

Bridge Asset Management Plan

February 2013



Knox City Council

Knox City Council



Bridge Asset Management Plan

February 2013

Executive Summary

Knox City Council has a network of 67 bridges, major culverts and boardwalks which assist in promoting connectivity across the municipality for vehicles, cyclists and pedestrians. Like other infrastructure asset classes, for which Council has responsibility, it is critical that these assets are managed appropriately and responsibly. This Asset Management Plan is intended to assist Council as it works towards more sustainable provision and management of its assets.

Chapter 1 – Introduction

- This Plan forms part of a suite of asset management plans previously adopted by Council.
- It has been developed to provide a strategic and practical framework for the management, protection and care of Council's vehicular and pedestrian bridges, boardwalks and major culverts.
- A list of structures considered in this Plan is provided in **Attachment 1**.
- A number of structures within the municipality are the responsibility of other authorities, and therefore not included in this Plan. Examples include bridges on VicRoads arterial roads, railway bridges and culverts under railway lines.
- Development and adoption of this Plan meets a number of Council objectives as well as the requirements of State and Federal Governments.
- Implementation of this Plan is expected to contribute to delivery of the following Council Plan Themes:
 - Dynamic Services & Facilities
 - Accessible Transport Choices
 - A Well Governed & Leading Organisation

Chapter 2 – Asset Knowledge

- Council is responsible for the management of 67 separate structures worth approximately \$7.9M (current replacement cost June 2011).
- In 2010/11, Council spent \$24,000 on bridge maintenance. This equates to an average of \$400 per structure. In the same year, \$57,000 was spent on renewal. There has been minimal upgrade funding for bridges since 2006/07.
- Data regarding Council owned and managed structures is stored within Council's asset management information system (Lifecycle) and the Geographic Information System (GIS).
- In 2007, load capacity data was recorded for all road bridges. While these load reports are recorded in Council's document management system, the data is not contained within Lifecycle.
- Demarcation agreements exist for all bridges located along the municipal boundary or on land for which VicRoads or Melbourne Water is the responsible authority (but not with Parks Victoria).
- A proposed hierarchy has been developed. It recognises the use and criticality of each structure and is expected to be used in future years to facilitate prioritisation of Council's renewal, upgrade, inspection and maintenance programs.
- Recommended improvement actions:

- Develop demarcation agreements for structures located on land managed by Parks Victoria
- Review of Council's Road Management Plan to incorporate use of the hierarchy where appropriate
- Confirm vehicle bridge load limits and record the data in Lifecycle

Chapter 3 – Current Asset Performance

- In 2011, a condition audit (Level 2 Inspection) was undertaken in accordance with the requirements described in the VicRoads Road Structures Inspection Manual 2011 and Council's specification.
- 84% of structures were considered to be in Fair condition.
- No structures were found to be in a Poor or Failed state.
- 275 bridge components were found to require some treatment or monitoring.
- In addition to the Level 2 Inspection, Council inspects all bridges, boardwalks and major culverts on a 6 monthly cycle in accordance with the Knox Road Management Plan.
- A review of maintenance history, since 2007, suggests that less than 20 issues are identified each year. The majority of issues are raised by the community and relate to pedestrian bridges. Often, the issues raised result in no action because the defect reported was either on a bridge that is not owned or managed by Council; the defect does not meet documented intervention levels or the defect reported is a known issue that is already being addressed by Council.
- The performance of Council's reactive bridge maintenance has been to a good standard.
- Recommended improvement actions:
 - Continue Level 2 Bridge Inspections on a 2 year cycle to maintain accurate condition data and inform future renewal expenditure

Chapter 4 – Understanding Community Expectations & Demand

- Council's bridge and culvert assets have been constructed to support Council's road and path network, whilst ensuring stormwater runoff is not obstructed. Community expectations and demand for bridges and culverts therefore arise from demand for improvements in water management or the connectivity of Council's roads and/or pathways.
- Stakeholders include: local residents and businesses, people passing through the municipality, Council's Insurers and other authorities including neighbouring Councils, VicRoads, Parks Victoria, Melbourne Water.
- Council currently investigates community expectations and demand in a number of ways:
 - Informal interactions between Council officers and the community as part of normal daily activities
 - Review of community requests
 - Community consultation undertaken during the development of strategic documents

- It is recognised that further strategic service planning work is required to better understand current and future community needs.
- Recommended improvement actions:
 - Consider demand forecasting and levels of service in all future Transport and Traffic and Integrated Water Management service planning work

Chapter 5 – Integrated Service & Asset Lifecycle Management

- A coordinated approach to the management of all phases of the service and asset lifecycles is considered necessary to sustainably meet community needs.
- The following services make use of Council's bridges, boardwalks and major culverts:
 - Transport and Traffic
 - Integrated Water Management
- These services were established long ago and are currently primarily in the operation phase.
- Council's Corporate Planning team is currently developing a Service Planning Framework to assist all service owners to undertake important strategic service planning work.
- This Plan focuses on analysing Council's approach to asset lifecycle management.
- Recommended improvement actions:
 - Develop a standardised approach/ framework for asset option analysis
 - Include maintenance and renewal cost estimates into designs to enable improved estimation of lifecycle costs associated with new works
 - Update design standards to address the issue of slippery timber decks and introduce routine maintenance activity to apply non-slip products to timber deck
 - Modify Level 1 Inspection process to cease use of paper forms and ensure all data is captured in Council's Work Order System (Lifecycle)
 - Introduce routine maintenance activities to routinely clear debris and maintain batters
 - Adopt a revised renewal ranking criteria that incorporates the hierarchy described in Chapter 2
 - Invest in strategic service planning

Chapter 6 – Financial Sustainability

- Financial sustainability requires a balance between the delivery of new assets and the maintenance, renewal or disposal of existing assets.
- Funding allocations at each stage of the asset lifecycle impact the standard to which the assets perform.
- It is recommended that Council adopt the funding levels summarised in the table below. This level of funding will enable:
 - Renewal of all identified condition state 4 components within 2 years; condition state 3 components within 4 years; and guardrail issues within 3 years.
 - Introduction of maintenance activities to apply non-slip products to timber deck surfaces, routinely clear debris and maintain batters

- Minor level of funding to facilitate implementation of all recommended improvement projects over the next 3 years
- Projected long term funding requirements are below what has been forecast in Council's Long Term Financial Strategy.

Recommended Funding (\$ '000)					
	2012/13	2013/14	2014/15	2015/16	2016/17
Capital Works – New/Upgrade					
Upgrades	\$50	\$0	\$0	\$0	\$0
Capital Works – Renewal					
Renewal (incl. Disposal)	\$100	\$153	\$158	\$163	\$135
Operating Budget – Maintenance					
Maintenance	\$22	\$40	\$41	\$43	\$44
Operating Budget – Operational Improvements					
Improvement Projects	\$0	\$1	\$1	\$1	\$0

- Recommended improvement actions:
 - Provide lifecycle cost training

Chapter 7 – Recommended Improvement Projects

- Thirteen (13) improvement projects have been identified. These are described in Chapter 7 and summarised in **Attachment 6**. They are the result of research and feedback as part of this Plan's development.
- A Project Leader has been assigned to each proposed project. Successful implementation will require each nominated Project Leader to incorporate the project into their annual business plan or prepare a business case to seek funding to deliver.
- Implementation of recommended projects is expected to result in the following desirable outcomes:
 - Improved Asset Knowledge and Data Management
 - Improved Integration of Decision Makers
 - Better Meet Community Expectations
 - Improved Financial Sustainability
 - Improved Risk Management
 - Strategic Investment in Asset Management

TABLE OF CONTENTS

- Chapter 1 Introduction..... 1
 - 1.1 Purpose of this Plan..... 2
 - 1.2 Drivers of Strategic Asset Management..... 2
 - 1.2.1 Council Drivers..... 2
 - 1.2.2 External Drivers 3
 - 1.3 Plan Scope 5
 - 1.3.1 Included Assets 5
 - 1.3.2 Excluded Assets 5
 - 1.4 Related Studies & Strategies 5
 - 1.5 Internal Stakeholders 5
- Chapter 2 Asset Knowledge 7
 - 2.1 Introduction..... 8
 - 2.2 Asset Information Management Systems 9
 - Geographic Information System (GIS) Latitude..... 10
 - Lifecycle – Asset Register 10
 - Lifecycle – Work Order System 10
 - Capturing New Assets & Asset Modifications 11
 - 2.3 Asset Inventory..... 11
 - 2.4 Asset Ownership / Demarcation of Responsibilities 12
 - 2.5 Asset Age Profile..... 13
 - 2.6 Annual Asset Valuations..... 13
 - 2.7 Asset Hierarchy/Criticality..... 14
 - 2.8 Recent Expenditure 15
 - Maintenance 16
 - Renewal..... 17

