

# Stormwater Asset Management Plan Summary

2008



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**POSITIVELY**

ME HEKE KI PŌNEKE  
WELLINGTON CITY COUNCIL

**Wellington**

*This Asset Management Plan has been prepared by*



# Summary Stormwater Asset Management Plan 2009

Wellington City Council

January 2009

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# 1.0 Overview

## 1.1 Activity description

The stormwater network protects human health and well-being, and makes the city viable, by reducing the risk of flooding. Each year the network carries about 80 million cubic metres of run-off from kerbs and channels and drains to streams and the harbour. The network is made up of more than 680km of pipes and tunnels with a total replacement cost of approximately \$640 million.



The stormwater network is managed in accordance with the stormwater asset management plan, which ensures service level requirements such as network condition and capacity, flood risk reduction, response to faults/complaints, and criteria for upgrades and renewals are met. The plan details how the Council will comply with all relevant legislation and regulatory requirements.

Key service level requirements and underlying standards include:

- Habitable dwellings should be protected from flooding during a 1 in 50-year rainfall event.
- Discharges from the stormwater system should have minimal impact on the aquatic receiving environment.

This plan covers the 10-year planning period from 2009/10 to 2017/18.

## 1.2 Council involvement

Reliable and sustainable flood protection is a fundamental requirement to protect the health and well-being of the community, including providing support for business development.

In urban areas, stormwater is most effectively disposed of by means of reticulated stormwater systems to the nearest watercourse. This allows the costs associated with maintaining high standards and efficient infrastructure to be spread over a wide population. The existing stormwater system has been developed and built up over many years as a public system to serve the needs of the community.

Wellington City Council manages Wellington's stormwater activity because:

- The activity directly supports the achievement of a number of community outcomes (outcomes the Wellington community believe describe the city they wish to live in). It also directly supports the achievement of Council outcome nine (safer – protecting public health and the environment, Figure 2), and supports economic growth of the community.
- The Council can provide a specified level of service in a cost-effective manner.
- The Local Government Act 2002 (section 130) requires the Council to provide water services (including stormwater services) and maintain its capacity to do so.
- The Health Act 1956, (sections 23 and 29) requires the Council to “improve, promote and protect public health” within the district as necessary.

- The community, through the community outcome process, has strongly indicated its support of Council involvement to sustainably manage the stormwater activity to protect public and environmental health, critical infrastructure and property, and to actively reduce adverse environmental impacts.

### 1.3 Key stormwater issues

Key stormwater issues identified by the Wellington City Council which are being addressed are:

- **Levels of service.** The level of service provided to Wellington City by the stormwater activity is consistent with current industry standards and levels of service provided by other councils in New Zealand. Analysis indicates the current level of service broadly satisfies community expectations. The Council will continue to gather data to better describe the actual level of service provided and determine resident satisfaction with a greater level of confidence.
- **Future change.** The effects of future climate change are uncertain, although warmer temperatures with some increases in peak rainfalls and rises in sea levels are expected. Population growth and urbanisation are expected to continue. The projected increase in stormwater run-off generated from these changes, decreased ability to dispose of the run-off through sea level rise and increased risk of coastal inundation requires active management, especially since planning for change and implementing identified initiatives takes time.
- **Environmental impact from stormwater flows.** Stormwater run-off from urbanised catchments is greater than from natural catchments, reflecting the higher proportion of impermeable surfaces. Increased run-off flows can scour and otherwise degrade natural watercourses, and the use of traditional piped systems reduces groundwater recharge. Contaminants such as oils, grease, metals and other contaminants washed from pavements and other areas in urban catchments and discharged into sumps are present in stormwater entering watercourses, the harbour and coastal receiving environments. While there is limited information on the impact of these contaminants on our environment, there is growing awareness in New Zealand that there is risk of environmental damage, and possibly a risk to public health. Further, the wastewater network occasionally overflows to the stormwater system in wet-weather events through a series of constructed overflows. The stormwater, contaminated with diluted wastewater, is then discharged to watercourses or the sea. The environmental and public health impacts of these discharges, and actions in place to address them, are covered within the wastewater asset management plan.
- **Risk of natural disaster.** A catastrophic natural disaster, such as a major earthquake, could limit the ability to provide reliable flood protection to the community and would hinder reinstatement of other necessary services, such as accommodation, water supply and wastewater disposal. Reinstating flood protection systems, both temporarily and permanently, would be costly and would take considerable time.
- **Continuous improvement.** The Council recognises the fundamental need to continually improve its asset management processes. Stormwater management must be provided at agreed service levels and with increasing efficiency to reduce costs, reduce resource use and minimise environmental impacts.

## 2.0 Strategic context

### 2.1 Strategic framework

The Council has facilitated the identification and definition of community outcomes by the Wellington “community”. The community outcomes guided the development of the Council’s own city outcomes, which interpret the community outcomes over which the Council has direct influence. The Council has identified key strategy areas, and within each of these areas has developed strategies in order to deliver the city outcomes. In turn, these strategies form a key input into the asset management plans, along with stakeholder and legislative requirements, current and future demand information, and risk issues.

Figure 1 indicates the linkages between the key legislation, planning and documents that guide the Council’s stormwater activity.

