NORTH SYDNEY COUNCIL

ASSET MANAGEMENT PLAN

KERB & GUTTER 2022-2032

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Kerb and Gutter

Executive Summary

North Sydney Council has approximately 258km of kerb and gutter assets located across the LGA. In 2018 Rapid Map Services consultants conducted a Kerb and Gutter condition audit for North Sydney Council. The objectives were to conduct a detailed inventory data collection, accurately map each Kerb and Gutter and assess each Kerb and Gutter in detail for condition and defects. Kerbs were split based on change of kerb type or material. The kerbs were further broken down into kerb segments based on change in condition and a condition score was assigned to each kerb segment.

Each Kerb and Gutter was attributed with a type, kerb material and gutter material.

Type:

- 248,411m of kerbs were barrier kerbs. This accounted for 96.3% by length of all kerbs surveyed. Other kerb types include dish crossing, mountable kerb and semi-mountable kerb.

Materials:

- 219,653m of all kerbs were made of concrete. This accounted for 85.2% by length of all kerbs surveyed.
- 26,871m of all kerbs were made of sandstone. This accounted for 10.4% by length of all kerbs surveyed.
- 5,198m of all kerbs were made of sandstone. This accounted for 2.0% by length of all kerbs surveyed.
- Other materials asphalt, brick, and timber

Each kerb and gutter were split into segments where the type, material and condition changed. A condition score was assigned to each segment.

Overall, some 62.7% by replacement cost of the portfolio is in very good to good condition (1-2). 32.7% is in fair condition (3) and 4.6% is in poor to very poor condition (4-5).

A Risk rating was assigned to each kerb segment. Overall, 95.4% of the portfolio has a low to medium risk rating and 4.6% has a high to very high risk rating.

The total Replacement Value of the portfolio is $74,881,908 as at 30 June 2021. The values are shown in the Table below.

Table 1: Kerb and Gutter – Summary Table

Asset Category	Length (m) (2021)	Replacement Value (2021)	Accumulated Depreciation (2021)	Fair Value (2021)	Depreciation Expense
Kerb and Gutter	**257,850**	**$74,881,908**	**$27,289,668**	**$47,592,240**	**$1,123,646**

The following table provides a summary of the quantities and replacement values for each kerb and gutter type. The portfolio is dominated by concrete barrier kerbs with a concrete gutter.

Table 2: Kerb and Gutter - Typology

Kerb and Gutter Type	Kerb Material	Gutter Material	Length (m)	Replacement Cost
Barrier	Asphalt (Formed)	Asphalt (Formed)	46	$5,097
	Asphalt (Formed)	Concrete	13	$1,441
	Asphalt (Formed)	No Gutter	174	$19,326
	Brick	No Gutter	21	$3,561
	Concrete	Asphalt (Formed)	1,540	$354,028
	Concrete	Concrete	205,879	$47,339,846
	Concrete	No Gutter	8,981	$1,546,000
	Granite	Concrete	5,128	$5,035,717
	Sandstone	Concrete	11,227	$7,662,900
	Sandstone	No Gutter	9,108	$5,946,804
	Sandstone	Sandstone	6,273	$4,281,586
	Timber	No Gutter	21	$3,670
		Barrier Total	**248,411**	**$72,199,977**
Dish Crossing	No Kerb	Concrete	5,648	$1,541,287
		Dish Crossing Total	**5,648**	**$1,541,287**
Mountable kerb	Asphalt (Formed)	No Gutter	205	$22,733
	Concrete	Concrete	2,453	$515,096
	Concrete	No Gutter	324	$55,846
	Granite	Concrete	70	$102,593
		Mountable kerb Total	**3,052**	**$696,268**
Semi-mountable kerb	Concrete	Concrete	286	$59,961
	Concrete	No Gutter	190	$32,713
	Sandstone	Concrete	263	$351,702
		Semi-mountable kerb Total	**739**	**$444,375**
		Grand Total	**257,850**	**$74,881,908**

Kerb and Gutter – Future Demand

Drivers affecting demand for Kerb and Gutter include things such as population growth, regulation changes – new development, community expectations (Public Safety), technological changes, economic factors and environmental factors.