Upgrade	18
CHAPTER 3 Current Asset Performance	19
3.1 Introduction.....	20
3.2 Audit Scope.....	20
3.3 Audit Results.....	21
3.3.1 Overall Condition Rating.....	21
3.3.1 VicRoads Level 2 Bridge Inspection Results.....	22
3.4 Maintenance History	24
Routine Inspections.....	24
Routine Maintenance.....	25
Reactive Maintenance.....	25
3.5 Insurance Claims History	28
3.6 Corporate Risk Register	29
Chapter 4 Understanding Community Expectations & Demand.....	30
4.1 Introduction.....	31
4.2 Relevant Services.....	31
4.3 Relevant Service Planning Documents	32
4.4 Levels of Service	32
4.5 External Stakeholders.....	33
4.6 Approach to Understanding Community Expectations.....	34
4.6.1 Investigation of Community Needs	34
4.6.2 Analysis of Customer Request Trends	35
4.7 Current Approach to Predicting Future Demand	35
4.7.1 Review of Asset Utilisation Data.....	36
4.7.2 Factors Influencing Demand.....	36
4.8 Demand Management Strategies	38
Chapter 5 Integrated Service & Asset Lifecycle Management.....	39
5.1 Introduction.....	40

5.2	Lifecycle Management	41
5.2.1	Horizon Scanning	41
5.2.2	Service Lifecycle.....	41
5.3	Asset Lifecycle Management.....	43
5.3.1	Asset Management Roles & Responsibilities	43
Chapter 6	Financial Sustainability	50
6.1	Introduction.....	51
6.2	Lifecycle Cost Components	51
6.3	Funding Sources	51
6.4	Financial Model	52
	Scenario 1 – Status Quo	53
	Scenario 2 – Medium.....	53
	Scenario 3 – High.....	54
6.5	Financial Model Results.....	54
	Renewal funding.....	57
6.6	Recommended Funding Levels.....	57
Chapter 7	Recommended Improvement Projects.....	59
7.1	Introduction.....	60
7.2	Improvement Recommendations	60
7.3	Implementation of Improvement Recommendations	63
7.4	BrAMP Implementation & Review	64

LIST OF ATTACHMENTS

1. Asset Inventory
2. Asset Handover Process
3. Extract of Knox Road Management Plan - Maintenance Service Levels
4. Financial Modelling Results & Proposed Renewal Prioritisation
5. Review Implications of Victorian Auditor-General's Office Report – Management of Road Bridges
6. List of Improvement Recommendations

LIST OF TABLES

Table 1 – Asset Inventory	12
Table 2 – Recent Asset Valuation – 2007/08 to 2010/11	14
Table 3 – Proposed bridge hierarchy	15
Table 4 – Bridge Maintenance Expenditure 2006/07 – 2010/11	17
Table 5 – Bridge Renewal Expenditure 2006/07 – 2010/11	17
Table 6 – Bridge New/Upgrade Expenditure 2006/07 – 2010/11	18
Table 7 – Knox - Condition Rating Descriptions	21
Table 8 – VicRoads – Condition Rating Descriptions	22
Table 9 – Comparison of 2007 and 2011 Level 2 inspection data	23
Table 10 – Treatment options for components fully or partially classified in condition 3 or 4 (2011)	24
Table 11 – Reactive Maintenance - Source of Requests	25
Table 12 – Public Safety Risks Attributed to Customer Requests (2007-2011)	26
Table 13 – Initial Assessment Performance	27
Table 14 – Temporary Protection Works Performance	27
Table 15 – Rectification Works Performance	28
Table 16 – Relevant Council Services	31
Table 17 – External Stakeholders	33
Table 18 – Customer Requests for Maintenance	35
Table 19 – Summary of Factors Influencing Demand	38
Table 20 – Service Lifecycle - Management Objectives	42
Table 21 – Asset Lifecycle – Current Asset Management Responsibilities	43
Table 22 – Proposed renewal ranking criteria	48
Table 23 – Summary of Model Funding Scenarios	53
Table 24 – Recommended Funding	58

LIST OF FIGURES

Figure 1 – Map – Bridges, Boardwalks & Major Culverts	9
Figure 2 – Asset Age Distribution	13
Figure 3 – Lifecycle Cost Components	16
Figure 4 – Condition of Council's bridge/culvert network (2011)	21
Figure 5 – Condition of Council's bridge/culvert network – by type (2011)	22

Figure 6 – Comparison of 2007 and 2011 Level 2 inspection data – average condition of components 23

Figure 7 – Service Delivery Lifecycle Model 40

Figure 8 – Service Lifecycle 41

Figure 9 – Asset Lifecycle Phases 43

Figure 10 – Lifecycle Cost Components 51

Figure 11 – Predicted Lifecycle Costs (Total) 55

Figure 12 – Predicted New/Upgrade Costs 55

Figure 13 – Predicted Renewal Costs 56

Figure 14 – Predicted Maintenance Costs 56

Figure 15 – Predicted Operational Costs 56

Figure 16 – Renewal Modelling Comparison 57

Chapter 1 Introduction

1.1 Purpose of this Plan

Knox City Council has a network of 67 bridges, major culverts and boardwalks which assist in promoting connectivity across the municipality for vehicles, cyclists and pedestrians. Like other infrastructure asset classes, for which Council has responsibility, it is critical that these assets are managed appropriately and responsibly. This Asset Management Plan is intended to assist Council as it works towards more sustainable provision and management of its assets.

The purpose of this Plan is to:

- Demonstrate responsible management of Council's bridge assets
- Meet expectations outlined in Council's Vision, policies and strategies
- Meet the National Asset Management Assessment Framework expectations as monitored by the Municipal Association of Victoria (MAV)
- Ensure that the community is provided an appropriate and consistent level of service
- Communicate and justify sustainable funding requirements

It is anticipated that implementation of this asset management plan (including the recommended improvement projects outlined in Chapter 7) will lead to improved management of Council's network of bridges, major culverts and boardwalks and contribute to delivery of the following strategic asset management objectives:

- Improved Asset Knowledge and Data Management
- Strategic Investment in Asset Management
- Improved Risk Management
- Improved Integration of Decision Makers
- Better Meet Community Expectations
- Improved Financial Sustainability

This asset management plan demonstrates Council's improving maturity with respect to core asset management knowledge and documentation.

1.2 Drivers of Strategic Asset Management

Development and adoption of this Plan meets a number of Council policy and strategy objectives, as well as general requirements of Federal and State Governments.

1.2.1 Council Drivers

Preparation of this Plan aligns with the principles of Council's overall asset management planning framework.

Council Plan

The Council Plan 2009-13 is Knox's key corporate document that supports the achievement of the Knox Vision 2025 over the medium term. The Council Plan identifies eight themes as the focus for action. The implementation and delivery of the following themes are supported by this Asset Management Plan:

Dynamic Services & Facilities	Continuously improve the capacity of Council's services and infrastructure to best meet the community's needs.
Accessible Transport Choices	Provide real travel choice and reduce inequalities in access to transport opportunities in Knox by advocating for and facilitating improvements in transport infrastructure and services.
A Well Governed & Leading Organisation	Ensure the highest standards and transparency of our governance practices and the capability of our organisation, and to improve the condition and suitability of the municipality's assets.

Asset Management Policy

Council's Asset Management Policy 2009 articulates Council's commitment to asset management. A key policy statement is that "Council will continue to invest in improving its asset management knowledge and commit to further research and development of asset management plans."

Strategic Asset Management Plan

Council's Strategic Asset Management Plan 2003-13 identifies several improvements required for the responsible management of all Council assets. One of the key recommendations (recommendation 18) outlines that individual Asset Management Plans for each asset category should be developed.

Other Asset Management Plans

This Plan forms part of Council's suite of asset management plans. Plans already adopted by Council are as follows:

- Footpath & Shared Path Asset Management Plan (2005)
- Road Asset Management Plan (2007)
- Building Asset Management Plan (2009)
- Drainage Asset Management Plan (2010)
- Open Space Asset Management Plan (2011)

1.2.2 External Drivers

National Asset Management Framework

In 2009, in order to foster a nationally consistent approach to asset management, the Local Government and Planning Ministers' Council developed a National Asset Management Framework, to focus on long term assets managed by local governments. For some time, most Victorian Councils have been part of the Municipal Association of Victoria's (MAV) asset management capacity building program, the STEP program. The development of a National Asset Management and Financial Planning Assessment Framework for Local Government replaces the assessment framework of the STEP program, and enables benchmarking and reporting to be undertaken at both State and National levels. One of the eleven elements of this new assessment framework is the requirement for Councils to work towards preparing documented asset management plans for all material asset categories. The framework also outlines key inclusions and components of a typical

asset management plan, which are consistent with the recommendations of the International Infrastructure Management Manual.