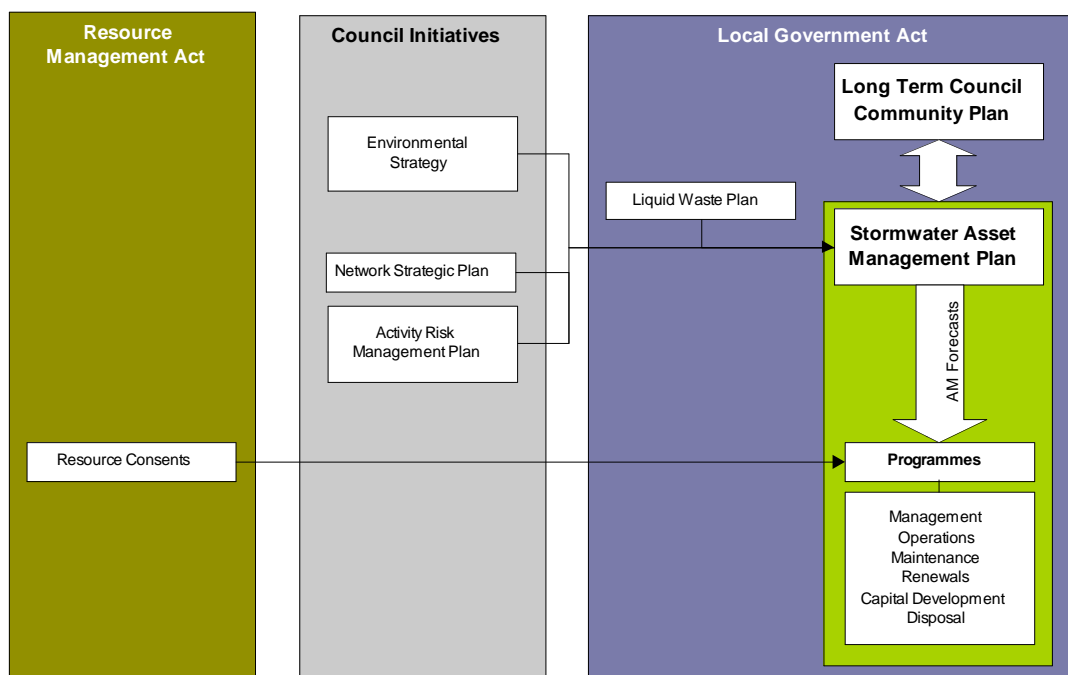


Figure 1 – Strategic framework

The stormwater activity contributes to the following community outcome:

“Wellington’s long-term environmental health will be protected by well-planned and well-maintained infrastructure.”

This plan gives effect to these high-level strategies, Council and community outcomes by having specific plans and a detailed programme of works to support and encourage quality of life, enterprise and prosperity through the provision of stormwater collection and disposal services.

Figure 2 shows the linkages between the community outcomes defined in the Long Term Council Community Plan and the stormwater activity, and the nature of the contribution.

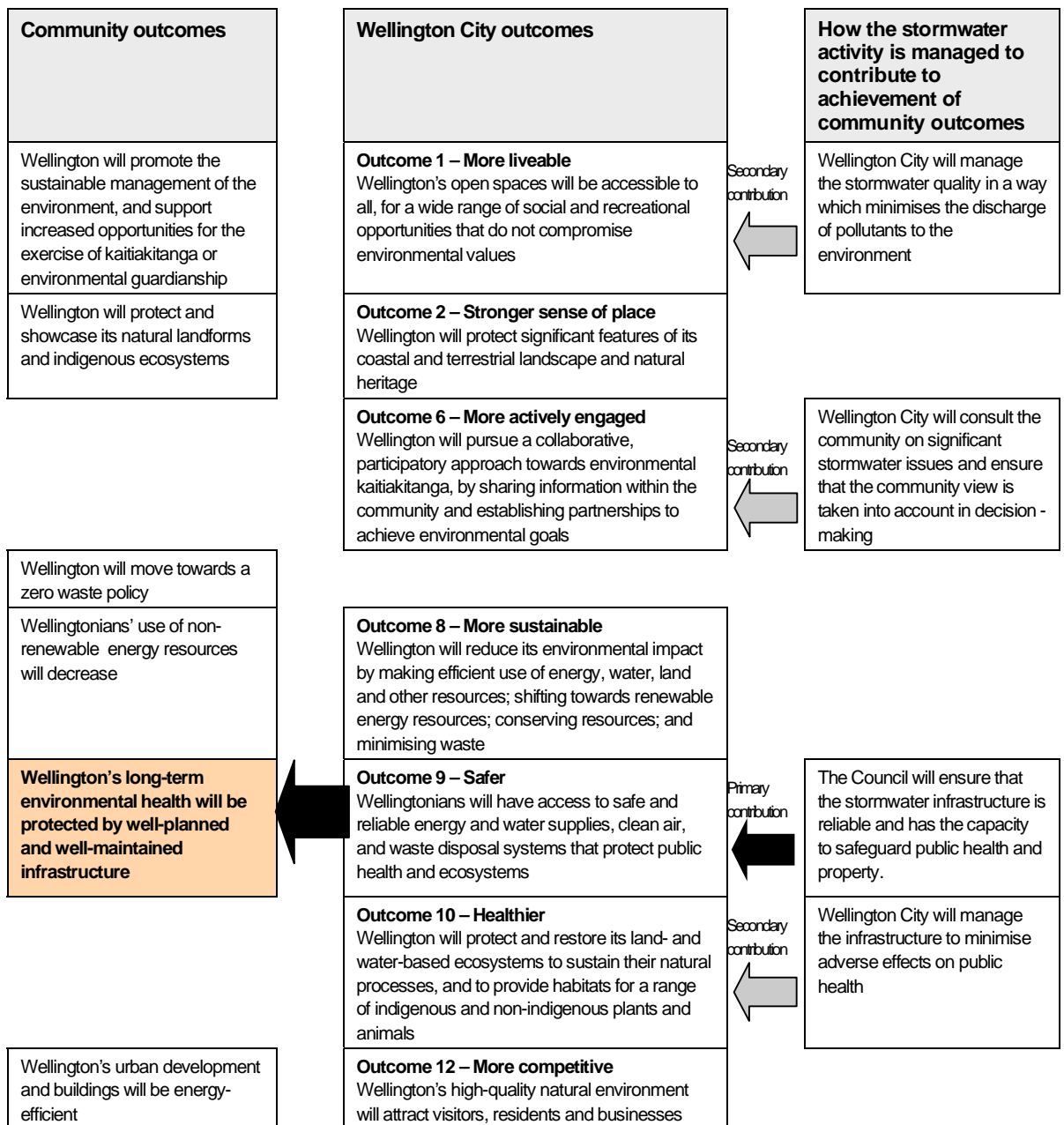


Figure 2 – Community outcomes, city outcomes and strategies

### 2.1.1 Environmental Strategy and Network Strategic Plan

The Environmental Strategy adopted by the Council in 2006 provides a high-level statement of the Council's long-term environmental intentions for Wellington as well as shorter-term priority areas for action. The Network Strategic Plan, due for completion in 2009, will identify the key strategic issues facing the stormwater network and set out our approach to managing these issues.