Kerb and Gutter – 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 3: Kerb and Gutter – Levels of Customer Service

Service Attribute	Expectation	Performance Measure Used	Current Performance	Desired Position in 10 Years.
Quality	Kerb and Gutter assets are well maintained.	Percentage of kerb and gutter in 'very good', 'good' or 'Fair' (1, 2, 3) condition and Percentage 'poor' or 'very poor' (4, 5) Condition.	95.4% (by length) of Kerb and Gutter in 'very good', 'good' or 'Fair' (1, 2, 3) condition. 4.6% (by length) of Kerb and Gutter assets in poor/very poor (4, 5) Condition.	Maintain – Condition 1-2-3 Improve and replace Condition 4-5
Function	Upgrade Kerb and Gutter assets in accordance with Public Domain Style Manual.	km of Kerb and Gutter assets constructed from granite.	5.2km (by length) of Kerb and Gutter assets constructed from granite.	Improve
Capacity and Use	Number of Kerb and Gutter assets required is appropriate.	Number of additional Kerb and Gutter assets required	New granite Kerb and Gutter assets are constructed on State Roads as part of Streetscape projects	New granite Kerb and Gutter assets on State Roads to be constructed as part of future Streetscape projects

Kerb and Gutter – 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., cleansing, 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., Kerb and Gutter repair – patching, minor works),
- Renewal – the activities that return the service capability of an asset up to that which it had originally (e.g. Kerb and Gutter replacement and or Kerb and Gutter component replacement),
- Upgrade/New – the activities to provide a higher level of service (e.g. additional Kerb and Gutter).

Table 4 shows the technical levels of service expected to be provided for Kerb and Gutter assets. The 'Desired' position in the table documents the position being recommended in this AM Plan.

Table 4: Kerb and Gutter – Technical Levels of Service

Service Attribute	Service Activity Objective	Activity Measure Process	Current Performance	Desired for Optimum Lifecycle Cost
Operations	Undertake network inspections to monitor condition	Network inspections to monitor condition	Network inspected in 2018	Network inspected every 5 years
Maintenance	Reactive service Requests completed in a timely manner or made safe.	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 assets to a satisfactory condition	Percentage of kerb and gutter in 'very good', 'good' or 'Fair' (1, 2, 3) condition and Percentage 'poor' or 'very poor' (4, 5) Condition.	95.4% of Kerb and Gutter assets in 'very good', 'good' or 'Fair' (1, 2, 3) condition. 4.6% of Kerb and Gutter assets in poor/very poor (4, 5) Condition.	Improve or replace
Upgrade	Upgrade Kerb and Gutter assets in accordance with Public Domain Style Manual.	km of Kerb and Gutter assets constructed from granite.	5.2km (by length) of of Kerb and Gutter assets constructed from granite in CBD.	Improve
New	Satisfactory provision of Kerb and Gutter assets.	Number of additional Kerb and Gutter assets required.	New granite Kerb and Gutter assets are constructed on State Roads as part of Streetscape projects	New granite Kerb and Gutter assets on State Roads to be constructed as part of future Streetscape projects

Kerb and Gutter – Condition

The condition of Council's kerb and gutter network was surveyed in 2018 by Consultants, Rapid Map Services Pty Ltd in conjunction with Asset & Facilities Management Consulting Pty Ltd. The following condition criteria was used.

Table 5: Kerb and Gutter Condition Survey Criteria

Grade	Condition	Description	
1	Very Good	As new, no need for intervention. Low risk to public safety. **No work required**	
		Cracking	No cracks or only occasional fine surface cracks.
		Misalignment	

Grade	Condition	Description	
		due to uplift/ settlement/ rotation	Nil
		Chipping/ Spalling	Nil
		Ponding	Nil
2	Good	Some signs of wear and tear. No immediate intervention required. Note for review at next inspection. Low to Medium risk to public safety. **Only minor work required**	
		Cracking	Isolated fine cracking at intervals.
		Misalignment due to uplift/ settlement/ rotation	Isolated misalignment up to 5mm.
		Chipping/ Spalling	Minor cosmetic chipping only. No impact on performance.
		Ponding	Minor ponding in channel only.
3	Fair	Some isolated defects. Generally able to be addressed through routine/ scheduled maintenance. Medium to High risk to public safety and amenity. **Some work required**	
		Cracking	Block cracking typically 3 to 5mm width. Up to 20% of length.
		Misalignment due to uplift/ settlement/ rotation	Misalignments of 5 to 15mm with up to 30% of length affected.
		Chipping/ Spalling	Isolated chipping, max 30mm diameter. Average 5m apart.
		Ponding	More significant ponding up to 10mm deep but confined to channel. Now more than 30% affected.
4	Poor	Extensive wear and tear. Requiring replacement of sections. High to Very High risk to public safety and amenity. **Some replacement or rehabilitation needed within 1 year**	
		Cracking	Block cracking over 5mm width but still intact. Generally, over 20% to 50% of section affected.
		Misalignment due to uplift/ settlement/ rotation	Misalignments 15 to 50mm width over 50% of length affected. Water infiltration to pavement.
		Chipping/ Spalling	Chipping and spalling with some water infiltration evident. No more than 50% of section affected.
		Ponding	Ponding up to 30mm deeps encroaching onto pavement and isolated pavement damage. No more than 30% of section affected.
5	Very Poor	Significant defects in terms of severity and extent. Requires full length replacement. High to Very High risk to public safety and, pavement and amenity. **Urgent replacement/ rehabilitation required**	
		Cracking	Block cracking, displacement and sections missing. Water infiltrating pavement. Generally, over more than 50% of the section affected.
		Misalignment	Misalignments over 50mm and over 50% of the section

