



**ASSET MANAGEMENT GUIDELINES - NSROC REGION
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PREPARED BY THE NSROC INFRASTRUCTURE GROUP



TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
1 BACKGROUND	2
1.1 Introduction	2
1.2 Context of Paper	3
2 DEFINITIONS AND GLOSSARY	4
3 ASSET HIERARCHY	6
3.1.1 Minimum Requirement	6
3.1.2 Desirable Approach	7
4 ASSET REGISTER	9
4.1 Data Management	9
4.1.1 Minimum Requirement	9
4.1.2 Desirable Approach	9
4.2 Format of Asset Register	9
4.2.1 Minimum Requirement	9
4.2.2 Desirable Approach	9
4.3 Completeness of Data	10
4.3.1 Minimum Requirement	10
4.3.2 Desirable Approach	10
5 CONDITION ASSESSMENT	11
5.1 Minimum Requirement	11
5.1.1 Road Assets	11
5.1.2 Stormwater Drainage Assets	12
5.1.3 Building Assets	12
5.1.4 Parks and Recreation Assets	13
5.2 Desirable Approach	13
5.2.1 Road Assets	13
5.2.2 Stormwater Drainage Assets	13
5.2.3 Building Assets	14
5.2.4 Parks and Recreation Assets	15
6 INDICATIVE ‘AVERAGE’ USEFUL LIFE	16
7 REPLACEMENT COST	18
8 RESIDUAL VALUE AT END OF ‘AVERAGE’ USEFUL LIFE	19
9 ASSET DEPRECIATION	21
9.1 Minimum Requirement	21
9.1.1 Accumulated Depreciation	21
9.1.2 Annual Depreciation	22
9.1.3 Written Down Cost	22
9.2 Desirable Approach	22
9.2.1 Accumulated Depreciation	22
9.2.2 Annual Depreciation	23
9.2.3 Written Down Cost	23
9.3 Example – Segmented straight line depreciation between segments	23



10	LEVEL OF SERVICE	25
11	CAPITAL RENEWAL WORKS PROGRAMME DEVELOPMENT	27
11.1	Identification of Capital Renewal Projects	27
11.1.1	Minimum Requirement	27
11.1.2	Desirable Approach	27
11.2	Cost Estimates	27
12	ASSET MANAGEMENT PLAN	28
12.1	Plan Layout – Minimum Requirement	28
12.1.1	Executive Summary	28
12.1.2	Introduction	28
12.1.3	Levels of Service	29
12.1.4	Overview of the Asset Portfolio	29
12.1.5	Maintenance Management	30
12.1.6	Capital Works Programme	30
12.1.7	Financial Summary of Plan	30
12.1.8	Asset Management Practices	30
12.1.9	Appendices	31
13	CONCLUSIONS	32



EXECUTIVE SUMMARY

The Northern Sydney Regional Organisation of Councils (NSROC) region consists of seven councils with major investment in infrastructure assets. There is significant imperative to ensure that the region is effectively managing their vast networks of assets in order to provide the necessary services to the community. With in excess of \$3.5 billion^{1,2} invested in infrastructure assets, it is essential that the councils within the NSROC region are effective stewards in the management of vast and complex networks of assets.

The NSROC Infrastructure Group consists of representatives from the seven NSROC councils and the aim of this group is to discuss asset management issues in relation to the vast infrastructure assets that each of the member councils has responsibility for.

Following an asset survey that was undertaken across the NSROC region in October and November 2006 which gathered information from each council on their current asset practices across road, drainage, building and park assets, it was identified that there are not uniform asset practices across councils on all matters. However there is similarity in specific asset practices undertaken by a number of councils across the four main asset classes – roads, drainage, buildings and parks.

The development of an asset management framework was a vital step for the NSROC region to take as there are few guidelines that provide specific direction on developing asset management plans and setting minimum standards for asset practices.

This paper provides direction on key components in the asset planning process. Furthermore, specific guidelines are provided for NSROC region councils to meet a 'minimum' requirement for asset practices. Where councils have adopted and met the 'minimum' requirements, a 'desirable' approach is to be adopted which aims to extend the asset management capability of councils.

The process of striving to meet the 'minimum' requirements will involve a significant change process for all councils. This process will take considerable time and is a component of a continuous improvement process to ensure that councils are able to effectively manage their assets.

Within this paper, an asset management plan is defined that will provide NSROC region councils with guidance around the 'minimum' requirements to developing their asset plans. These plans will be the culmination of significant change identified throughout this paper. A 'desirable' approach to the development of asset management plans is also defined and represents an additional level of information for councils to manage their assets.

It is recognised that for NSROC region councils to meet the 'minimum' requirements that significant change is required and this will involve a gradual process of improvement. However, the adoption of this framework will enable councils to effectively manage their infrastructure and be in a position to communicate the factors that have an impact on the infrastructure assets to stakeholders that will include councillors and the community.

NOTES

1 – The total replacement cost of road, drainage, building and park assets in the 2005 / 2006 financial year. This figure does not include foreshore assets; wharfs; sea walls and does not include any land value associated with the assets.

2 – Not all councils provided data on park assets. In order to determine a more realistic value for park assets, the value provided by the 4 councils was extrapolated in order to identify an indicative replacement cost for all councils. This value also excludes buildings in parks including amenity blocks.



1 BACKGROUND

1.1 Introduction

The Northern Sydney Regional Organisation of Councils (NSROC) Infrastructure Group consists of representatives from the seven member councils. The purpose of the Infrastructure Group is to discuss asset management issues in relation to the vast infrastructure assets that each of the member councils has responsibility for.

A snapshot of the NSROC region is provided below, which comprises the following councils:

- Hornsby;
- Hunters Hill;
- Ku-ring-gai;
- Lane Cove;
- North Sydney;
- Ryde; and
- Willoughby.



Following the asset survey that detailed the status of asset management activities across the NSROC region in December 2006, the NSROC Infrastructure Group agreed to develop an asset management framework that would represent a “better practice” approach for the councils to adopt. Whilst it is not expected that all councils would adopt all components of the framework / model, it is expected that councils would undertake change to adopt the minimum requirements.

There is an increasing requirement for councils to demonstrate effective planning to enable councils to be financially sustainable in the future. It is viewed that the development of asset management plans will be a key step in regard to the infrastructure assets that each council has responsibility for. Key to this planning will be the development of a long term financial strategy that identifies the projected cash flows into the future in relation to the ownership of assets.



1.2 Context of Paper

The development of an asset management framework for the NSROC region has been a result of a number of factors including:

- Significant information in the asset management industry with competing interpretation of the commonly used terms and 'what' components constitute an asset management framework;
- Few guidelines provide specific direction on developing asset management plans and setting minimum standards for asset practices;
- Increasing requirement for councils to have asset management plans in place in order to access additional sources of funding and grants;
- A lack of consistency across the NSROC region in terms of the building blocks in asset practices such as the adoption of consistent 'average' useful life for assets; and
- A requirement for councils to understand their future obligations in respect of their asset networks by incorporating asset planning practices including long term financial modelling to identify their capability of remaining financial sustainable into the future.

At this stage it is important to note the status of asset practices across the NSROC region. Within the region, the level of asset management capability varies between the councils and it is important to identify that the progression of asset management practices involves a significant change process and the timeframe to implement these changes will involve significant planning and time.

For this reason, the development of an asset management framework for the NSROC region must revolve around the following key points:

- Continuous improvement process;
- Provide a framework that is realistic for councils to implement; and
- Provide a framework that allows all councils to progress and advance their asset practices by allowing less developed councils to strive for 'minimum' requirements and more advanced councils to aim for 'desirable' practices which are an extension of the 'minimum' requirements.