The strategy identifies as priorities over the next three years the following actions relevant to the stormwater activity:

- increase efforts to improve the quality of streams
- increase the Council's promotion of sustainable resource use, including a drive for energy efficiency in the operation of the city's infrastructure.

## **2.1.2 Liquid Waste Management Plan**

This plan was adopted by the Council in 2005 to meet the requirements set out in the Local Government Act 2002 and the New Zealand Waste Strategy 2002. The plan states objectives, policies and actions relating to the sustainable management of stormwater and wastewater discharges which provide a framework for asset management planning. The goals of the Liquid Waste Plan are to:

- lower the social costs and risks of waste
- reduce damage to the environment from waste generation and disposal
- increase economic benefit by more efficient use of materials.

## **2.2 Growth in demand**

### **2.2.1 Changing demand**

Factors which influence demand for the stormwater activity are:

- growth
  - population change
  - sub-divisional activity and residential change
- climate change
- increasing customer expectations.

### **2.2.2 Key issues with changing demand**

Stormwater management is an activity that influences a range of outcomes, including safety, environmental well-being, health, sustainability and economic development. The key issues for the stormwater activity related to growth and changing demand for services in the city are as follows.

#### **Social**

The expected growth rate in Wellington City is predicted to be approximately 0.7 per cent per year over the next 20 years<sup>1</sup> (an increase of approximately 27,000 residents). Further, the average number of people per dwelling is decreasing in Wellington, as it is elsewhere in New Zealand. In line with declining household size, Wellington will need to provide approximately 24,000 additional dwellings between 2006 and 2026.

Property development associated with increasing population implies increasing stormwater generation. Development of the northern suburbs and changing housing needs to smaller lot sizes and more use of concrete and other sealed surfaces around homes will increase stormwater flows with more rainfall run-off directed to the system.

There is an increasing expectation from the community that flooding incidents will occur less frequently, will be less severe and will be dealt with more rapidly.

Changes in growth and demand on the stormwater infrastructure affect:

- the ability of the stormwater network to meet the increase of stormwater flows
- the frequency with which secondary overland flow paths are used, including roads and private properties
- the likelihood of flooding and subsequent property damage.

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<sup>1</sup> A slow -down in growth is expected around 2030 in conjunction with an ageing population and projected slowing of world population growth.

## **Environmental**

There is an increasing focus on the quality of the environment, including water quality in watercourses and the coastal receiving waters. The Council will continue to implement a range of strategies intended to reduce contamination of stormwater. Some preliminary work has been undertaken to investigate environmental effects of contamination associated with urban run-off. Climate change leading to higher-intensity rainfall events could increase environmental damage caused by flooding and slips.

Inflow from stormwater pipes and infiltration of groundwater causes occasional overflow of wastewater from the wastewater network despite programmes to reduce inflow and infiltration. The Council has invested heavily in improving the water quality of harbour, sea and streams through assessment, monitoring and investigation projects, and implementation of physical works. The focus has been on reducing wastewater pollution from the city's stormwater system at 11 consented sites and other selected sites as part of the wastewater activity.

## **Cultural**

The discharge of contaminated stormwater to receiving waters is offensive to the tangata whenua. Asset management planning includes a range of strategies to identify and reduce the contamination within stormwater discharges.

## **Economic**

An effective and reliable stormwater system which provides adequate protection against flooding supports economic activity in the city. The economic cost to individuals and to the community can be catastrophic in major flood events, as seen in the 1976 and 2004 floods in the Wellington region when numerous dwellings were flooded. The strategies and funding policies in the asset management plan are focused on minimising the cost of services and ensuring the equitable allocation of costs while maintaining and improving the quality of the stormwater service. Growth in industry may increase impervious areas within the catchment and so increase stormwater run-off, as well as increasing the risk of point source contamination of the stormwater discharges.

## 2.3 Stormwater demand projections

Figure 3 below presents estimated indicative cumulative increases in stormwater run-off from development and climate change. This projection assumes medium growth projections and climate change forecasts. Greater detail is provided in individual catchment management plans, including the capability of both the primary and secondary stormwater systems to manage these flows.

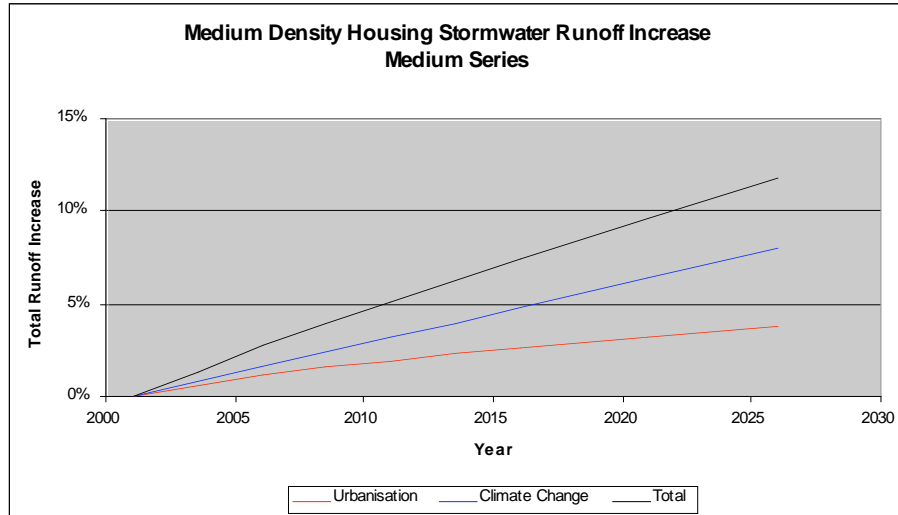


Figure 3 – Projected cumulative increase in stormwater flows

## 2.4 Demand management

In addition to asset development works, the Council currently implements the following demand management techniques:

**Regulation** – The District Plan dated July 2000, discourages greenfield development through its urban containment policies by encouraging infill housing in existing urban areas. It includes policies to limit site coverage and therefore peak run-off volumes.