Grade	Condition	Description	
		due to uplift/ settlement/ rotation	affected. Water infiltration to pavement.
		Chipping/ Spalling	Major spalling of sections. Water infiltration common. Over 50% of the length affected.
		Ponding	Ponding over 30mm deep significantly encroaching onto pavement. Infiltration evident over 30% of length. Significant impact on adjoining pavement.

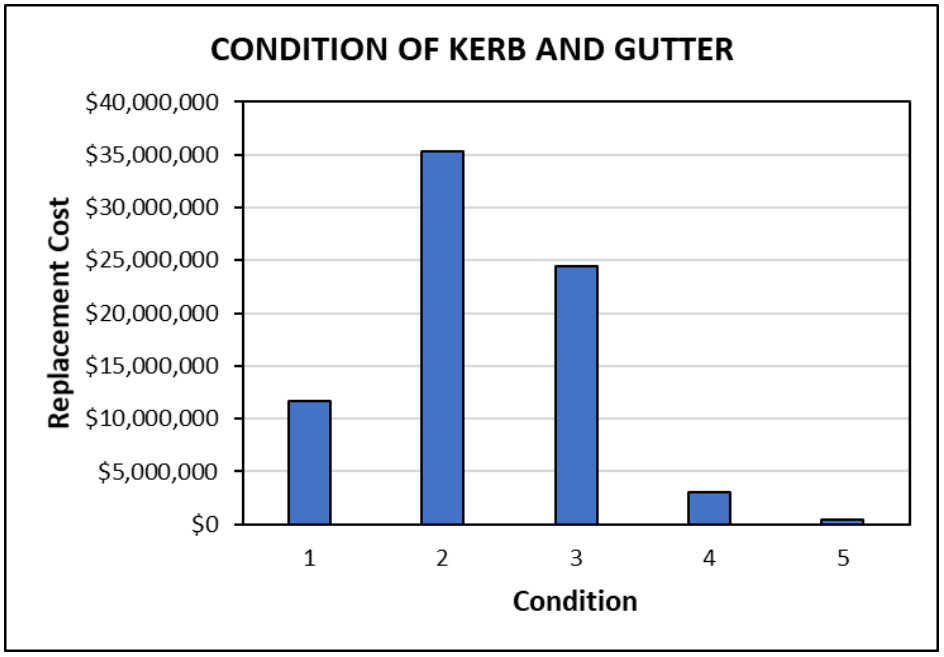
As per IPWEA Condition Assessment & Asset Performance Guidelines Practice Note 2 v2 2014 Kerb and Channel

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

Table 6: Kerb and Gutter Condition Survey Results - Overall

CONDITION OF KERB AND GUTTER – ENTIRE NETWORK			
Condition	**Length (m)**	**Replacement Cost**	**% Condition (based on cost)**
1 (Very Good)	31,057	$11,650,951	15.6%
2 (Good)	122,055	$35,301,986	47.1%
3 (Fair)	90,528	$24,457,441	32.7%
4 (poor)	12,515	$2,991,530	4.0%
5 (Very Poor)	1,695	$480,000	0.6%
Total	**257,850**	**$74,881,908**	**100.0%**

The Graph below shows the condition of Kerb and Gutter assets over the entire network in terms of replacement cost.



Kerb and Gutter – Review of Useful Lives

The Table below shows the ranges of Useful Lives from the IPWEA 2017 Practice Note – "Useful Life of Infrastructure" from detailed studies in South Australia, Tasmania, as well as an IPWEA Workshop.

Kerb and Gutter – Review of Useful Lives							
Description	**South Aust. Tonkin Rpt**			**IPWEA Workshop**		**Tasmania Audit Office**	
	Min	Max	Avg	Min	Max	Min	Max
Upright Concrete Kerbs	55	100	74	55	100	50	80
Median Concrete Kerbs	40	100	70				
Valley Drain Concrete Kerbs	55	100	72				

The useful lives of all types of kerb and gutter assets were reviewed by Australis Pty Ltd and are shown in the following Table.

