NORTH SYDNEY COUNCIL

ASSET MANAGEMENT PLAN

STORMWATER DRAINAGE & GROSS POLLUTANT TRAPS 2022-2032

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Stormwater Drainage and GPT Assets

Executive Summary

Located across the North Sydney LGA are 25 individual gross Pollutant Traps (GPTs). These are supported by a network of approximately 101km of stormwater drainage pipes and 5,926 individual pit structures.

Stormwater Drainage Assets

Stormwater drainage assets in North Sydney provide a vital service to the local community. During rainfall events stormwater flows from surfaces, in particular, hard surfaces such as roofs, footpaths, and roads. This water is then collected by street gutters, pits, and pipes. North Sydney Council embraces the principles of Water Sensitive Urban Design (WSUD). As such some of this water is harvested for the watering of a number of sporting fields as well as Cammeray Golf Course. Also seventy percent (70%) of stormwater in the North Sydney catchment passes through Stormwater Quality Improvement Devices (SQIDS) to improve water quality before entering the harbour. In addition, Council has built several rain gardens and bio retention swales to improve water quality.

A significant proportion of the main trunk drainage pipes in North Sydney were built around 100 years ago and are now approaching the end of their useful life and require replacement. Also a large number of concrete pipes under roads have prematurely failed due to excessive vehicle loads.

North Sydney has an area of 10 square km. The catchments are generally short and steep. The characteristics of the catchments have also changed over the decades. Increased development, increased hard surfaces, and therefore increased rainfall runoff has meant that the useful life of many of these pipes has reduced due to capacity issues.

- Councils has approximately 101km of stormwater drainage pipes.
- Council has approximately 5,926 stormwater drainage pits.
- Detailed proactive CCTV condition surveys are carried out on approximately 4 to 8% of Council's pipe network each year. Reactive CCTV inspections are also carried out as required.

Gross Pollutant Trap Assets

Stormwater drainage assets and the associated Gross Pollutant Trap (GPT) network in North Sydney provide a vital service to the local community. During rainfall events stormwater flows from surfaces, in particular, hard surfaces such as roofs, footpaths, and roads. Stormwater is rainwater plus anything the rain carries along with it including litter, nutrients, chemicals, sediments. This water is then collected by street gutters, pits, pipes, and then where present, the water flows into various Stormwater Quality Improvement Devices (SQIDS). Stormwater eventually enters our waterways inhabited by fish, frogs and other aquatic animals and plants.

The two main issues that need to be addressed when managing stormwater are quantity and quality. North Sydney covers an area of 10 square km. The stormwater catchments are generally short and steep. North Sydney is an established area that is highly urbanised. This means that there is a significant amount of stormwater carrying pollution flowing from hard surfaces that needs to be managed by council. North Sydney Council embraces the principles of Water Sensitive Urban Design (WSUD) and has invested a significant amount of funds on improving the quality of stormwater.

North Sydney Council has recently undertaken an audit of the performance of its Gross Pollutant Traps (GPTs) network within the North Sydney LGA. Consultants, Optimal Stormwater, were engaged to undertake a detailed audit on the performance of each of Council's Gross Pollutant Traps (GPTs). The audit findings were presented to Council's Environment Reference Group Meeting held in the Ros Crichton Pavilion on Monday, 30 May 2016. GPTs contain trash racks or litter basket components. Many of these components are exposed to salt water and require replacement every five years. The consultant report recommended to increase the maintenance budget of the GPTs so that trash racks or litter basket components can be replaced when broken or rusted.

Each Gross Pollutant Trap has been categorised as a GPT or a Trash Rack / Litter basket:

- 15 are GPTs
- 10 are Trash Racks/ Litter Baskets, which are split into Litter Basket structure and Litter baskets
- A detailed inspection and inventory of Councils GPT network was undertaken in 2016 by consultants "Optimal Stormwater". The report is attached to the Appendix of this Asset Management Plan.

Note: *in 2020-21 Council's network of 25 GPTs collected a total of 539 tonnes of rubbish and debris from entering the harbour. The total amount of rubbish and debris collected and prevented from entering the harbour since 2013 is now 3,645 tonnes.*

As per the recommendation of Council's Environment Reference Group Asset Management Plan has been prepared to facilitate the identified upgrade requirements for Councils GPT network to ensure that they are working as designed and to maximise efficiency in reducing the amount of pollutants from entering Sydney Harbour.

Overall, some 88% by replacement cost of the stormwater drainage portfolio is in very good to good condition (1-2), 1.5% is in fair condition (3) and 10.5% is in poor to very poor condition (4-5). Also 48% by replacement cost of the GPT portfolio is in very good to good condition (1-2), 12% is in fair condition (3) and 40% is in poor to very poor condition (4-5).

A Risk rating was assigned to each stormwater drainage asset. Overall, 89.5% of the portfolio has a low to medium risk rating and 10.5% has a high to very high risk rating. Also a Risk rating was assigned to each GPT asset. Overall, 60% of the portfolio has a low to medium risk rating and 40% has a high to very high risk rating.

The total Replacement Value of the portfolio is $204,552,675 as at 30 June 2021. The values are shown in the Table below.

Table 1: Stormwater Drainage and GPT Assets – Summary Table

Asset Category	Replacement Value (2021)	Accumulated Depreciation (2021)	Fair Value (2021)	Depreciation Expense
Stormwater Pipes	$175,013,502	$47,819,939	$127,193,564	$1,483,801
Stormwater Pits	$20,549,353	$5,910,005	$14,639,348	$273,173
GPTs	$8,989,820	$4,850,512	$4,139,308	$196,083
TOTAL	**$204,552,675**	**$58,580,456**	**$145,972,220**	**$1,953,057**

The following table provides a summary of the quantities for each Stormwater Drainage and GPT Assets by type. The portfolio is dominated by Concrete, PVC and terracotta (Vitrified Clay) Pipes.

Table 2A: Stormwater Drainage and GPT Assets – Typology – Pipes

Pipe Type - Material	Length of Pipe Type (m)
Cast Iron	39
Unidentified Plastic	42
Brick	665
Composite brick/concrete	101
Concrete	89,374
Glass Reinforced Plastic	137

Pipe Type - Material	Length of Pipe Type (m)
Masonry - in regular courses	324
Polyethylene	78
Polypropylene	120
Polyvinyl chloride	2,086
Concrete box culvert	1,324
Sandstone Culvert	153
Steel	24
Vitrified clay	7,065
Other (state in Comments)	171
Not known	154
Total	**100,858**

Table 2B: Stormwater Drainage and GPT Assets – Typology – Pits

Pit Type	Count of Pit Type
BLIND PIT	4
CONVERTER	65
HEADWALL	24
INLET	10
JUNCTION BURRIED	204
JUNCTION SOLID LID	647
LETTER BOX	52
NODE (DROPPER NO PIT)	6
NODE (JUNCTION NO PIT)	225
ON GRADE EKI	21
ON GRADE GRATE	293
ON GRADE GRATE & EKI	1,900
OUTLET	66
SAG EKI	8
SAG GRATE	97
SAG GRATE & EKI	530
UNKNOWN PIT TYPE	1,774
Total	**5,926**

Table 2C: Stormwater Drainage and GPT Assets – Typology – Gross Pollutant Traps

Asset Category	No of Gross Pollutant Traps
GPTs	15
Litter Basket Structure	11
Litter Baskets	10
TOTAL	**25**

Stormwater Drainage and GPT Assets – Future demand

For stormwater drainage the future upgrade/ new capital works program will be primarily based on the Catchment Study which is currently being undertaken. In addition, as part of each major renewal project, a detailed design is undertaken and improvements to the capacity of the of stormwater system made as required. A review of stormwater drainage projects completed in the last 3 financial years showed that a significant amount of new drainage was carried out during the process of renewing pipes in poor condition (based on improving capacity to a suitable standard). It should be noted that most of the renewal expenditure is actually upgrade work, for example, an existing 300mm diameter pipe replaced with a 450mm diameter pipe. To simplify calculations, it has been assumed that any upgrade work is considered to be renewal work on the basis that the upgraded pipe meets the modern equivalent standard.

For Gross Pollutant Traps the future Upgrades and capital works program will be primarily based on the recommendations of the *"Optimal Stormwater"* consultant's report of 2016 and also will be informed by the outcomes of Councils Flood Study which is currently underway.

Stormwater Drainage and GPT Assets – Levels of Customer Service

Service levels are defined service levels in two terms, customer levels of service and technical levels of service. These are supplemented by organisational measures.

Customer Levels of Service measure how the customer receives the service and whether value to the customer is provided.

Customer levels of service measures used in the asset management plan are:

Quality How good is the service … *what is the condition or quality of the service?*

Function Is it suitable for its intended purpose …. *Is it the right service?*

Capacity/Use Is the service over or under used … *do we need more or less of these assets?*

The current and expected customer service levels are detailed in the table below.