This paper will provide a 'minimum' and 'desirable' approach to an asset management framework. It is important to note that the asset management framework for the NSROC region does not represent a "best practice" approach to asset management. The framework will aim to provide councils with a "better practice" approach in order to progress their asset practices.

This paper will be structured in terms of the components that make up the asset management framework. The paper will be structured with the following sections:

- Background;
- Definitions and Glossary;
- Asset Hierarchy;
- Asset Register;
- Condition Assessment;
- Indicative 'Average' Useful Life;
- Replacement Cost;
- Residual Value at End of 'Average' Useful Life;
- Asset Depreciation;
- Level of Service;
- Capital Works Programme Development;
- Asset Management Plan; and
- Conclusions.



2 DEFINITIONS AND GLOSSARY

There are various terms and references made in respect to asset management. To provide a consistent basis for terms used through this paper, the following definitions are provided:

Asset Hierarchy³ is a framework for segmenting an asset base into appropriate classifications. The asset hierarchy can be based on asset function; asset type or a combination of the two.

Asset Management⁴ is the systematic and coordinated activities and practices through which an organisation optimally manages its physical assets and their associated performance, risks and expenditures over their lifecycles for the purpose of achieving its organisational strategic plan.

Asset Management Policy⁵ outlines 'how' and 'why' asset management will be undertaken across the organisation as a whole with the objective of setting the broad framework for undertaking asset management in a structured and co-ordinated way (Source: International Infrastructure Management Manual (IIMM)).

Asset Management Plans⁵ are long term plans (usually 20 years or more for infrastructure assets) that outline the asset activities for each service area with the objective of outlining actions and resources to provide a defined level of service in the most cost effective way (Source: International Infrastructure Management Manual (IIMM)).

Asset management plans may include:

- Asset systems software;
- Asset register;
- Service standards;
- Work prioritisation methodology including:
 - capital works (rehabilitation and replacement activities); and
 - operations (routine maintenance activities and excludes operating costs such as water treatment for swimming pools)
- Funding requirement methodology including:
 - maintaining at current network condition; and
 - moving network condition to a target level.

Asset Register⁵ is a detailed record of asset data, which can be in an electronic or hard copy format.

Asset Systems Software⁵ - IT based systems (internally developed and / or externally developed) that store information relating to infrastructure assets. These IT systems may, or may not be, linked to other organisational systems such as financial systems.

Critical Assets³ are assets for which the financial, business or service level consequences of failure are sufficiently severe to justify proactive inspection and rehabilitation. Critical assets have a lower threshold for action than non-critical assets.

Depreciation³ is the wearing out, consumption or other loss of value of an asset whether arising from use, passing of time or obsolescence through technological and market changes. It is accounted for by the allocation of the cost (or revalued amount) of the asset less its residual value over its useful life.

Indicative 'Average' Useful Life³ is the 'average' life that an infrastructure asset is expected to provide the service for which it was created / acquired.

Replacement Cost⁷ is the cost of replacing the service potential of an existing asset by reference to some measure of capacity

Residual Life⁷ is the remaining useful life of an asset at a specified date.



Residual Value³ is the net market or recoverable value which would be realised from disposal of an asset or facility at the end of its life.

Service standards⁵ may include:

- Level of service;
- Intervention levels; and
- Response times.

Written Down Current (Replacement) Cost⁷ is the current (replacement) cost of an asset less, where applicable, accumulated depreciation calculated on the basis of such cost to reflect the already consumed or expired service potential.

NOTES

3 – International Infrastructure Management Manual (2006).

4 - British Standards Institute PAS-55.

5 - Terms adopted from the “NSROC Infrastructure Asset Management Group – Terms of Reference” dated 11 October 2006.

7 – Local Government Asset Accounting Manual (Update No. 4 July 1999).



3 ASSET HIERARCHY

The asset hierarchy aims to provide a suitable framework to structure asset data by segmenting an asset base into appropriate classifications. The structure of the asset hierarchy should be developed to an appropriate level that assists in managing the assets.

As the structure of an asset base will be used to arrange information within asset systems software, it is recognised that many councils will have developed an asset hierarchy that currently exists within their asset systems software. However, there is a requirement that all councils would look to address the minimum requirement.

For the purposes of this paper the assets have been defined as either 'major assets' or 'other assets' with respect to their make up of the overall infrastructure portfolio for the NSROC region councils. The asset classes are distinguished as follows:

'Major Assets' may include the following:

- Road assets;
- Stormwater drainage assets;
- Building / Property assets; and
- Parks and recreation assets.

'Other Assets' may include the following:

- Footpath assets;
- Foreshore assets;
- Car park assets;
- Bridges;
- Aquatic leisure centre assets; and
- Other assets – may include trees, cultural enhancements, monuments, retaining structures, cycle ways etc.

This paper will be focussed at addressing the issues related to 'major assets' as these asset classes represent the majority of the replacement cost of the NSROC region councils. Furthermore, the 'major assets' would represent a majority of the financial and human resource effort that is applied to the asset portfolio.

It is recognised that councils may have 'other' assets that they will consider to be a 'major' asset as a result of the replacement cost or risk factors associated with these asset.

3.1.1 Minimum Requirement

The minimum requirement is for an asset hierarchy that allows the grouping of the assets to be identifiable within the asset register. As a minimum requirement the following key asset categories will be held within the asset register:

'Major Assets'

- Road assets;
- Stormwater drainage assets;
- Building / Property assets;
- Parks and recreation assets⁶;

'Other Assets'

- Footpath assets;



- Foreshore assets;
- Car park assets;
- Bridges;
- Aquatic leisure centre assets; and
- Other assets – may include trees, cultural enhancements, monuments, retaining structures, cycle ways etc.

3.1.2 Desirable Approach

The desirable requirement is for a more detailed view of the asset hierarchy within the asset register. A desirable position will further breakdown the 'minimum' requirements into sub-categories of assets, which may include:

'Major Assets'

Road assets

- Surface;
- Pavement;
- Formation;
- Kerb and gutter;
- Shoulders;
- Traffic control devices;
- Lines;
- Signs;
- Street lighting; and
- Road side furniture – bus shelters, bins, seats etc.

Stormwater drainage assets:

- Conduits;
- Pits and Devices – pits, inlets; blind / buried pits; headwalls; converters, gross pollutant traps (GPT), etc;
- Wetlands and detention basins;
- Creeks;
- Open channels; and
- Flood structures.

Building / Property assets:

- Structure – foundations, frames and structural walls;
- External items – roof, windows, external doors, site features (driveway, car park, fences, landscaping), paving, veranda, shade structures;
- Internal items and fittings – ceilings, carpet, tiling, wall linings, fans, switches, joinery, etc.; and
- Building services – electrical services (cabling / wiring, lighting, switchboards, control panels etc), mechanical services (heating, ventilation, air conditioning) and plumbing services (bathroom / kitchen / laundry items).

Parks and recreation assets⁶:

- Playground equipment;
- Playing fields / surfaces and Parklands – parklands, sports fields, synthetic surfaces, basketball courts, tennis courts, skateboard parks;



- Park improvements – barbeques facilities, shelters, seating, fences, lighting, landscaping, irrigation etc; and
- Other furniture – signs, sight screens, shade sails, security cameras, poles, plaques, etc.

‘Other Assets’

Footpath assets:

- Pavement material.

Foreshore assets:

- Sea walls;
- Wharf / Jetty / Pontoon structures; and
- Other marine assets – including boat ramps, tidal pools and boat sheds.

Car park assets.

Bridges:

- Superstructure (deck);
- Sub structure;
- Abutments; and
- Barriers and rails.

Aquatic leisure centre assets:

- Building – structure, fit out and building services;
- Pool structures –all pool structures including diving pools;
- External works – including landscaping and concourses;
- Filtration system;
- Chlorination system;
- Pumping equipment; and
- Other plant and equipment.