Kerb and Gutter Type	Kerb Material	Gutter Material	Useful Life (Years)
Barrier	Asphalt (Formed)	Asphalt (Formed)	20
	Asphalt (Formed)	Concrete	20
	Asphalt (Formed)	No Gutter	20
	Brick	No Gutter	60
	Concrete	Asphalt (Formed)	60
	Concrete	Concrete	60
	Concrete	No Gutter	60
	Granite	Concrete	80
	Sandstone	Concrete	80
	Sandstone	No Gutter	80
	Sandstone	Sandstone	80
	Timber	No Gutter	20
Dish Crossing	No Kerb	Concrete	60
Mountable kerb	Asphalt (Formed)	No Gutter	20
	Concrete	Concrete	60
	Concrete	No Gutter	60
	Granite	Concrete	80
Semi-mountable kerb	Concrete	Concrete	60
	Concrete	No Gutter	60
	Sandstone	Concrete	80

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

Capital funding to maintain a renewal ratio of 1	
	Annual Depreciation
Kerb and Gutter	**$1,123,646**

A budget of $1,123,646 is required on average over the long term to maintain the condition of Council's kerb and gutter network, noting that fluctuations in renewal requirements in the medium term.

Kerb and Gutter – 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 $1,123,646. Therefore, an annual average capital renewal funding of $1,123,646 (2021 dollars) will achieve an Asset Renewal Funding Ratio of 1.

The cost to fully replace assets identified by Consultants, Rapid Map Services Pty Ltd 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 $18,151,447. This is an average annual cost of $1,815,145 which is greater than the $1,123,646 Depreciation Expense and is greater than the average annual forecast budget of $1,580,000. With further investigation and detailed design it is hoped that alternate and lesser cost solutions may be possible to maintain kerb and gutter assets at an optimal level.

Kerb and Gutter – Capital works

Replacement of kerb and gutter sections 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 kerb and gutter section requiring capital works as described in the following table.

Kerb and Gutter – Managing the Risks

There are risks associated with providing and maintaining Kerb and Gutter assets are primarily as follows:

- Kerb and gutter in poor condition – causing possible trip hazard – public safety hazards, injury.
- Cracked Kerb and Gutter – causing water to enter the road pavement potentially causing premature road pavement failure

The following risk response table was used to identify those Kerb and Gutter assets requiring action within the next 10 years.

Table 7: Kerb and Gutter – Risk Response Table

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

Consideration has been given to each Kerb and Gutter asset whether to replace the Kerb and Gutter or perform maintenance on it.

Segments that have a **Very High or High** risk rating were considered to need replacement within the 1-4 year forecast period.

Segments with a **Medium** risk rating were also considered needing replacement within the 4-10 year forecast period.

Examples of failed and failing Kerb and Gutter in the North Sydney LGA

Examples of failed Kerb and Gutter in the North Sydney LGA

Examples of failed Kerb and Gutter in the North Sydney LGA

Examples of failed Kerb and Gutter in the North Sydney LGA

Council will endeavour to manage these risks within available funding by prioritising Kerb and Gutter renewal works based on the Kerb and Gutter Condition Audit prepared by Consultants, Rapid Map Services Pty Ltd.

Table 8: Kerb and Gutter – Capital renewal Priorities based on Condition and Risk Rating

Risk Matrix - Kerb and Gutter (Condition and Risk Rating)					
Likelihood of Kerb and Gutter failing (L) Refer to Table 5. Condition Criteria	Kerb and Gutter – Length (m)				
	Road Hierarchy	Lane	Local Road	Collector	State/ Regional Road
	Park Hierarchy	Local	District	Regional	
	Footpath Hierarchy	Category 3	Category 2	Category 1	
	Priority	d	c	b	a
Condition 1 – Very Good (15.6%)	5	10,300	15,380	6,472	3,617
Condition 2 - Good (47.1%)	4	31,065	53,445	27,122	8,233
Condition 3 – Fair (32.7%)	3	20,333	40,200	23,017	4,699
Condition 4 – Poor (4.6%)	2	2,496	5,663	3,259	858
Condition 5 – Very Poor (0.6%)	1	554	624	425	86

(Note: Also Refer to Table 6)

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

Note: Capital works are proposed for those Kerb and Gutter sections identified in *"Very Poor"*, "Poor" and *"Fair"* condition.

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

It should be noted that Kerb and Gutter sections may also be replaced based on other criteria including:

- Damage
- Restorations
- Kerb and Gutter replaced in association with other projects such as road or drainage works
- Streetscape projects

Kerb and Gutter – 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. repairs, patching.

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 be steady as the asset stock is not forecast to increase. The following table summarises the prioritised capital works.