Table 3A: Stormwater Drainage and GPT Assets – Levels of Customer Service – Stormwater Drainage Assets

Service Attribute	Expectation	Performance Measure Used	Current Performance	Desired Position in 10 Years
Quality	Stormwater Drainage Assets met the "End user / Community Needs"	Percentage of Stormwater Drainage Assets in 'very good', 'good' or 'Fair' (1, 2, 3) and percentage 'poor' or 'very poor' (4, 5) Condition.	89.5% of Stormwater Drainage Assets in 'very good', 'good' or 'Fair' (1, 2, 3) condition. 10.5% of Stormwater Drainage Assets in 'poor' or 'very poor' (4, 5) Condition.	Maintain – Condition 1-2-3 Improve and replace Condition 4-5

Service Attribute	Expectation	Performance Measure Used	Current Performance	Desired Position in 10 Years
Function /Capacity and Use	Amount of Stormwater Drainage Assets required is to be determined. General current assumption is that the capacity of NSC Storm water and associated Assets is appropriate.	Number of additional Stormwater Drainage Assets Is to be determined by the completion of the Catchment Study currently underway. Key measurement is the number of flood affected houses/properties that will be identified across the LGA at the completion of Catchment Study (Flood Study)	Number of additional Stormwater Drainage Assets Is to be determined by the completion of the Catchment Study currently underway. Key measurement is the number of flood affected houses/properties that will be identified across the LGA at the completion of Catchment Study (Flood Study)	Improve – reduce the number of flood affected houses/properties

Table 3B: Stormwater Drainage and GPT Assets – Levels of Customer Service – Gross Pollutant Traps

Service Attribute	Expectation	Performance Measure Used	Current Performance	Desired Position in 10 Years.
Quality	Gross Pollutant Traps meet the "End user / Community Needs"	Percentage of GPT Devices that are currently suitable and fit for purpose and have been assessed as being in 'very good', 'good' or 'fair' condition (1, 2 and 3). Percentage of the network is in 'poor' or 'very poor' (4, 5) Condition.	59.9% of GPT Devices (12 out of 26) are currently suitable and fit for purpose and have been assessed as being in 'very good', 'good' or 'fair' condition (1, 2 and 3). 40.1% (14 out of 26) of the network is in 'poor' or 'very poor' (4, 5) Condition.	Maintain and upgrade – Condition 1-2-3 Improve and replace Condition 4-5
Function	Gross Pollutant Traps(GPTs) – Capturing storm water pollution and debris from entering the Harbour.	Percentage of GPT Devices are currently Suitable	46% of GPT Devices Suitable (12 out of 26)	100% of GPT Devices Suitable
Capacity and Use	GPT systems and overall network capacity is appropriate.	Percentage of Catchment Area treated by a GPT	69% of catchment treated (Area treated = 753Ha, Total area = 1090Ha)	Target is for 90% of North Sydney's catchment to be treated

Stormwater Drainage and GPT Assets – Levels of Technical Service

Technical Levels of Service - Supporting the customer service levels are operational or technical measures of performance. These technical measures relate to the allocation of resources to service activities to best achieve the desired customer outcomes and demonstrate effective performance.

Technical service measures are linked to the activities and annual budgets covering:

- Operations – the regular activities to provide services (e.g. cleaning and inspections, etc).
- Maintenance – the activities necessary to retain an asset as near as practicable to an appropriate service condition. Maintenance activities enable an asset to provide service for its planned life (e.g. Stormwater Drainage and GPT Assets repairs.
- Renewal – the activities that return the service capability of an asset up to that which it had originally (e.g. Stormwater pipe re-lining, section replacement and or minor upsizing of pipes and pits or associated assets in the network.
- Upgrade/New – the activities to provide a higher level of service (e.g. extending a pipeline or upgrading it to a superior material for another function – i.e. changing the pipeline or culvert to another material such as changing old terracotta lines to PVC or concrete. Creating new parts of the stormwater and drainage network where there previously was no network or requirement for Stormwater Drainage and GPT Assets (e.g. New developments).

Table 4A and 4B show the technical levels of service expected to be provided for Stormwater Drainage and GPT Assets. The 'Desired' position in the table documents the position being recommended in this AM Plan.

Table 4A: Stormwater Drainage and GPT Assets – Technical Levels of Service – Stormwater Drainage Assets

Service Attribute	Service Activity Objective	Activity Measure Process	Current Performance	Desired for Optimum Lifecycle Cost
Operations	Undertake network inspections to monitor condition. Proactive and Reactive inspection of pipe to monitor condition	Stormwater pipes CCTV'd to monitor condition	All reactive CCTV inspections undertaken as soon as practical. Additional proactive inspections also carried out.	All reactive CCTV inspections undertaken as soon as practical. Additional proactive inspections also carried out.
Maintenance	Reactive service Requests completed within adopted timeframes	Respond to complaints.	Minor repairs undertaken in accordance with Maintenance Management System	Minor repairs undertaken in accordance with Maintenance Management Delivery System.
Renewal	Maintain existing Pits & Pipes assets to a satisfactory condition	Percentage of Stormwater Drainage Assets in 'very good', 'good' or 'Fair' (1, 2, 3) and percentage 'poor' or 'very poor' (4, 5) Condition.	89.5% of Stormwater Drainage Assets in 'very good', 'good' or 'Fair' (1, 2, 3) condition. 10.5% of Stormwater Drainage Assets in 'poor' or 'very poor' (4, 5) Condition.	Maintain – Condition 1-2-3 Improve and replace Condition 4-5
Upgrade/New	Satisfactory provision of Stormwater Drainage and GPT Assets.	Number of additional Stormwater Drainage Assets Is to be determined by the completion of the Catchment	Number of additional Stormwater Drainage Assets Is to be determined by the completion of the Catchment Study currently underway.	Improve – reduce the number of flood affected houses/properties

Service Attribute	Service Activity Objective	Activity Measure Process	Current Performance	Desired for Optimum Lifecycle Cost
		Study currently underway. Key measurement is the number of flood affected houses/properties that will be identified across the LGA at the completion of Catchment Study (Flood Study)	Key measurement is the number of flood affected houses/properties that will be identified across the LGA at the completion of Catchment Study (Flood Study)	

Table 4B: Stormwater Drainage and GPT Assets – Technical Levels of Service – Gross Pollutant Traps

Service Attribute	Service Activity Objective	Activity Measure Process	Current Performance	Desired for Optimum Lifecycle Cost
Operations	GPTs are clean at optimised frequency to minimise litter bypass	Frequency of GPT Cleaning	GPTs are cleaned in accordance within their optimal schedules which may vary for each GPT.	GPTs are cleaned in accordance within their optimal schedules which may vary for each GPT.
Maintenance	Reactive service Requests completed within adopted timeframes	Respond to complaints.	Minor repairs undertaken in accordance with Maintenance Management System	Minor repairs undertaken in accordance with Maintenance Management Delivery System.
Renewal/ Upgrade	Maintain existing GPT assets to a satisfactory condition	Number of renewed/upgraded GPTs constructed	At least 1 GPT is renewed/upgraded annually. It has been identified that 10 out of 26 GPTs of the current network requires to be De-commissioned and replaced with more efficient GPTs as per Consultants Report.	At least 1 GPT is renewed/upgraded annually
New	New GPTs to capture pollution in areas not currently treated	Number of new GPTs constructed	It has been identified that 4 new GPTs are required to capture pollution in areas not currently treated and this will take Council to within 85% of the	New GPTs are to be considered once existing GPTs have been upgraded.

Service Attribute	Service Activity Objective	Activity Measure Process	Current Performance	Desired for Optimum Lifecycle Cost
			catchment being treated. The target established is 90% of North Sydney's catchment should be treated.	

Stormwater Drainage and GPT Assets - Condition

Stormwater Drainage Assets

The condition of Council's of Stormwater Drainage Assets has been progressively surveyed using CCTV inspection contractors since 2006. This information is collated in a database using WINCAN Pipe Inspection Software. CCTV condition surveys are expensive due to the equipment and specialised contractors required. In addition this method of data collection often requires the organisation of Work Zones, RMS Road Occupancy Licences, and traffic control which adds to the cost of the survey. Detailed reactive and proactive CCTV condition surveys are carried out on approximately 4 to 8% of Council's pipe network each year.

The condition profile as shown in Table 6. It is based on the CCTV condition survey carried out in accordance with the WSAA Conduit Inspection Reporting Code. The graph also shows that the amount of pipes in condition "1" is relatively high. It is likely that some of these condition 1 pipes may be in condition 2 or even in condition 3. This could be due to a CCTV Operator not observing and recording very small defects such as hairline cracks. The reasons for not observing very small defects include inadequate equipment such as poor lighting, not using the correctly sized "camera tractor" or camera configuration to centre the camera in varying pipe sizes, or simply assuming that the pipe is generally in reasonable condition. Improved specifications and closer monitoring, as well as the increased use of high definition cameras, should overcome the issues of not observing minor defects. It should be noted that this does not impact on either the short or medium term capital works programs which are based on pipes which have been clearly identified as condition 5.