The International Infrastructure Management Manual (IIMM) notes that there are benefits in accepting limited objectives for the first asset management plan and recommends that an organisation wishing to implement asset management effectively should produce a plan now, recognise its deficiencies and undertake the necessary improvement activities to enhance the plan. The IIMM recommends core asset management plans address and include best available current information and include the following:

- Random condition/performance sampling
- A simple risk assessment to identify critical assets
- Documentation of existing levels of service
- A contrast of existing management strategies with opportunities for improvement
- Prioritisation of capital works using simple ranking criteria,
- Basic financial forecasting
- An identification of priorities for future asset management plan development
- Performance measures

The development of this Bridge Asset Management Plan meets and exceeds the requirements of a core asset management plan, while at the same time acknowledging improvements required to begin progressing towards a more advanced level.

Victorian Auditor-General's Office Report – Management of Road Bridges

In December 2011, the Victorian Auditor-General's Office (VAGO) prepared a report *Management of Road Bridges* which outlined its assessment of whether VicRoads and five selected Councils were managing road bridges and major culverts effectively. A number of recommendations were made to improve Council policies, plans, processes and data management to demonstrate effective asset management with respect to road bridges.

Although Knox City Council was not a participant in the audit, it is considered good governance to assess Council's performance in the areas considered by the VAGO report. Attachment 5 provides a summary of the assessment undertaken by Council's Sustainable Infrastructure department during the development of this Plan. Recommendations of the report have also been reviewed in order to identify improvement opportunities that are either addressed via the content of this Bridge Asset Management Plan or can be addressed via the implementation of recommended improvement actions summarised in Chapter 7.

1.3 Plan Scope

Council's current knowledge and approach to bridge and boardwalk asset management is evaluated in this Plan. Recent performance, as measured by asset condition, risk exposure, maintenance performance and financial sustainability, is considered with a view to identifying gaps in current asset knowledge and service delivery. Strategic and operational techniques are proposed to address gaps and improve decision making across the asset lifecycle. Financial forecasting has been undertaken to highlight the long term implications of alternative funding decisions and assist future budget preparations.

1.3.1 Included Assets

The following Council owned and managed structures are included in this Plan:

- Bridges – vehicular
- Bridges – pedestrian
- Boardwalks
- Major Culverts (typically under Council roads)

A list of assets included in this Plan is provided in Attachment 1.

1.3.2 Excluded Assets

There are a number of bridges and culverts within the municipality that are the responsibility of other authorities, and therefore not included in this Plan. Examples include bridges on VicRoads arterial roads, railway bridges and culverts under railway lines. Minor culverts, such as those under shared paths, are generally not recorded and do not form part of this Plan. These culverts are managed in accordance with Council's Drainage Asset Management Plan.

1.4 Related Studies & Strategies

As noted previously, this plan supports the delivery of Council's strategic objectives as set out in the Council Plan and Asset Management Policy. Other documents that inform the strategic direction of bridge management include:

- Strategic Asset Management Plan (2003)
- Footpath & Shared Path Asset Management Plan (2005)
- Road Asset Management Plan (2007)
- Drainage Asset Management Plan (2010)
- Road Management Plan (2010)
- Integrated Transport Plan (currently being reviewed)

The results of financial modelling, presented later in this document, will inform Council's Long Term Financial Strategy and Annual Budget.

1.5 Internal Stakeholders

The management of Council's bridges is typically limited to the Engineering & Infrastructure directorate, as these assets are a component of Council's transport network.

Internal stakeholders are listed below. External stakeholders are discussed in Chapter 4.

- Operations

- Construction
- Works Services
- Parks Services
- Community Infrastructure
 - Project Delivery
 - Asset Preservation
- Sustainable Infrastructure
 - Asset Strategy
 - Traffic & Transport
 - Capital Works
- Information Management
- City Planning
 - Urban Planning (Subdivisions)

Responsibilities of all departments involved in bridge asset management are discussed in Chapter 5 of this Plan.

A Reference Group made up of representatives from all relevant Council departments was established during the development of this Plan. The Reference Group was consulted (individually and as a group) throughout the process to:

- Ensure the plan accurately represents current practice
- Assist in the identification of gaps
- Ensure the plan includes reasonable improvement recommendations.

Chapter 2 Asset Knowledge

2.1 Introduction

Council is currently responsible for the management of 67 separate structures worth approximately \$7.9M (current replacement cost June 2011). The bridge infrastructure asset class represents approximately 0.7% of Council's total fixed asset base. Although these assets are minor in a financial sense, their role as links in Council's transport network, as well as the inherent public safety risks associated with structural failure, means they need to be managed in a strategic and proactive manner.

This Chapter outlines Council's existing asset portfolio. The following aspects are described:

- Information Management Systems
- Inventory
- Ownership and demarcation of responsibilities
- Age and remaining life profile
- Valuations
- Hierarchy/criticality
- Recent expenditure – maintenance, renewal and upgrade

Figure 1 overleaf, illustrates the distribution of each structures within the municipality.

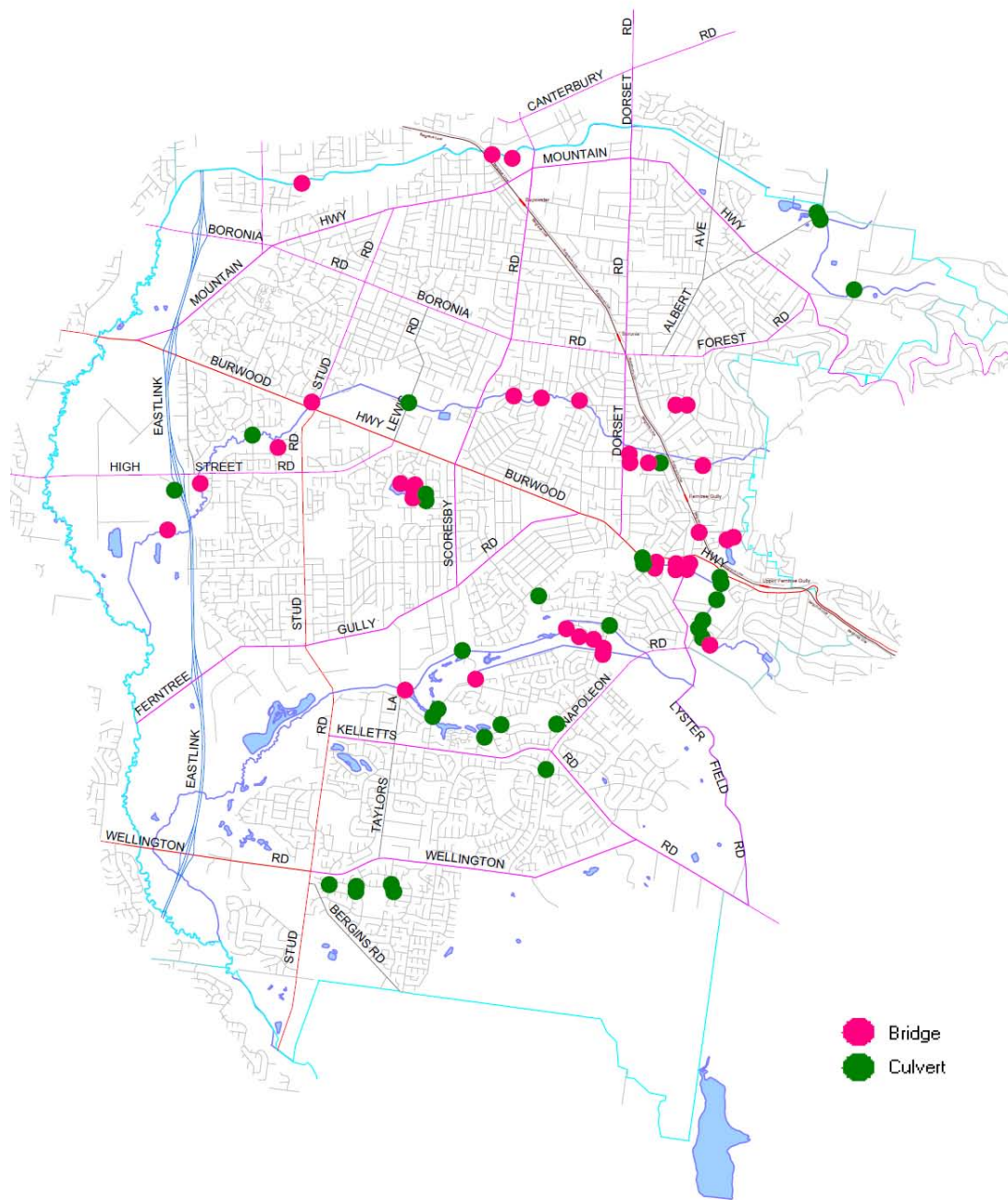


Figure 1 – Map – Bridges, Boardwalks & Major Culverts

2.2 Asset Information Management Systems

Council has a complete formal dataset regarding all bridges, boardwalks and major culverts applicable to this Plan. Council's asset knowledge exists predominantly in the asset register of its corporate asset management system (Lifecycle) and spatially on its Geographic Information System (GIS) Latitude.