Kerb and Gutter – Prioritised Expenditure Forecast

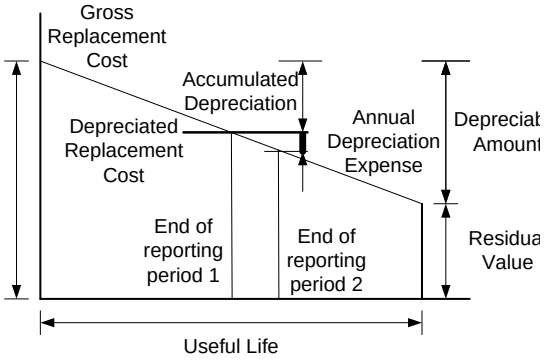
Table 9: Kerb and Gutter – Prioritised Expenditure Forecast – 10 years FY2023-FY2032

Year		Priority	Capital Costs	Maintenance Costs	Total Costs
1	2022/23	1a to 1b	$1,400,000	$10,000	$1,410,000
2	2023/24	1b	$1,600,000	$10,000	$1,610,000
3	2024/25	1c	$1,600,000	$10,000	$1,610,000
4-10	2025/32	1c to 2b	$11,200,000	$70,000	$11,270,000
Works Identified	2025/32	2b	$2,151,447		$2,151,447
		Grand Total	**$17,951,447**	**$100,000**	**$18,051,447**

In summary the current value of Kerb and Gutter assets is detailed in the Table below.

Table 10: Kerb and Gutter – Valuation

Asset Category	Length (m) (2021)	Replacement Value (2021)	Accumulated Depreciation (2021)	Fair Value (2021)	Depreciation Expense
Kerb and Gutter	**257,850**	**$74,881,908**	**$27,289,668**	**$47,592,240**	**$1,123,646**



Kerb and Gutter – Valuation Forecast

Asset values (Kerb and Gutter) are forecast to increase slowly. It is forecast that some 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. New Kerb and Gutter assets include the construction of granite Kerb and Gutter on State Roads (Kerb and Gutter is normally owned by the State Government). Upgrade of existing concrete Kerb and Gutter to granite in the CBD will also increase values.

Kerb and Gutter – Key Assumptions – Financial Forecasts

Key assumptions made in this asset management plan for Kerb and Gutter are:

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

Key Assumptions	Risks of Change to Assumptions
Useful Lives of Kerb and Gutter	Low risk
Rate of deterioration	Low risk

Kerb and Gutter – Creation / Acquisition / Upgrade Program

New works are those that create a new asset that did not previously exist, or works which will upgrade or improve an existing asset beyond its existing capacity. They may result from growth, social or environmental needs. Assets may also be acquired at no cost. No new assets are currently identified.

Kerb and Gutter – Disposal Plan

No Kerb and Gutter Assets have been identified for disposal.

Kerb and Gutter – 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 detailed condition report on Kerb and Gutter.

Kerb and Gutter – Improvement Plan

The improvement plan is shown in the table below.

Task No	Task	Responsibility	Resources Required	Timeline
1	Research the Useful Life of Kerb and Gutter	EPS	Staff Time	2024

Kerb and Gutter – 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.

Kerb and Gutter – 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.

Kerb and Gutter assets requiring renewal/replacement have been identified by the Kerb and Gutter Condition Audit completed by Consultants, Rapid Map Services Pty Ltd in conjunction with Asset & Facilities Management Consulting Pty Ltd, in 2018.

Kerb and Gutter – 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 12: Funding Scenarios – Kerb and Gutter – North Sydney Councils 10 Year Plan

Scenario	Capital Funding Level required per annum	10 Year Plan $ Total
Scenario 1.	$1,580,000/year	**$15,800,000**
Scenario 2.	$1,580,000/year	**$15,800,000**
Scenario 3.	$1,580,000/year	**$15,800,000**

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

Kerb and Gutter – 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 adopted, then there is less risk of Kerb and Gutter failures.

Kerb and Gutter – 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 Kerb and Gutter assets identified by the Kerb and Gutter Condition Audit completed by Consultants, Rapid Map Services Pty Ltd in conjunction with Asset & Facilities Management Consulting Pty Ltd, in 2018.

