



MASTERPLANNING FOR CLIMATE RESILIENT COMMUNITIES

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ABSTRACT

Introduction: Tararua District Council (TDC) is committed to ensuring the sustainable development and resilience of the communities within its jurisdiction. With the increasing frequency and intensity of extreme weather events, it is essential to incorporate climate change considerations into the master planning process.

WSP and Woods worked with TDC to support their masterplan and recommend three waters servicing plans to cater for the existing population and future growth for the four largest towns within the district - Dannevirke, Woodville, Pahiatua and Eketahuna. These towns are experiencing unexpected rapid growth in recent years ahead of forecast growth, which is putting pressure on the existing aging reticulation systems that are already experiencing capacity constraints.

InfoWorks ICM was used to undertake wastewater and stormwater model builds for the four townships. The models were used to investigate options for future master planning and infrastructure upgrades with a focus on climate change, resilient infrastructure, sustainability, operations and flood management.

Methods and Tools: On completion of hydraulic model build, a high-level calibration of the wastewater model was undertaken to understand the interaction between the stormwater and wastewater systems. Flow gauge data was available at treatment facilities which allowed wastewater flows to be estimated for the four townships. Areas of the network which acted as combined system were identified with TDC Operations team and the calibration process confirmed the presence of high levels of Inflow and Infiltration (I&I) within the wastewater reticulation network. This was particularly problematic in the winter months where groundwater infiltration is estimated to make up as much as 60% of dry weather flow in some townships. Due to the age and material of the network, pipe condition is expected to be a factor contributing to the high groundwater inflows.

A Multi Criteria Analysis (MCA) process was developed and used to confirm the preferred upgrades for stormwater and wastewater networks. The MCA process was undertaken in collaboration with all stakeholders to evaluate the long list options against a number of criteria including environmental, economic, cultural and social aspects and scored to identify the preferred servicing options. Although significant interaction between the stormwater and wastewater network had been identified, when considering future infrastructure requirements separate systems were designed to have a conservative approach with consideration to the resilience of the infrastructure to flood events, climate change and promoting sustainability.

Conclusion: This study has provided the TDC with a comprehensive understanding of the infrastructure challenges and has identified a range of options for addressing these challenges. The study found that I&I presents a significant challenge which would increase with anticipated growth and changes in rainfall pattern. This study will inform the development of a comprehensive master plan for the townships, with the goal of creating sustainable and resilient infrastructure for the future. The study highlights the importance of considering climate change and sustainability in the master planning process, and the



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benefits of incorporating these considerations into the infrastructure development. The study also emphasizes the importance of collaboration with stakeholders and engagement with the communities in achieving this goal.

Keywords

Climate Change, Resilience, Master planning, Wastewater, Stormwater InfoWorks ICM, Infrastructure, Inflow and Infiltration