

HOBSONS
BAY CITY
COUNCIL



Drainage Asset Management Plan

Prepared by:

City Design and Assets Department



Acknowledgements

Council acknowledges all language groups of the Kulin Nation as the traditional owners of these municipal lands. We recognise the first people's relationship to this land and offer our respect to their elders past and present.

Council acknowledges the legal responsibility to comply with the Charter of Human Rights and Responsibilities Act 2006 and the Equal Opportunity Act 2010. The Charter of Human Rights and Responsibilities Act 2006 is designed to protect the fundamental rights and freedoms of citizens. The Charter gives legal protection to 20 fundamental human rights under four key values that include freedom, respect, equality and dignity.

For further information, or to receive a copy of this document in an alternate format, contact Council on (03) 9932 1000.

Contents

1.	Executive Summary	1
2.	Introduction	5
	2.1 Purpose	5
	2.2 Overview of this Plan	5
	2.3 Key Stakeholders	5
	2.4 Portfolio Description	8
	2.5 Infrastructure Valuation Summary	10
3.	Renewals Modelling	11
	3.1 Condition Profile	11
	3.2 Renewals Forecast	11
4.	Future Demand	14
	4.1 Flood Modelling Investigations	14
	4.2 Water Harvesting Strategies (Demand Management)	15
	4.3 Integrated Water Management Plan	16
	4.4 Proposed Upgrades from Flood Modelling and Water Harvesting	16
	4.5 Gross Pollutant Traps	18
	4.6 Demand Analysis (Drainage Water Quality and Quantity)	18
5.	Levels of Service	20
	5.1 Community Research and Expectations	20
	5.2 Community Levels of Service	22
	5.3 Technical Levels of Service	24
6.	Risk Management Plan	26
7.	Lifecycle Management Strategy	28
	7.1 Renewal/Replacement Plan	28
	7.2 Creation/Acquisition/Upgrade Plan	28
	7.3 Operations and Maintenance Planning	28
	7.4 Disposal Plan	29
8.	Financial Summary	30
	8.1 10 Year Capital Works Forecast – Drainage Portfolio	30
	8.2 Ten Year Operational Forecast – Drainage	32

8.3	Key Assumptions made in Financial Forecasts	33
8.4	Funding Strategy	33
9.	Improvement Projects	34
10.1	Improvement Plan	34
10.2	Improvement Plan Timetable	34
10.	Support / Reference Documents	35

1. Executive Summary

This Drainage Asset Management Plan (DAMP) has been developed to manage Hobsons Bay municipal drainage network. The DAMP combines management, financial, engineering and technical practices to ensure the level of service required by customers is provided at the most economical cost to the community and the environment.

Portfolio Description

Council drainage portfolio incorporates the following asset groupings:

- ▶ Underground pipes, culverts and pits to capture and convey stormwater to an appropriate discharge point.
- ▶ Retention basins to capture stormwater and mitigate peak flows during storm events.
- ▶ Water harvesting systems to capture stormwater for reuse such as irrigation.
- ▶ Gross pollution traps to prevent rubbish from discharging to waterways and the bay

Council's stormwater drainage network discharges into:

- ▶ Melbourne water waterways or drainage system
- ▶ Directly into Port Phillip Bay
- ▶ Into Council's ponds, lakes and wetlands.

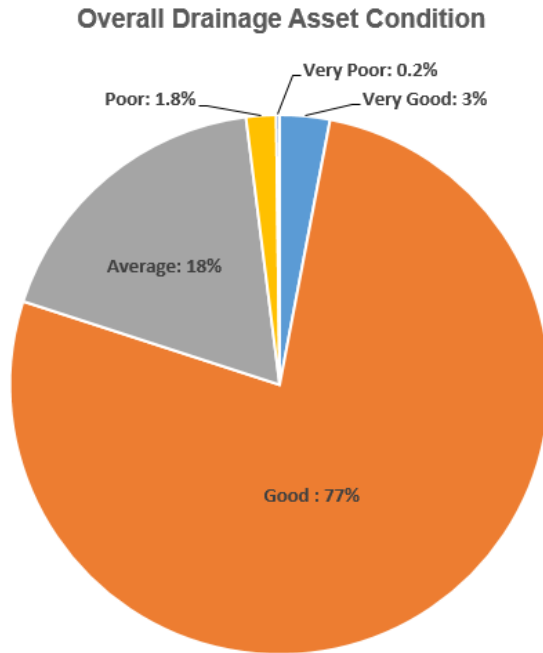
Overall there is some 540 kilometers of stormwater pipes and over 20,000 stormwater pits.

The drainage portfolio has a replacement value of \$227M as of December 2018.

Condition Profile

The following chart present the summary results from the 2018 portfolio condition audits.

Figure 1.1 Drainage Assets Condition Chart

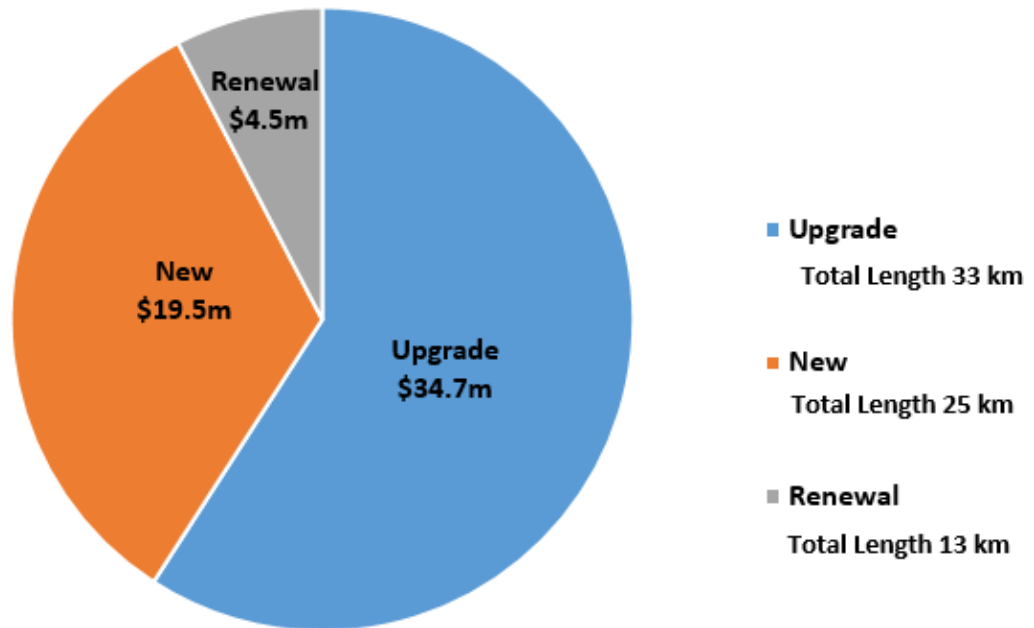


The majority of the drainage assets (98%) are in very good to average condition. This shows that the drainage network is in an overall good condition. A small proportion of about 2.0% of assets are in poor and very poor respectively. These poor condition assets are typically those being planned for renewal within the next five years.

Flood mapping program completed in 2017 highlighted numerous locations where streets are prone to flooding and heavily flooded during various storm events. As a result of further investigations a significant new and upgrade program is proposed to address this flooding.

Capital Expenditure Budget Forecast

The chart below combines all the drainage new, upgrade and renewal requirements based on the findings of 2017 Flood mapping program and the 2018 Drainage condition audit.



