buildings affected by high hazard.	City Centre area is fully developed, no known treatment devices/interventions. Opportunities to implement centralised devices (in brownfield) are poor – however, development will likely be large-scale with treatment able to be integrated into development.	No watercourses remaining in City Centre area.	No watercourses remaining in City Centre area.	Network capacity mapping not available for City Centre. Detailed stormwater modelling undertaken for the City Centre show limited ponding or flooding in the 2y and 10y ARI events.	Known cultural sites – not located within watercourse or location not considered to be at risk.

PART 11 - CONCLUSIONS AND RECOMMENDATIONS

11.1 Conclusions

(a) This system performance assessment has been completed in a constrained timeframes using existing available information, modelling assessments, master plans and planned infrastructure investment programmes.

(b) There are several strategic servicing challenges facing Hamilton citywide. These challenges are largely independent of the geographic locations of intensifications and include the environment limits of the Waikato River and our ability to rely on the river for additional potable water supply and to discharge contaminants arising from urban land uses (wastewater and stormwater) and climate change impacts (including source security, flood hazard risks, erosion and increasing wastewater network overflows). These elements have not been specifically included in the traffic light assessment but are significant and exacerbate the scale and costs of future investments needed to service the growing city and restore and protect the Awa.

(c) The existing information is based on and respond to historic population and growth projections and demands (2017) (refer Figure 7). These projections are significantly lower than what the HCC district plan currently enables (duplexing policy), and the level of intensification being contemplated in the NPS-UD or MDRS.

(d) The overall assessments highlight that all of the 19 discrete areas have servicing challenges with one or more of the waters services.

(e) Enabling further intensification without a clear funded infrastructure investment strategy to ensure health and wellbeing of the Waikato River is restored and protected does not align with Te Ture Whaimana.

(f) While the costs to upgrade the networks and treatment plants and headworks to provide for NPS-UD and MDRS across the city have not been quantified at this stage. It is clear that the cost and practical challenges with doing so across the city, all at once will be prohibitive. There is a significant infrastructure investment deficit from that recommended to respond to the 2017 population projections and what has been funded in the 2021-2031 LTP.

(g) Prioritising specific areas of the city for high density development would provide the ability to prioritise infrastructure investment in

strategic locations, contribute toward Te Ture Whaimana, and provide for growth.

11.1.2 **Water supply conclusions:**

(a) In general, the traffic light assessment showed that greenfield areas scored better based on the criteria adopted. Due in part to these areas being underdeveloped in the short term and therefore hydraulic results at 2031 horizon based on very little infrastructure in place.

(b) Generally speaking, the proposed NPS-UD density increases signal a minimum uplift of 3 times the previously utilised demands in Master Planning for Strategic Infrastructure. These density increases applied to an existing built-up environment trigger a number of design requirements which require upsizing at the local infrastructure level. For example, all existing 50 mm Rider mains become undersized and need upsizing to a 150 mm Principal main, which would have to occur virtually on one side off every local road within a housing density change zone.

(c) There is currently a lack of existing detailed technical assessments which support water supply infrastructure planning in existing brownfield areas for the 2031 horizon and beyond.

11.1.3 **Wastewater conclusions:**

(a) Significant investment will be required to treat wastewater to an acceptable standard in the future in order to satisfy the obligations under Te Ture Whaimana and other regulatory instruments.

(b) Generally speaking, the proposed NPS-UD density increases signal a minimum uplift of 3 times the previously utilised demands in Master Planning for Strategic Infrastructure. These density increases applied to an existing built-up environment trigger a number of design requirements which require upsizing at the local infrastructure level and a step change in trunk and strategic conveyance network investment.

11.1.4 Stormwater conclusions:

(a) In general, the traffic light assessment showed that greenfield areas scored better based on the criteria adopted. This was partially due to the fact that these areas were supported by more completed supporting evidence, but also reflecting that development of resilient

networks that align with the principles of Te Ture Whaimana.

(b) Undertaking the traffic light assessments for a number of the identified studies was difficult as they spanned multiple stormwater catchments with differing levels of constraints or available supporting information.

(c) There is a lack of detailed technical assessments which support stormwater infrastructure planning in the existing urban areas.

(d) Lack of suitable sites to retrofit stormwater treatment in brownfield areas presents a significant challenge to achieving upgraded stormwater networks which achieve current level of service standards.

11.2 Recommendations

11.2.1 Prioritising where MDRS and high density development should be enabled that delivers on Te Ture Whaimana and Council's many strategic objectives to enable planned infrastructure investment strategies.