It should be noted that Kerb and Gutter sections may also be replaced based on other criteria including:

- Damage
- Restorations
- Kerb and Gutter replaced in association with other projects such as road or drainage works. Reasons for replacing kerb and gutter other than condition also includes the removal of gutter bridges, level adjustments, ponding issues etc.
- Streetscape projects

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

Table13: Kerb and Gutter – Renewal and Replacement Program

Priority Projects 2022/23 (Year 1)

Replace Year	Priority	Location	Risk Rating / Category	Condition	Cost Estimate
2022/23	1a	Shirley Rd (PSID 496)	Very High (5)	Very Poor	$71,909
2022/23	1a	Ernest St (PSID 218)	Very High (5)	Very Poor	$14,002
2022/23	1b	Bent St (PSID 94)	Very High (5)	Very Poor	$122,226
2022/23	1b	West St (PSID 564)	Very High (5)	Very Poor	$99,394
2022/23	1b	Albany St (PSID 8)	Very High (5)	Very Poor	$13,557
2022/23	1b	Young St (PSID 802)	Very High (5)	Very Poor	$50,270
2022/23	1b	Rocklands Rd (PSID 477)	Very High (5)	Very Poor	$20,502
2022/23	1b	Shirley Rd (PSID 497)	Very High (5)	Very Poor	$77,540
2022/23	1b	Alexander St (PSID 18)	Very High (5)	Very Poor	$33,497
2022/23	1b	Morton St (PSID 404)	Very High (5)	Very Poor	$106,372
		Estimated K&G works in association with Road Reconstruction Projects			$490,731
		Estimated K&G works in association with Drainage Projects			$300,000
				TOTAL	**$1,400,000**

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

Table 14: Kerb and Gutter – Renewal and Replacement Program

Priority Projects 2023/24 (Year 2)

Year	Priority	Location	Risk Rating	Condition	Cost Estimate
2023/24	1a	Chandos St (Westbound) (PSID 157)	Very High (5)	Very Poor	$86,331
2023/24	1b	Milson Rd (PSID 792)	Very High (5)	Very Poor	$57,968
2023/24	1b	Young St (PSID 803)	Very High (5)	Very Poor	$52,008
2023/24	1b	Shirley Rd (PSID 498)	Very High (5)	Very Poor	$236,180
2023/24	1b	Murdoch St (PSID 409)	Very High (5)	Very Poor	$214,696
2023/24	1b	Grafton St (PSID 249)	Very High (5)	Very Poor	$54,956
2023/24	1b	Telopea St (PSID 520)	Very High (5)	Very Poor	$13,723
2023/24	1b	Gillies St (PSID 246)	Very High (5)	Very Poor	$93,950
2023/24	1b	Ernest St (PSID 216)	Very High (5)	Very Poor	$17,942
2023/24	1b	Palmer St (PSID 433)	Very High (5)	Very Poor	$43,903
		Estimated K&G works in association with Road Reconstruction Projects			$428,343
		Estimated K&G works in association with Drainage Projects			$300,000
				TOTAL	**$1,600,000**

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

Table 15: Kerb and Gutter – Renewal and Replacement Program

Priority Projects 2024/25 (Year 3)

Year	Priority	Location	Risk Rating	Condition	Cost Estimate
2024/25	1c	Woolcott St (PSID 596)	Very High (5)	Very Poor	$79,587
2024/25	1c	King St (PSID 314)	Very High (5)	Very Poor	$220,961
2024/25	1c	Pine St (PSID 445)	Very High (5)	Very Poor	$177,926
2024/25	1c	Armstrong St (PSID 32)	Very High (5)	Very Poor	$43,630
2024/25	1c	Benelong Rd (PSID 87)	Very High (5)	Very Poor	$84,016
2024/25	1c	Illiliwa St (PSID 300)	Very High (5)	Very Poor	$72,974
2024/25	1c	Mckye St (PSID 357)	Very High (5)	Very Poor	$210,789
		Estimated K&G works in association with Road Reconstruction Projects			$410,117
		Estimated K&G works in association with Drainage Projects			$300,000
				TOTAL	**$1,600,000**

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

Table 16: **Kerb and Gutter – Renewal and Replacement Program**

Priority Projects 2025/32 (Year 4-10)