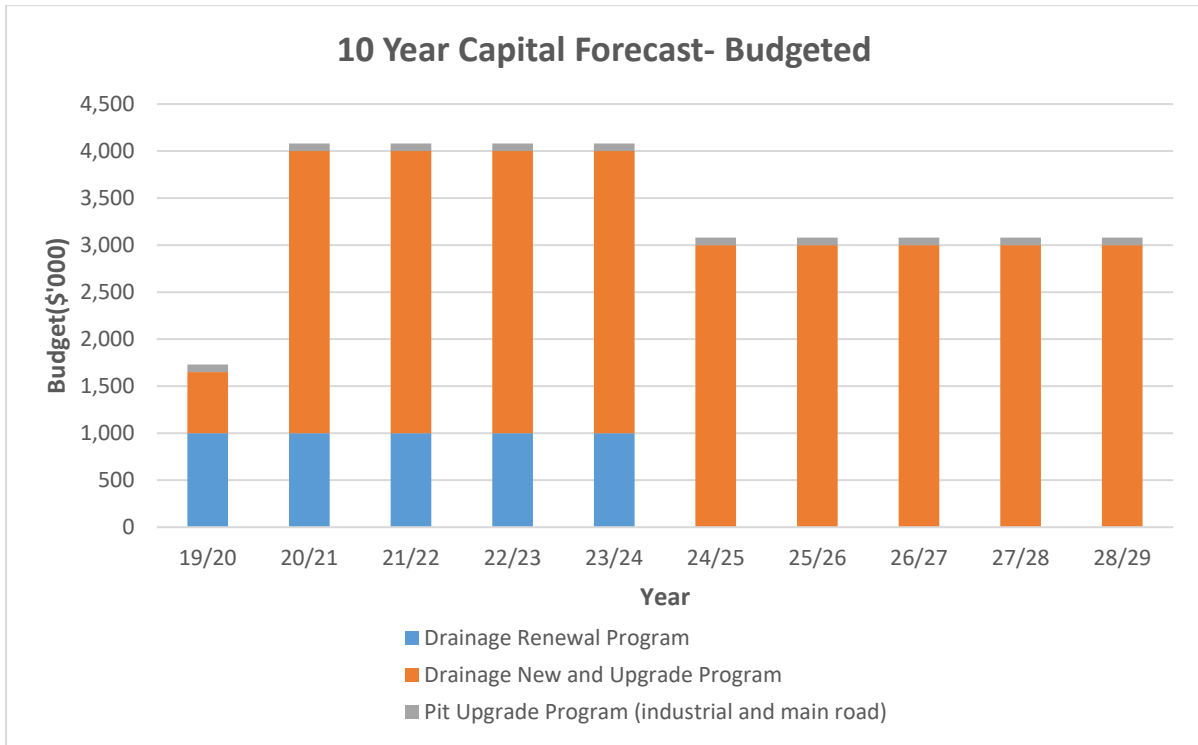
The condition audit identifies a total of 13km of existing pipes are in poor condition and need renewal. The flood mapping result identifies approximately 33km of existing pipes need to be upgraded and 25km of new pipes are required to eliminate flooding in the municipality.

The poor condition drainage assets are included for renewal within the next 5 years. The required expenditure to address the current backlog of renewal works over the next 5 years is approximately \$4.5 million.

Based on the results of flood mapping program for the whole municipality, the total cost to complete all the new and upgrade works and eliminate flooding in 1 in 20 year storm event is approximately \$55 million. To complete the highest priority projects over the next 10 years an estimated cost of \$28 million required

The following chart indicates the proposed expenditure budget forecast for the next 10 years (as of December 2018) for those assets specifically within the Drainage portfolio.

Figure 1.2 10 Year Capital Forecast Chart – Drainage Portfolio



Overall these capital works comprise \$33 M which are divided into \$5 million for renewal works and \$28 million for new and upgrade works.

2. Introduction

2.1 Purpose

This asset management plan defines Council strategy for the responsible management of its Stormwater Drainage assets in a manner that is compliant with regulatory requirements and is sustainable within available resources. This plan will also be used to communicate any need for additional funding in order to provide the desired/required levels of service.

2.2 Overview of this Plan

This plan focuses on providing the follow key information to assist long term planning for infrastructure to support and sustain drainage service standards:

- ▶ Portfolio Description – provides an understanding of the current asset base used to deliver services to the community.
- ▶ Renewals Modelling – provides an assessment, based on available data, of the required asset renewals anticipated over the forecast period.
- ▶ Future Demand – provides an understanding of the current and future changes in demand over the forecast period to allow for the inclusion in financial planning for any growth-related capital works and changes to operational budgets.
- ▶ Levels of Service and Performance – provides the strategic level, asset performance targets and current performance to drive required capital or maintenance intervention works.
- ▶ Risk Management – Understanding the primary risks associated with the open space portfolio and implementing plans to address those risks.
- ▶ Lifecycle Management Strategies – Describes how asset management decisions have been made for the formulation of expenditure forecasts presented in this plan and links through to improvements to make future plans better.
- ▶ Financial Forecasts – provides forecasts of proposed capital and operations expenditure over the 10 year outlook in order to deliver on the levels of service requirements.
- ▶ Asset Management Improvements – provides a listing of key action items and improvements proposed to enable future versions of this plan to improve accuracy or confidence in the forecasts made.

2.3 Key Stakeholders

The stakeholders and their roles in the implementation of this Asset Management Plan are shown in Table 2.1.

Table 2.1 Stakeholders in the Asset Management Plan

Stakeholder	Role in the Asset Management Plan
Councillors/Board Members	<ul style="list-style-type: none"> ▶ Represent needs of community/shareholders ▶ Allocate resources to meet the organisation’s objectives in providing services while managing risks, and ▶ Ensure organisation is financial sustainable.

Stakeholder	Role in the Asset Management Plan
Chief Executive Officer	<ul style="list-style-type: none"> ▶ Allocate resources to meet the organisation’s objectives in providing services while managing risks ▶ Ensure organisation is financial sustainable.
Directors	<ul style="list-style-type: none"> ▶ Overall responsibility for Asset Management ▶ Ensure funds are invested appropriately to ensure best value for money is delivered to the community ▶ Provide leadership in influencing decision-making processes related to Asset Management.
Asset Managers	<ul style="list-style-type: none"> ▶ Provide Leadership for effective Asset Management ▶ Identify resource requirements for delivering various assets management services to the community ▶ Ensuring Asset Management services are provided in accordance with Corporate Plan and Council priorities ▶ Deliver services in a cost effective and sustainable manner ▶ Identifying resource requirements for specific asset classes ▶ Responsible for reviewing and keeping AM plan up to date ▶ Responsible for preparing budget submissions in accordance with the Asset Management Plan ▶ Delivering nominated renewal, upgrade projects ▶ Responsible for Asset Officer, and ▶ Coordinate with Asset officers and field workgroup leaders to identify areas of need, process improvement.
Coordinators	<ul style="list-style-type: none"> ▶ Leadership of team to deliver particular functions ▶ Delivery of business functions as described through Council plans such as the Corporate Plan, Operational Plan and Asset Management Plan. ▶ Responsible for keeping asset data up to date ▶ Assist with financial accounting for assets ▶ Operation and Maintenance management to meet agreed levels of service, and ▶ Highlight issues requiring attention of senior management.
Community Customers	<ul style="list-style-type: none"> ▶ Be aware of service levels and costs ▶ Participate in consultation processes, and ▶ Provide feedback on services.
State and Federal Government and Industry Associations	<ul style="list-style-type: none"> ▶ Provide Leadership in promoting Best Practice Asset management ▶ Facilitate Training and Education Re: Current Asset Management Plan, and

Stakeholder	Role in the Asset Management Plan
	<ul style="list-style-type: none"> ▶ Recognising the importance of Local Government assets to community and provide funding and other assistance to sustain.

2.4 Portfolio Description

Hobsons Bay is situated at the northern end of Port Phillip Bay, about 10km west of central Melbourne. The peoples of the Kulin Nation were the first people to occupy the area. Today, it is home to the suburbs of Altona, Altona Meadows, Altona North, Brooklyn, Laverton, Newport, Seabrook, Seaholme, South Kingsville, Spotswood, Williamstown and Williamstown North.