Other assets:

- Mobile Plant and Equipment;
- Trees;
- Cycle ways;
- Public Art;
- Library books;
- Fences;
- Monuments; and
- Retaining structures.

NOTE

6 – Buildings within parks are not included within the ‘Parks and recreation’ assets. These assets are included within the ‘Building / Property’ assets and may include toilets, amenity blocks, grandstands, club houses, sports buildings, canteens, memorial centres, etc.



4 ASSET REGISTER

The asset register represents a key component of the asset management process by recording key asset information.

Given the significant cost and time required to capture and keep asset information current, it is important for all councils to capture information that is relevant and which assists councils in making decisions about their assets.

4.1 Data Management

4.1.1 Minimum Requirement

The following is regarded as minimum information that NSROC councils should aim to record against their assets:

- Unique asset reference ID number (name);
- Asset description;
- Location of the asset;
- Age or Condition of the asset;
- Replacement cost;
- 'Average' useful life;
- Residual life;
- Date of last rehabilitation; and
- Specific asset attributes including length / size / area / diameter / quantity etc.

4.1.2 Desirable Approach

The following information is regarded as desirable information that NSROC councils should aim to enhance their asset register in addition to the minimum requirement:

- Construction / acquisition date;
- Maintenance history;
- Date of last asset inspection;
- Criticality of the asset;
- Date of valuation;
- Annual depreciation;
- Accumulated depreciation;
- Written down replacement cost; and
- GPS coordinates of the asset.

4.2 Format of Asset Register

4.2.1 Minimum Requirement

The minimum requirement is for an asset register to exist in a hard copy format.

4.2.2 Desirable Approach

The desirable approach is for the asset register to exist in an electronic format that allows for simple record updates and general 'housekeeping' of data.



4.3 Completeness of Data

4.3.1 Minimum Requirement

The aim for the NSROC region would be to ensure that greater than 90% of the 'minimum' requirements of the asset register is held against all assets.

4.3.2 Desirable Approach

The aim for the NSROC region would be to ensure that greater than 90% of the 'desirable' requirements of the asset register is held against all assets.

Due to the significant time and resource effort to capture additional data, it is felt that the NSROC councils should aim to implement continuous improvement initiatives around capturing additional data over a longer timeframe.



5 CONDITION ASSESSMENT

The condition assessment process is an important component in monitoring the asset in order to ensure that the service potential of the asset can be fulfilled. Without a structured methodology, there will be additional risk of asset degradation and which ultimately could lead to asset failure.

The development of such a methodology could include:

- Developing a hierarchy of assets;
- Defining the different inspection requirements in relation to the hierarchy of assets ie. the items and detail to be assessed;
- Defining the frequency of assessment taking into consideration the hierarchy of the assets;
- Resource requirements to complete the condition assessment process – financial and human resources including any requirement for external consultants;
- Technology and process of the inspection - this would detail 'how' the inspection would be completed and the particular templates that could be used in the condition assessment process; and
- Defined condition rating system – this would provide the basis to undertake and rate the assets. The definition of each rating including photo records would also provide a quantifiable system that may reduce individual assessor subjectivity.

There are numerous variations of condition ratings that are used to undertake a condition assessment. Many of these rating systems are quite similar and generally will relate the condition of the asset from a 'near perfect' to a 'near failure' scenario and the various stages in between. Of more importance in undertaking a condition assessment is the completion of the assessment with a consistent approach ensuring that where the same rating is applied within an asset class that the basis for applying the same rating is sound. For example, if a condition rating indicates that an asset is in a 'poor' condition, that this is consistent and comparable when used across numerous assets.

As a result, a simplistic but nonetheless relevant condition rating approach is suggested as the basis for councils to apply in the condition assessment process. The following rating is a suggested approach and has been taken from the International Infrastructure Management Manual (2006):

Condition Rating	Condition Description
1	Very Good Condition – Only normal maintenance required
2	Minor Defects Only – Minor maintenance required (5%)
3	Maintenance Required to Return to Accepted Level of Service – Significant maintenance required (10%-20%)
4	Requires Renewal – Significant renewal / upgrade required (20%-40%)
5	Asset Unserviceable – Over 50% of asset requires replacement

5.1 Minimum Requirement

The minimum requirement is for the condition assessment process to be a documented approach that details the following items in the methodology according to the 'major assets':

5.1.1 Road Assets

Methodology Item	Detailed Requirement
Asset Hierarchy	The road assessment will generally be based on the 'whole' road segment.
Inspection Requirements	A number of the councils are using a pavement management system (PMS). The factors that may be considered in an overall assessment of the road (either using a PMS or council staff) will include: <ul style="list-style-type: none"> • Roughness.



Methodology Item	Detailed Requirement
Frequency of assessment	As a number of the councils are using a pavement management system (PMS), the assessment process will generally be based on assessing 20% of the network per annum on a rolling basis.
Resource Requirements	The assessment will require a combination of council staff and external consultants, and in the event of using an external consultant the necessary funding.
Technology and Process	As a number of the councils are using a pavement management system (PMS), the process will involve a combination of visual assessment and testing of the road surface. The format of data collection should be in a template as a minimum.

5.1.2 Stormwater Drainage Assets

Methodology Item	Detailed Requirement
Asset Hierarchy	Stormwater drainage assets will include: <ul style="list-style-type: none"> • Conduits; and • Pits and Devices.
Inspection Requirements	A visual condition assessment of conduits may consider the following factors: <ul style="list-style-type: none"> • Joint displacement; • Sediment / obstruction; • Cracking; and • Structural issues.
Frequency of assessment	Inspections will be based on the following 'reactive' responses: <ul style="list-style-type: none"> • Complaints received; and • Flood based response. Councils will also adopt a 'proactive' process to assess condition by inspecting 10% per annum of the network on a rolling basis.
Resource Requirements	Visual inspection will be undertaken by council staff.
Technology and Process	A template in hard copy with specific attributes to capture is a minimum requirement.

5.1.3 Building Assets

Methodology Item	Detailed Requirement
Asset Hierarchy	Assessment would be at an overall building level.
Inspection Requirements	Items that may be captured in the assessment include: <ul style="list-style-type: none"> • General building elements ie. walls, flooring, fittings etc; • Legal / Statutory Compliance requirements ie. fire safety; and • Complaints / defect based assessment (ad-hoc assessment).
Frequency of assessment	Legal / Statutory Compliance requirements ie. fire safety, will be based on the statutory requirements. In addition, the assessment process will generally be based on assessing 20% of the network per annum on a rolling basis.
Resource Requirements	Inspection will generally be undertaken by council staff or external consultant as required.
Technology and Process	Where council inspection is undertaken, a template in hard copy with specific attributes to capture is a minimum requirement.



5.1.4 Parks and Recreation Assets

Methodology Item	Detailed Requirement
Asset Hierarchy	Assessment would be at an overall park / recreation area level.
Inspection Requirements	Inspections will be based on: <ul style="list-style-type: none"> • General park elements ie. seats, playing surfaces, playground equipment etc; • Legal / Statutory Compliance requirements ie. playground equipment; and • Complaints / defect based assessment (ad-hoc assessment).
Frequency of assessment	Legal / Statutory Compliance requirements ie. playground equipment, will be based on the statutory requirements. In addition, the assessment process will generally be based on assessing 20% of the network per annum on a rolling basis.
Resource Requirements	Inspection will generally be undertaken by council staff or external consultant as required.
Technology and Process	Where council inspection is undertaken, a template in hard copy with specific attributes to capture is a minimum requirement.