**Education** – This includes promoting environmental awareness and the effects of activities such as car washing, where contaminants may enter the stormwater system through sumps.

**Demand substitution** – implementing integrated solutions through:

- maximising the use and benefits of natural catchment areas, including soakage and storage/attenuation potential
- exploring opportunities to reduce stormwater run-off through re-vegetation programmes, the use of porous pavements and infiltration drainage (soakage)
- managing waterways using a holistic approach as articulated in the Council's Bush and Streams Restoration Plan, "Wet and Wild" 2001
- minimising run-off impacts through raising affected properties, or purchasing, protecting and reselling affected properties.

Demand management options that will be considered for future introduction include:

**Education** – increased promotion of environmental awareness and the effects of activities such as car washing, that may allow contaminants to enter the stormwater system through sumps.

**Demand substitution** – exploring opportunities to reduce stormwater run-off through capture of run-off from roofs for re-use as a non-drinking water source.

## 3.0 Our assets

### 3.1 Asset description

Stormwater management and flood control in Wellington City is achieved through:

- Primary system:
  - Structures that intercept and direct rainfall run-off to conveyance systems: These include kerbs, channels, sumps and specific intake structures. Kerbs, channels and sumps are managed as part of the Transportation activity.
  - Conveyance systems which transport the run-off to the sea: These are generally piped systems, although in some cases are natural watercourses. Many of the natural streams in the Wellington City area were piped many years ago. Typically, the larger pipes in the stormwater drainage system are laid along the beds of the original streams (often on private property) with the smaller feeder pipes in legal road.
- Secondary system:
  - Overland flow paths and ponding areas safely manage flows in excess of the capacity of the primary system. Most secondary flow paths tend to be roads.

Activities contributing to coastal flood defences are managed separately, such as:

- provision of seawalls, managed as part of the Transportation activity
- dune stabilisation, managed as part of the Gardens and Beaches activity.

The broad asset groups and the physical quantities are shown in Figure 4. Figure 5 shows the proportion of the total replacement value for the main asset groups.

Activity	Asset components	Quantity
Pipe systems	Pipes	649 km.
	Tunnels	1 km.
	Kaiwharawhara sediment/debris collection facility	1
	Ngauranga sediment/debris collection facility	1
	Karori sediment/debris collection facility	1
Natural systems	Porirua Stream - 33 per cent share with Porirua City Council	1
	Ngauranga Stream	1
	Kaiwharawhara Stream	1
	Karori Stream	1
	Ohariu Stream	1
	Owhiro Stream	1

Figure 4 – Stormwater assets summary

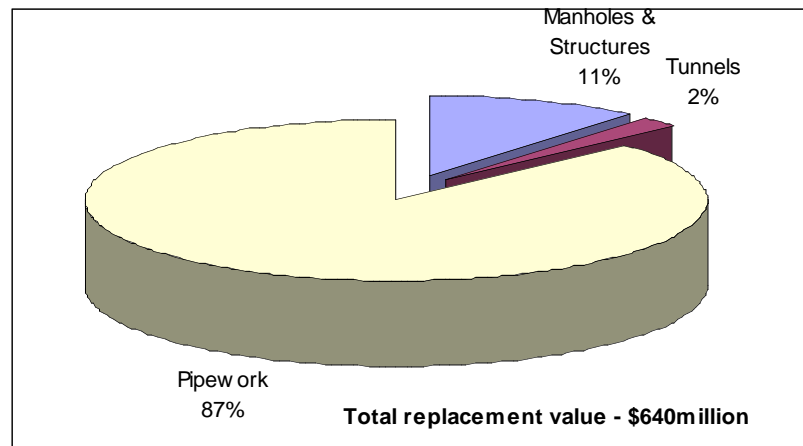


Figure 5 – Stormwater asset replacement cost

- The majority of the stormwater reticulation network is less than 375mm diameter pipes. Only 26 per cent of the network by replacement cost is of 525mm diameter or greater.
- Eighty-five per cent of the piped network was constructed during the 1950s and 1960s as presented in Figure 6.
- Secondary flow paths such as roads, kerbs, channels and sumps are maintained and administered through the Roding, Traffic and Transportation Asset Management Plan.