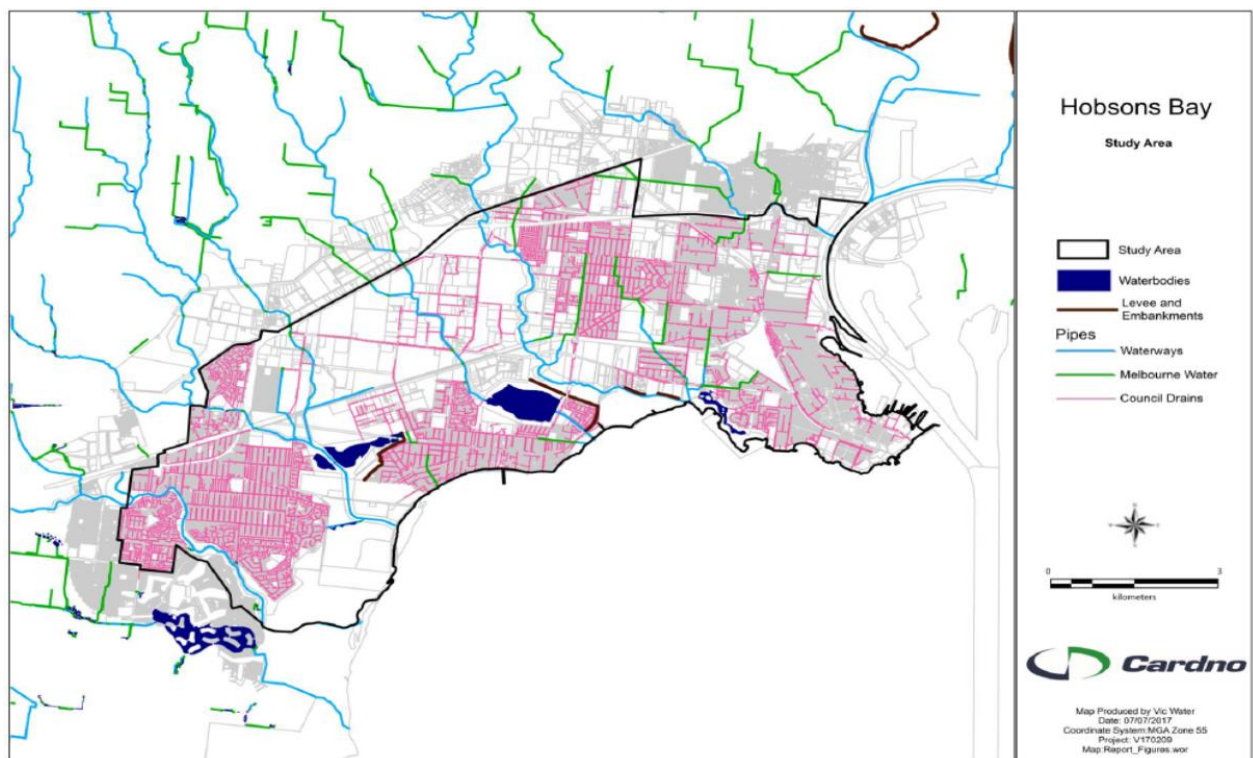
Each suburb has its own unique character, from the historic seaport of Williamstown with its range of heritage buildings, to the more recently developed residential areas of Altona Meadows and Seabrook. Hobsons Bay also has a range of major industrial complexes, which contribute significantly to the economy of Victoria.

It covers an area of approximately 66 square kilometres with over 20kms of coastline. It is also home to significant coastal wetlands, five creek systems, remnant native grasslands, and important flora and fauna habitats, which makes up 24 per cent of the city's total land area.

The city is located within 7 and 20 kilometres from the CBD and has good access to regional transport facilities such as the West Gate Freeway, the Western Ring Road, CityLink, the National Rail Line, together with the ports and airports of Melbourne and Avalon. A number of sites of significance to the Aboriginal community are located throughout the municipality, particularly along the coastal trail.

In 2017, Hobsons Bay had an estimated resident population of 95,046 people.

Figure 2.1 Hobsons Bay City Council Waterways and Drainage



Source: Cardno Flood Modelling Report Nov 2017

Council's stormwater drainage network discharges into:

- ▶ Melbourne water waterways or drainage system
- ▶ Directly into Port Phillip Bay
- ▶ Into Council's ponds, lakes and wetlands.

As can be seen from Figure 2.1 the majority of waterways span across multiple Councils. As such Melbourne Water is a key stakeholder in the coordinated management of drainage catchments.

City West Water is also a stakeholder in the delivery of recycled water and has an interest in Council's water harvesting systems.

The portfolio of Drainage assets includes:

- ▶ Underground pipes, culverts and pits to capture and convey stormwater to an appropriate discharge point.
- ▶ Retention basins to capture stormwater and mitigate peak flows during storm events.
- ▶ Water harvesting systems to capture stormwater for reuse such as irrigation.
- ▶ Gross pollution traps to prevent rubbish from discharging to waterways and the bay

2.5 Infrastructure Valuation Summary

The following table summarises the valuation details for the stormwater portfolio. Overall there is some 540 kilometers of stormwater pipes and over 20,000 stormwater pits.

Table 2.3 Stormwater Assets Summary December 2018

Type	Subtype	Replacement Value	Depreciated Value	Annual Depreciation	Count
Pipes	Stormwater Channel	\$333,776	\$231,815	\$3,338	9
	Stormwater Culvert	\$4,391,974	\$2,887,670	\$43,920	362
	Stormwater Pipe	\$185,079,727	\$124,168,670	\$1,850,797	20,089
	Total Pipes	\$189,805,477	\$127,288,155	\$1,898,055	20,460
Pits	Buried Pit	\$203,148	\$140,042	\$4,063	118
	End Wall	\$428,200	\$278,597	\$8,564	66
	End Wall with Apron	\$751,490	\$503,336	\$15,030	84
	Grated Junction Pit	\$34,534	\$24,185	\$691	19
	Grated Pit	\$3,761,157	\$2,539,842	\$75,221	2,029
	Grated Side Entry Pit	\$1,511,443	\$1,044,603	\$30,230	910
	Gross Pollutant Trap	\$182,001	\$119,237	\$2,788	27
	Head Wall	\$115,800	\$65,250	\$2,316	23
	Head Wall with Apron	\$280,480	\$189,571	\$5,610	38
	Inspection Opening	\$44,575	\$30,402	\$891	22
	Junction Pit	\$8,898,050	\$5,966,953	\$177,955	4,625
	Junction Pit with Side Entry	\$10,979	\$7,648	\$220	6
	Other Pit	\$36,103	\$23,894	\$722	22
	Side Entry Pit	\$15,784,493	\$10,168,968	\$315,692	9,321
	Unknown Pit	\$4,867,278	\$3,373,898	\$97,345	3,115
	Total Pits	\$36,909,732	\$24,476,426	\$737,338	20,425
	Grand Total		\$226,715,209	\$151,764,581	\$2,635,392

3. Renewals Modelling

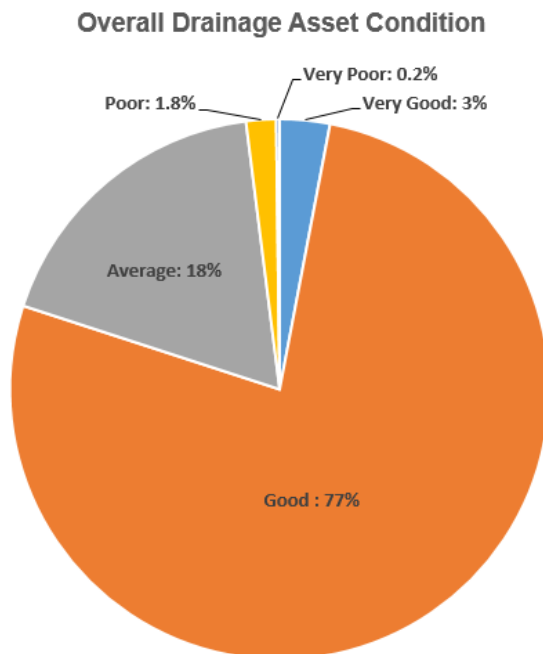
3.1 Condition Profile

The following chart present the summary results from the recent 2018 portfolio condition audit completed by RapidMap.