5.2 Desirable Approach

The 'desirable' requirement is for condition assessment process to be a documented approach that details the following items in the methodology according to the specific asset class with a focus on relating the condition assessments to the more critical / important assets in the network according to the 'major assets':

5.2.1 Road Assets

Methodology Item	Detailed Requirement
Asset Hierarchy	As for the minimum approach.
Inspection Requirements	As for the minimum approach and including: <ul style="list-style-type: none"> • Structural assessment; • Potholes; • Cracking; • Ravelling (texture); and • Rutting.
Frequency of assessment	The assessment process will be based on the critical nature of the road network with the more critical assets to be assessed more frequently. The breakdown of the critical assets may be related to sub-arterial and collector roads representing the critical component of the network and local roads representing the non-critical assets. Accordingly, the following guidelines are provided: <ul style="list-style-type: none"> • Critical assets (sub-arterial and collector roads) - assessing 25% to 40% of the network per annum on a rolling basis; and • Non critical assets (local roads) - assessing 20% of the network per annum on a rolling basis.
Resource Requirements	As for the minimum approach.
Technology and Process	As for the minimum approach.

5.2.2 Stormwater Drainage Assets

Methodology Item	Detailed Requirement
Asset Hierarchy	As for the minimum approach.



Methodology Item	Detailed Requirement
Inspection Requirements	As for the minimum approach and including: <ul style="list-style-type: none"> Erosion of invert. The condition assessment inspection would also be undertaken by CCTV inspection in the 'desirable' approach.
Frequency of assessment	As for the minimum approach and linking the assessment process to the critical nature of the assets. The breakdown of the critical assets may be related to assets located in flood prone areas / largest cross sectional area conduit sections representing the critical component of the network and all other assets representing the non-critical assets. Accordingly, the following guidelines are provided: <ul style="list-style-type: none"> Critical assets (assets located in flood prone areas / largest cross sectional area conduit sections) - assessing 20% of the network per annum on a rolling basis; and Non critical assets (all other stormwater drainage assets) - assessing 10% of the network per annum on a rolling basis.
Resource Requirements	Where condition assessment is undertaken by closed circuit television (CCTV), external consultants will generally be engaged to undertake these services with council staff required for review and assessment of reports.
Technology and Process	Inspection via CCTV will generally produce reports on condition.

5.2.3 Building Assets

Methodology Item	Detailed Requirement
Asset Hierarchy	Assessment would be based on the sub-components of the building including: <ul style="list-style-type: none"> Structure; External items; Internal items and fittings; and Building services.
Inspection Requirements	As for the minimum approach.
Frequency of assessment	As for the minimum approach and linking the assessment process to the critical nature of the assets. The breakdown of the critical assets may be related to buildings of importance to the community (ie. health care buildings) and to councils ability to operate (ie. civic buildings) representing the critical buildings and all other assets representing the non-critical assets (ie. public toilets). Accordingly, the following guidelines are provided: <ul style="list-style-type: none"> Critical assets - assessing 40% - 50% of the buildings per annum on a rolling basis; and Non critical assets (all other buildings) - assessing 20% of the buildings per annum on a rolling basis.
Resource Requirements	As for the minimum approach.
Technology and Process	As for the minimum approach.



5.2.4 Parks and Recreation Assets

Methodology Item	Detailed Requirement
Asset Hierarchy	Assessment would be based on the sub-components of the park including: <ul style="list-style-type: none"> • Playground equipment; • Playing fields / surfaces and Parklands; • Park improvements; and • Other assets (signs, sight screens, shade sails, security cameras, poles, plaques, etc).
Inspection Requirements	As for the minimum approach.
Frequency of assessment	As for the minimum approach and linking the assessment process to the critical nature of the assets. The breakdown of the critical assets may be related to parks of importance to the community (parks with greater amenity and providing greater services) representing the critical buildings and all other assets representing the non-critical assets. Accordingly, the following guidelines are provided: <ul style="list-style-type: none"> • Critical assets - assessing 40% - 50% of the parks per annum on a rolling basis; and • Non critical assets (all other buildings) - assessing 20% of the buildings per annum on a rolling basis.
Resource Requirements	As for the minimum approach.
Technology and Process	As for the minimum approach.



6 INDICATIVE ‘AVERAGE’ USEFUL LIFE

The determination of the indicative ‘average’ useful life of an asset is a complicated process, which has a significant impact on the planning processes and activities associated with the assets.

In the development of a useful life range for the assets, the term “useful” is specifically adopted rather than that of “design”. This is a result of the inference that surrounds the term “design” and its meaning to asset managers / practitioners. Often, the asset managers / practitioners have a background and training in a technical field and often that field is in engineering. Within this technical expertise is the commonly used term of “design” in reference to the process of developing and implementing technical solutions (ie. the design of structural elements in a building) that will often involve ‘safety factors’ or an allowance for ‘tolerance’ due to such things as material properties and construction / implementation factors. The premise of these ‘safety factors’ is to make allowance for risk.

It is important to note that the adoption of an ‘average’ useful life is aimed at adopting a value that won’t be the lowest nor will it be the highest achieved value ie. a statistical representative of a larger sample of values. From this we can identify that there will be failure of assets below an ‘average’ adopted due to a number of factors. There will also be assets that significantly provide service beyond the ‘average’ adopted value. Some of the factors that affect this can include:

- The completion of maintenance activities over the life of the asset ie. providing a level of care to the asset to ensure that it will fulfil its service potential;
- Usage / utilisation factors where the asset may be over / under utilised in providing its service; and
- Technical and commercial obsolescence factors that may affect the assets provision of service.

In lieu of the potentially conservative adoption of ‘safety factors’ in asset planning and the adoption of an ‘average’ value to the useful life of an asset, it is important to observe that there will be instances at a ‘singular’ asset level that will fall outside of the proposed guidelines (either above or below). However is important to take a strategic view over the entire network in adopting an ‘average’ useful life to the assets.

The following guideline is provided for NSROC region councils to the application of the indicative ‘average’ useful life of infrastructure assets with reference to data captured in an asset survey undertaken by the NSROC region in October and November 2006:

Asset Category	Asset Sub Component	Indicative ‘Average’ Useful Life – Lower Range	Indicative ‘Average’ Useful Life – Upper Range
Roads	Surface – spray seal	8	10
	Surface - asphalt	15	20
	Pavement – asphalt	20	25
	Pavement – concrete	70	80
	Formation	80	100
	Kerb and gutter	60	80
	Shoulders	10	12
Footpaths	Rigid (concrete)	30	50
	Flexible (asphalt concrete)	20	25
	Pavers – concrete base	40	50
	Pavers – without concrete base	15	20
	Gravel	10	12
Stormwater drainage assets	Conduits	60	80
	Pits	30	40
Buildings	Structure	70	80
	External items	30	40



Asset Category	Asset Sub Component	Indicative 'Average' Useful Life – Lower Range	Indicative 'Average' Useful Life – Upper Range
	Internal items and fittings	15	20
	Building services	15	20
Parks and Recreation	Playground equipment – simple play equipment (less moving parts)	10	15
	Playground equipment – more complicated play equipment (more moving parts)	5	10
Bridges	Concrete / Steel	80	100
	Timber	40	60



7 REPLACEMENT COST

In accordance with AASB 116, the fair value of an asset is “the amount for which an asset could be exchanged between knowledgeable, willing parties in an arm’s length transaction”.

The fair value could be obtained by:

- Identifying whether there is an active and liquid market ie. market value;
- Determining whether there is observable market evidence or recent transaction prices ie. current market rentals, NPV / DCF; or
- Determining whether there is no market evidence ie. depreciated replacement cost.

As infrastructure assets generally have long lives and no secondary market on which they are bought and sold, it is appropriate that current replacement cost be utilised by NSROC region councils to determine the cost to reinstate the service capacity of the asset. Furthermore it is worth identifying that a combination of internal (council engineers) and external resources will assess the replacement cost of the assets.