Year	Priority	Location	Risk Rating	Condition	Cost Estimate
2025/32	1c	Milner Cres (PSID 385)	Very High (5)	Very Poor	$80,181
2025/32	1c	Cowdroy Ave (PSID 177)	Very High (5)	Very Poor	$98,032
2025/32	1c	Mitchell St (PSID 397)	Very High (5)	Very Poor	$39,159
2025/32	1c	Peel St (PSID 440)	Very High (5)	Very Poor	$84,094
2025/32	1c	Rowlison Pde (PSID 482)	Very High (5)	Very Poor	$115,195
2025/32	1c	Boyle St (PSID 110)	Very High (5)	Very Poor	$94,685
2025/32	1c	Weringa Ave (PSID 561)	Very High (5)	Very Poor	$148,534
2025/32	1c	Reed St (PSID 464)	Very High (5)	Very Poor	$110,123
2025/32	1c	Sinclair St (PSID 505)	Very High (5)	Very Poor	$162,598
2025/32	1c	Hazelbank Rd (PSID 273)	Very High (5)	Very Poor	$151,831
2025/32	1c	Alan St (PSID 5)	Very High (5)	Very Poor	$139,670
2025/32	1c	Ellalong Rd (PSID 208)	Very High (5)	Very Poor	$124,993
2025/32	1c	Belmont Ave (PSID 73)	Very High (5)	Very Poor	$42,565
2025/32	1c	Rosalind St (PSID 479)	Very High (5)	Very Poor	$295,390
2025/32	1c	Belmont Ave (PSID 72)	Very High (5)	Very Poor	$45,840
2025/32	1c	Spofforth St (Northbound) (PSID 513)	Very High (5)	Very Poor	$58,264
2025/32	1c	Cammeray Park	Very High (5)	Very Poor	$145,958
2025/32	1c	Palmer St (PSID 432)	Very High (5)	Very Poor	$30,473
2025/32	1c	Carabella St (PSID 138)	Very High (5)	Very Poor	$96,293
2025/32	1d	Robertson La (PSID 841)	Very High (5)	Very Poor	$160,920
2025/32	1d	Westleigh La (PSID 836)	Very High (5)	Very Poor	$122,810
2025/32	1d	Morden St (PSID 402)	Very High (5)	Very Poor	$92,075
2025/32	1d	Mcintosh La (PSID 731)	Very High (5)	Very Poor	$17,383
2025/32	1d	Cambridge St (PSID 644)	Very High (5)	Very Poor	$8,340
2025/32	1d	Clarke La (PSID 655)	Very High (5)	Very Poor	$76,524
2025/32	1d	Horace St (PSID 292)	Very High (5)	Very Poor	$100,012
2025/32	1d	Elliott St (PSID 677)	Very High (5)	Very Poor	$90,455
2025/32	1d	Lambert St (PSID 713)	Very High (5)	Very Poor	$51,723
2025/32	1d	John St (PSID 309)	Very High (5)	Very Poor	$38,405
2025/32	1d	Chapel La (PSID 647)	Very High (5)	Very Poor	$15,055
2025/32	1d	Hume La (PSID 973)	Very High (5)	Very Poor	$34,381
2025/32	1d	Balfour St (PSID 44)	Very High (5)	Very Poor	$144,467
2025/32	1d	Priory Rd (PSID 453)	Very High (5)	Very Poor	$152,598
2025/32	1d	Rocklands La (PSID 475)	Very High (5)	Very Poor	$1,496

Year	Priority	Location	Risk Rating	Condition	Cost Estimate
2025/32	1d	Boronia St (PSID 109)	Very High (5)	Very Poor	$158,066
2025/32	1d	Benelong La (PSID 1026)	Very High (5)	Very Poor	$75,926
2025/32	1d	Holdsworth St (PSID 284)	Very High (5)	Very Poor	$122,701
2025/32	1d	Guthrie Ave (PSID 856)	Very High (5)	Very Poor	$7,729
2025/32	1d	Cairo St (PSID 132)	Very High (5)	Very Poor	$28,251
2025/32	1d	Rodborough Ave (PSID 770)	Very High (5)	Very Poor	$21,434
2025/32	1d	Colin St (PSID 171)	Very High (5)	Very Poor	$132,641
2025/32	1d	Atchison La (PSID 625)	Very High (5)	Very Poor	$18,652
2025/32	2a	High St (PSID 278)	High (4)	Poor	$168,321
2025/32	2a	Chandos St (PSID 154)	High (4)	Poor	$45,070
2025/32	2a	Wycombe Rd (PSID 604)	High (4)	Poor	$81,424
2025/32	2a	Kurraba Rd (PSID 321)	High (4)	Poor	$246,841
2025/32	2a	Chandos St (Westbound) (PSID 158)	High (4)	Poor	$69,690
2025/32	2a	Rangers Rd (PSID 458)	High (4)	Poor	$146,631
2025/32	2a	Bannerman St (PSID 54)	High (4)	Poor	$144,855
2025/32	2a	Clark Rd (PSID 164)	High (4)	Poor	$110,804
2025/32	2a	Clark Rd (PSID 165)	High (4)	Poor	$139,182
2025/32	2a	Gerard St (PSID 244)	High (4)	Poor	$2,545
2025/32	2b	Olympic Dr (PSID 752)	High (4)	Poor	$151,855
2025/32	2b	Grosvenor La (PSID 257)	High (4)	Poor	$42,304
2025/32	2b	Union St (PSID 535)	High (4)	Poor	$270,879
2025/32	2b	West St (PSID 563)	High (4)	Poor	$215,233
		Estimated K&G works in association with Road Reconstruction Projects			$3,528,444
		Estimated K&G works in association with Drainage Projects			$2,100,000
				TOTAL	**$11,200,000**