Geographic Information System (GIS) Latitude

The following layer on Council's GIS is dedicated to bridges and culverts that are the responsibility of Knox City Council:

- Layer 91 – Bridges and Culverts

Lifecycle – Asset Register

Bridge and culvert data is currently stored in the asset register of Council's asset management system (Lifecycle) in line with the following structure:

Category: Transport
Sub Category 1: Bridges and Culverts

For each bridge or culvert, the asset register includes the following populated fields:

- Sub Category 2 (eg. vehicular bridge, pedestrian bridge, culvert)
- Asset Name
- Address
- Suburb
- GIS Link
- Type (eg. veh – conc & steel, veh – timber & steel, ped – timber & steel, ped – timber, <1m dia, 1-2m dia, >1m dia)
- Deck width
- Deck length
- Deck area
- Overall economic life
- Year of Construction

A number of financial fields (such as replacement cost, depreciated replacement cost) are also populated against each bridge asset in the register. A review of the asset register structure is currently being undertaken in 2012.

In 2007, load capacity data was recorded for the five road bridges. While these load reports are recorded in Council's document management system, the data is not contained within Lifecycle.

Lifecycle – Work Order System

Council's Work Order System is used to facilitate delivery and record maintenance activities undertaken by the Operations department. In general, the Work Orders created using this system are linked to the asset register by way of unique identifiers. Historically, in terms of bridges, road segments have provided unique IDs where bridges are located in Council's road reserve, and park parent numbers (or site IDs) have been used where bridges are located on Council maintained land. These unique IDs have enabled Work Orders to be tagged to a specific location. Although, historically, maintenance activities have been tagged to either a road segment or park, recent system developments have enabled Works Orders to be tagged directly to an existing bridge ID. Work Orders can also be grouped by the fact that maintenance requests for bridges, culverts and boardwalks are recorded against the following maintenance activities:

- Road Bridge Maintenance (B&C-REA-072)
- Pedestrian Bridge & Boardwalk Maintenance (B&C-REA-073)

This enables Council to analyse the history of customer requests for maintenance, as discussed later in this Plan.

Capturing New Assets & Asset Modifications

In order for Council to be confident that it has a reliable understanding of the assets that it is responsible for, it is considered important that Council have in place robust procedures for capturing new assets and asset modifications.

Ongoing data management work is undertaken to identify data discrepancies and ensure assets are recorded appropriately. This work is primarily done by both the Asset Strategy and Information Systems teams.

New or upgrade works are rarely undertaken for this asset class. When works do occur, the data is recorded in Council's asset register, either through the existing subdivision handover process or through the capital works handover process (refer Attachment 2).

With respect to renewal, while these works are regularly undertaken, they typically focus on component renewal rather than entire bridge renewal. Council's Construction team maintains this data. The Asset Register (or GIS) is only updated if there is a significant change to the attributes of the bridge/culvert such as deck area, material or useful life.

Asset condition audits are also used to verify and update Council's Asset Register and capture changes that may have occurred during the period between audits. This is particularly important for recording information relating to each bridge's condition and remaining useful life.

2.3 Asset Inventory

Council's bridge and major culvert inventory is summarised in the following table. While most bridges and culverts are unique in their size, design, functionality and composition, Council has rationalised the asset class into the seven categories listed below predominantly for financial valuation purposes.

Asset Type	Valuation Type	Quantity	Current Replacement Cost (\$'000)	Written Down Value (\$'000)	Expected Useful Life
Bridge	Vehicular Bridge – Timber & Steel	1	\$101	\$69	100 years
Bridge	Vehicular Bridge – Concrete & Steel	4	\$666	\$517	100 years
Bridge	Pedestrian Bridge – Timber & Steel	21	\$1,027	\$876	100 years
Bridge	Pedestrian Bridge – Timber	10	\$184	\$78	30 years
Major Culvert	Culverts >2m diameter	13	\$3,073	\$2,356	100 years

Asset Type	Valuation Type	Quantity	Current Replacement Cost (\$'000)	Written Down Value (\$'000)	Expected Useful Life
Major Culvert	Culverts 1-2m diameter	11	\$2,497	\$1,828	100 years
Major Culvert	Culverts <1m diameter	7	\$343	\$285	100 years
TOTAL		67	\$7,891	\$6,009	

Table 1 – Asset Inventory

Source: 2010/11 Annual Asset Valuations (Knox City Council Annual Report 2010/11)

A full listing of Council bridges and culverts is in Attachment 1.

2.4 Asset Ownership / Demarcation of Responsibilities

All bridges and culverts in Council's asset register are owned and maintained by Council. In some instances, these bridges are not in a Council road reserve, nor on other Council owned land. For example, some Council bridges that form part of Council's shared path network have been constructed on Melbourne Water land. There are a number of other bridges, particularly around the City boundary, where demarcation of responsibility has been clarified with neighbouring authorities.

Council has boundary agreements in place with Maroondah, Whitehorse and Monash City Councils (documented in Council's Road Management Plan). These agreements outline the responsibilities for bridges on the City boundary (most notably along Dandenong Creek). Only one of these bridges (B68 –at the end of King Street, Bayswater) is the responsibility of Knox City Council. The remainder are the responsibility of VicRoads or the Cities of Maroondah, Whitehorse or Monash.

There are also four bridges located within the Dandenong Valley Parklands along Council's western boundary. The Monash-Knox boundary agreement, included in Council's Road Management Plan, indicates that both the Cities of Monash and Knox have agreed that Parks Victoria is the responsible authority for these structures. Formal confirmation has not yet been obtained from Parks Victoria.

Responsibility for the Chandler Road bridge (road over rail bridge) is currently subject to negotiations as part of the Rail Safety Interface Agreement (Metro Trains Melbourne & Knox City Council). Until this document is finalised, Council continues to operate to the draft guidelines *Demarcation of Responsibility Guidelines at Road-Rail Interfaces (August 2009)* which confirms the rail authority is responsible for all metropolitan road over rail bridges, except those which are on arterial roads.

2.5 Asset Age Profile

Considering the adopted useful lives for bridges and culverts (30 years for timber pedestrian bridges/boardwalks and 100 years for all other bridges and culverts), most of Council's bridge structures are relatively young as evidenced in the distribution of ages shown below.