Gross Pollutant Traps

The condition of council's 26 GPTs and litter baskets was surveyed extensively in 2016 by consultants Optimal Storm water Pty Ltd. The performance of the GPTs is monitored regularly through Council's cleaning regime and any damage faults or repairs are reported through by Council's cleaning contractor to the Engineering and Property Services Division. Obsolescence has been factored into the condition of GPTs. Where a GPT has been deemed not fit for purpose, it has been deemed as being in very poor condition.

Table 5: Stormwater Drainage and GPT Assets Survey Criteria

Grade	Condition	Description
0	Not inspected	Yet to be condition assessed.
1	Very Good	Sound Stormwater Drainage and GPT Assets designed to current standards and well maintained with no defects. **No work required**
2	Good	As grade 1 but not designed to current standards or showing minor wear, tear and deterioration of capacity e.g. tree root intrusion, minor collapse and or undersize – with *minor* capacity and or blockage issues – has potential to block in large storm events, but no undermining of Stormwater Drainage and GPT Assets that would seriously compromise property or life. Needs to be reinspected in 2- 3 years. Deterioration has no significant impact on performance of the Stormwater Drainage and GPT Assets. **Only minor work required**
3	Fair	Stormwater Drainage and GPT Assets functionally sound, but capacity and function

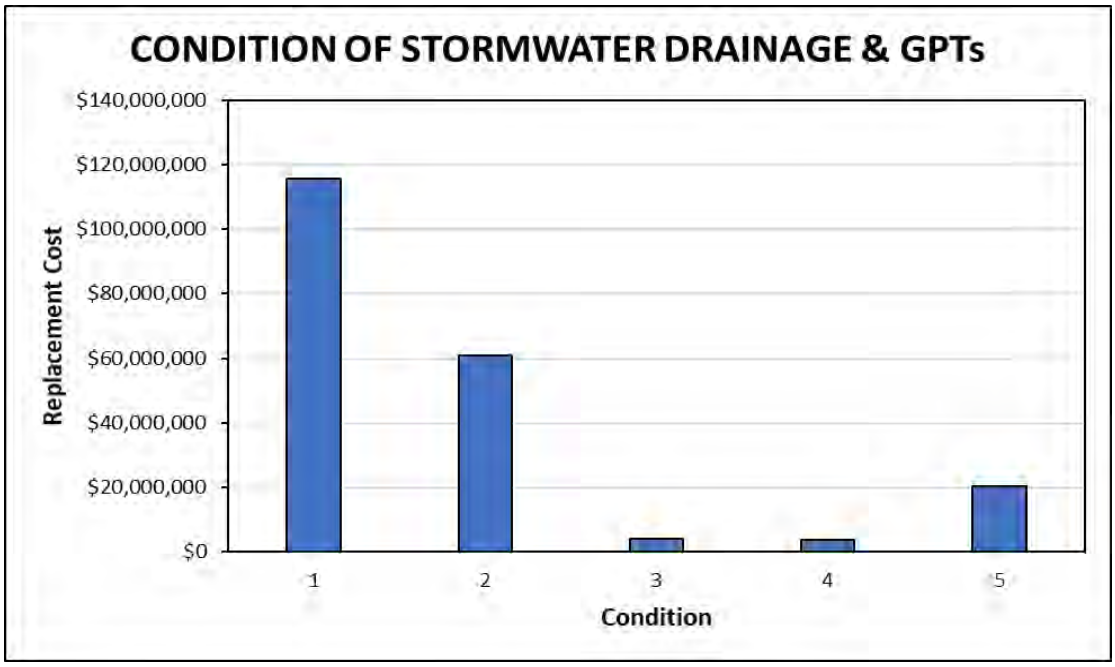
Grade	Condition	Description
		affected by minor defects e.g. tree root intrusions, blockages from other sources, collapsed sections, undermining or washout of foundations to the line of is starting to become apparent – *moderate* capacity and or blockage issues – has a moderate potential to block in large storm events, but no significant undermining of Stormwater Drainage and GPT Assets that would seriously compromise property or life. **Some repair work and replacement of sections work required within 4 -10 years**
4	Poor	Stormwater Drainage and GPT Assets functioning but with problems due to significant defects e.g. Major tree root intrusions, major blockages from other sources , large % of line collapsed in sections, undermining or washout of foundations to the line of is major causing structural and performance issues with the line – *major* capacity and or blockage issues – has a major potential to block in large and or moderate storm events - undermining of Stormwater Drainage and GPT Assets is showing signs of failure that would that would lead to property damage and or seriously compromise public safety and or life., likely to cause significantly deteriorate within 1-2 years. **Significant replacement or rehabilitation needed within 2-4 years**
5	Very Poor	Stormwater Drainage and GPT Assets is not functioning and or has failed due to significant defects e.g. Major tree root intrusions, major blockages from other sources, more that 75% of line collapsed in sections, undermining or washout of foundations to the line has caused the line to fail / collapse – *major* capacity and or blockage issues – will block and not function in any storm event. Stormwater Drainage and GPT Assets have failed and would lead to property damage and or seriously compromise public safety and or life. Stormwater Drainage and GPT Assets has serious problems and has failed or are about to fail in the near future, causing unacceptable stability, appearance and public safety hazard. **Urgent replacement/ rehabilitation required**

The table below shows the Replacement Cost for each of the condition scores. In practice and where funds permit Stormwater Drainage and GPT Assets in condition 3 are generally replaced at the same time as Stormwater Drainage and GPT Assets in condition 4 or 5 if they are adjacent, there are potential risks, and it is cost effective.

Table 6: Stormwater Drainage and GPT Assets Survey Results

CONDITION OF STORMWATER DRAINAGE & GPT ASSETS		
Condition	**Replacement Cost**	**% Condition (based on known data and cost)**
1 (Very Good)	$115,736,683	56.6%
2 (Good)	$60,703,463	29.7%
3 (Fair)	$4,017,595	2.0%
4 (poor)	$3,659,728	1.8%
5 (Very Poor)	$20,435,208	10.0%
Total	**$204,552,676**	**100.0%**

The following graph shows the condition rating of Council's overall Stormwater Drainage and GPT Assets over the entire network in terms of replacement cost.



Stormwater Drainage and GPT Assets – Review of Useful Lives

Council has adopted componentisation of stormwater pipes into pipe and conduit to allow for relining treatments, all other assets are simple single component items. Following is the useful life table from Australis's report.

Useful Lives of Stormwater Drainage and GPT Assets	
Asset (Sub)Category	**Useful Life Range (years)**
Pipes	70-100
Pits	80
Gross Pollutant Traps	50

Based on reviewed useful lives the total annual Depreciation is as follows:

Capital funding to maintain a renewal ratio of 1	
	Annual Depreciation
Stormwater Drainage and GPT Assets	**$1,953,057**

A budget of $1,953,057 is required on average over the long term to maintain the condition of Council's stormwater drainage and GPT network, noting that fluctuations in renewal requirements in the medium term.

Stormwater Drainage and GPT Assets – Funding Strategy

The Asset Renewal Funding Ratio is the most important indicator. It compares funding with depreciation. An Asset Renewal Funding Ratio of 1 or greater sustained over the long term indicates the optimal renewal and replacement of assets.

The forecast for Depreciation (or Long Term Average Annual Asset Consumption) is $1,953,057. Therefore, an annual average capital renewal funding of $1,953,057 (2021 dollars) will achieve an Asset Renewal Funding Ratio of 1.

The cost to fully replace assets in condition 4 and 5 as well as the cost to replace the condition 3 assets which will become condition 4 over the next 10 is $25,629,326. This is an average annual cost of $2,562,933 which is greater than the $1,953,057 Depreciation Expense and is less than the average annual forecast budget of $2,980,483. With further investigation and detailed design it is hoped that alternate and lesser cost solutions may be possible to maintain stormwater drainage and GPT assets at an optimal level.

Additional funds will be required to upgrade the existing Stormwater Drainage and GPT network in accordance with recommendations of the Flood Study which is due to be completed.

Stormwater Drainage and GPT Assets – Capital Works

Replacement of Stormwater Drainage and GPT Assets is assumed to be a capital works project.

The ranking criteria used to determine priority of identified renewal and replacement proposals is detailed in Table 7. A priority for action of 1 to 5 has been assigned to each Stormwater Drainage and GPT Assets requiring capital works as described following table.

Stormwater Drainage and GPT Assets – Managing the Risks

There are risks associated with providing and maintaining Stormwater Drainage and GPT Assets. They are primarily as follows:

- Stormwater Drainage Assets in a poor or very poor condition, i.e. the Stormwater Drainage Asset has failed due to significant defects e.g. major tree root intrusions, major blockages from other sources, undermining or washout of foundations to the line that has caused the line to block or collapse. This may lead to property damage and or seriously compromise public safety and or life.
- Capacity of Stormwater Drainage Assets to cope with major flooding events.
- Gross Pollutant Trap Assets in a Poor or very Poor condition. IE the Gross Pollutant Trap Asset is not functioning and or has failed due to significant defects e.g. Corrosion – structural failure and or capacity issues. This will lead to Environmental pollution, possible property damage and or seriously compromise public safety and or life.