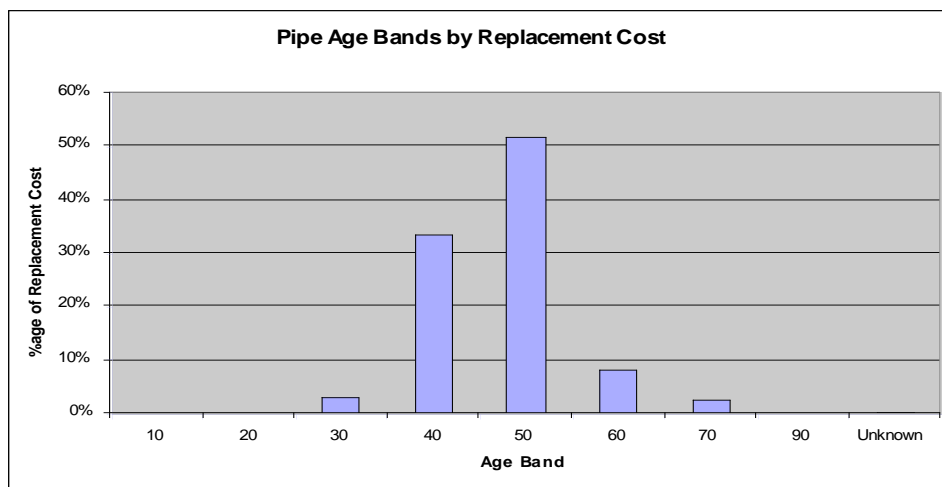


Figure 6 – Pipe network age profile

### 3.2 Asset capacity and performance

- With minor exceptions, Wellington’s stormwater network has the capacity to manage moderate rainfall events. Ongoing analysis and modelling as part of the catchment management plan development helps quantify the actual level of flood protection provided. This is likely to be in the order of between a one in two-year and a one in five-year rainfall event. Stormwater run-off in rainfall events more severe than this is not managed by the primary system and flows down secondary overland flow paths. These flow paths are generally roads, although can also include parks, reserves and private property.
- Various areas in the city have been identified as having less than the target level of flood protection. Catchment management planning to identify options and priorities

for flood protection works for 11 catchments is in progress. This includes the five linked inner-city catchments – Harris, Te Aro, Taranaki, Tory and Newtown catchments – which have been assessed as being the highest flood risk priority.

- The natural streams were piped many years ago, with larger pipes laid along the beds of the original stream often in private property. In 2001, the Council adopted the Bush and Streams Restoration Plan, “Wet and Wild” 2001 as part of a wider natural environmental strategy to protect the remaining streams.
- Water quality has improved through implementation of the sewage pollution elimination programme as part of the wastewater activity, and is now considered moderate. However, increasing environmental requirements are anticipated and remedial works are required on some discharges within the contributing catchments as reported in the Baseline Assessment of Environmental Effects (BAEE).

### 3.3 Asset condition

A "top-down" assessment of the pipe condition has provided the Council with the condition grade profile as shown in Figure 7 (where condition grade 1 indicates very good condition and pipes in condition grade 5 have failed or are about to fail). The pipe network is generally in moderate to good condition, and is consistent with the assessments made in 2000.

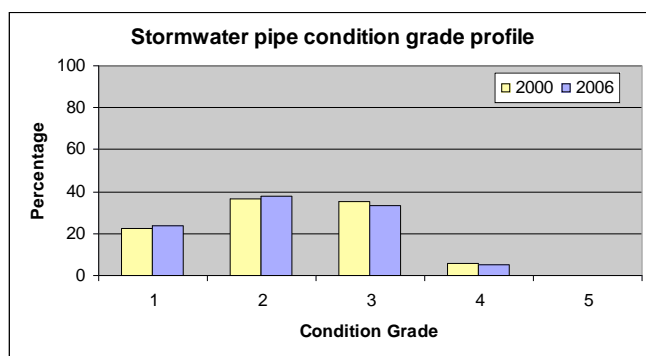


Figure 7 – Citywide condition grade profile

### 3.4 Significant negative effects

The potential significant negative effects of the stormwater activity are:

- Environmental values can be degraded by stormwater run-off contaminated with microbiological content (from cross-connection and overflows from the wastewater system, sediments, oils, greases, metals, animal waste and organic material washed from roads and other impervious areas, and rubbish and contaminants illegally discharged into the stormwater system). In rural areas, run-off may also be contaminated with herbicides, pesticides and fertilisers.
- Social values, the quality of life and public health, can be diminished by:
  - blockage of stormwater system leading to overflows and flooding of adjacent areas and buildings
  - excessive inflow/infiltration of stormwater into the wastewater network, causing wastewater overflows to land, streams, the harbour and coast (this is managed within the wastewater activity).



- Cultural sensitivities are compromised by contaminated stormwater discharges to watercourses and coastal receiving waters.
- Economic costs to the community accrue as a result of flooding and the discharge of contaminated stormwater into watercourses or coastal receiving waters.

The Council mitigates these potential negative effects by a mix of:

- asset management planning
- asset maintenance, renewal and development work
- monitoring and testing
- compliance with comprehensive environmental and health and safety procedures
- public education
- regulatory controls (e.g. building floor level restrictions) and bylaws.

### **3.5 Levels of service**

#### **3.5.1 Broad approach**

The Council plans to continue delivering broadly the same level of service within the stormwater activity, with gradual improvements to flooding and environmental protection. Improvements being introduced are expected to increase operational efficiency, cost-effectiveness and environmental performance through developing robust frameworks to increase confidence in correct project option selection and works prioritisation.

#### **3.5.2 Performance measures**

The contribution of the stormwater activity to the achievement of the city's community outcomes is measured by the activity key performance measures presented in the Long Term Council and Community Plan (LTCCP). They cover the aspects of service that are of most interest to the community and are reported in the Annual Report.

The Council has developed a number of operational measures to enable us to assess the overall quality of the stormwater activity (such as environmental, technical and cost-effectiveness standards). These measures are reported on in the detailed asset management plan.

The current and future activity measures adopted, and the levels of performance achieved, are shown overleaf.

Performance measure	Target	How we are doing
<b>Activity measures</b>		
<ul style="list-style-type: none"> <li>Response time to service requests – percentage of requests for service responded to within one hour of notification (response includes investigation and prioritisation of work).</li> </ul>	07/08	97%
	08/09	97%
	09/10	97%
	17/18	97%
<ul style="list-style-type: none"> <li>Customer satisfaction – percentage of customers who are satisfied with work carried out (specific to the stormwater operations and maintenance activities).</li> </ul>	07/08	75%
	08/09	75%
	09/10	75%
	17/18	80%
<ul style="list-style-type: none"> <li>The percentage of sampling days when the following contaminants are not seen: scums or foams, floating or suspended material, abnormal colour or clarity, fats or gross solids.</li> </ul>	07/08	100%
	08/09	100%
	09/10	100%
	17/18	100%
<ul style="list-style-type: none"> <li>The percentage of monitored freshwater sites where annual median faecal coliform bacteria counts are less than 1000 per 100ml (lower levels of these bacteria mean cleaner water).</li> </ul>	07/08	80%
	08/09	80%
	09/10	90%
	17/18	90%
<ul style="list-style-type: none"> <li>The percentage of sampling days at monitored bathing beaches when water quality complies with Ministry for the Environment guidelines (green status).</li> </ul>	07/08	90%
	08/09	90%
	09/10	90%
	17/18	90%