As can be seen, the majority of drainage assets (98%) are in very good to average condition. This demonstrates that the drainage portfolio of assets is overall in a good condition and able to provide the service level expected by the end users.

A small proportion of about 2.0% assets are in poor and very poor condition (approximately 13 kilometres). These assets are typically those being considered for renewal within the next five years.

Figure 3.1 Drainage Assets Condition Chart



3.2 Renewals Forecast

The following tables and chart present the proposed renewal, refurbishment and maintenance plan for the drainage portfolio over the next 10 years as presented in the 2018 RapidMap condition audit report.

Defect types have been taken into consideration when determining the potential end of life treatment of relining vs replacement. For example - Pipes with certain defect types such as joint displacements would be unlikely candidates for relining. Structural relining has been budgeted at 75% of the full replacement value. None of the pipelines identified as due for renewal within the next 10 years were considered candidates for structural relining.

Defects, Condition and Risk rating have been taken into consideration when determining the recommended 10 year treatment plan.

The works identified below have not been separated into capital and operations budgets.

Table 3.1 Proposed Works by Risk Rating – Pipe Assets

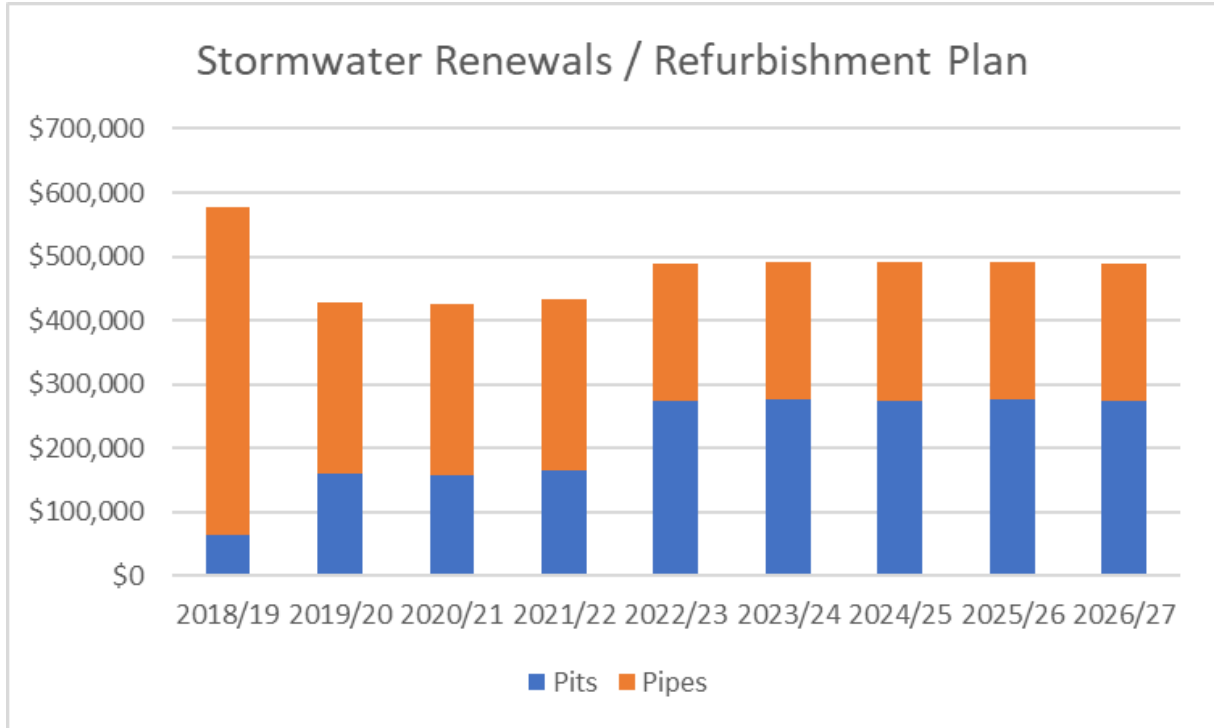
Sum of Pipe Treatment Costs Treatment	Risk Rating				Grand Total
	Low	Medium	High	Very High	
Insitu hole repairs	\$734,000	\$495,000	\$35,000		\$1,264,000
Remove Obstructions	\$44,500	\$15,500	\$1,000		\$61,000
Remove Obstructions and Insitu hole repairs	\$12,000	\$3,000	\$1,500		\$16,500
Repair Protrusion	\$247,000	\$188,000	\$27,000		\$462,000
Repair Protrusion and Insitu hole repairs	\$40,000	\$36,000	\$8,000		\$84,000
Replace Pipe		\$66,300	\$182,000	\$260,000	\$508,300
Grand Total	\$1,077,500	\$803,800	\$254,500	\$260,000	\$2,395,800

Table 3.2 Proposed Works by Risk Rating – Pit Assets

Sum of Pit Treatment Costs Treatment	Risk Rating				Grand Total
	Low	Medium	High	Very High	
Mortar / Brickwork repairs	\$9,500	\$5,000			\$14,500
Repair service pipe intrusion	\$41,000	\$12,000			\$53,000
Replace cover / surround	\$171,700	\$62,050	\$4,250		\$238,000
Replace cover / surround within 10 years	\$397,800	\$146,200	\$5,950		\$549,950
Replace cover within 10 years	\$87,300	\$31,950	\$450		\$119,700
Replace ladder	\$3,000		\$1,500		\$4,500
Replace Lintel	\$163,500	\$43,500	\$4,500		\$211,500
Replace Lintel / Cover	\$36,000	\$4,000			\$40,000
Replace Lintel and Surround	\$2,000				\$2,000
Replace pit	\$287,150	\$84,800	\$19,950	\$13,400	\$405,300
Replace pit within 10 years	\$175,400	\$92,900	\$13,500		\$281,800
Grand Total	\$1,374,350	\$482,400	\$50,100	\$13,400	\$1,920,250

The following chart presents the proposed renewals plan for the next ten years as presented in the RapidMap report.

Figure 3.2 Drainage Assets Renewal Chart



Overall this proposed work total some \$4.3M over the ten years.

An alternative renewals plan considers replacement of all condition 4 and 5 assets over the ten year period. This approach totals some \$4.5M. As can be seen these two approaches present similar expenditure requirements for the required renewals work.

4. Future Demand

4.1 Flood Modelling Investigations

Conclusions from the flood modelling investigations undertaken by Cardno in 2017 identified the following:

The flood modelling and analysis of the Hobsons Bay municipality indicates that flooding from the stormwater drainage network is likely to affect a significant number of properties and public spaces. The investigation has found:

- ▶ There are a number of areas where overland flooding may have a significant impact on the community. These areas include, but are not limited to the following locations:
 1. - Hobson Street, Newport
 2. - Blackshaws Road at Schutt Street, Newport
 3. - Blenheim Road, near Mason Street, Newport
 4. - McIntyre Drive, Altona
 5. - Civic Parade, Altona
 6. - Seves St Esplanade to Railway street south Altona
 7. - Linnet Street, Emu Avenue and Robin Streets, Altona
 8. - The Esplande, Altona
 9. - Charlotte Street and Hanson Street, Newport
 10. - Central Avenue between Point Cook Road and Merton Street, Altona Meadows
 11. - Nelson Avenue between Merton Street and Victoria Street, Altona Meadows
- ▶ There are areas of the municipality that are not indicated as serviced by underground drainage infrastructure where flooding may be able to be mitigated. These areas are mostly found in Williamstown, due to the older nature of the suburb. Some areas of Williamstown have significant gutter drainage in the street network, which will be shown as inundated in the model results.
- ▶ The identified unserved areas require approximately 25 kilometres of additional underground drainage. The 25 kilometres of additional underground drainage does not include upgrades to the existing network to cater for the additional flows from the proposed new drainage works.