The replacement cost will typically be determined by reference to the attribute information of the asset (area, quantity, diameter etc) and the use of a unit rate for the replacement. As further information is available, the use of greater asset sub-components and unit rates associated with the sub-components will form the basis for the replacement cost.



8 RESIDUAL VALUE AT END OF 'AVERAGE' USEFUL LIFE

The residual life is the remaining useful life at a specified point in time. It is important to note that the residual life can change as a result of a number of factors including:

- Condition of the asset at a specified point in time;
- Physical wear and tear of the asset – including the completion of scheduled (preventative) maintenance activities over the life of the asset;
- Expected usage of the asset – capacity or physical output; and
- Technical or commercial obsolescence – arising from changes to the service requirement of that asset ie. the service that the asset was created for no longer exists or has altered.

A number of issues exist in determining a residual value at the end of the 'average' useful life for infrastructure assets:

- A majority of infrastructure assets do not have a secondary market on which the assets can be traded / sold at the end of their lives;
- Infrastructure assets have long lives and at the end of their lives there may be technological or commercial obsolescence issues which will affect their value at the end of their life; and
- Although an asset may be considered to be at the end of its life with respect to condition assessment factors, it is more than likely that the asset will still be capable of fulfilling some of its service potential for which it was created / commissioned. This then implies that part of the asset has not been completely 'consumed' and as such will still have some 'value'.

Furthermore, an important observation in determining the residual value of the assets will be the adopted 'average' useful life of the asset. Where the 'average' useful life adopted for an asset is at the lower range (or below), then it may be reasonable to expect that the residual value of the asset may be considerably higher than an 'average' useful life that is at the higher range. The basis for this would be that where the value adopted is below an 'average' useful life that the asset may not be fully 'consumed' in terms of service provision. With a greater level of service potential remaining, the residual value of the asset would be higher.

Based on the NSROC region asset survey undertaken in October – November 2006, it appears that a majority of councils adopt a residual value of 0% of the replacement cost. Where councils are not adopting a nil residual value, councils appear to applying a residual value of 10% of replacement cost. An observation from either of these residual values applied and in particular applying a nil residual value illustrates that councils have the view that there is little or no value at the end of the assets 'average' useful life (or design life as may be the term used). But as raised in previous sections, a conservative approach may have been taken to the determination of 'average' useful life and furthermore that the asset may still be capable of delivering part of its service function when a decision is made the asset has reached the end of its life and needs to be replaced.

The following guideline is provided for NSROC region councils to the assessment of the residual value of significant infrastructure assets. It is important to note that the residual values detailed below are related to the indicative 'average' useful lives detailed in section 6:

Asset Category	Asset Sub Component	Residual Value – Lower Range (% of Replacement Cost)	Residual Value – Upper Range (% of Replacement Cost)
Roads	Surface	0	10
	Pavement	0	10
	Formation	0	30
	Kerb and gutter	0	30
	Shoulders	0	10



Asset Category	Asset Sub Component	Residual Value – Lower Range (% of Replacement Cost)	Residual Value – Upper Range (% of Replacement Cost)
Footpaths	Concrete Asphalt Concrete Pavers Gravel	0	10
Stormwater drainage assets	Conduits	0	30
	Pits and devices	0	30
Buildings	Entire building including all sub components	0	30
Parks and Recreation	Playground equipment – simple play equipment (less moving parts)	0	10
	Playground equipment – more complicated play equipment (more moving parts)	0	10
Bridges	All sub components	0	10



9 ASSET DEPRECIATION

With greater focus on compliance with AASB 116, specifically where the “depreciation method used shall reflect the pattern in which the asset’s future economic benefits are expected to be consumed by the entity”, it is imperative that the depreciation methodology reflect the phases of the asset over its lifecycle.

The consumption of service potential is recognised as an expense in the financial reports. It is assumed that the basis upon which a council identifies a yearly depreciation charge and the expense through to the financial statements is conducted via a documented depreciation methodology.

The outcomes from this process include:

- Annual depreciation – the annual charge applied to the financial statements representing the ‘wear and tear’ of the asset over that particular year; and
- Accumulated depreciation – the sum of all annual depreciation charges since creation / acquisition.

9.1 Minimum Requirement

It is a minimum requirement that NSROC region councils have a documented depreciation methodology which is ‘reasonable’ and ‘justifiable’.

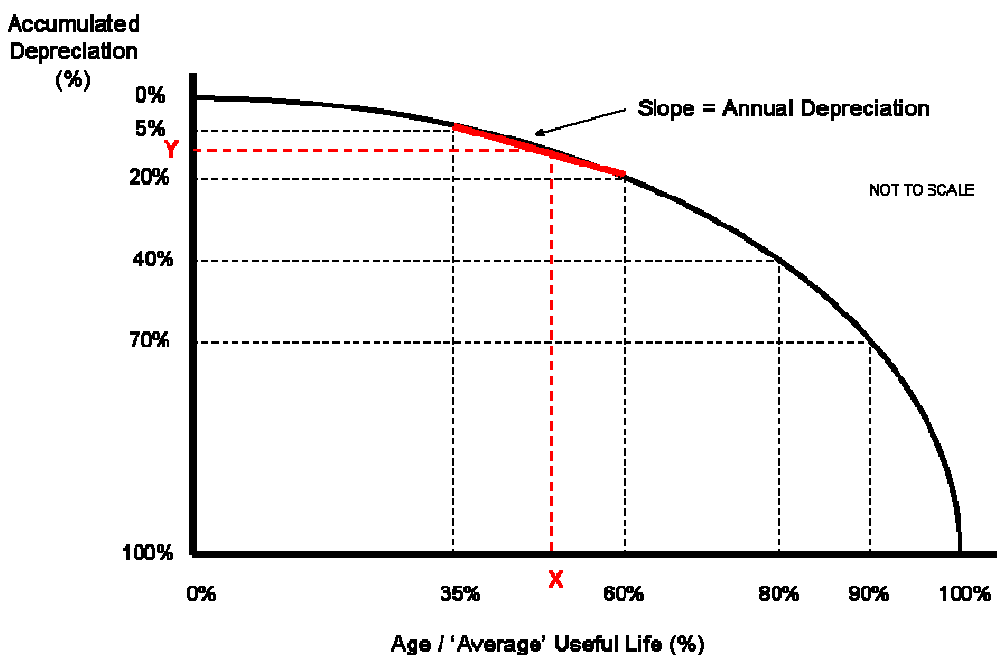
The ‘minimum’ requirement for the NSROC region councils will be to use age to determine the depreciation charge against their assets.

9.1.1 Accumulated Depreciation

The following sections detail a proposed model to determine depreciation rather than the adoption of a ‘straight-line’ approach to depreciation for each asset. As a minimum the age of the asset will be used to determine the accumulated depreciation with reference to the model of decay of the asset as illustrated below.

The calculation of the accumulated depreciation can be determined by one of two methods:

- An equation that applies to the continuous curve / decay profile; or
- Using segmented straight line depreciation between the nominated phases.



NOTE – As further information is gathered by councils, the proportions used in the decay model may change.



9.1.2 Annual Depreciation

The annual depreciation charge will be identified with reference to the 'slope' between the segments as detailed in the figure above in section 9.1.1.