Figure 8 Levels of performance

### 3.6 Community engagement

The Local Government Act (2002) requires the Council to consult with affected and interested parties in making decisions. The Council ensures that all interested stakeholders have an opportunity to influence level of service decisions by:

- ongoing consultation with the community regarding community outcomes as part of the LTCCP development
- consultation with the community in 2000 as part of the Strategic Review (for the consultation process, alternative levels of service were developed together with associated cost implications, but feedback received from the community was not comprehensive)
- consultation as part of the preparation of catchment management plans and flood protection programmes
- making asset management plans available on the request
- newsletters distributed with rates notices
- consulting with affected persons on specific projects (as required by the RMA 2001).

While much of the Council's consultation will continue to be done at a high level, there is a need to seek the community's view on the trade-offs necessary where there are conflicting goals. We need to establish a balance between levels of flood protection provided by the primary (piped) system and cost. Although overland flow paths and natural ponding areas provide an integrated flood protection system, there is evidence that the community considers these secondary flows undesirable. We also need to establish a balance between protection of the environment from urban contamination and cost. It is likely that consent conditions will increase in this regard.

## 4.0 Managing our assets

### 4.1 Asset management model

The asset management planning process implemented by the Council is shown in Figure 9.

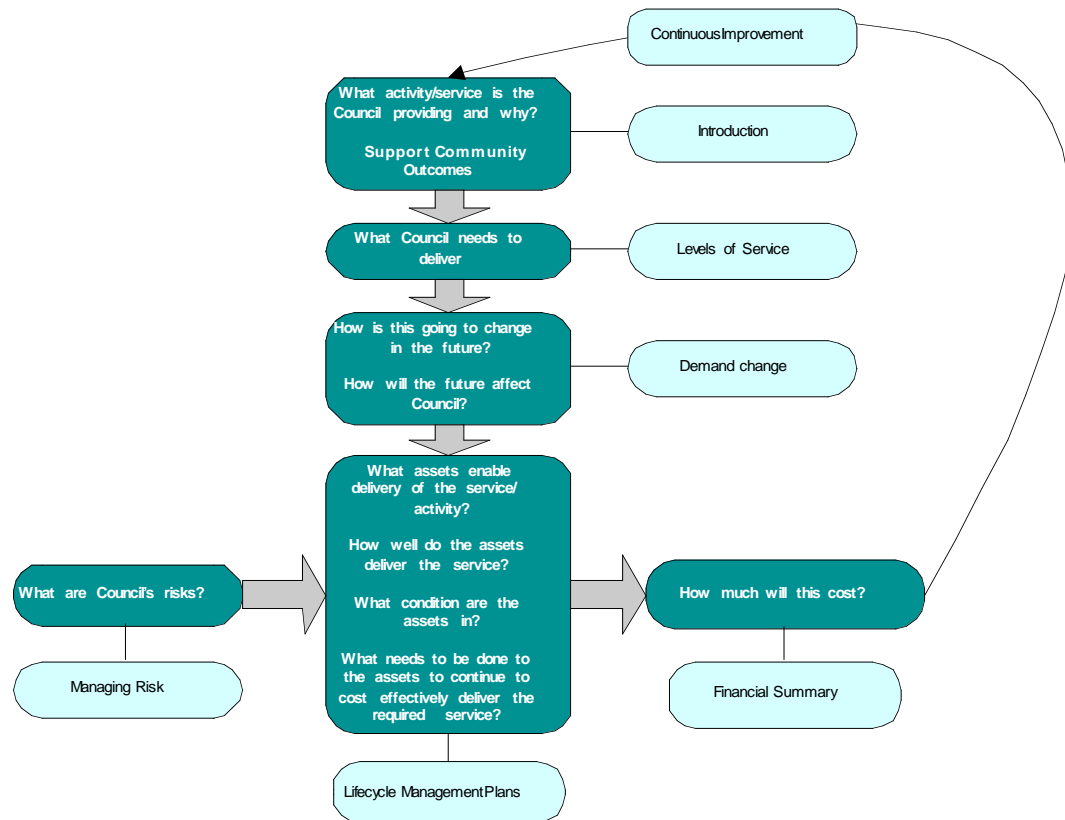


Figure 9 – Asset management planning model

### 4.2 Risk management

Risk management is an inherent part of the Council's overall stormwater management approach. Management of service levels, environmental and demand/growth related risks are dealt with through the strategies outlined in sections two and three of this plan and this section.

The Council's current approach to risk management can be summarised as:

- address known high and extreme risks with new management/operational strategies and/or a forward programme of remedial works, with priorities based on a risk matrix system
- manage the current known lesser risks within the existing strategies and work programmes
- where risks are unknown, develop a plan to better identify and/or quantify the risks prior to implementation of risk mitigation measures.

The Council is improving its understanding of risk using programmes to improve asset knowledge. Works activities and associated expenditure requirements are being reviewed constantly as knowledge of these assets improves. Figure 10 shows management actions planned for the highest identified risks. Other risk events, such as asset failure, have either

sound controls in place to reduce the severity of the potential risk (such as in the case of pipe deterioration failures), or have a naturally low probability of occurrence (such as failure in the case of a major earthquake).