The following risk response table was used to identify those Stormwater Drainage and GPT Assets requiring action within the next 10 years.

Table 7: Stormwater Drainage and GPT Assets – Risk Response Table

Level of Risk		Category	Action Required	Time frame for repairs, upgrade or replacement
VH	Very High Risk	5	Immediate corrective action	1-10 Years
H	High Risk	4	Prioritised action required	4-10 Years
M	Medium Risk	3	Planned action required	10-20 Years
L	Low Risk	2	Manage by routine procedures	Inspections 5-10 years
New	No Risk	1	None	None

Consideration has been given to each Stormwater Drainage and GPT Asset as to whether to replace the asset or perform maintenance on it.

Stormwater Drainage and GPT Assets that have a **Very High or High** risk rating were considered to need replacement within the 1-10 year forecast period.

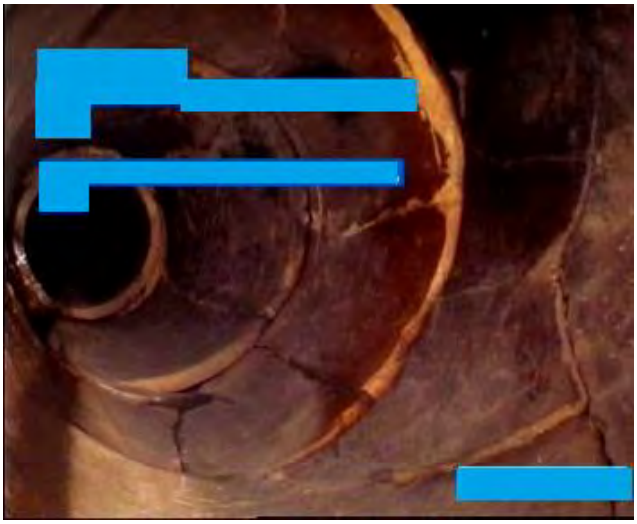
Stormwater Drainage and GPT Assets with a **Medium** risk rating were also considered needing replacement within the 10-20 year forecast period.

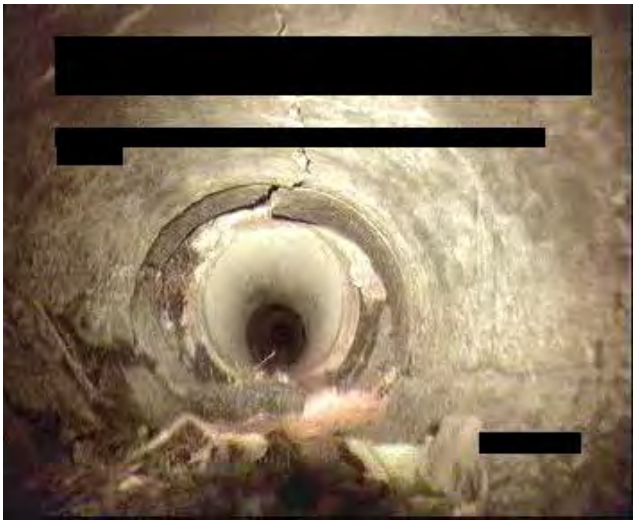

Stormwater Pipes in very poor condition – collapsed and blocked


Flooding Issues

Sinkholes created from collapsed pipes and washout from leaking pipes

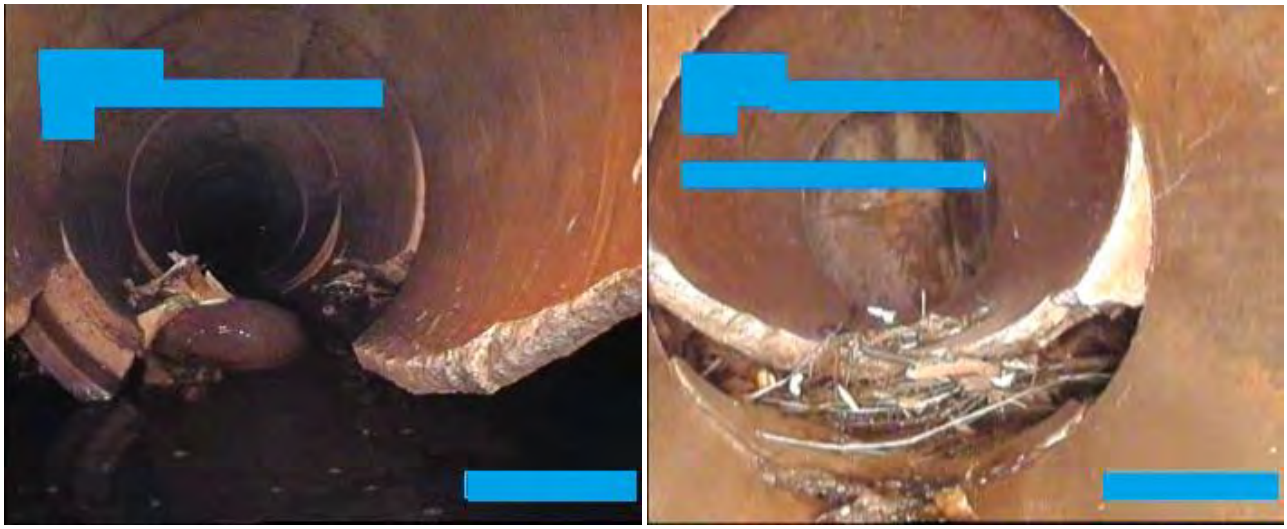
Stormwater Pipes in very poor condition – collapsed and blocked





Stormwater Pipes in very poor condition – collapsed and blocked

Stormwater Pipes in very poor condition – Tree root infiltrations and blocked



Stormwater Pipes in very poor condition – collapsed

Lids are too heavy - The wood is starting to chip; they should be replaced. Lifting points rusted or broken off



Difficult access to a lot of pits



Corrosion and structural damage to a number of pits


The floatables flap was jammed open due to a broken hinge and pollution trapped in it stopping it closing.



Trashracks is bent over and there is a lot of rust. Exclusion bars are rusting – lifting points are rusting due to the corrosive environment

Sediment and trash build up in front of the weir and in pits generally – low capacity.

Council will endeavour to manage these risks within available funding by prioritising stormwater drainage and GPT asset renewal works based on the ongoing condition survey being carried out by Council's contractors which began in 2006 and the GPT Audit Report by consultants Optimal Stormwater.

Table 8: Stormwater Drainage and GPT Assets – Capital renewal Priorities based on Condition and Risk Rating

Risk Matrix - Stormwater Drainage and GPT Assets (Condition and Risk Rating)					
Likelihood of Stormwater Drainage and GPT Assets failing (L)	Stormwater Drainage and GPT Assets length pipe (m)/ (Number of GPTs)				
	Road Hierarchy	Lane	Local Road	Collector	State/ Regional Road
	Park Hierarchy	Local	District	Regional	
	Pipe Size	0-375	>375-600	>600-900	>900
	Priority	d	c	b	a
Condition 1 – Very Good (56.6%)	5	4,507	16,158 (3)	14,242 (1)	7,233
Condition 2 - Good (29.7%)	4	987 (4)	22,171	8,450 (1)	8,573 (1)
Condition 3 – Fair (2.0%)	3	39 (2)	1,090 (1)	401 (1)	430 (1)
Condition 4 – Poor (1.8%)	2	163 (3)	762 (2)	763	273
Condition 5 – Very Poor (10.0%)	1	1,117	5,674 (4)	3,465	1,504 (1)

(Note: Also Refer to Table 6)

Note: This table is based on data in the current register.

Note: Factors which are used to determine the risk category include 'Road Hierarchy', 'Park Hierarchy' and 'Pipe Size'. The most critical factor is used to determine the priority.

Note: It has been assumed that the condition of pits corresponds to the that of the adjacent pipe, as pits are generally replaced at the same time as the adjacent pipe.

It should be noted that Stormwater Drainage and GPT Assets may also be replaced based on other criteria including:

- Streetscape and Public Domain Upgrades
- Kerb and gutter upgrades
- Building Developments (DA Conditions)
- Stormwater Drainage and GPT Assets replaced in association with other projects such as Park and or Streetscape upgrades and associated projects.

Stormwater Drainage and GPT Assets – Maintenance

Routine maintenance is the regular on-going work that is necessary to keep assets operating, including instances where portions of the asset fail and need immediate repair to make the asset operational again, e.g. Patch lining, cleaning, minor repairs.

Maintenance includes all actions necessary for retaining an asset as near as practicable to an appropriate service condition including regular ongoing day-to-day work necessary to keep assets operating.