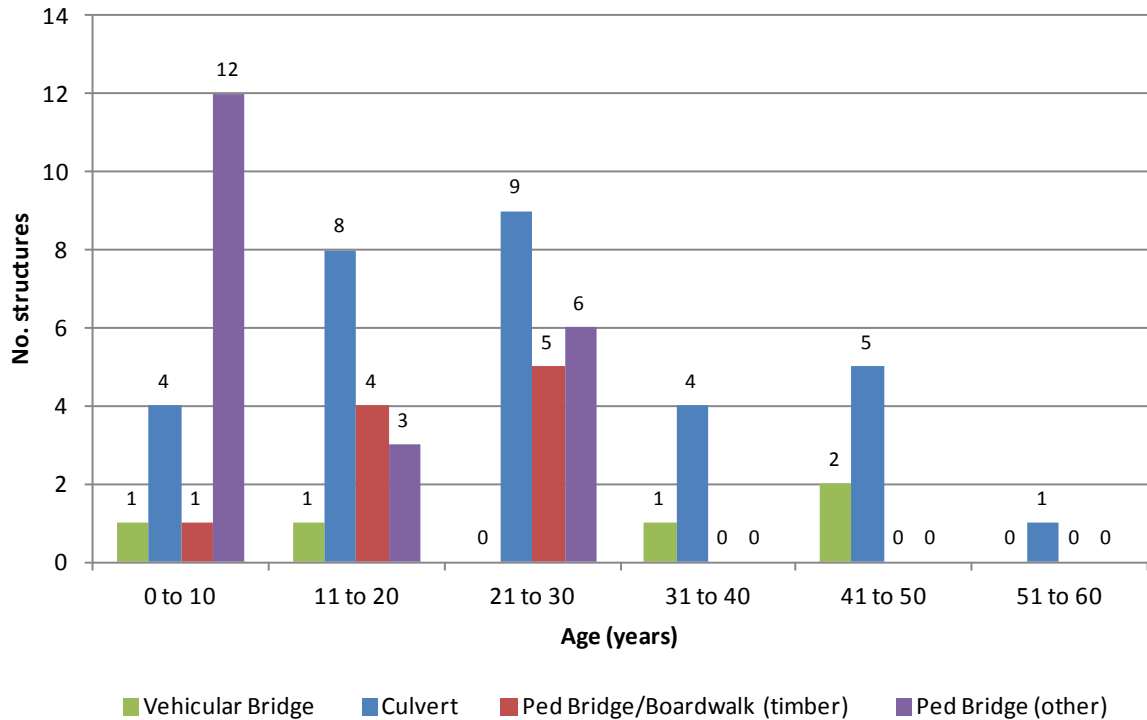


Figure 2 – Asset Age Distribution

The age distribution illustrated here is based on the year of construction. Many of Council's bridges have had minor renewal works which have typically extended their remaining useful lives. The concept of remaining useful life is more pertinent from an asset management perspective than purely age. An old bridge may have been partially renewed several times without being fully reconstructed and therefore still have a substantial remaining life.

2.6 Annual Asset Valuations

Bridge valuations are reported in Council's financial reports under the Infrastructure Asset category. Council's annual financial reports are prepared in accordance with relevant accounting standards, including AASB 116, as well as Council's Fixed Asset Accounting Policy. In line with these standards, assets purchased or constructed which have a value above the prescribed threshold level (\$5,000 for bridges), are recorded as non-current assets. Assets with a value below the threshold level are treated as expenditure in the year of purchase.

In 2010/11, the current replacement cost of Council bridges and culverts was reported as \$7.9M. Formal asset valuations are undertaken on a three year cycle, and are verified by the Finance Department, as well as Council's auditors, before being incorporated into Council's Annual Report. In the intervening years, unit rates are checked for any material rises and new assets are brought to account at cost.

Asset valuations are undertaken predominantly by the Sustainable Infrastructure Department which determines representative greenfield unit rates to apply to the validated asset inventory. Valuations are based on the assumption that each asset is constructed on undisturbed ground (greenfield site). Rates for bridges (per deck area) are derived from first principles. The standard of straight line depreciation is then applied to determine the written down value, based on an assessment of consumed useful life.

The table below summarises the current and recent valuation of the bridge network.

Year	Current Replacement Cost (\$'000)	Written Down Value (\$'000)
2007/08	\$6,474	\$5,094
2008/09	\$6,531	\$5,082
2009/10	\$6,563	\$5,043
2010/11	\$7,891	\$6,009

Table 2 – Recent Asset Valuation – 2007/08 to 2010/11

2.7 Asset Hierarchy/Criticality

The International Infrastructure Management Manual (IIMM) recommends that core asset management plans identify critical assets and events. Critical assets are defined as those which have a significant consequence if they become unable to deliver the expected service level. To this end, the establishment of an asset hierarchy is an important part of the process of identifying critical assets.

Historically, as illustrated previously (refer section 2.3) bridges and culverts have been classified by types for valuation purposes. It is now recognised that there is a need to also classify them according to their functional purpose in order to recognise their use and criticality.

The criticality of each individual Council bridge and culvert should therefore be considered within the context of the associated road or path hierarchy as defined in the Knox Road Asset Management Plan and Knox Footpath & Shared Path Asset Management Plan respectively.

Given that each Council bridge or culvert has been constructed to support a road or pathway, if any of the structures become unable to deliver their expected service level, they will impact the effectiveness of the associated road or path network. For example, a bridge supporting a section of link road will affect the link road's ability to: efficiently channel traffic through the municipality; link VicRoads arterial roads; and carry traffic between major commercial, industrial and residential areas.

The following table illustrates the hierarchy recommended to be adopted for all Council bridges and culverts. The relationship to the road and path hierarchy is shown together with the number of bridges within each classification.

Hierarchy Classification	Description	Criticality Assessment (Associated Road / Footpath Hierarchy)
Road Bridge	<p>Bridge has been constructed to support a road that is listed on Council's public road register. The bridge is typically one of the following construction types:</p> <ul style="list-style-type: none"> • Timber & Steel • Concrete & Steel 	<p>Collector: 2 Access: 3 Total: 5</p>
Road Culvert	<p>Culvert supports a road that is listed on Council's public road register. It also forms part of the municipal drainage network.</p>	<p>Link: 5 Collector: 14 Access: 9 Total: 28</p>
Pedestrian Bridge/Boardwalk	<p>Bridge has been constructed to support a constructed footpath or shared path that is listed in Council's asset register (Lifecycle). The bridge may be one of the following construction types:</p> <ul style="list-style-type: none"> • Timber & Steel • Timber 	<p>Commercial Access: 1 Local Access: 3 Reserves: 6 Shared Paths: 21 Total: 31</p>
Pedestrian Culvert	<p>Culvert supports a constructed footpath or shared path that is listed in Council's asset register (Lifecycle). It also forms part of the municipal drainage network.</p>	<p>Reserves: 1 Shared Path: 2 Total: 3</p>

Table 3 – Proposed bridge hierarchy

There are currently separate maintenance activities for vehicle and pedestrian structures, so this differentiation is already acknowledged in part.

Adoption of a hierarchy supports efficient bridge asset management practices by providing rationale for variation of standards across each classification. Council can use the hierarchy to prioritise delivery of:

- Renewals
- Upgrades
- Routine inspections
- Maintenance activities

2.8 Recent Expenditure

Funding allocations at each stage of the asset lifecycle impact on the standard to which the asset class is able to perform. Lifecycle cost components are illustrated in Figure 3 and described below. Financial sustainability requires a balance between the maintenance, renewal and disposal of existing assets and the delivery of new and upgraded assets.

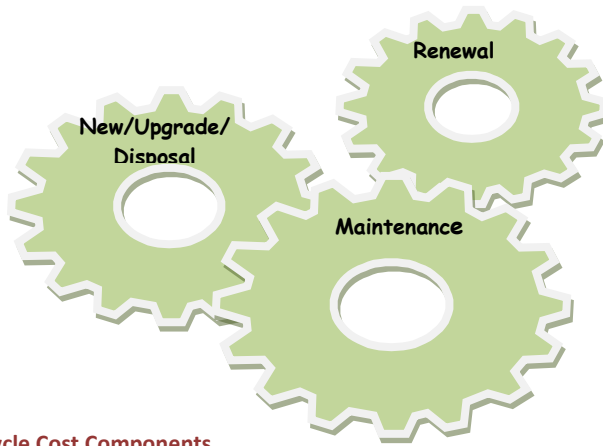


Figure 3 – Lifecycle Cost Components

Maintenance expenditure is required to ensure Council's asset network is safe and functional. It is recurrent operational expenditure to ensure that the asset achieves its useful life and provides the required level of service.

Renewal expenditure is required to reinstate or rehabilitate existing assets that have deteriorated to such an extent that they have become unserviceable. It is capital expenditure used to return the service potential or the life of the asset up to that which it had originally.

New/Upgrade expenditure results from ongoing strategic assessment of the functionality of the network. Upgrades enable an increase in the level of service that can be provided or an increase in the life of the asset beyond that which it had originally.

Disposal costs are generally absorbed into the expenditure for asset renewal or upgrades.

Infrastructure owning organisations are increasingly focusing on the adequate provision of *renewal* funding to address backlogs in asset investment and to indicate a sustainable level of asset capital funding.

The figures in this section of the report summarise recent trends in Council expenditure for maintenance, renewal and new/upgrade.

Maintenance

Council undertakes a routine hazard inspection program for all bridges and major culverts as well as having two reactive maintenance activities (one for road bridges, one for pedestrian bridges/boardwalks). The inspection frequencies and maintenance service level standards are documented in the Knox Road Management Plan. There are currently no funded routine maintenance activities.

Maintenance funding, as shown in the table below, has remained relatively constant in recent years, with Council spending approximately \$400 on average per bridge annually for maintenance purposes.