11.2.2 **Water**

(a) Complete master planning for strategic infrastructure required to accommodate proposed growth across the city and beyond. Master planning will require updated population projections that better reflects desired/anticipated infill development, and clarity of what new development areas should be considered (including any areas currently outside of the city boundary).

(b) Carry out detailed network planning at the local/street level to understand future investments needed to respond to growth and intensification over time. The assessment will need co-ordination with all 3 waters infrastructure and other utilities.

(c) Review critical renewals programmes and seek funding to enable growth related upsizing to accommodate more intensification.

(d) Review sizing of upgrades funded in current LTP to ensure investments are appropriately sized or future proofed to meet future demand.

11.2.3 **Wastewater**

(a) Complete a more detailed effects-based assessment on wastewater overflows, looking at locations, potential impacts on receiving environment and sites of cultural significance (historic, customary and contemporary).

(b) Undertake detailed network planning to understand future investments needed to respond to growth and intensification over time. Assessments will require updated population projections that better reflect desired/anticipated infill development.

(c) Review critical renewals programmes and seek funding to enable growth related upsizing to accommodate more intensification.

(d) Review sizing of upgrades funded in current LTP to ensure investments are appropriately sized or future proofed to meet future demand.

(e) Complete assessment against "step change" investment criteria using work completed to inform the Infrastructure Acceleration Fund application process.

(f) Complete master planning for strategic infrastructure required to accommodate proposed growth across the city and beyond. Master planning will require updated population projections that better reflects desired/anticipated infill development, and clarity of what new development areas should be considered (including any areas currently outside of the city boundary).

(g) Review and qualify the implications of additional growth and demand on wastewater treatment plant upgrade programme, funding and regional consents for the wastewater treatment plant (including wastewater discharge consents).

11.2.4 **Stormwater**

(a) Undertake detailed brownfield network planning to understand future investments needed to respond to growth and intensification over time. This should include both conveyance and quality network infrastructure and consider best practice approaches to integrating the two, e.g., through establishing blue-green corridor networks.

(b) Prioritise investigations into feasibility of on-lot stormwater

(c) Prioritise completing detailed technical assessments required to support ICMPs for all catchments, i.e. watercourse walk-overs, ecological assessments and flood modelling studies.

(d) Develop city-wide stormwater network capacity mapping

(e) Revise this traffic light assessment based on updated supporting technical evidence.

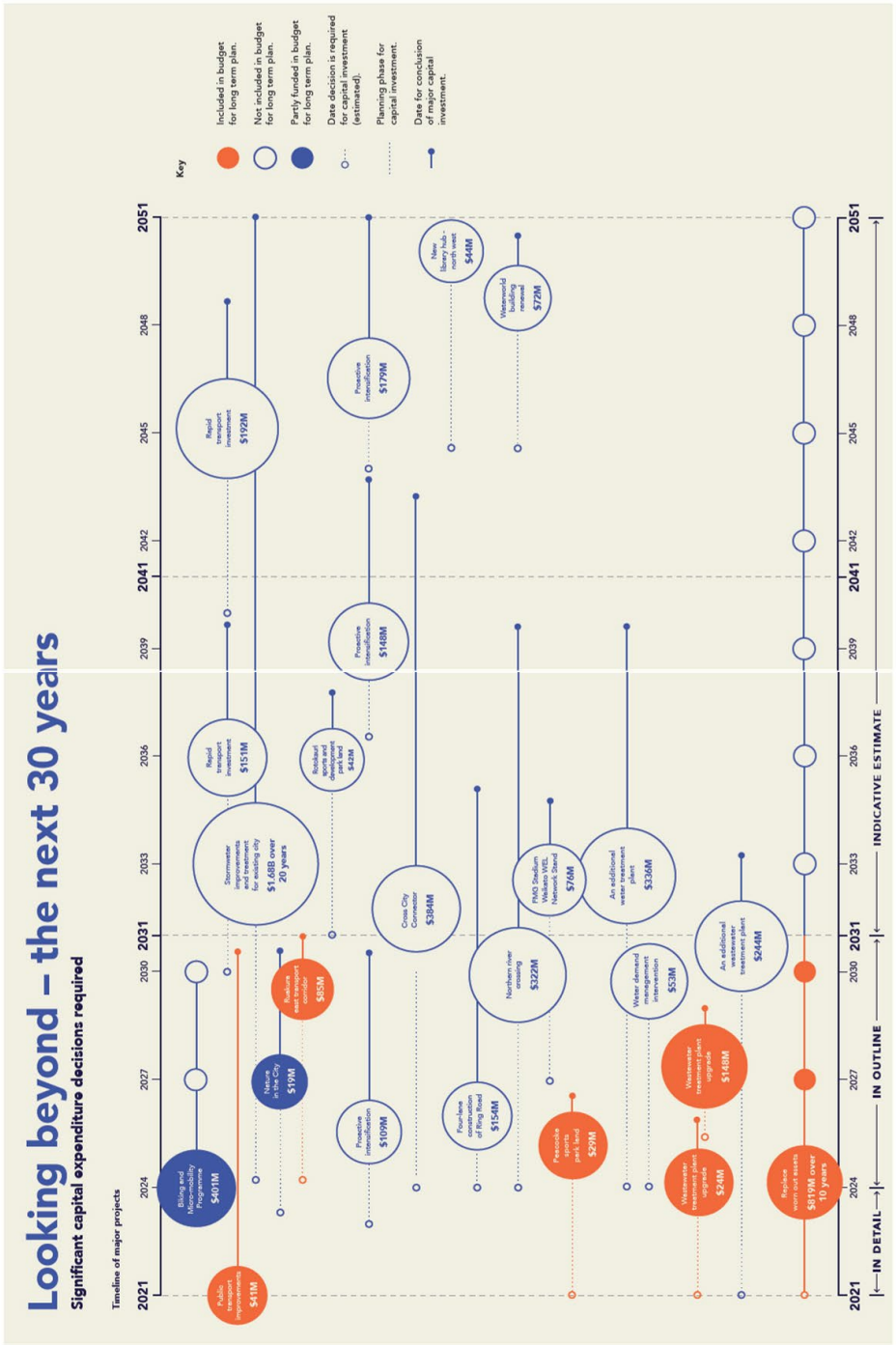
(f) Complete updated stormwater master planning for strategic