9.1.3 Written Down Cost

The written down replacement cost will be determined as:

$$\text{Written Down Cost} = \text{Replacement Cost} - \text{Accumulated Depreciation}$$

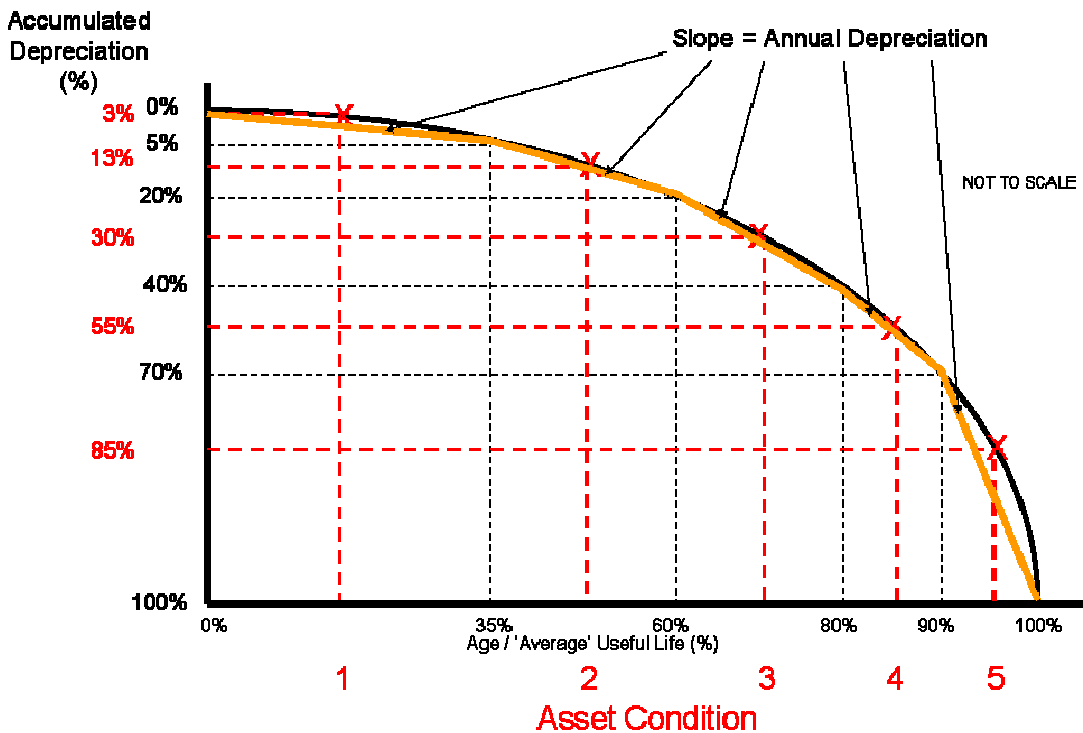
The written down cost is essentially allowing for the wear or consumption of the asset.

9.2 Desirable Approach

The desirable approach that NSROC region councils should adopt will involve the use of condition information to determine the depreciation charge against their assets.

9.2.1 Accumulated Depreciation

As an approximation of the accumulated depreciation, the mid point of each condition rating status may provide an approximation to the accumulated depreciation as illustrated below:





This corresponds with the following accumulated depreciation as detailed below:

Asset Condition	Accumulated Depreciation
1	3%
2	13%
3	30%
4	55%
5	85%

In between periods of condition assessment, there will be an adjustment to the accumulated depreciation for the time of last inspection using the annual depreciation which is detailed below in section 9.2.2.

9.2.2 Annual Depreciation

The annual depreciation charge will be identified with reference to the 'slope' between the segments as detailed in the figure above in section 9.2.1.

9.2.3 Written Down Cost

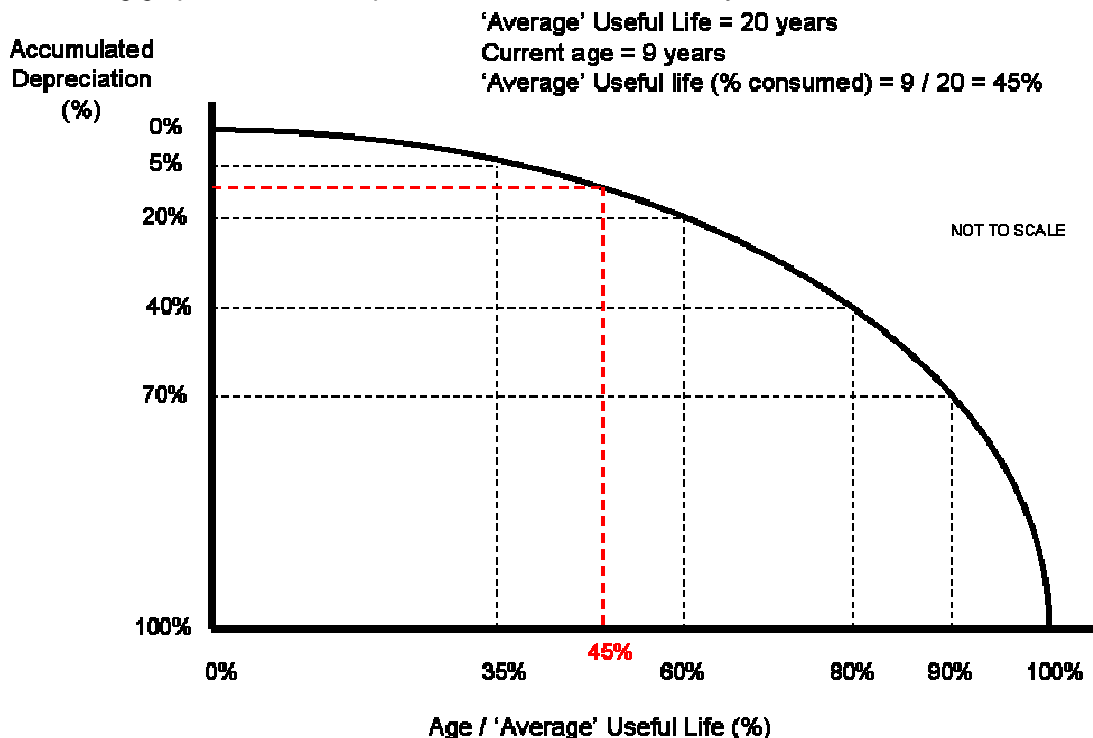
The written down replacement cost will be determined as:

$$\text{Written Down Cost} = \text{Replacement Cost} - \text{Accumulated Depreciation}$$

The written down cost is essentially allowing for the wear or consumption of the asset.

9.3 Example – Segmented straight line depreciation between segments

Assume that an asset has an 'average' useful life of 20 years. Assume that the asset is currently 9 years of age. The following graph illustrates the position of the asset in its life cycle:



The proportion of the 'average' useful life is 45%. The age in years based on the indicative decay model can be determined as follows based on the 'average' useful life of 20 years:



Age / 'Average' Useful Life (%) within decay profile	Calculation to determine age profile in decay model	Age in Years related to decay model	Cumulative Age
35%	35% * 20 years	7 years	7 years
25%	25% * 20 years	5 years	12 years
20%	20% * 20 years	4 years	16 years
10%	10% * 20 years	2 years	18 years
10%	10% * 20 years	2 years	20 years

The table below table details the depreciation in an indicative decay model:

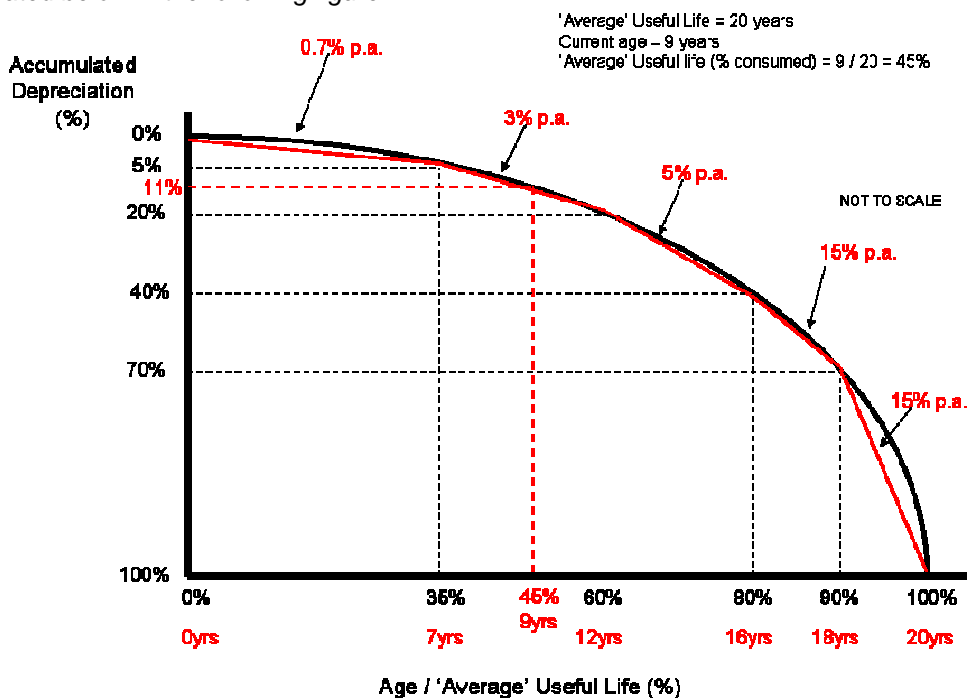
Change in Accumulated Depreciation	Age / 'Average' Useful Life (%) (in Years)	Annual Depreciation per year ('slope' between segments)
5%	7 years	5% over 7 years = 0.7% p.a.
15%	5 years	15% over 5 years = 3% p.a.
20%	4 years	20% over 4 years = 5% p.a.
30%	2 years	30% over 2 years = 15% p.a.
30%	2 years	30% over 2 years = 15% p.a.

To determine the accumulated depreciation we have:

- 5% over 7 years = **0.7% p.a.**
- 15% over 5 years = **3% p.a.**

For an asset aged 9 years, the accumulated depreciation is 5% (over the 1st 7 years) + 2 years at 3% per annum = **11%**.

This is illustrated below in the following figure:





10 LEVEL OF SERVICE

The assessment of levels of service for each asset category is a key part of an asset management plan and will be related to the proportion of the asset network that is within each condition rating. This enables councils to work towards a quantifiable 'target' level of service across the network. The condition rating breakdown will be based on the condition rating contained within section 5.

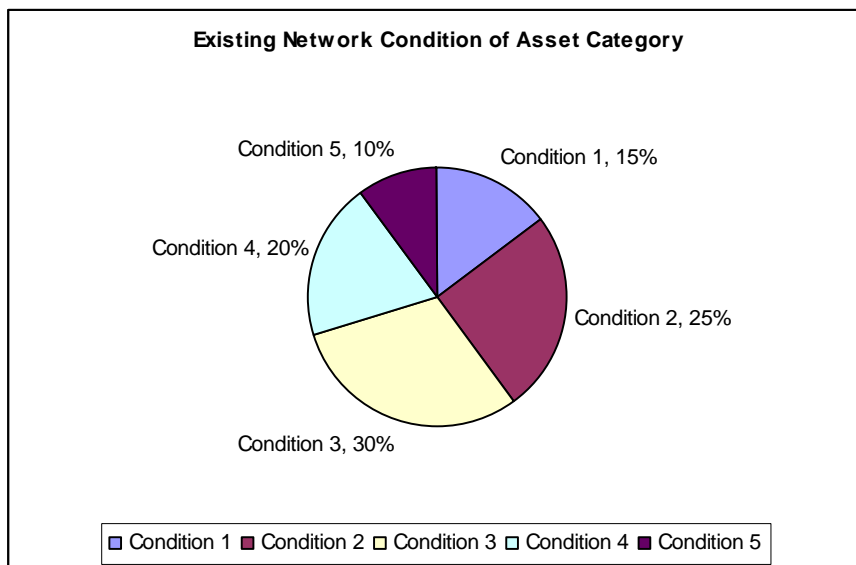
The process required to develop a level of service across the asset network will involve the following stages:

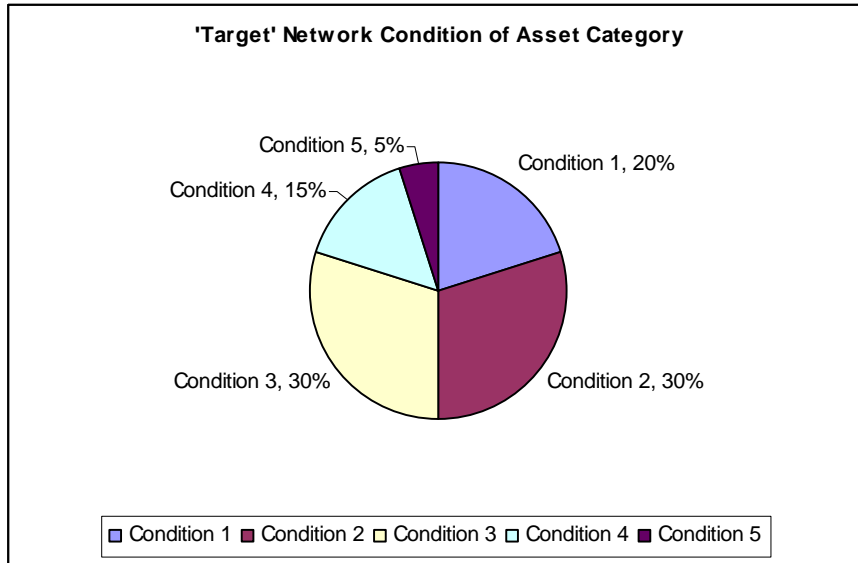
- Identify the existing network condition for each asset category;
- Identify a 'target' network condition to be achieved for each asset category;
- Determine and document strategies to achieve the iterative change in the network condition; and
- Identify the cost to implement these strategies.

The existing network condition will have a significant bearing on the 'target' network condition that each council will work towards. Furthermore there will be significant cost implications in setting an appropriate and realistic 'target' network condition.

The strategies to improve the network condition towards a 'target' level will take considerable financial resources and time to achieve. It is viewed that the setting of the 'target' network condition will be achieved over a long term period of 10 years in line with the asset management plans.

An illustration of an existing and 'target' network condition is provided below.





The movement towards a 'target' network condition may involve a reduction in the proportion of the asset category that are rated as condition 4 and 5, with a subsequent increase in the proportion of the asset category that are rated as condition 1 and 2.

Importantly, the setting of a 'target' network condition will depend on councils existing network condition and the financial resources that are available to implement strategies towards the 'target'.



11 CAPITAL RENEWAL WORKS PROGRAMME DEVELOPMENT

A capital renewal works programme will aim to prioritise the allocation of resources to the assets that require most urgent renewal / replacement.

11.1 Identification of Capital Renewal Projects

11.1.1 Minimum Requirement

The following approaches represent a range of options for the NSROC region councils and the use of one of these approaches would represent a minimum requirement to developing an initial capital works programme:

- 'Worst first' – by utilising a simple condition rating that has been applied to the asset as part of a condition assessment process, the rating that indicates the poorest asset condition would be used to identify assets that require renewal / replacement. For example, if a condition rating of 1 to 5 is applied to assets with 5 representing 'very poor' then asset condition would be prioritised according to condition 5, then condition 4, and so on; and
- Asset age – where the asset condition is not available, the use of age could be utilised to develop a capital works programme. In the absence of condition data, it would be assumed that the oldest assets would be approaching a stage of renewal / replacement as the asset approaches the end of its useful life.

Following the determination of the initial capital works programme, detailed site investigations / assessment would be required to assess the validity of results obtained. The aim of this process is to:

- Confirm the tasks in the programme and that they are relevant and reflect the information that they have been based on;
- Identify treatment options to the tasks identified; and
- Identify the impact and coordinate works that may overlap with different asset classes. For example, where road reconstruction is planned, it would be beneficial to identify stormwater drainage works that are required in this location in order to undertake the works in parallel.