It should be noted that the flood analysis contains many assumptions regarding the drainage network, including the estimated size of the drainage and the invert levels. As such, the results presented are considered indicative and any detailed mitigation options should be subject to further concept and detailed design.

These areas will be investigated further to develop more detailed designs and costs so that their implementation can be scheduled into the ten-year plan.

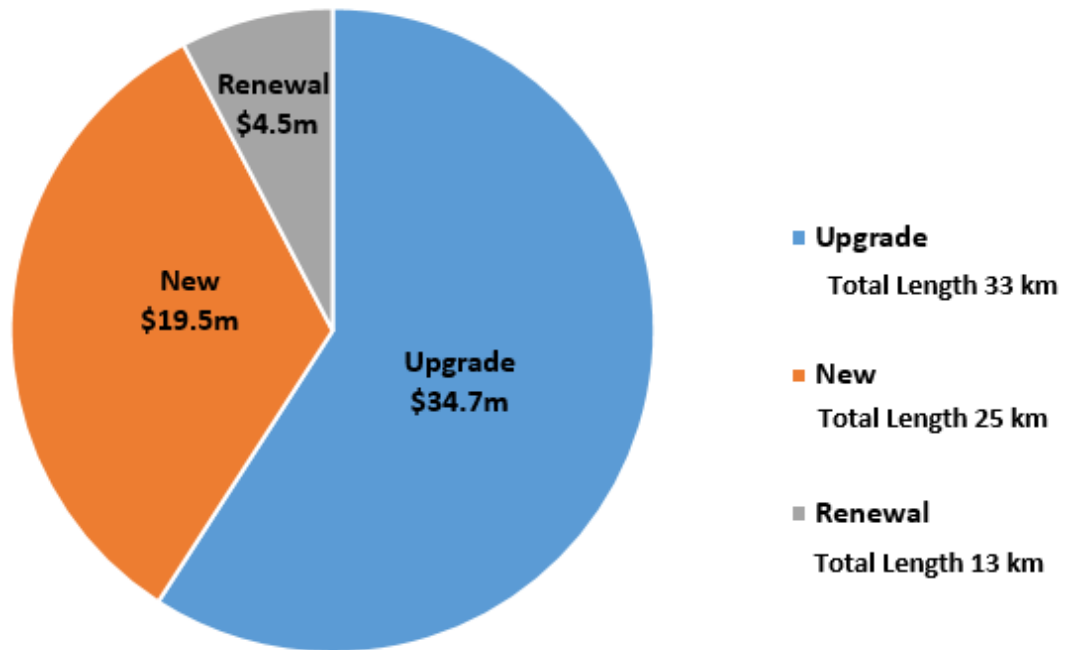
Further to the flood modelling report Council has translated the proposed pipe and pit size upgrades (approximately 33 kilometres) and additional drainage areas into preliminary cost estimates.

Combining the findings from the flood modelling investigations with the drainage condition assessment report produced the following figure 4.1.

Additional to these estimates \$2.9M in upgrades has been identified for Melbourne Water assets to accommodate the improved capacities discharging from council drainage. Council will work with Melbourne Water to facilitate the timely completion of these upgrades.

Besides those sites listed, Council is investigating more sites across the whole municipality.

Figure 4.1 Drainage New, Upgrade and Renewals Required Expenditure Forecasts



4.2 Water Harvesting Strategies (Demand Management)

Capturing and reusing stormwater within the stormwater network serves two primary purposes.

- ▶ It provides a significant source of good quality non-potable water for such purposes as irrigation of sports fields, gardens and other open spaces thus reducing cost to Council to purchase and use potable water.
- ▶ It may assist with mitigation of peak discharge flows during storm events thus deferring the need for pipeline capacity upgrades.

The demand for improved quality of green spaces and hence watering is anticipated to increase in coming years. In addition, the impact of climate change suggests the likelihood of less rainfall and the need for more artificial watering of grass and vegetation in order to maintain its health.

A previous report prepared by City West Water identified a number of sites across Hobsons Bay that would be suitable sites for either stormwater or rainwater harvesting sites.

The following is a list of sites that have been completed and operational:

- ▶ Laverton Recreational Reserve
- ▶ Altona Green Reserve

- ▶ Paisley Park (Altona Golf Course)
- ▶ Williamstown Cricket Ground

Council will continue to explore any stormwater harvesting opportunity where feasible.

4.3 Integrated Water Management Plan

In 2014 Council prepared an Integrated Water Management Plan 2014-2019 (IWMP).

The IWMP is a key strategic document to guide Council's water management activities. This plan falls under the umbrella of Council's Sustainability Framework and describes Council's water management goals for the next five years as well as how Council will measure its progress as we plan, deliver and advocate for improved water management.

Council's priority actions over the five years (2014-2019) were:

- ▶ increase water security by introducing effective monitoring and control to reduce wasted water as well as extending its portfolio of alternative water supplies
- ▶ increase public amenity by increasing the amount of alternative water that is available to irrigate and protect green infrastructure
- ▶ protect waterways and the Bay from key pollutants that reduce its recreational value by encouraging best practice stormwater management
- ▶ increase public health by working with key stakeholders to prevent pollutants from entering the stormwater system. Council will also investigate techniques for using urban greening to mitigate the urban heat island effect
- ▶ increase biodiversity by working with residents and developers to reduce peak stormwater flows and pollutants running off hard surfaces through the use of sustainable stormwater treatment
- ▶ reduce nuisance flooding by increasing stormwater harvesting activities and encouraging best practice stormwater management in new developments

Council is also an active partner on regional and sub-regional water projects including the Water Future West strategy development, lead by the Office of Living Victoria, and Greening the West, lead by City West Water.

4.4 Proposed Upgrades from Flood Modelling and Water Harvesting

Consideration of the above matters by Council has identified the following projects to be implemented as the initial projects to address the hydraulic capacity needs of the drainage network plus take opportunities to implement water harvesting within certain projects.

Table 4.1 Drainage New and Upgrade Project for 11 Priority sites

Drainage new and upgrade project for 11 priority sites	Remarks
1 – Esplanade, Altona – Sargood St Outfall.	
2 – McIntyre St, Altona	
3 – Emu Ave, Linnet Street and Robin Avenue, Altona	



4 – Civic Parade, Altona	Explore detention system to collect Civic Parade runoff or alternatively construct swale drain alongside the oval discharging into Cherry Lake
5 – Seves St Esplanade to Railway street south Altona	
6 – Blenheim Road, Newport – Near Mason Street	Explore detention system in WL Floyd Reserve to collect water runoff
7 – Charlotte Street and Hanson Street, Newport	
8 – Blackshaws Road, Newport – Near Schutt Street including Junction Street	
9 – Hobsons Street, Newport	Explore detention system in Digman Reserve to collect water runoff
10 – Nelson Street, Altona Meadows – Between Victoria and Merton Streets	
11 – Central Avenue, Altona Meadows – Between Pt Cook Road and Merton Street	Explore detention system in Bruce Comben Reserve to collect water runoff

Notes

- ▶ The estimated project costs of these 11 sites are in the range of \$6m to \$8m excluding contamination cost where required
- ▶ Project 1 is planned to be completed in 2019/20.
- ▶ Project 2 to 11 are being designed in 2019/20. Costs will be developed once the design is completed. Water detention system will be adopted for those identified sites where feasible.
- ▶ Project 2 to 11 construction works will be carried out progressively from 2019/20 over a few years subject to budget approval.
- ▶ Council is currently working on additional sites other than the 11 identified. The cost of these additional sites has not been included in this plan. It is estimated that cost for additional sites to be in the range of \$40-50 Million.