infrastructure required to support both brownfield and greenfield forecast growth.

(g) Review available funding programmes for brownfield stormwater quality and quality infrastructure in the current LTP against expected growth and seek additional funding stream for the shortfall

APPENDIX A – CATCHMENT MAPS

APPENDIX B - INFRASTRUCTURE INVESTMENT 2021-51



APPENDIX C – WATER ASSESSMENT SUMMARY REPORTS

APPENDIX D – WASTEWATER ASSESSMENT SUMMARY REPORTS

APPENDIX E – STORMWATER ASSESSMENT SUMMARY REPORTS

PART 12 - BIBLIOGRAPHY

Hamilton City Council. (2021). *2021-31 Long Term Plan*. Retrieved from https://www.hamilton.govt.nz/our-council/10-year-plan/Documents/2021-31%20Long-Term%20Plan%20Volume%201%20FINAL%20for%20web.pdf

Hamilton City Council. (2021). *2021-51 Infrastructure Strategy*. Retrieved from Hamilton City Council: https://www.hamilton.govt.nz/our-council/10-year-plan/Documents/2021-51%20Infrastructure%20Strategy%20FINAL.%20%20May%202021.pdf

Hamilton City Council. (2022). *District Plan*. Retrieved from Hamilton City Council: https://www.hamilton.govt.nz/our-council/council-publications/districtplans/Pages/District%20Plan.aspx

Kāinga Ora. (2021). *Housing Acceleration Fund*. Retrieved from Kāinga Ora: https://kaingaora.govt.nz/working-with-us/housing-acceleration-fund/

Ministry for the Environment. (2018). *Climate change projections for the Waikato region*. Retrieved from Ministry for the Environment: https://environment.govt.nz/facts-and-science/climate-change/impacts-of-climate-change-per-region/projections-waikato-region/#:~:text=Higher%20temperatures%20and%20changes%20in,of%20pest%20species%20like%20carp

Ministry for the Environment. (2020). *National Policy Statement on Urban Development 2020*. Retrieved from Ministry for the Environment: https://environment.govt.nz/assets/Publications/Files/AA-Gazetted-NPSUD-17.07.2020-pdf.pdf

Parliamentary Counsel Office. (2021). *New Zealand Legislation*. Retrieved from Resource Management (Enabling Housing Supply and Other Matters) Amendment Act 2021: https://www.legislation.govt.nz/act/public/2021/0059/latest/LMS566049.html

Royal Society Te Aparangi. (2016). *Climate change implications for New Zealand*. Retrieved from Royal Society Te Aparangi: https://www.royalsociety.org.nz/what-we-do/our-expert-advice/all-expert-advice-papers/climate-change-implications-for-new-zealand/#:~:text=2016%3A%20New%20Zealand%20is%20being,which%20are%20changing%20the%20climate.

Waikato River Authority. (2010). *Te Ture Whaimana Vision and Strategy for the Waikato River*. Retrieved from Waikato River Authority: https://waikatoriver.org.nz/wp-content/uploads/2019/03/Vision-and-Strategy-Reprint-2019web.pdf

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