Current maintenance expenditure levels are considered to be adequate to meet projected service levels.

Over the longer term future operations and maintenance expenditure is forecast to increase as the asset stock increases. The following table summarises the prioritised capital and maintenance works.

Stormwater Drainage and GPT Assets – Prioritised Expenditure Forecast

Table 9A: Stormwater Drainage Assets – Prioritised Expenditure Forecast – 10 years FY2023-FY2032

Year		Priority	Capital Costs	Maintenance Costs	Total Costs
1	2022/23	1b – 1d	$2,475,000	$478,074	$2,953,074
2	2023/24	1b – 1c	$3,096,802	$478,074	$3,574,876
3	2024/25	1a – 1c	$2,570,000	$478,074	$3,048,074
4-10	2025/32	1a – 1c	$17,990,000	$3,346,518	$21,336,518
Grand Total			**$26,131,802**	**$4,780,740**	**$30,912,542**

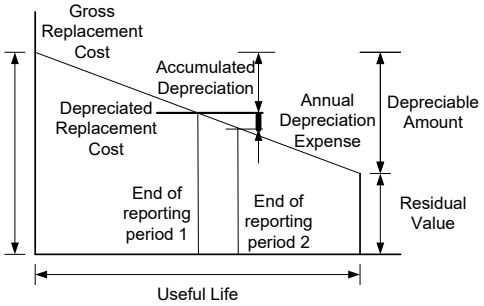
Table 9B: GPT Assets – Prioritised Expenditure Forecast – 10 years FY2023-FY2032

Year		Priority	Capital Costs	Maintenance Costs	Total Costs
1	2022/23	1a – 1c	$873,025	$298,423	$1,171,448
2	2023/24	1c	$800,000	$298,423	$1,098,423
3	2024/25	1c	$250,000	$298,423	$548,423
4-10	2025/32	1c – 2c	$1,750,000	$2,088,964	$3,838,964
Works Identified	2025/32	2c	$904,191		$904,191
Grand Total			**$4,577,216**	**$2,984,234**	**$7,561,449**

In summary the current value of Stormwater Drainage and GPT Assets is detailed in the table below.

Table 10: Stormwater Drainage and GPT Assets – Valuation

Asset Category	Replacement Value (2021)	Accumulated Depreciation (2021)	Fair Value (2021)	Depreciation Expense
Stormwater Pipes	$175,013,502	$47,819,939	$127,193,564	$1,483,801
Stormwater Pits	$20,549,353	$5,910,005	$14,639,348	$273,173
GPTs	$8,989,820	$4,850,512	$4,139,308	$196,083
TOTAL	**$204,552,675**	**$58,580,456**	**$145,972,220**	**$1,953,057**



Stormwater Drainage and GPT Assets – Valuation Forecast

Asset values for Stormwater Drainage and GPT Assets are forecast to increase as additional assets are added to the asset stock. Additional assets will generally add to the operations and maintenance needs in the longer term, as well as the need for future renewal. Additional assets will also add to future depreciation forecasts. It is also forecast that additional assets are expected to be added to the asset stock from new construction and acquisition by Council or from assets constructed by land developers or other assets donated to Council.

Stormwater Drainage and GPT Assets – Key Assumptions – Financial Forecasts

Key assumptions made in this asset management plan are listed in the Table 11 below.

Table:11 Key Assumptions made in AM Plan and Risks of Change

Key Assumptions	Risks of Change to Assumptions
Use of detailed CCTV condition data to determine the remaining life of assets greater than 30 years.	Low risk
Assumptions of assets of unknown condition	Medium risk

Stormwater Drainage and GPT Assets – Creation / Acquisition / Upgrade Program

New works are those that create a new asset that did not previously exist. New Stormwater Drainage assets are likely to be identified from the following sources:

1. Additional pits and pipes associated with renewal projects to improve capacity identified from detailed designs.
2. Past flooding issues
3. Flood Study
4. Additional GPTs as identified in the Optimal Stormwater Consultants reports and built by Council as part of the Capital Works Program.

Stormwater Drainage and GPT Assets – Disposal Plan

No Stormwater Drainage Assets have been identified for disposal.

One Gross Pollutant Trap has been identified for disposal.

Stormwater Drainage and GPT Assets – Forecast reliability and confidence

The estimated confidence level and reliability of data used in this AMP is considered to be reliable as the data is based on a Councils ongoing CCTV network inspections. Each of Councils 26 x GPTs are inspected on average monthly when they are cleaned.

Stormwater Drainage and GPT Assets – Improvement Plan

The improvement plan is shown in the table below.

Task No	Task	Responsibility	Resources Required	Timeline
1	Continue to collect detailed (expensive) CCTV condition data.	EPS	Staff Time as well as additional Recurrent budget	Ongoing
2	Record actual costs of all works to improve unit rates.	EPS/Finance	Staff Time	Ongoing
3	Continue Flood Study Process. This will quantity the extent of upgrade/new capital work required.	EPS	Staff Time / funding	Subject to State Gov't funding

Stormwater Drainage and GPT Assets – Monitoring and Review Procedures

This Asset Management Plan will be reviewed during annual budget planning processes and amended to show any material changes in service levels and/or resources available to provide those services as a result of budget decisions.

The Asset Management Plan has a life of 4 years and is due for complete revision and updating within 1 year of each Council election.

Stormwater Drainage and GPT Assets – Renewal and Replacement Program

Renewal and replacement expenditure is major work which does not increase the asset's design capacity but restores, rehabilitates, replaces or renews an existing asset to its original service potential. Work over and above restoring an asset to original service potential is considered to be an upgrade/expansion or new work expenditure resulting in additional future operations and maintenance costs.

Stormwater Drainage Assets requiring renewal/replacement have been identified by the ongoing Stormwater Drainage and GPT Assets Condition Audit which began in 2006.

Gross Pollutant Trap Assets requiring renewal/replacement have been identified by the Gross Pollutant Trap audit Report completed by consultants Optimal Stormwater in 2016 and reported to Council in July 2016.

Stormwater Drainage and GPT Assets – Funding Scenarios

The Long Term Financial Plan includes three scenarios, all of which maintain current services levels but propose differing levels of capital expenditure on the renewal of Council's ageing infrastructure assets.

In summary:

- Pessimistic Scenario - This Scenario results in a decline in operating results and deficits in the later years.
- Optimistic Scenario - This Scenario results in improvements in operating results for the life of the plan.
- Planned Scenario - This Scenario results modest surplus operating results for the life of the plan.

Table 12A: Funding Scenarios Stormwater Drainage Assets – North Sydney Councils 10 Year Plan

Scenario	Capital Funding Level Required Per Annum	10 Year Plan $ Total
Scenario 1.	$2,613,180/year	**$26,131,802**
Scenario 2.	$2,613,180/year	**$26,131,802**
Scenario 3.	$2,613,180/year	**$26,131,802**

Note: *These Scenarios are based on the 10-year Long Term Financial Plan.*

Table 12B: Funding Scenarios Gross Pollutant Trap Assets – North Sydney Councils 10 Year Plan

Scenario	Capital Funding Level Required Per Annum	10 Year Plan $ Total
Scenario 1.	$367,303/year	**$3,673,025**
Scenario 2.	$367,303/year	**$3,673,025**
Scenario 3.	$367,303/year	**$3,673,025**

Note: *These Scenarios are based on the 10-year Long Term Financial Plan.*

Stormwater Drainage and GPT Assets – Service and Risk Tradeoffs

The decisions made in adopting this AM Plan are based on the objective to achieve the optimum benefits from the available resources.

Service trade-off

If this funding Scenario is adopted, then the Level of Service will be maintained.

Risk trade-off

If this funding Scenario is not adopted, then there is increased risk of failures. These include:

- Stormwater pipe collapse due to being in poor condition or due to structural collapse. The risk increases depending on the location of the collapsed pipe. Pipes can fail under roads due to excessive loading or condition resulting in a large void suddenly opening up within the roadway.
- Excessive overland flow and flooding due to either blocked pipes or pipes and pits that are under capacity.
- Gross Pollutant Traps Assets are not functioning and or has failed due to significant defects e.g., Major blockages from other sources, more that 75% of the GPT is not functioning collapsed in sections– major capacity and or blockage issues – will block and not function in any storm event.

Stormwater Drainage and GPT Assets – Renewal and Replacement Program – FY2023-FY2032 (10 Year Plan)

Council's projected 10 year Capital Renewal Program is shown in the Tables below. It is based on the funding required to replace Stormwater Drainage and GPT Assets in accordance with the ongoing condition survey being carried out by Council's contractors as well as the GPT Upgrade Report by consultants Optimal Stormwater 2018.

It should be noted that Stormwater Drainage and GPT Assets may also be replaced based on other criteria including:

- Streetscape and Public Domain Upgrades

- Kerb and gutter upgrades
- Building Developments (DA Conditions)
- Stormwater Drainage and GPT Assets replaced in association with other projects such as Park and or Streetscape upgrades and associated Projects.