Year	No. bridges	Maintenance Expenditure (actual) (rounded)
2006/07	66	\$23,000
2007/08	66	\$25,000
2008/09	66	\$26,000
2009/10	66	\$32,000
2010/11	67	\$24,000

Table 4 – Bridge Maintenance Expenditure 2006/07 – 2010/11

Source: All expenditure data has been obtained from Council Annual Reports and verified by Finance.

Renewal

Renewal works are typically undertaken under the capital works program *1000 – Bridges*. The bridge renewal program is currently managed by Council's Construction team, which uses audit data (Level 2 inspections) as the basis of prioritising works. Due to the complex component nature of bridges, renewal works typically focus on specific components rather than involving complete bridge renewals.

Recent renewal funding levels are summarised in the table below.

Year	No. bridges	Renewal Expenditure (actual) (rounded)
2006/07	66	\$208,000
2007/08	66	\$56,000
2008/09	66	\$57,000
2009/10	66	\$32,000
2010/11	67	\$57,000

Table 5 – Bridge Renewal Expenditure 2006/07 – 2010/11

Source: All expenditure data has been obtained from Council Annual Reports and verified by Finance.

Funding for this program has remained relatively constant in recent years, and is a legacy of long term data provided in Council's Long Term Financial Strategy. It is the aim of this asset management plan to be able to more accurately estimate the amount of sustainable renewal funding required in the future.

Upgrade

Bridge upgrades are typically funded under capital works program 4007 – *Road and Bridge Construction*. Projects delivered under this program may involve the construction of new structures or the significant upgrade of existing bridges. There are also other capital works programs that sometimes involve bridge or boardwalk construction or upgrade. These programs generally involve shared path or footpath works and are discussed in section 5.3.

Currently the Finance team reviews the scope of individual capital works programs and determines the expenditure on bridges, culverts and boardwalks. The figures below have been derived from Finance. As can be seen, Council has historically spent very little on new or upgraded bridges due to the focus on maintaining existing infrastructure combined with the fact there is little identified strategic need for new bridges.

Year	New/Upgrade funding (actual) (rounded)
2006/07	\$86,000
2007/08	\$0
2008/09	\$0
2009/10	\$0
2010/11	\$0

Table 6 – Bridge New/Upgrade Expenditure 2006/07 – 2010/11

Source: All expenditure data has been obtained from Council Annual Reports and verified by Finance.

Chapter 3 Current Asset Performance

3.1 Introduction

Council needs to understand the condition of its assets in order to properly maintain and value them.

An audit was conducted during 2011 to complement and update data collected in previous audits. This Chapter summarises the audit findings. Recent history of maintenance and renewal is also discussed, together with Council's history of insurance claims. Risks identified on Council's corporate risk register were also reviewed. This information provides an indication of the current performance of this asset class.

3.2 Audit Scope

The audit, undertaken in 2011 by Pitt & Sherry Pty Ltd gathered condition data and verified existing information relating to bridges, boardwalks and major culverts. It followed a similar audit undertaken in 2007.

All structures were inspected to the requirements of VicRoads Level 2 Inspections in accordance with standardised VicRoads guidelines (VicRoads Road Structures Inspection Manual 2011).

The auditors collected the following standard information for each bridge:

- Classification of each bridge/culvert component
- Rating of each component's condition (% of each component in condition state 1-4)
- Identification of treatments and their costs (including treatment method, option and urgency)
- Verification of inventory information (including GPS coordinates, deck width and length)

As a further aspect of the audit, Council requested the following information to assist with condition analysis and financial modelling:

- Estimated remaining useful life
- Overall bridge condition rating

It is intended that future audits follow the format of this audit to ensure consistency for benchmarking purposes. The VicRoads Road Structures Inspection Manual recommends Level 2 Inspections are undertaken every 2 to 5 years, depending upon "the condition of the components, estimated rates of deterioration, the environment, traffic volumes and taking into consideration any completed maintenance, strengthening or replacement of components in poor condition." Bridge condition audits are essential for sound management of bridge infrastructure. Repeated surveying over the long term, will improve Council's ability to predict asset deterioration, assist in the identification of immediate and priority bridge works, act to maximise the useful life of the audited assets and provide updated data to assist in the planning of renewal works. Council already plans to conduct its next Level 2 Inspections in 2013/14.

3.3 Audit Results

3.3.1 Overall Condition Rating

In order to provide an overall summary of the condition of Council's bridges and culverts, the auditor assessed each of them against Council's standard condition rating system, as documented in the table below.

Condition Rating	Description	% Remaining Life
1 – Excellent	Asset is as new	95%
2 – Good	Asset is functional and displays superficial defects only	75%
3 – Fair	Asset is functional but shows signs of moderate wear & tear	50%
4 – Poor	Asset functionality is reduced. Asset has significant defects affecting major components	25%
5 – Failed	Asset is not functional	5%

Table 7 – Knox - Condition Rating Descriptions

The graph below shows the overall assessment of Council's 67 structures in accordance with this condition rating system. The equivalent data was not collected during the previous audit in 2007, meaning that a comparison between successive audits cannot be demonstrated. It is, however, expected that future audits will include this assessment to enable future comparison.

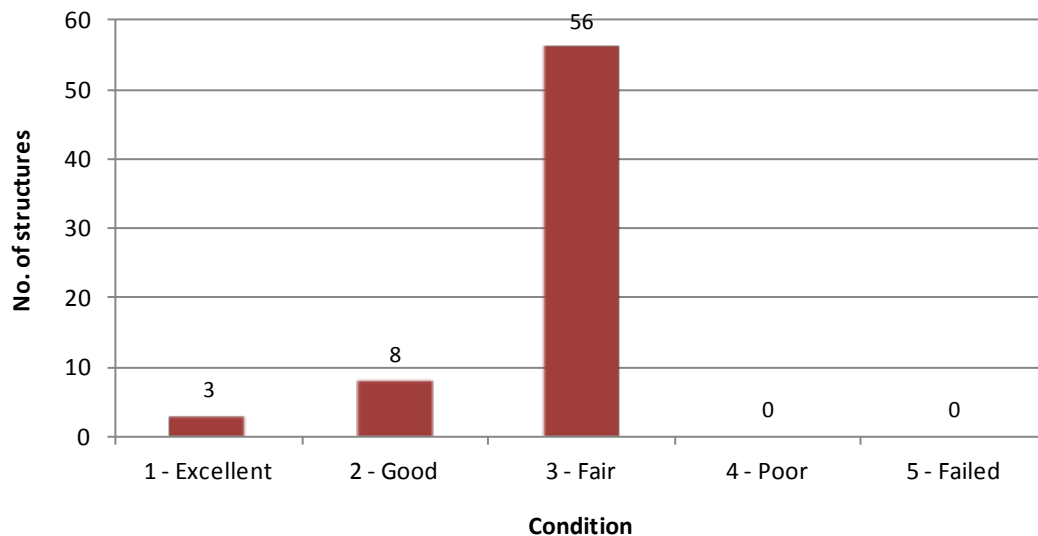


Figure 4 – Condition of Council's bridge/culvert network (2011)

The previous asset condition information is further broken down by structure type in the following graph.

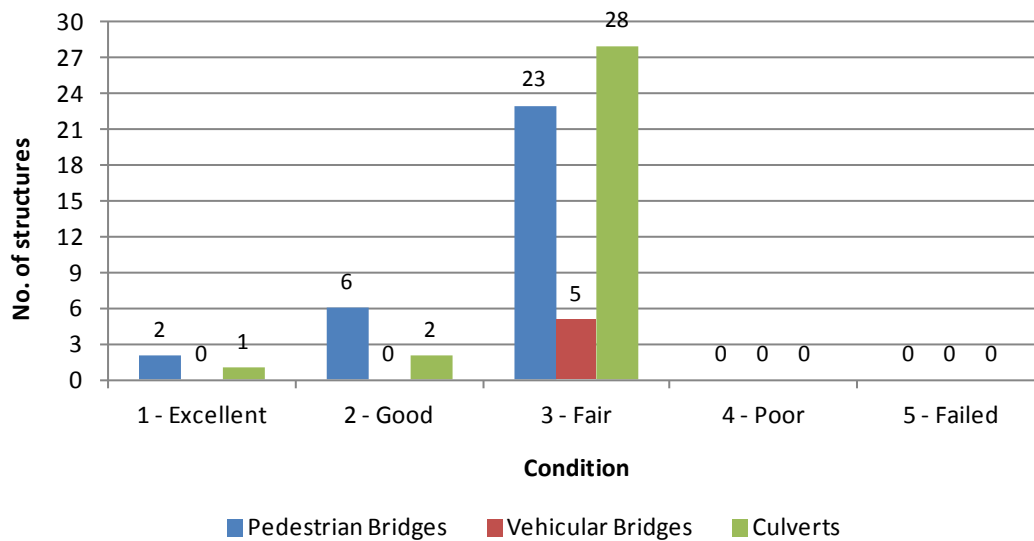


Figure 5 – Condition of Council's bridge/culvert network – by type (2011)

Providing an overall structure assessment has shown some promising results. Over 80% of the structures were reported to be in a Fair state. There were no structures that were considered to be in a Poor or Failed state. Interestingly, all of Council's vehicular bridges were assessed to be in a Fair state, while pedestrian bridges and all major culverts ranged from Excellent to Fair.