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

Table 17: **Kerb and Gutter – Renewal and Replacement Program**

Works Identified – Years 2025 - 32 (Year 4-10)

Year	Priority	Location	Risk Rating	Condition	Cost Estimate
2025/32	2b	West St (PSID 566)	High (4)	Poor	$27,196
2025/32	2b	Amherst St (PSID 24)	High (4)	Poor	$165,081
2025/32	2b	Spruson St (PSID 514)	High (4)	Poor	$69,327
2025/32	2b	Wycombe Rd (PSID 600)	High (4)	Poor	$112,068
2025/32	2b	Milson Rd (PSID 393)	High (4)	Poor	$167,843

Year	Priority	Location	Risk Rating	Condition	Cost Estimate
2025/32	2b	Park Ave (PSID 434)	High (4)	Poor	$103,700
2025/32	2b	Yeo St (PSID 608)	High (4)	Poor	$89,409
2025/32	2b	Parraween St (PSID 438)	High (4)	Poor	$3,026
2025/32	2b	Mclaren St (PSID 358)	High (4)	Poor	$121,648
2025/32	2b	Hume St (PSID 295)	High (4)	Poor	$9,600
2025/32	2b	Lavender St (PSID 332)	High (4)	Poor	$95,802
2025/32	2b	Ridge St (PSID 470)	High (4)	Poor	$187,682
2025/32	2b	Rangers Rd (PSID 457)	High (4)	Poor	$9,327
2025/32	2b	Murdoch St (PSID 411)	High (4)	Poor	$170,106
2025/32	2b	Rawson St (PSID 459)	High (4)	Poor	$28,584
2025/32	2b	Ridge St (PSID 469)	High (4)	Poor	$130,831
2025/32	2b	Willoughby Rd (PSID 586)	High (4)	Poor	$55,175
2025/32	2b	Little Spring St (PSID 717)	High (4)	Poor	$152,551
2025/32	2b	Ennis Rd (PSID 678)	High (4)	Poor	$237,510
		Contingency			$214,981
				TOTAL	**$2,151,447**

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

Kerb and Gutter Renewal Program

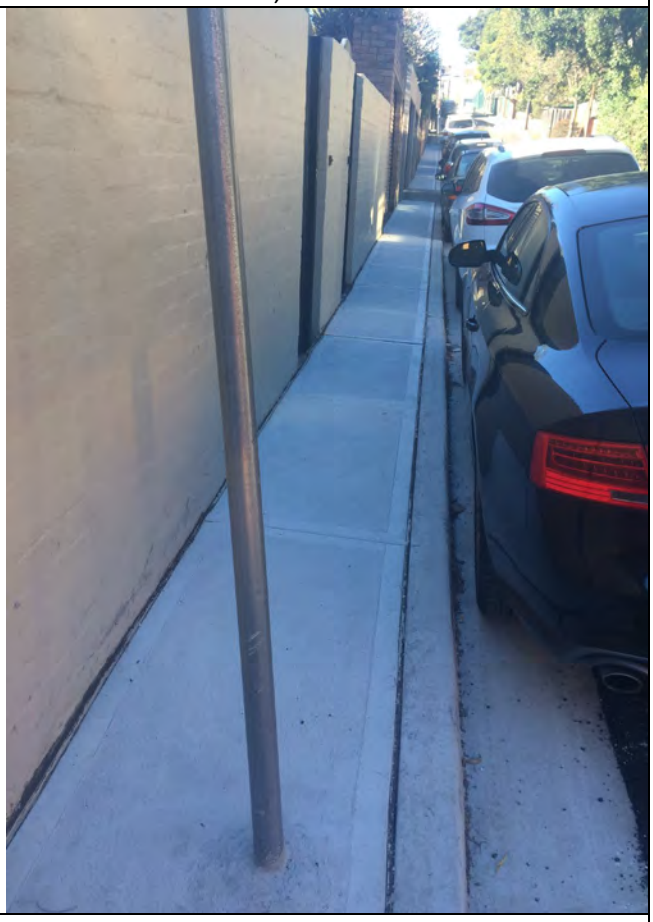
Cremorne Lane, Cremorne - Before

Cremorne Lane, Cremorne - After

Ernest Lane, Crows Nest - Before

Ernest Lane, Crows Nest - After

Crescent Place, Kirribilli - Before



Crescent Place, Kirribilli - After

	
Whatmore Street, Waverton - Before	Whatmore Street, Waverton - After

Kerb and Gutter – 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.

Kerb and Gutter – References

- Kerb and Gutter Data Collection & Condition Survey Audit by Consultants, Rapid Map Services Pty Ltd in conjunction with Asset & Facilities Management Consulting Pty Ltd.

- 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 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	