Project priorities may also be subject to change due to accelerated deterioration, sudden failure or finalization of detailed designs and project costings.

Table 13: Stormwater Drainage Assets – Renewal and Replacement Program

Priority Projects 2022/23 (Year 1)

Year	Priority	Location	Risk Rating / Category	Condition	Capital Cost
2022/23	1c	Willoughby St and Elamang Ave	Very High (5)	Very Poor	$600,000
2022/23	1b	Amherst Street – stage 1	Very High (5)	Very Poor	$500,000
2022/23	1b	Carter St at Cairo	Very High (5)	Very Poor	$300,000
2022/23	1d	Alexander Lane	Very High (5)	Very Poor	$300,000
2022/23		Pipe Relining Program	Very High (5)	Very Poor	$575,075
2022/23		Critical Inlet Program	Very High (5)	Very Poor	$50,000
2022/23		Drainage Design	Very High (5)	Very Poor	$120,000
2022/23		Contingency			$29,925
				Total	**$2,475,000**

Note: *These Cost estimates do not include inflation / building escalations costs which can vary between 3-8% each year.*

Table 14: Stormwater Drainage Assets – Renewal and Replacement Program

Priority Projects 2023/24 (Year 2)

Year	Priority	Location	Risk Rating / Category	Condition	Capital Cost
2023/24	1b	Amherst Street – stage 2	Very High (5)	Very Poor	$500,000
2023/24	1c	Angelo Street	Very High (5)	Very Poor	$1,000,000
2023/24	1b	Young Street	Very High (5)	Very Poor	$300,000
2023/24	1b	Bennelong Road	Very High (5)	Very Poor	$300,000
2023/24	1b	Hazelbank – Stage 1	Very High (5)	Very Poor	$200,000
2023/24		Pipe Relining Program			$575,075
2023/24		Critical Inlet Program			$50,000
2023/24		Drainage Design			$120,000
2023/24		Contingency			$51,727
				Total	**$3,096,802**

Note: *These Cost estimates do not include inflation / building escalations costs which can vary between 3-8% each year.*

Table 15: Stormwater Drainage Assets – Renewal and Replacement Program

Priority Projects 2024/25 (Year 3)

Year	Priority	Location	Risk Rating / Category	Condition	Capital Cost
2024/25	1b	Hazelbank – Stage 2	Very High (5)	Very Poor	$300,000
2024/25	1c	Balfour Street	Very High (5)	Very Poor	$300,000
2024/25	1a	Kurraba at Wycombe	Very High (5)	Very Poor	$300,000
2024/25	1b	West Street	Very High (5)	Very Poor	$400,000
2024/25	1c	Dumbarton + GPT	Very High (5)	Very Poor	$300,000
2024/25		Pipe Relining Program			$575,075
2024/25		Critical Inlet Program			$50,000
2024/25		Drainage Design			$120,000
2024/25		Contingency			$224,925
				Total	**$3,048,074**

Note: *These Cost estimates do not include inflation / building escalations costs which can vary between 3-8% each year.*

Table 16: Stormwater Drainage Assets – Renewal and Replacement Program

Priority Projects 2025/32 (Year 4-10)

Year	Priority	Location	Risk Rating / Category	Condition	Capital Cost
2025/32	1b	Hazelbank – Stage 3	Very High (5)	Very Poor	$300,000
2025/32	1c	Kurraba Wharf Steps	Very High (5)	Very Poor	$500,000
2025/32	1a	Berry And Miller Street	Very High (5)	Very Poor	$1,000,000
2025/32	1a	Miller St And Pine St	Very High (5)	Very Poor	$500,000
2025/32	1a	# Brennan Park, Wollstonecraft	Very High (5)	Very Poor	$26,068
2025/32	1a	Bannerman St, Cremorne	Very High (5)	Very Poor	$38,256
2025/32	1a	Belgrave St, Cremorne	Very High (5)	Very Poor	$59,613
2025/32	1a	Carlow St, North Sydney	Very High (5)	Very Poor	$5,556
2025/32	1a	Carlyle St, Wollstonecraft	Very High (5)	Very Poor	$7,341
2025/32	1a	Chandos St, Crows Nest	Very High (5)	Very Poor	$147,417
2025/32	1a	Chandos St, St Leonards	Very High (5)	Very Poor	$206,880
2025/32	1a	Christie St, St Leonards	Very High (5)	Very Poor	$15,508
2025/32	1a	Clark Rd, Neutral Bay	Very High (5)	Very Poor	$20,636
2025/32	1a	Clark Rd, North Sydney	Very High (5)	Very Poor	$50,599
2025/32	1a	Colindia Ave, Neutral Bay	Very High (5)	Very Poor	$37,063
2025/32	1a	Cranbrook Ave, Cremorne	Very High (5)	Very Poor	$9,563
2025/32	1a	Cremorne Rd, Cremorne Point	Very High (5)	Very Poor	$20,378
2025/32	1a	Gerard St, Cremorne	Very High (5)	Very Poor	$112,369
2025/32	1a	Gerard St, Cremorne, Cremorne	Very High (5)	Very Poor	$87,014
2025/32	1a	Grasmere La, Cremorne	Very High (5)	Very Poor	$8,210
2025/32	1a	Grasmere Rd, Cremorne	Very High (5)	Very Poor	$5,180
2025/32	1a	Hume St, Wollstonecraft	Very High (5)	Very Poor	$12,149
2025/32	1a	Kurraba Rd, Neutral Bay	Very High (5)	Very Poor	$133,494
2025/32	1a	Lavender Cres, Lavender Bay	Very High (5)	Very Poor	$5,437

Year	Priority	Location	Risk Rating / Category	Condition	Capital Cost
2025/32	1a	Lithgow St, St Leonards	Very High (5)	Very Poor	$53,742
2025/32	1a	Macpherson St, Cremorne	Very High (5)	Very Poor	$6,274
2025/32	1a	Miller St, North Sydney	Very High (5)	Very Poor	$461,795
2025/32	1a	Milson Rd, Cremorne Point	Very High (5)	Very Poor	$37,865
2025/32	1a	Munro St, Mcmahons Point	Very High (5)	Very Poor	$97,199
2025/32	1a	Parraween St, Cremorne	Very High (5)	Very Poor	$18,418
2025/32	1a	Rangers Rd, Cremorne	Very High (5)	Very Poor	$134,095
2025/32	1a	River Rd, Wollstonecraft	Very High (5)	Very Poor	$21,213
2025/32	1a	River Rd, Wollstonecraft	Very High (5)	Very Poor	$88,527
2025/32	1a	Rocklands La, Wollstonecraft	Very High (5)	Very Poor	$107,216
2025/32	1a	Russell St, Wollstonecraft	Very High (5)	Very Poor	$60,460
2025/32	1a	Shellcove Rd, Neutral Bay	Very High (5)	Very Poor	$10,553
2025/32	1a	Wilona Ave, North Sydney	Very High (5)	Very Poor	$74,085
2025/32	1a	Wycombe Rd, Neutral Bay	Very High (5)	Very Poor	$21,116
2025/32	1b	Private Property, North Sydney	Very High (5)	Very Poor	$14,557
2025/32	1b	# Bradfield Park, Kirribilli	Very High (5)	Very Poor	$27,705
2025/32	1b	# Brightmore Reserve, Cremorne	Very High (5)	Very Poor	$346,276
2025/32	1b	# Brightmore Reserve, Neutral Bay	Very High (5)	Very Poor	$528,661
2025/32	1b	# Grasmere Reserve, Cremorne	Very High (5)	Very Poor	$344,182
2025/32	1b	# Primrose Park, Cremorne	Very High (5)	Very Poor	$97,263
2025/32	1b	# St Leonards Park, North Sydney	Very High (5)	Very Poor	$263,940
2025/32	1b	Albany St, Crows Nest	Very High (5)	Very Poor	$65,488
2025/32	1b	Albany St, St Leonards	Very High (5)	Very Poor	$113,270
2025/32	1b	Alexander St, Crows Nest	Very High (5)	Very Poor	$91,280
2025/32	1b	Alfred St North, Neutral Bay	Very High (5)	Very Poor	$163,449
2025/32	1b	Alfred St Nth, Neutral Bay	Very High (5)	Very Poor	$2,841
2025/32	1b	Alfred Street North, Neutral Bay	Very High (5)	Very Poor	$170,515
2025/32	1b	Amherst St, Cammeray	Very High (5)	Very Poor	$397,507
2025/32	1b	Amherst Street, Cammeray	Very High (5)	Very Poor	$180,041
2025/32	1b	Amherst Street, Cammeray	Very High (5)	Very Poor	$118,932
2025/32	1b	Anderson St, Neutral Bay	Very High (5)	Very Poor	$3,228
2025/32	1b	Arthur St, Lavender Bay	Very High (5)	Very Poor	$23,510
2025/32	1b	Atchison St, Crows Nest	Very High (5)	Very Poor	$47,784
2025/32	1b	Balls Head Rd, Waverton	Very High (5)	Very Poor	$12,514
2025/32	1b	Bay Rd, North Sydney	Very High (5)	Very Poor	$315,000
2025/32	1b	Bay Rd, Waverton	Very High (5)	Very Poor	$31,456
2025/32	1b	Belgrave St, Cremorne	Very High (5)	Very Poor	$134,725
2025/32	1b	Bellevue St, Cammeray	Very High (5)	Very Poor	$87,712
2025/32	1b	Belmont To Newlands Footway, Wollstonecraft	Very High (5)	Very Poor	$15,015
2025/32	1b	Ben Boyd Rd, Neutral Bay	Very High (5)	Very Poor	$14,641
2025/32	1b	Benelong Rd, Cremorne	Very High (5)	Very Poor	$93,923
2025/32	1b	Bent St, Neutral Bay	Very High (5)	Very Poor	$137,533
2025/32	1b	Blues Point Rd, Mcmahons Point	Very High (5)	Very Poor	$215,634