3.3.1 VicRoads Level 2 Bridge Inspection Results

In Level 2 inspections, each component of the structure is evaluated and percentage breakdown of condition provided. The VicRoads guidelines document four states of condition (1 to 4). In other words, a particular component may be assessed as being 60% in condition state 1, 30% in condition state 2, 10% in condition state 3 and 0% in condition state 4. In general, the definitions of the VicRoads conditions (from the VicRoads Road Structures Inspection Manual 2011) are as follows.

Condition State	Description
1	Component is in good condition with little or no deterioration.
2	Component shows deterioration of a minor nature with primary supporting material with first signs of being affected.
3	Component shows advancing deterioration and loss of protection to the supporting material which is showing deterioration and minor loss of section.
4	Component shows advanced deterioration, loss of effective section to the primary supporting material, is acting differently to design or is showing signs of overstress.

Table 8 – VicRoads – Condition Rating Descriptions

The format of the Level 2 bridge inspection data enables comparisons between the 2007 and 2011 audits.

The table below illustrates the number of components that were reported to be in condition state 3 or 4 in accordance with the VicRoads guidelines. While there was an increase in the number of components being categorised as condition state 3 or 4, the extent per component had decreased between the audits.

	2007 Audit		2011 Audit	
	Condition State 3	Condition State 4	Condition State 3	Condition State 4
Number of structures having components partially/fully in condition	17	28	54	16
Number of components partially/fully in condition	23	47	251	24
Average Extent per component	43.6%	86.5%	32.1%	35.4%

Table 9 – Comparison of 2007 and 2011 Level 2 inspection data

The component condition information is also presented in the following graph. It shows the average percentage of components in each of the VicRoads conditions. While the overall percentage of condition state 4 components has decreased between audits, the percentage of condition state 3 components has increased.

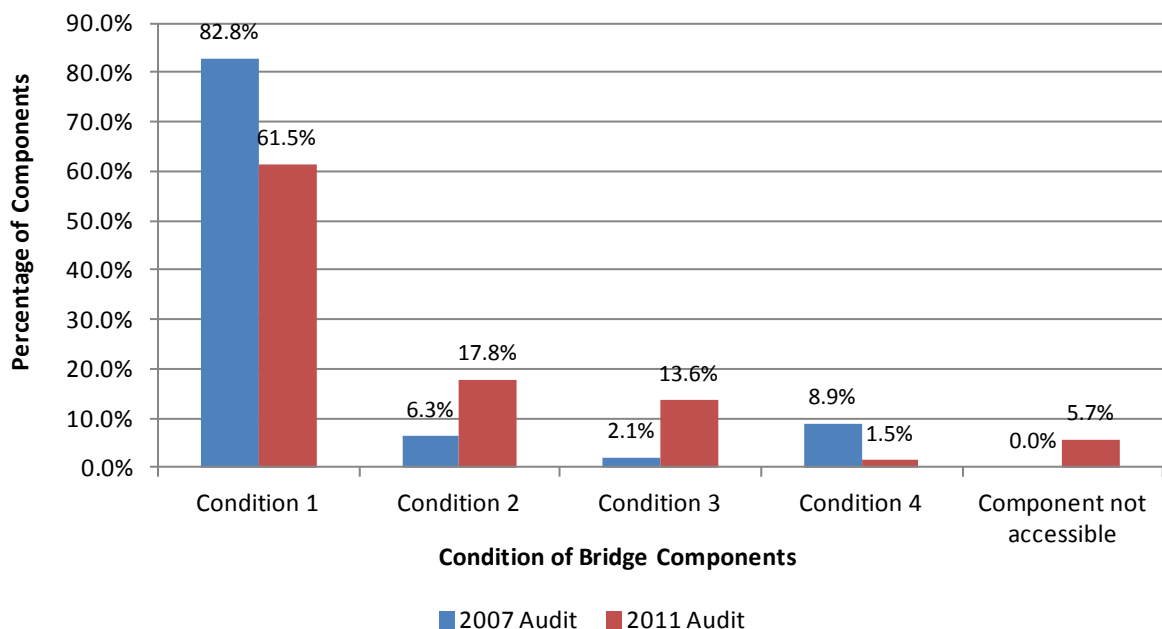


Figure 6 – Comparison of 2007 and 2011 Level 2 inspection data – average condition of components

In summary, the overall condition of Council's bridges and major culverts is Good to Fair, with no major problems or inherent risks to Council. The lack of overall condition 4 (Poor) and 5 (Failed) structures can be attributed to the maintenance and renewal of individual components carried out by Council on an ongoing basis.

Level 2 inspections recommend treatment options for components in condition states 3 or 4, and these components have typically been the focus of renewal works in the past. Based on the 2011 audit, 275 components require some degree of treatment, monitoring or attention. The recommended treatment options are summarised in the table below. The auditors recommended that all recommended actions be undertaken in approximately the next 2 years.

Treatment Option	Condition State 3	Condition State 4
	No. of components	No. of components
1. Do nothing	6	0
2. Maintain the member	112	1
3. Repair the member	110	10
4. Strengthen the member	0	0
5. Replacement or new installation	23	13
TOTAL	251	24

Table 10 – Treatment options for components fully or partially classified in condition 3 or 4 (2011)

It should be noted that there has been no substantial reduction in the percentage and number of components in condition states 3 and 4. Despite recent expenditure on maintenance and renewal works, the current estimated cost (from the audit) to treat all condition 3 and 4 components across Council's bridge and culvert network is approximately \$505,000. This compares to \$366,000 in 2007 (approximately \$412,000 in nominal terms). Funding adequacy and future requirements are discussed in Chapter 6.

3.4 Maintenance History

Routine Inspections

In accordance with Council's Road Management Plan, all bridges, culverts and boardwalks are inspected for hazards on a 6 month cycle, regardless of whether they are located in road reserve or on other parcels of Council land. The scope of the routine hazard inspections is documented in Council's Road Management Plan and is essentially consistent with the content of VicRoads Level 1 bridge inspections, as documented in the VicRoads Road Structures Inspection Manual 2011. Hazard inspections are recorded in Council's Work Order System (Lifecycle). Identified hazards that exceed Council's intervention levels automatically generate Work Orders to enable the hazard to be rectified. Analysis of data stored in the Work Order System shows that 100% of scheduled inspections in 2011 occurred on time.

Routine Maintenance

Council does not have a routine maintenance program for bridges, boardwalks and major culverts.

Reactive Maintenance

The Knox Work Order System (Lifecycle) monitors the delivery of Council's reactive maintenance service levels. Table 11 below summarises the source of maintenance requests received for the following relevant activities during the five year period January 2007 to December 2011:

- Road Bridge Maintenance (B&C-REA-072)
- Pedestrian Bridge & Boardwalk Maintenance (B&C-REA-073)

The table below indicates that there are only a small number of maintenance issues raised against bridges. Most issues are raised by customers. During the last three years, there have been no hazards identified by Council officers during the regular routine hazard inspections, which occur on a 6 month cycle. Some issues have been identified as a result of ad hoc inspections which occur randomly whenever staff undertaking other maintenance works within the municipality identify a potential hazard.

Issue Identified by	No. Issues Identified				
	2007	2008	2009	2010	2011
Road Bridge Maintenance (B&C-REA-072)					
Customer Request (including After Hours Call-outs)	0	3	3	2	1
Hazard Inspection	3	0	0	0	0
Ad hoc Inspection	2	2	3	1	0
Pedestrian Bridge & Boardwalk Maintenance (B&C-REA-073)					
Customer Request (including After Hours Call-outs)	11	5	4	8	14
Hazard Inspection	1	2	0	0	0
Ad hoc Inspection	2	2	1	1	1
TOTAL:	19	14	11	12	16

Table 11 – Reactive Maintenance - Source of Requests

Data source: Work Order System (LifeCycle) January 2007 to December 2011

The distribution of risks, associated with defects reported by customers during the period January 2007 to December 2011, is presented in Table 12 below.