Core value	Risk event description	May lead to	Existing controls to manage the risk	Additional controls planned to reduce the risk further
Environmental performance	Inflow of stormwater runoff and infiltration of groundwater into the wastewater network may exceed design allowances	Wastewater overflows into the stormwater network and contamination of watercourses and the sea	Managed as part of the wastewater activity	Managed as part of the wastewater activity
	Contaminants associated with urban centres, such as oils, heavy metals and litter enter the stormwater system	Contamination of the harbour or streams	Stormwater sumps have catchpits and baffles	Assess the effects of urban runoff on aquatic environments, and develop options for prevention and treatment
Service quality	Demand forecasts may not be accurate, planning action may be deferred	Increased frequency of flooding and slips	Monitoring of flood occurrence and requests for service, catchment management plan preparation, flood hazard maps and model development, climate change monitoring	Review demand assumptions and incorporate consistent assumptions in the catchment management plan analysis and network models. Undertake routine demand forecast reviews. Take a proactive role in climate change panels
	District Plan may be re-zoned leading to altered "fully developed" catchment characteristics	Increased frequency of flooding and slips	Catchment management plan preparation	Formalise a process to ensure that stormwater impacts are assessed prior to any District Plan change
Customer focus	Safety risks associated with working on the network	Near misses. Serious harm incidents, fatalities	Strong health and safety requirements in contracts and operational procedures, training and audits	Review the adequacy of the existing controls, develop contingency plans
	A pedestrian, particularly a child, may enter or be washed into the stormwater network or culvert	Near misses. Serious harm incidents, fatalities	Some intakes have grilles which prevent entry	Identify possible entry sites and assess for protection needs
Cost effectiveness	Community needs and aspirations may not be fully understood. Activities may not match community needs and aspirations	Inefficient management of the assets and community dissatisfaction	Levels of service are based on legislative requirements, industry practice and broad understanding of community expectations	Complete development of the asset performance monitoring framework. Complete Key Performance Indicator data analysis to improve levels of service descriptions. Review community consultation needs and implement recommendations
	Poor contractor workmanship	Significantly shortened asset lives	Standard contract management procedures, site observations, monitoring and testing	Complete the development of integrated contractor quality assurance process requirements

Figure 10 – Highest risks and mitigation – stormwater

### 4.3 Operating and maintaining the assets

The operations and maintenance strategy is intended to maintain the current levels of service, mitigate risks and minimise costs by implementing a balanced programme of planned and reactive works. The risk analysis has highlighted 11 risks associated with managing the stormwater activity, and operating and maintaining the network. Specific improvement projects have been identified to address these risks and have been programmed for implementation.

Although the Council's maintenance strategy for pipelines is mainly reactive, based on the number of stormwater service faults calls received, we operate an asset condition monitoring programme that records service fault notifications. This includes prioritised and programmed closed circuit television (CCTV) and physical drain inspections. Only piped systems that are considered to be in the "critical"<sup>2</sup> category (18 per cent) are proactively inspected to assess structural integrity.

Asset management planning, assisted by computer-based hydraulic modelling is undertaken to better understand flood risk and system performance, and identify opportunities to improve this. Flood hazard maps are prepared and catchment management plans developed for each catchment to ensure the stormwater system has sufficient capacity to cope with heavy rain.

A comprehensive emergency management plan is in place. The Council investigates the opportunities to introduce new technologies and stormwater management techniques (e.g. soakage, re-vegetation and stormwater re-use).

Water quality sampling and analysis for 82 sites are carried out fortnightly by an accredited contractor.

The Porirua stream is managed by Porirua City Council. Wellington City Council contributes 33 per cent of total maintenance costs associated with managing this watercourse.

### 4.4 Asset investment and growth

The Council aims to enhance the capability and integrity of our assets at the lowest long-term cost and ensure inter-generational equity.

In terms of asset investment, this is largely driven by the closure of identified service gaps such as capacity shortfalls or recreational water quality issues. The Council has developed a robust framework to ensure that focus is placed on the best value projects that deliver the highest benefits per dollar spent, and that the project option chosen to close these service gaps is the best practicable option.

#### 4.4.1 Asset renewals

Longer-term asset renewal needs are identified through analysis of condition assessments. More detailed, shorter-term prioritised programmes are developed with reference to failure history, risk assessment (including consideration of financial, environmental and social implications of failure) and, in the case of critical drains, CCTV, visual condition assessments and site inspection information. Assets are therefore renewed when analysis

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<sup>2</sup> Pipes for which failure would have severe consequences, generally large diameter pipes or pipes under dwellings.

indicates it is more cost-effective in the long term to replace rather than continue to maintain the pipe.

#### **4.4.2 Asset development**

Upgrade works required to close service gaps are primarily identified as a result of risk assessments, targeted investigations and catchment management plan preparation.

The Council's citywide flood protection approach divides the city into 34 catchments. Catchment management plans are being developed on a prioritised basis considering:

- flooding risk
- environmental risk
- customer reputation/potential growth issues
- health and safety risk.

These plans assess not only works required to increase the capacity of the primary (piped) system to achieve the target level of service, but also consider:

- sanitary sewer overflows
- environmental management
- contaminants such as litter, heavy metals, hydrocarbons
- education to achieve desired outcomes
- land use and development controls
- run-off management
- recognition of stormwater as a potential resource.

Identified upgrade works include the construction of new pipes, increase in the size of existing pipes, development of catchment features to assist the primary (piped) system such as overland flow paths, natural ponding facilities, watercourse enhancements, and facilities to improve water quality.

The costs and benefits of potential flood protection projects are assessed to develop a prioritised works programme. Major upgrades in the central city and Island Bay have been undertaken in recent years.

Pipelines no longer required to transport stormwater and not being physically replaced are marked as "disused" on records. These pipes are kept intact where possible as the Council or others may use these again in the future.

## 5.0 Financial information

### 5.1 Financial forecast

The consolidated 10-year financial forecasts for the stormwater activity are presented in Figure 11. The consolidated financial forecast is included as an attachment.