Year	Priority	Location	Risk Rating / Category	Condition	Capital Cost
2025/32	1b	Blues Point Rd, North Sydney	Very High (5)	Very Poor	$52,882
2025/32	1b	Bridge End, Wollstonecraft	Very High (5)	Very Poor	$28,634
2025/32	1b	Brothers Avenue, Cammeray	Very High (5)	Very Poor	$120,672
2025/32	1b	Broughton St, Kirribilli	Very High (5)	Very Poor	$12,753
2025/32	1b	Broughton St, Kirribilli	Very High (5)	Very Poor	$36,531
2025/32	1b	Cairo St, Cammeray	Very High (5)	Very Poor	$3,862
2025/32	1b	Carr St, Waverton	Very High (5)	Very Poor	$143,974
2025/32	1b	Carter St, Cammeray, Cammeray	Very High (5)	Very Poor	$7,866
2025/32	1b	Clark Road, Kirribilli	Very High (5)	Very Poor	$19,331
2025/32	1b	Cremorne Rd, Cremorne Point	Very High (5)	Very Poor	$32,490
2025/32	1b	Cremorne Reserve, Cremorne Point	Very High (5)	Very Poor	$82,277
2025/32	1b	Cremorne To Reserve Footway, Cremorne Point	Very High (5)	Very Poor	$20,622
2025/32	1b	Crows Nest Rd, Waverton	Very High (5)	Very Poor	$74,708
2025/32	1b	Crows Nest Rd, Wollstonecraft	Very High (5)	Very Poor	$35,781
2025/32	1b	Doris St, North Sydney	Very High (5)	Very Poor	$5,835
2025/32	1b	Earle St, Cremorne	Very High (5)	Very Poor	$26,347
2025/32	1b	Ernest La, Crows Nest	Very High (5)	Very Poor	$6,703
2025/32	1b	Ernest St, Crows Nest	Very High (5)	Very Poor	$22,066
2025/32	1b	Gerard Lane, Cremorne	Very High (5)	Very Poor	$4,572
2025/32	1b	Gerard St, Cremorne	Very High (5)	Very Poor	$29,055
2025/32	1b	Grafton St, Cremorne	Very High (5)	Very Poor	$26,520
2025/32	1b	Grasmere La, Cremorne	Very High (5)	Very Poor	$7,553
2025/32	1b	Grasmere Rd, Cremorne	Very High (5)	Very Poor	$7,014
2025/32	1b	Grosvenor St, Neutral Bay	Very High (5)	Very Poor	$68,675
2025/32	1b	Harriott La, Waverton	Very High (5)	Very Poor	$8,824
2025/32	1b	Harriott St, Waverton	Very High (5)	Very Poor	$38,127
2025/32	1b	Hayes St, Neutral Bay	Very High (5)	Very Poor	$221,582
2025/32	1b	Henry Lawson Ave, Mcmahons Point	Very High (5)	Very Poor	$11,390
2025/32	1b	Hodgson Ave, Cremorne Point	Very High (5)	Very Poor	$44,574
2025/32	1b	Holdsworth St, Neutral Bay	Very High (5)	Very Poor	$54,374
2025/32	1b	Ivy St, Wollstonecraft	Very High (5)	Very Poor	$25,927
2025/32	1b	Lavender St, Lavender Bay	Very High (5)	Very Poor	$60,408
2025/32	1b	Lavender St, North Sydney	Very High (5)	Very Poor	$4,033
2025/32	1b	Lindsay St, Neutral Bay	Very High (5)	Very Poor	$29,525
2025/32	1b	Lower Bent St, Neutral Bay	Very High (5)	Very Poor	$264,699
2025/32	1b	Macpherson St, Cremorne	Very High (5)	Very Poor	$18,895
2025/32	1b	Mclaren St, North Sydney	Very High (5)	Very Poor	$39,425
2025/32	1b	Miller St, Cammeray	Very High (5)	Very Poor	$140,560
2025/32	1b	Miller St, North Sydney, North Sydney	Very High (5)	Very Poor	$57,501
2025/32	1b	Milson Rd, Cremorne Point	Very High (5)	Very Poor	$253,466
2025/32	1b	Morton St, Wollstonecraft	Very High (5)	Very Poor	$249,461
2025/32	1b	Mount St, North Sydney	Very High (5)	Very Poor	$18,901
2025/32	1b	Murdoch St, Cremorne	Very High (5)	Very Poor	$21,350

Year	Priority	Location	Risk Rating / Category	Condition	Capital Cost
2025/32	1b	Newlands St, Wollstonecraft	Very High (5)	Very Poor	$10,819
2025/32	1b	Nook Ave, Neutral Bay	Very High (5)	Very Poor	$15,925
2025/32	1b	Olympic Dr, Kirribilli	Very High (5)	Very Poor	$3,508
2025/32	1b	Olympic Dr, Milsons Point	Very High (5)	Very Poor	$56,372
2025/32	1b	Parraween St, Cremorne	Very High (5)	Very Poor	$37,545
2025/32	1b	Powell St, Cremorne	Very High (5)	Very Poor	$7,378
2025/32	1b	Raleigh St, Cammeray	Very High (5)	Very Poor	$9,571
2025/32	1b	Rocklands Rd, Wollstonecraft	Very High (5)	Very Poor	$57,110
2025/32	1b	Russell St, Wollstonecraft	Very High (5)	Very Poor	$17,589
2025/32	1b	Shirley Rd, Wollstonecraft	Very High (5)	Very Poor	$42,193
2025/32	1b	Spencer Rd, Cremorne	Very High (5)	Very Poor	$43,740
2025/32	1b	Spring St, North Sydney	Very High (5)	Very Poor	$15,957
2025/32	1b	Union St, Mcmahons Point	Very High (5)	Very Poor	$599,165
2025/32	1b	Waiwera St, Lavender Bay	Very High (5)	Very Poor	$10,259
2025/32	1b	Walker St, North Sydney, North Sydney	Very High (5)	Very Poor	$73,261
2025/32		Pipe Relining Program			$4,025,525
2025/32		Critical Inlet Program			$350,000
2025/32		Drainage Design			$840,000
2025/32		Contingency			$774,467
				Total	**$17,990,000**

Note: *These Cost estimates do not include inflation / building escalations costs which can vary between 3-8% each year.*

Table 17: Gross Pollutant Trap Assets – Renewal and Replacement Program

Priority Projects 2022/23 (Year 1)

Replace Year	Priority	Location	Risk Rating / Category	Condition	Capital Cost
2022/23	1c	Willoughby Street	Very High (5)	Very Poor	$573,025
2022/23	1a	Blues Point Road	Very High (5)	Very Poor	$300,000
				Total	**$873,025**

Note: *These Cost estimates do not include inflation / building escalations costs which can vary between 3-8% each year.*

Table 18: Gross Pollutant Trap Assets – Renewal and Replacement Program

Priority Projects 2023/24 (Year 2)

Replace Year	Priority	Location	Risk Rating / Category	Condition	Capital Cost
2023/24	1c	Honda Road	Very High (5)	Very Poor	$800,000
				Total	**$800,000**

Note: *These Cost estimates do not include inflation / building escalations costs which can vary between 3-8% each year.*

Table 19: Gross Pollutant Trap Assets – Renewal and Replacement Program

Priority Projects 2024/25 (Year 3)

Replace Year	Priority	Location	Risk Rating / Category	Condition	Capital Cost
2024/25	1c	Waverton Park - West	Very High (5)	Very Poor	$250,000
				Total	**$250,000**

Note: *These Cost estimates do not include inflation / building escalations costs which can vary between 3-8% each year.*

Table 20: Gross Pollutant Trap Assets – Renewal and Replacement Program

Priority Projects 2025/32 (Year 4-10)

Replace Year	Priority	Location	Risk Rating / Category	Condition	Capital Cost
2025/32	1c	Ryries Parade	Very High (5)	Very Poor	$400,000
2025/32	2b	Balls Head Road	High (4)	Poor	$300,000
2025/32	2b	Walker Street	High (4)	Poor	$750,000
2025/32	2c	Dumbarton Street/Munro Street	High (4)	Poor	$300,000
				Total	**$1,750,000**

Note: *These Cost estimates do not include inflation / building escalations costs which can vary between 3-8% each year.*

Table 21: Gross Pollutant Trap Assets – Renewal and Replacement Program

Works Identified 2025/32 (Year 4-10)

Replace Year	Priority	Location	Risk Rating / Category	Condition	Capital Cost
2025/32	2c	Peel Street	High (4)	Poor	$400,000
2025/32	2c	Holbrook Ave	High (4)	Poor	$504,191
				Total	**$904,191**

Note: *These Cost estimates do not include inflation / building escalations costs which can vary between 3-8% each year.*

Stormwater Drainage Assets – Renewal Program

Pit and Pipe replacement at Bob Gordon Reserve, Lavender Bay.