11.1.2 Desirable Approach

The desirable approach to the development of a capital works programme may include the minimum requirements identified with an overlay of the critical nature of the assets. This will ensure that the necessary works are being directed at assets either in terms of the potential and consequence of asset failure or importance of the assets. By prioritising works by their criticality, assets in a 'very poor' condition would be prioritised according to the critical assets and then non-critical assets. As an example, stormwater drainage assets that are in a 'very poor' condition and are located in a 'sag point' or have a high cross sectional area may be prioritised over similar critical smaller cross sectional area conduits.

An alternative to this process would be to identify the critical timing of treatments by undertaking a cost-benefit analysis of a range of treatment options that will prolong the life of the asset and minimise the whole of life cost of owning the asset. This approach will involve the use of risk analysis to identify the various treatment options within a treatment matrix and the use of decision trees to identify the most appropriate response.

11.2 Cost Estimates

An estimate of the cost of the capital works programme will take into consideration asset attribute information such as length and diameter and unit rate applied to the asset category. As greater information is available, the unit rates may be applied to the component assets.

As part of the capital works programme, the costs will be compared against:

- The figures contained within the Asset Management Plans; and
- Proposed council Management Plan budgets.



12 ASSET MANAGEMENT PLAN

A NSROC region approach to the development of asset management plans has been developed. The factors behind the development of the key components in an asset management plan include:

- Significant information in the asset management industry with competing interpretation of the commonly used terms and 'what' components constitute an asset management framework;
- Few guidelines provide specific direction on developing asset management plans and setting minimum standards for asset practices;
- Increasing requirement for councils to have asset management plans in place in order to access additional sources of funding and grants;
- A lack of consistency across the NSROC region in terms of the building blocks in asset practices such as the adoption of consistent 'average' useful life for assets; and
- A requirement for councils to understand their future obligations in respect of their asset networks by incorporating asset planning practices including long term financial modelling to identify their capability of remaining financial sustainable into the future.

The following sections will define the layout and inclusions for the NSROC region councils. The plan will define a minimum requirement for councils to adopt. Within each section, a description of the information that would be required is detailed.

It is proposed that the asset management plans will be developed with a view to long term planning which will be based on a 10 year forward planning process. Furthermore, that financial planning will also be based around planning over the long term and will reflect the asset management plan ie. 10 year projections.

It is expected that councils would review these plans every 5 years as a minimum requirement.

12.1 Plan Layout – Minimum Requirement

The following asset management plan layout is proposed with a view that councils will be undertaking a significant change process. It is recognised that some of the components in the asset management plan may not be achievable within the short term and that the minimum requirement should be adopted in light of a continuous improvement process.

12.1.1 Executive Summary

The executive summary will include a section on:

- Objectives of the plan – details 'what' the plan aims to achieve;
- Summary of the assets covered by the plan;
- Level of Service – providing an overview of the 'target' network condition of the asset category; and
- Current funding levels – including the capital works programme and recurrent maintenance programme.

12.1.2 Introduction

The introduction will provide the background for why the council manages their assets and will include a section on:

- Background of the plan including why it is required;
- How it links in with councils strategic documents (ie. a councils Management Plan);
- Who the asset management plan is to be used by;
- At what stage the council is in its current asset management practices and planning ie. is this the first stage in a process review; and
- Assumptions and exclusions of the asset management plan.



12.1.3 Levels of Service

This section will provide detail on the current levels of service that council is managing the assets at and will include:

- The current levels of service being provided by the assets;
- Identify how council will measure its performance against the levels of service;
- Identify statutory / compliance requirements that may impact on the levels of service; and
- Reference to strategic council documents that may impact on the levels of service.

12.1.4 Overview of the Asset Portfolio

This section will provide the following information in regard to the assets that are included in the plan:

12.1.4.1 Physical Parameters

- Breakdown of the asset portfolio by number and by 'type' of assets. For example, building asset may be separated into 'council buildings', 'community buildings', etc;
- Identify how the assets are broken down into sub-component assets;
- Discuss any critical assets in the portfolio;
- Identify the overall age of the asset portfolio;
- Provide a summary of the asset portfolio that may discuss current issues associated with the portfolio including age, condition, utilisation, capacity, etc.; and
- A detailed register of assets may be included as an appendix to the plan.

12.1.4.2 Asset Condition

- Identify the overall condition of the asset portfolio;
- Identify trends with condition and age of the asset portfolio; and
- Provide details of how condition is assessed with reference to the condition assessment methodology which can be included as an appendix to the plan.

12.1.4.3 Asset Life

- Define the 'average' Useful Life of assets; and
- Define the residual life of assets.

12.1.4.4 Asset Valuation

- Detail the replacement cost of the assets;
- Detail the annual depreciation of the assets;
- Detail the accumulated depreciation of the assets;
- Detail the residual value at end of 'average' useful life of the assets;
- Detail the written down replacement cost of the assets;
- Description of how the value of assets is determined with reference to the valuation methodology which can be included as an appendix to the plan;
- Description of how the depreciation of assets is determined with reference to the depreciation methodology which can be included as an appendix to the plan; and
- Identify any major re-valuation between periods covered by the plan.



12.1.5 Maintenance Management

This section will provide information on the routine (planned), corrective (reactive), statutory and deferred maintenance activities undertaken by council and will:

- Define typical routine maintenance tasks for the assets;
- Define the maintenance standards that will be adopted for the assets including performance criteria by which maintenance needs will be assessed;
- Define any statutory maintenance activities associated with the assets;
- Define any deferred maintenance that is required on the assets; and
- Provide a forecast of maintenance activities against the assets.

12.1.6 Capital Works Programme

This section will provide information on renewal or replacement expenditure that restore, rehabilitates, replaces or renews an existing asset to its original capacity. Information detailed will:

- Provide an overview of the capital works programme methodology including how assets are identified for replacement / renewal with reference to the capital works programme methodology which can be included as an appendix to the plan;
- Provide an overview of the capital works programme over coming periods;
- Reference to strategic council documents that have detailed capital works activities; and
- Provide a forecast of capital works programmes against the assets.

12.1.7 Financial Summary of Plan

This section will provide an overview of the financial aspects and should be aimed at 10 year planning. This section will:

- Provide a forecast of maintenance activities against the assets; and
- Provide a forecast of capital works programmes against the assets.

12.1.8 Asset Management Practices

This section will include information on the practices used by council to manage their assets:

12.1.8.1 Asset Systems Software

- Define the system that stores the core asset information;
- Define other systems used to manage the assets;
- Identify the information that is captured in the system;
- Identify the currency of data in the system; and
- Identify the completeness of data in the system.

12.1.8.2 Process and Procedures

- Identify the key procedural documents that affect the management of the assets. These procedures may include the condition assessment methodology; valuation methodology; depreciation methodology etc.; and
- Identify where the key procedural document are located, date of preparation and the requirements for reviewing / updating the procedure.



12.1.9 Appendices

The appendices should detail reference material within the body of the plan.



13 CONCLUSIONS

The progression of asset management practices across the NSROC region councils requires the development of a consistent asset management framework, which provides councils with guidance on developing and implementing process change to their asset portfolios.

The adoption of the 'minimum' requirements contained within this document provides a continuous improvement process for councils to achieve better asset practices. The provision of an asset management plan will provide councils with guidance on the key inclusions that are relevant to Local Government.

The adoption of the asset practices and the asset management plan detailed in this paper will involve significant change within councils. The success of the implementation of these changes depends on corporate wide support for the changes with the provision of the necessary resources (human resource and financial) to achieve these outcomes.