4.5 Gross Pollutant Traps

In order to continually improve the water quality discharged by council's drainage into the bay and Melbourne Water waterways the following level of service standard has been defined for implementation over the coming years.

- ▶ GPT's shall be assessed for installation on all outlets of 1000mm diameter or larger that discharge to a waterway, open drain, lake or bay.

From recent network modelling it has been identified that there are some 440 discharge points from Council's drainage network. Some 50 of these locations have a discharge pipe size of 1000mm or more.

Council presently has GPT's on about 20 of these locations.

Further investigation is to be undertaken to confirm the locations, timing and type of GPT to be installed at each as well as budget requirements. The expenditure for this program will be included in the future capital works program.

For other minor drainage outlets consideration may be given to netting rather than a trap structure.

Council has acknowledged that to implement this rollout of GPTs and increase in the operational budget will be required to maintain a regular cleaning and disposal program for each GPT.

4.6 Demand Analysis (Drainage Water Quality and Quantity)

Morphum Environmental was engaged by RapidMap to provide a desktop demand analysis review for inclusion in the asset management plan. This section summaries the finding of their review.

4.6.1 Demand Drivers

Council's fundamental role is to provide services to the community and its drainage assets, which currently include approximately 20,460 stormwater pipes and 20,425 stormwater pits (RapidMap's raw data, 2018), are a means to support this. Consequently, future demand for drainage and associated drainage assets are driven by:

- A. the additional areas that need to be serviced due to population growth (increasing the extent of the network),
- B. pipes that are already known to be under capacity, and
- C. the additional demand placed on the existing assets from increased run-off due to:
 - i. increased impervious areas (i.e. paved and built over as a result in developed of infill and greenfield sites),
 - ii. increased frequency and intensity of rainfall events due to changes in the climate, and
 - iii. coastal inundation forecasts (i.e. rising sea level).

Other issues/trends that may affect the investment required in the drainage network are:

- changes or enforcement of legislation and guidance and/or new technology, particularly regarding water quality (stormwater treatment),
- changing community expectations of service levels, and

- changing best practice for stormwater design and flood modelling (particularly with regard to climate change scenarios).

These changes are signalled in many of the Hobsons Bay City Council strategies and reports.

4.6.2 Key Findings

Impact of Development

Development has a significant impact on the demand placed on the drainage network due to increased impervious areas and an increase in contaminants being generated from different land-uses. This is often off-set by the requirement that a WSUD approach is used in new developments.

The extent of new pipework has been estimated to be 25km by Cardno in 2017, the cost of which has been estimated. This work will be updated with the recently completed RapidMap asset data project. The 25km of Council funded new drainage is additional to the drainage assets that will be handed over by Developers over the next twenty years. There is some 23km of new roads anticipated through these development applications (Demand Forecast - Roads Asset Management Plan 2019). The length of associated drainage assets has not yet been estimated.

Impact of WSUD Approach

Best practice in integrated water resources management is changing fast. Responding with best practice stormwater design will be allowed for in the 10-year AMP once detailed scoping of projects has been completed. HBCC are responding to this changing landscape with a focus on identifying harvesting and retention potential, and a project to investigate gross pollutant traps (GPTs) on their network.

Impact of Sea Level Rise

Sea level rise will impact on capacity of the drainage network from inundation of outfalls. Storm surge may also result in damage to outfalls and pipe assets. This is not able to be assessed fully at this time and the costs are yet to be assessed. Asset data collection on outfalls is being progressed and an assessment of risk from sea level rise will be considered.

5. Levels of Service

The levels of service provided by Council are divided into community and technical levels of service. Community Levels of Service relate to how the community (or users) receive the service in terms of safety, quality, quantity, reliability, accessibility and responsiveness to requests.

In addition to these standards Technical service standards can also be put in place that support the delivery of the Community levels of services and the achievement of Council's legal, regulatory and due care obligations to its ratepayers.

5.1 Community Research and Expectations

Council undertake an annual customer satisfaction survey to gauge its performance over the year which is compared to previous years. The survey addresses the following aspects that combine to provide Council's "Overall Performance":

- ▶ Reputation
- ▶ Overall Services and Facilities
- ▶ Value for Money

For this asset management plan the focus is on the customer satisfaction for Overall Services and Facilities.

Survey results are presented as:

- ▶ the percentage of respondents that provided a score within each of the four categories described in table 5.1 below and,
- ▶ an index score calculated and represented as a score out of 100 on a 0 to 100 scale as required by the Local Government Performance Reporting Framework (LGPRF).

Table 5.1 Customer Survey Scoring System

Category	Score	Index Value
Very satisfied	8 –10	80 –100
Satisfied	6 –7	60 –79
Neutral	5	40 –59
Dissatisfied	1 –4	0 –39

The following table provides an extract from the 2018 customer survey for those survey results relevant to Drainage asset management.

Table 5.2 Drainage - Customer Survey Results 2018

Service Category	Service Area	Very Dissatisfied	Neutral	Satisfied	Very Satisfied	Index 2018	Index 2017
Overall - Services, facilities, and infrastructure delivery		6%	8%	41%	45%	71%	73%
Roads and Footpaths	Drains Maintenance and Repairs	18%	11%	31%	39%	64%	69%
Council's Environment Activities	Protection and Enhancement of Foreshore	8%	9%	34%	49%	72%	74%
Baseline Indicators	The water quality of local creeks, lakes, waterways and wetlands	7%	7%	34%	52%	73%	72%

Described below in the customer levels of service section of this plan the target level of service for the annual customer survey is as follows:

- ▶ Overall customer satisfaction rating (Index) for Drains Maintenance and Repair – 70%
- ▶ Each service area relating to Drainage to have no greater than 10% of respondents being Very Dissatisfied with the service.

Overall, Drains Maintenance and Repairs achieved an index rating of 64% which is below the target of 70%. This rating most likely relates primarily to numerous localised flooding sites that occur each year. An investigation and proposed treatment plan is presently in place which should improve this rating over time.

The Protection and Enhancement of Foreshores and the Water Quality of Local Creeks, Lakes, Waterways and Wetlands are service areas relating to drainage through the provision of traps, retardation basins and alike to prevent rubbish and excessive silt discharge to lakes, waterways and the bay.

Current ratings show these services are at an acceptable standard from the customer perspective.

Key conclusions from the customer satisfaction survey in relation to the Drainage asset management plan are:

- ▶ Drainage maintenance and repairs is under performing. Flood prevention works should improve the performance in this area. Budget has been allowed for this issue.
- ▶ Environmental aspects of stormwater drainage are above an acceptable performance standard.

5.2 Community Levels of Service

The following table aims to identify these levels of services, their target performance and how they will be measured. Results from the assessment of Council's performance against achieving the targets can drive expenditure changes in both the capital and operational budgets.

Table 5.3 Community Service Standards

Service Criteria	Service Level Statement	Performance Measures (Community)	Current Performance (LoS)	Target Performance (LoS)	Performance Monitoring
Customer Satisfaction	Customer satisfaction ratings are maintained at or above the performance target for those assessment criteria relating to Drainage	Overall customer satisfaction rating (Index) for Drain Maintenance and Repairs	64%	70% or higher	Annual Community Survey Report
Responsiveness	Customer service requests will be responded to in a timely manner and rectified within agreed timelines	% of drainage service requests and complaints managed and resolved within the target response times	-	90% or higher	CONFIRM system report

5.3 Technical Levels of Service

The following table provides performance measures and targets for technically related service standards. These technical standards aim to support the delivery of the customer service standards.