Pit and Pipe replacement at Carabella Street. Kirribilli.

Pit and Pipe replacement at Echo Street, Cammeray, (LEFT), and at Carter Street, Cammeray (RIGHT)

Pit and Pipe replacement at Abbott Street, Cammeray (LEFT), and at Montpellier Street, Neutral Bay (RIGHT).

Pit and Pipe replacement at Milson Road, Cremorne Point.

Pit and Pipe replacement at Carlyle Lane, Wollstonecraft.

Gross Pollutant Traps Assets – Renewal Program

Replacement of GPT at Little Young St, Cremorne.

Replacement of GPT at Little Young St, Cremorne.

Replacement of GPT at Little Young St, Cremorne.

Replacement of GPT Lids at Elamang Avenue, Neutral Bay.

Replacement of GPT Lids at Elamang Avenue, Neutral Bay.

Stormwater Drainage and GPT Assets – Performance Measures

The effectiveness of the asset management plan can be measured in the following ways:

- The degree to which the required projected expenditures identified in this asset management plan are incorporated into the long term financial plan,
- The degree to which 1-5 year detailed works programs, budgets, business plans and corporate structures take into account the 'global' works program trends provided by the asset management plan,
- The degree to which the existing and projected service levels and service consequences (what we cannot do), risks and residual risks are incorporated into the Strategic Plan and associated plans,
- The Asset Renewal Funding Ratio achieving the target of 1.0.

Stormwater Drainage and GPT Assets – References

- GPT Audit Report by Optimal Stormwater
- IPWEA, 2015 Practice Note 5 Stormwater Drainage, Institute of Public Works Engineering Australasia, Sydney
- IPWEA, 2006, 'International Infrastructure Management Manual', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/IIMM
- IPWEA, 2008, 'NAMS.PLUS Asset Management', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/namsplus.
- IPWEA, 2015, 2nd edn., 'Australian Infrastructure Financial Management Manual', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/AIFMM.
- IPWEA, 2015, 3rd edn., 'International Infrastructure Management Manual', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/IIMM
- IPWEA, 2012 LTFP Practice Note 6 PN Long Term Financial Plan, Institute of Public Works Engineering Australasia, Sydney

APPENDICES

Appendix A: Maintenance Management System Drainage Pits and Kerb & Guttering

Inspection areas have been defined in accordance with the identified key factors of:

- Volume of pedestrian traffic, eg. transport hubs; retail/commercial areas; schools and hospitals.
- Use by people over 50 years old.

Inspection frequencies are based on these areas as defined by the reference maps and the resources currently available to undertake the inspections.

Red – 2 times per year; **Blue** – Annual; **Other** – Once every 2 years;

The results of inspections will be downloaded into the MMDS database. There are 5 categories in which a defect may be placed. Not all categories may be applicable to every inspection area and/or type of asset:

Cat 5		Will be **made safe** no later than 2 working days after allocation of defect to work crew. Defect may then be re-categorised as Cat 4 or Cat 3.
Cat 4		Will be repaired no later than 10 working days after allocation of defect to work crew.
Cat 3		Will be placed on Zone Maintenance Program. This program operates on an 8 week cycle, however, depending on workload and reactive maintenance requests, Cat 3 defects may miss a cycle or more before repairs are able to be undertaken.
Cat 2		Deferred maintenance. Could also have aesthetic issues such as gum, stains, services mark-up, etc. May be addressed if close-by to Cat 4 or Cat 3 defect that is being repaired. Otherwise will be re-inspected on next area inspection.
Cat 1		As new. Surface displaying no defects.

Intervention Matrix

KERB + GUTTER	RED	BLUE	OTHER
MISSING/DAMAGED/LOOSE	28	24	21
> 50mm/GRATE NOT BICYCLE SAFE	23	19	16
25mm – 50mm/GRATE BLOCKED	20	16	13
10mm – 25mm	18	14	11
AESTHETIC	12	8	5
AS NEW	10	6	3

Scoring example: 28 = High Use Area score 10 and Defect of Missing or Loose score 18

The focus of inspections will be the kerb section and unobstructed gutter sections. It is noted that the gutter section may be obstructed and not visible due to parked vehicles during inspection. Inspectors are not expected to get down on their hands and knees to look for defects. The kerb and guttering includes all drainage kerb inlets, convertor outlets, gutter grates or access pit lids in gutter. Driveway crossings shall be listed as **private** when selecting the owner of the asset.

NORTH SYDNEY COUNCIL - GUIDE FOR KERB + GUTTER DEFECT RATING

AN EXPLANATION OF THE DEFECT INSPECTION SYSTEM

AREA OF INSPECTION		SCORE
RED	HIGH PEDESTRIAN TRAFFIC AREAS WITH SIGNIFICANT USAGE BY PEDESTRIANS OVER 50 YEARS OLD INSPECTIONS - 2 PER YEAR	10
BLUE	HIGH PEDESTRIAN TRAFFIC AREAS WITH MODERATE USAGE BY PEDESTRIANS OVER 50 YEARS OLD or MEDIUM PEDESTRIAN TRAFFIC AREAS WITH SIGNIFICANT USAGE BY PEDESTRIANS OVER 50 YEARS OLD INSPECTIONS - ANNUAL	6
WHITE	ALL OTHER AREAS IN LGA EXCLUDING PARKS; RESERVES and PLAZAS INSPECTION - EVERY 2 YEARS **NOTE:** IN THESE AREAS ONLY DEFECTS GREATER THAN ABOUT 10mm WILL HAVE DETAILS RECORDED.	3

KERB + GUTTER TYPE	
CONCRETE	SANDSTONE
GRANITE	OTHER
DRIVEWAY CROSSING - STANDARD or GUTTER BRIDGE	LETTERBOX or OTHER PIT TYPE
KERB INLET or CONVERTOR OUTLET	GUTTER GRATE or PIT LID IN GUTTER

DEFECT – MAY BE **HEIGHT or WIDTH**	
SECTION MISSING, BADLY DAMAGED or LOOSE UNDER FOOT	18
GREATER THAN ABOUT 50mm – MAY BE HEIGHT or WIDTH	13
GUTTER GRATE NOT BICYCLE SAFE/DAMAGED	13
BETWEEN ABOUT 25mm AND ABOUT 50mm – MAY BE HEIGHT or WIDTH	10
GUTTER GRATE BLOCKED - LEAF LITTER, DEBRIS or OTHER ITEM eg. POLLUTION CONTROLS	10
BETWEEN ABOUT 10mm AND ABOUT 25mm – MAY BE HEIGHT or WIDTH	8
AESTHETIC ISSUES - GUM; STAINS, SERVICES MARK-UP; etc	2
NO DEFECT - IF THIS IS SELECTED A PHOTO MUST BE TAKEN OF THE INSPECTED ITEM or PSID	0

HAZARD TYPE	
TRIP - LIFTING/DROPPING OF SECTION TO ADJACENT SECTION	UNEVEN SURFACE - CHIPPED or ERODED SURFACE
CRACKING - DEFECT NOT AT CONSTRUCTION JOINT	MISSING - SECTION OF KERB MISSING EG. OVER DRAIN PIPE
BROKEN/OUT OF ALIGNMENT- LOOSE UNDER FOOT	SERVICE ACCESS COVER - LOOSE/LIFTED/DROPPED

OTHER ASPECTS	
AREA HAS OBSTRUCTIONS DUE TO TREE ROOTS or OTHER VEGETATION	PRESENCE OF PARTICULAR ASPECT/S NOTED PRIOR TO DEPARTURE FROM PSID. REFERRED TO RELEVANT NSC SECTION VIA EMAIL
AREA HAS EDGE SCOUR (DROP OFF ALONG EDGE OF VERGE/TREE SITE) > 50MM	
AREA HAS PLANTING, GRASS and/or WEED GROWTH OVERGROWING KERB	