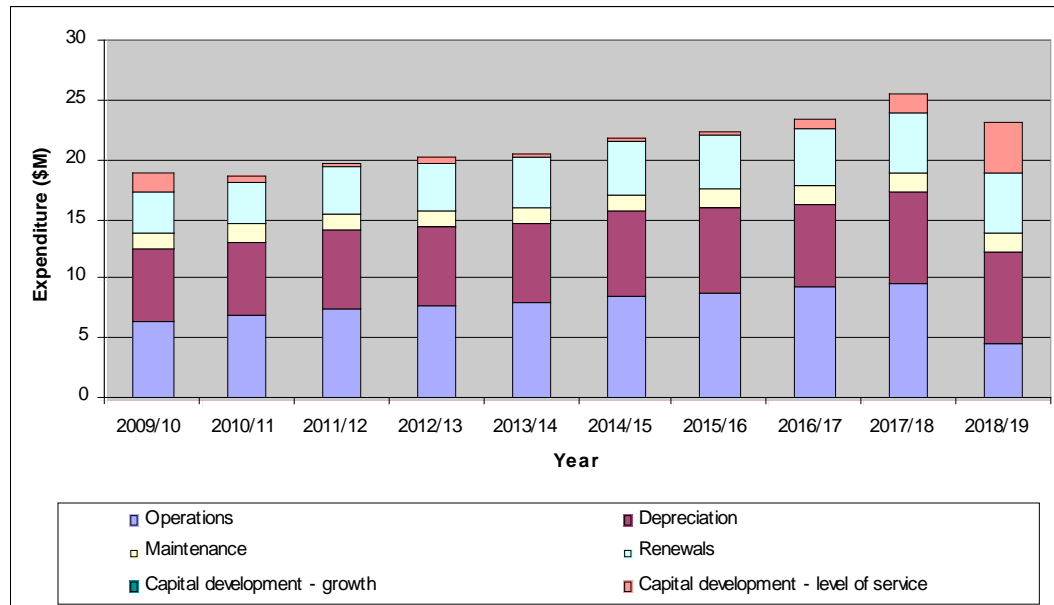


Figure 11 – Consolidated financial forecast

The key trends in the 10-year financial forecast are:

- Operations and asset management – increases from \$13.9 million to \$19.0 million in 2017/18, before reducing to \$14.0 million the following year. Increases are due predominantly to significant incremental increases in corporate interest allocation to reflect the level of investment in capital works and the resulting increase in asset value. Depreciation also increases marginally, reflecting this capital investment.
- Maintenance – reduces from \$1.4 million showing marginal increases through the planning period to reflect additional unplanned maintenance needs as the network ages.
- Renewals – approximately \$3.3 million per year is budgeted for next year with gradual increases over the next 10 years for renewal works to reach \$5.0 million in 2018/19.
- Capital development for level of service enhancement – \$10.5 million is budgeted over the next 10 years for ongoing network upgrades to improve the level of flood protection in vulnerable parts of the city.
- No growth-related projects have been identified for this asset management plan.

## 5.2 Assumptions and data confidence

### 5.2.1 Assumptions

The following general assumptions have been made in preparing the expenditure forecasts:

- All expenditure is stated in dollar values as at June 2008 with no allowance made for inflation over the 10-year planning period. They will be inflation-indexed in terms of the BERL economic forecast index for the water industry, as recommended by the Audit Office, prior to finalising in the LTCCP.
- The rate and pattern of urban growth and development continues as assumed and noted within Section 2.2 of this plan.
- Maintenance costs are based largely on historical expenditure and assume there are no significant changes in contract rates (above the rate of inflation). Impacts of fuel tax are still being assessed and will be included in updated financial forecasts in subsequent versions of this plan.
- Maintenance and renewal allocations have been based on preserving current levels of service. Expenditure levels have been increased to match the growth of new assets and achieve the target levels of service noted in Section 2.
- Remaining lives for pipeline renewals planning are based on a top-down condition assessment and assumed deterioration profile.
- Repairs exceeding \$10,000 are capitalised as a renewals item.
- The dominant reason (growth or level of service enhancement) for renewing or upgrading a stormwater drain is used to assign such works to a corresponding renewal or upgrading programme.

### 5.2.2 Confidence levels

The short-term forecasts have been assessed as being reliable based on the grading system from the NZ Guidelines for Infrastructure Asset Grading Standards. The most significant potential changes to the forecasts will result from:

- The desired level of service and service standards may change from those identified in this asset management plan, particularly consent and other regulatory or legislative requirements.
- Assumptions made as to the average useful lives and average remaining lives of the asset groups based on current local knowledge and experience, historical trends, and predictive modelling outputs may no longer be valid. (These need to be reviewed and the accuracy improved based on real time assessments of asset deterioration. Review of the effective economic life of pipeline assets has the potential for greatest variance in future cost predictions.)
- Peak stormwater flows may change due to the effect of climate change.
- Contract rates may be above inflation due to market or other external influences.

## 5.3 Development contributions

Development contributions are not levied for the stormwater activity.

## 5.4 Funding the stormwater activity

The activities undertaken in order to provide the stormwater service are funded as described below:

### Operating expenditure

- Who benefits:
  - identifiable parts of the community – 50 per cent
  - whole community – 50 per cent
- Who pays:
  - base (residential sector) – 80 per cent
  - commercial sector – 20 per cent
- Funding mechanism:
  - residential targeted rates – 80 per cent
  - commercial targeted rates – 20 per cent

### Capital expenditure

- Renewal and rehabilitation
  - funded from depreciation (an operating expense funded from rates). Any annual surplus depreciation is used to repay borrowings.
- Capital - level of service enhancement
  - primarily funded from borrowings.
  - contributions from third-party capital subsidies.
  - contributions from sale of surplus assets where applicable (this is decided on a case-by-case basis – funds received in this manner which are not applied to capital development works are used to repay borrowings)
  - contributions from restricted or special funds where applicable (this is decided on a case-by-case basis)
- Capital development – growth related
  - primarily funded from development contributions
  - RMA-based financial contributions continue to be used in some circumstances
  - contributions from borrowings.