Table 5.4 Technical Service Standards

Service Criteria	Service Level Statement	Performance Measures (Technical)	Current Performance (LoS)	Target Performance (LoS)	Performance Monitoring
Condition	Drainage assets are serviceable and maintained in good condition	Drainage assets are maintained at condition 3 or better. Those assessed as condition 4 (poor) or 5 (end of life) are included in the 5-year renewals plan. Drainage assets are cleaned periodically	98%	100% 100%	Condition audit reports Council inspection program
Water Quality	Provision of clean pollutant free waterways	Gross Pollutant Traps are to be cleaned regularly to remove all the trapped objects, rubbish etc	100%	100%	Council inspection program
Sustainability	Stormwater reuse	Stormwater reuse opportunities to be periodically investigated to maximise the use of stormwater for purposes such as irrigation		Opportunities reviewed no more than every 5 years. Projects identified assessed and where appropriate budgeted.	Periodic reviews reported in AM Plans

Service Criteria	Service Level Statement	Performance Measures (Technical)	Current Performance (LoS)	Target Performance (LoS)	Performance Monitoring
Safety	Drainage assets are free of major hazards such as drowning risks	Drainage assets are assessed periodically to ensure they present minimal risk to public safety through such actions as: <ul style="list-style-type: none"> ▶ Warnings or barriers to entry into flood water ▶ Grated entries to inlets, headwalls etc do not present a high risk of body entrapment and drowning 		High safety risk issues identified to be rectified immediately	Council inspection program

6. Risk Management Plan

The following risks and associated strategies have been identified for Drainage asset management. A formal risk rating workshop has not been undertaken at this stage and has been identified as a key improvement area for future asset management plans.

Table 6.1 Drainage Assets Management Risks and Strategies

Risk	Risk Management Strategy
Community safety risk.	<p>Condition and safety audits undertaken on a periodic and regular basis to identify and action risks.</p> <p>Flora and fauna control practices to reduce risks of bites, stings, allergic reactions etc</p> <p>Risk of drowning to be minimised by the appropriate use of domed filed inlets and escapable headwall inlet grates.</p>
Staff and contractor safety whilst performing work duties	<p>Operational training and safe work methods provided for various aspects including:</p> <ul style="list-style-type: none"> ▶ Interaction with the general public ▶ Confined space entry ▶ PPE requirements ▶ Vehicle and equipment operations ▶ Animal management
Discharge of rubbish to waterways and the bay	<p>Investigations are underway as to which outlets should have a GPT installed to capture rubbish before it reaches either a Melbourne Water waterway or Port Phillip Bay.</p>
Silt or pollutants discharging to waterways or the bay	<p>Council guidelines exist for any projects or development work for the prevention of excessive soils or pollutants entering the stormwater system.</p>
Flooding intensity and frequency increasing with climate change	<p>Investigations underway to determine the likely impact of climate change on various assets and services including the drainage network.</p> <p>Consultant's report and subsequent capital works program in place to address known flooding hotspots and undersized assets.</p>

Risk	Risk Management Strategy
<p>Insufficient expenditure and resources provided to sustain the Open Space asset portfolio</p>	<p>Condition audits and asset management plans prepared to identify the expenditure needs which are compared against the budgets provided.</p> <p>Asset Sustainability Ratios prepared and reported.</p> <p>Asset sustainability ratio is presently low however this is due to the vast majority of the portfolio being in a good condition and not requiring renewals expenditure.</p> <p>Expenditure largely being directed toward addressing the significant number of localised flooding locations.</p>
<p>Customer dissatisfaction</p>	<p>Yearly customer satisfaction survey.</p> <p>Investigation and actioning of any areas of dissatisfaction in order to improve for future surveys.</p>

7. Lifecycle Management Strategy

7.1 Renewal/Replacement Plan

Drainage management typically identify renewals capital works through the following methods:

- ▶ Asset condition audits that identify assets in condition 4 or 5 are scheduled for renewal within the ten year forecast period. Further investigation on each of these assets determines the specific treatment needed for that asset.
- ▶ Risk analysis may identify a high risk assets which results in the requirements for a renewals capital project to reduce risk to acceptable levels.
- ▶ Customer Service Request may identify a work item that is of significant cost or there is a repetition of issues with the same infrastructure. In these cases, further investigation is undertaken and, if appropriate, a capital works project is initiated.

7.2 Creation/Acquisition/Upgrade Plan

7.2.1 Flood Rectification Upgrades

Through a consultant's report, as described in the future demand section of this plan, a significant investment is proposed to address regular and significant localised flooding following storm events. Council is presently developing detailed designs for 11 key flooding locations to be addressed over the coming years. It is likely that to fully address all the flooding issues this will take a number of years beyond the 10 year outlook period.

7.2.2 Developer Contributed Assets

As part of any new development drainage infrastructure is to be provided to Council's design and build specification. A list of development applications for the next ten years is reviewed by Council to determine if additional connecting drainage assets are required to be augmented to cater for the new drainage flow.

7.2.3 Compliance Based Upgrades

From time to time legislation and acts may be changed that requires Council to implement upgrade capital works. For example, to meet additional environmental discharge requirements or water reuse targets.

Changes to the Australian stormwater design standards in recent years has effectively made many of the existing smaller diameter drains undersized. As assets are renewed there is generally some upgrade to meet current standards.

7.3 Operations and Maintenance Planning

Operations – There is very little requirements for operation of the drainage network other than perhaps some water harvesting activities.

Maintenance – Drainage assets are maintained via an external contract. The current maintenance contract allows for a 12 monthly inspection and cleaning of all Council owned stormwater pits excluding those located within Private property. This is undertaken as a lump sum component. Some locations have a 6

monthly cleaning or as requested due to silting and are included in the schedule of rates under the current contract.

GPT's are inspected and serviced on average 6 times per year or as requested/required.

7.4 Disposal Plan

Very little to no disposal works are typically planned by Council for the drainage portfolio. Any disposal would generally relate to the disposal of decommissioned assets that have had their function transferred to a new drainage facility to meet population growth within the area.

8. Financial Summary

8.1 10 Year Capital Works Forecast – Drainage Portfolio

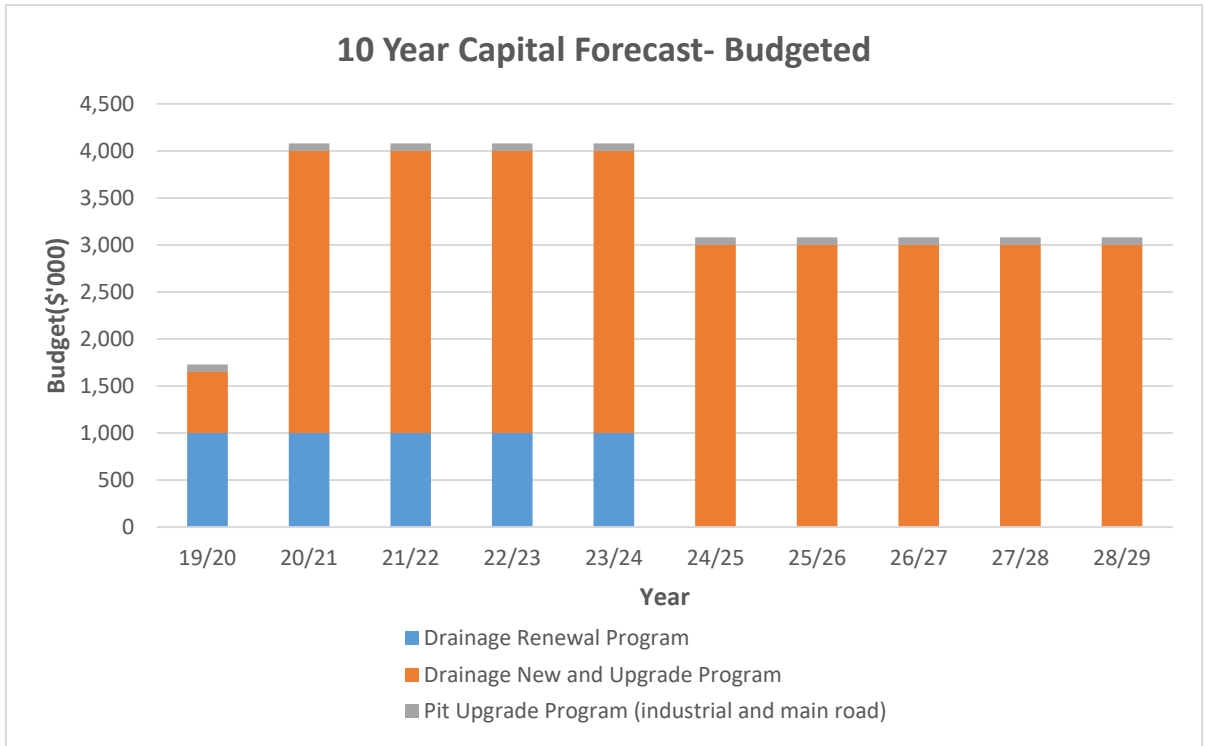
Each capital works project or programme has been assigned a category of work (Renewal, Upgrade, New). The forecast capital for the next 10 years is presented in the following table and chart. These capital works represent those capital projects specifically related to the Drainage portfolio. Overall some \$5.0M in Renewals expenditure is forecast (\$1.0M pa) to address all the assets identified in condition 4 and 5.

As of December 2018, New and Upgrade works total some \$3.0M per annum commencing 2020/21 with the majority of this being directed towards the new or upsizing of assets to address highest priority projects. The total cost to complete all the required new and upgrade works across the entire municipality is approximately \$55M.

Table 8.1 10 Year Forecast Capital Works – Drainage Portfolio (\$'000)

Class	Program Name / Scope	Total	Budget 18/19	Budget 19/20	Budget 20/21	Budget 21/22	Budget 22/23	Budget 23/24	Budget 24/25	Budget 25/26	Budget 26/27	Budget 27/28
		30,450	80	1,730	4,080	4,080	4,080	4,080	3,080	3,080	3,080	3,080
Renewal	Drainage Renewal Program	5,000		1,000	1,000	1,000	1,000	1,000				
New/Upgrade	Drainage New and Upgrade Program	24,650		650	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000
Upgrade	Pit Upgrade Program (industrial and main roads)	800	80	80	80	80	80	80	80	80	80	80

Figure 8.1 10 Year Capital Forecast Chart – Drainage Portfolio



8.2 Ten Year Operational Forecast – Drainage

The overall operational budget for the Drainage asset portfolio for the 2018/19 financial year is \$903,264 which covers lump sum and provisional drainage works provided principally through an external contract agreement.

Over the next ten years there will likely be impacts on the operational budget requirements to cater for the following changes:

- ▶ Additional GPT's – number and locations yet to be determined
- ▶ Additional drainage pipes and pits to areas previously not drained
- ▶ Population growth and resulting new subdivision developments
- ▶ Flood mitigation works proposed primarily will not change the operational budget needs as they will largely result in increased size replacement pipes and pits rather than additional pipes and pits.

Based on the current list of development applications for the next ten years plus the proposed population growth it is estimated that the drainage network will grow by some 10.5%

New area drainage (\$19.5M) provided through the flood mitigation projects is expected to increase the portfolio by an additional 8.6% over the ten year period.

Combing these an estimated 19.1% increase in the drainage portfolio is anticipated over the next ten years. Correspondingly a 19.1% increase in the operational budget is anticipated to maintain the network to a similar standard as today. This roughly translate to a budget increase of 2.0% per annum.

In addition to the increase network maintenance costs the additional GPT's are estimated increase over the next 4 years resulting in an increased cleaning budget of some \$50,000 pa.

As a result, it is estimated an operational budget to increase in real terms (excluding CPI) by some 25% over the next ten years from \$903,264 to \$1,129,484.

Table 8.2 Proposed Operational Budget – Drainage Portfolio

Financial Year	Proposed Opex Budget	Network Increase	GPT's	Total
2018/19	\$903,264			
2019/20	\$921,329	2%	\$5,000	\$926,329
2020/21	\$939,756	2%	\$10,000	\$949,756
2021/22	\$958,551	2%	\$25,000	\$983,551
2022/23	\$977,722	2%	\$50,000	\$1,027,722
2023/24	\$997,276	2%	\$50,000	\$1,047,276
2024/25	\$1,017,222	2%	\$50,000	\$1,067,222
2025/26	\$1,037,566	2%	\$50,000	\$1,087,566
2026/27	\$1,058,318	2%	\$50,000	\$1,108,318
2027/28	\$1,079,484	2%	\$50,000	\$1,129,484

8.3 Key Assumptions made in Financial Forecasts

- ▶ Expenditure projections are in line with Council 10 year capital works forecast as at December 2018.
- ▶ Expenditure is presented in current dollar terms and does not include any indexation for inflation and other cost increases.

8.4 Funding Strategy

The projected expenditure identified is to be funded from Council's operating and capital budgets. The funding strategy is detailed in Council's 10-year long term financial plan.

9. Improvement Projects

9.1 Improvement Plan

The following list is a set of potential improvement projects identified during the formulation of this document and other asset management improvements.

- ▶ Asset Register Improvements – Review data collection and condition assessment project to ensure the asset register is updated
- ▶ Operational budget impacts – Further review of the likely operational impact over the ten year forecast from new and upgrade capital works is required.
- ▶ Risk management - Workshop risks and where appropriate develop risk management or mitigation action plans.
- ▶ Levels of service – Implement systems to allow for the reporting of performance for each of the levels of service criteria.
- ▶ Melbourne Water Upgrades - Council to work with Melbourne Water to facilitate the timely completion of the identified upgrades necessary to accommodate Council drainage upgrades.
- ▶ Development Guidelines – Develop and adopt design standards for small and large development regarding stormwater drainage and stormwater reuse.

9.2 Improvement Plan Timetable

Further to the list of improvements listed here develop a timetable and responsible officer for each improvement to implement change before the production of the next asset management plan.

This asset management plan is to be review every 4 years.

10. Support / Reference Documents

The following is a list of support or reference documents that were taken into consideration in the preparation of this asset management plan.

- ▶ 10 Year Capital Works Program and Budget Submission List 2018
- ▶ Asset Register extracts for each class of asset relevant to the Drainage portfolio
- ▶ RapidMap Australia - Drainage Assets Inventory Data Collection & Condition Survey 2018
- ▶ HBCC - Flood Modelling Report - V170209 – Cardno Nov 2017
- ▶ HBCC - 2018 Annual Community Survey Results
- ▶ Appendix 1_Climate Change Adaptation Plan Background Report 2018
- ▶ GPT's - LH304 Wader Beach final report 2017 Appendix 4 e-version
- ▶ IWMP - Integrated Water Management Plan_final_2014
- ▶ IWMP - Technical support document 2014
- ▶ HBCC Asset Management Policy
- ▶ HBCC Risk Management Policy
- ▶ HBCC Open Space Strategy – Nov 2017
- ▶ Hobsons Bay Open Space Water Security Plan Small (A1253851)
- ▶ Water Security and WSUD opportunities report_final_June_2017 (A2648281)
- ▶ Morphem Environmental – Demand Analysis Report March 2019