Identified Risk	No. Issues Identified - Customer Requests Only				
	2007	2008	2009	2010	2011
Extreme	0	0	0	0	0
High	3	2	2	1	3
Medium	3	0	0	3	2
Low	1	3	0	0	0
No Hazard	4	3	5	6	11
Total	11	8	7	10	16

Table 12 – Public Safety Risks Attributed to Customer Requests (2007-2011)

It is worth noting that the majority of issues that are raised by the community ultimately end up being classified as “No Hazard”. In other words, on inspection or evaluation by Council staff:

- The defect observed did not exceed Council’s maintenance intervention levels (6 issues)
- Council does not have responsibility for maintenance of the reported defect (eg. the bridge is owned and maintained by others, but customers incorrectly perceive it to be the responsibility of Council) (6 issues)
- The reported defect was found to be a duplicate (i.e. the issue had already been raised and was being addressed under an existing work request) (9 issues)

Until 2011, the Work Order System did not require officers to indicate why an issue was assessed as “No Hazard”. Therefore, for the remainder of issues classified as “No Hazard” (8), it is difficult to analyse why the issue was classified as such. The recent upgrade to the Work Order System to provide validation in this field has facilitated better data collection and enabled more in depth analysis.

**Delivery of Maintenance Service Levels
Initial Assessment**

All requests for maintenance received by the Operations Centre are assessed before actioning. This includes assigning a public safety risk rating which determines the timing of risk mitigation works. All issues rated as Extreme or High risk require temporary protection works to mitigate the risk.

In terms of performance against initial assessment timeframes, the table below illustrates that during the period January 2007 to December 2011 a total of 75% of the 52 issues raised by customers were assessed within the target timeframes.

Reactive Maintenance Activity		Target Days for Initial Assessment	% Assessed on Time
B&C-REA-072	Road Bridge Maintenance	2	55.6%
B&C-REA-073	Pedestrian Bridge & Boardwalk Maintenance	2	79.1%

Table 13 – Initial Assessment Performance

Data source: Work Order System (LifeCycle) January 2007 to December 2011

Note: Only activities requiring initial assessment (i.e. issues arising from customer requests) are shown in the table.

Temporary Protection Works

Issues rated as an Extreme or High risk require Council to undertake temporary works to mitigate the risk. The table below illustrates that during the period January 2007 to December 2011, a total of 16 issues required temporary works. As can be evidenced in the table below, all but one temporary works issues were completed on time. This is a good result that indicates that the Works Services team responds promptly to potential high risk issues on the bridge network.

Reactive Maintenance Activity		Target Days for Temporary Protection Works	Number of Requests Assessed as Extreme or High	% Temporary Protection Works Completed on Time
B&C-REA-072	Road Bridge Maintenance	1 – Extreme 5 - High	8	100.0%
B&C-REA-073	Pedestrian Bridge & Boardwalk Maintenance	1 – Extreme 5 - High	8	87.5%

Table 14 – Temporary Protection Works Performance

Data source: Work Order System (LifeCycle) January 2007 to December 2011

Note: Only activities requiring temporary protection works in the given timeframe have been represented in the table.

Rectification Works

During the period January 2007 to December 2011, a total of 23 issues required maintenance works to rectify the issue identified. As can be seen in the table below, Council's performance in meeting its documented timeframes is generally sound. Given the low number of issues over a five year period, the percentage measure does not necessarily best reflect Council's performance.

Reactive Maintenance Activity		Target Days for Rectification Works	Number of Issues Requiring Rectification Works	% Rectification Works Completed on Time
B&C-REA-072	Road Bridge Maintenance	64	6	50.0%
B&C-REA-073	Pedestrian Bridge & Boardwalk Maintenance	64	17	82.4%

Table 15 – Rectification Works Performance

Data source: Work Order System (Lifecycle) January 2007 to December 2011

Overall, the performance of Council's reactive maintenance has been of a good standard. In essence, it is clear that there are very few bridge hazards identified which exceed Council's maintenance intervention levels.

In light of the fact that very few issues are raised during six monthly routine hazard inspections, there is an opportunity to review the frequency of these inspections at the time of Council's next Road Management Plan review.

3.5 Insurance Claims History

Insurance claims are managed by Council's Safety, Risk and Wellbeing team. Claims are separated into two categories:

- Public Liability – where a person has been injured or property has been damaged and the claimant is seeking damages from Council.
- Property – claims made for loss or damage to Council's infrastructure including building and contents.

Overall, bridges and culverts have not posed a significant insurance risk to Council.

Public Liability

An analysis was undertaken of all over-excess (greater than \$10,000) and under-excess public liability claims received in the 17 year period (from 1994 and 2011). Over-excess public liability claims are managed by Council's insurer MAV Insurance (formerly Civic Mutual Plus – CMP).

Claims received by Council relate to all aspects of Council activities and include claims arising from Council assets or from professional advice. As of August 2011, a total of 273 claims had been made against Council. Council's bridges and culverts have accounted for none of these claims.

A key point to note is that public liability claims against Council, with respect to personal injury, are expected to continue to be limited in the future. The main reason for this is changes made to relevant State Government legislation between late 2002 and early 2004 (Limitation of Actions (Amendment) Act 2002, Wrongs and Other Acts (Public Liability Insurance Reform) Act 2002, Wrongs and Limitation of Actions Acts (Insurance Reform) Act 2003, Wrongs and Other Acts (Law of Negligence) Act 2003). The legislative changes were intended to codify the law of negligence to shift the burden of truth to the plaintiff and broaden the base of defence against claims of negligence.

Despite the impact of legislative changes, and the absence of public liability claims relating to bridges and culverts, it is important that Council continues to maintain, renew and upgrade its bridge and culvert network to minimise public safety and property risks.

Property

Limited information was available for the analysis of property claims relating to bridges and culverts. Over-excess property claims (over \$5,000) are managed by JMAPP. No records of recent over-excess claims regarding Council bridges, boardwalks or major culverts could be found.

No recent under-excess claims appear to have been identified. It is important to note that all under-excess claims that relate to Council bridges and culverts are handled by the relevant Council team/unit (such as Works Services). These units undertake the necessary corrective actions including asset repair. Repairs are funded from the relevant department's annual operational budget.

3.6 Corporate Risk Register

Council's Corporate Risk Register lists risks relating to Council assets. These risks are identified from sources such as audits (internal and external), external reports, plans and strategies and annual business planning. The identification, assessment, evaluation, treatment and monitoring of risks are undertaken in accordance with Council's Integrated Risk Management procedure. The frequency of required reporting depends on the rating level assigned to each risk.

There are currently no identified risks reported in Council's risk register relating specifically to bridge assets.

Chapter 4 Understanding Community Expectations & Demand

4.1 Introduction

It is generally accepted that wherever Council provides a well-connected and maintained network of roads and paths community wellbeing is improved. Increased opportunities for social interaction and physical activity improve residents' health and sense of connectedness.

Council's bridge and culvert assets have been constructed to support Council's road, footpath and shared path network, whilst ensuring stormwater runoff is not obstructed. As a result, community expectations and demand for bridges and culverts typically arise from demand for improvements in the connectivity of Council's roads and/or pathways. Given this relationship, this Chapter summarises the services that these assets support and highlights how demand for transport improvements simultaneously places demands on Council's bridge and culvert network.

Council's Traffic & Transport team has primary strategic responsibility for ensuring that Council's footpath, shared path and road network meets community expectations within legislative and other practical constraints. This team therefore has responsibility to remain abreast of changes in all factors likely to affect community expectations and demand. The information presented in this Chapter is intended to complement ongoing strategic demand management and integrated transport planning work undertaken by the Traffic & Transport team.

4.2 Relevant Services

The following services make use of Council's bridges, boardwalks and culverts. Council's Service Planning Framework lists and defines services provided by Council to the community. A service owner has been defined for each service and is essentially the department or team that has primary responsibility for defining and communicating the strategic direction and objectives of the service.

Service	Objective	Current Service Owner
Transport and Traffic	Provide local traffic management and advocacy for broad transport choices for a range of traffic and transport services provided by Council.	Traffic & Transport
Integrated Water Management	Provide technical and strategic support and drainage advice/drainage services related to development and residential enquiries and the provision of integrated water management.	Project Delivery

Table 16 – Relevant Council Services

Provision of Council assets that support these services provides tangible and intangible benefits that include the ability for people to move freely around and through the municipality as well as improved wellbeing resulting from unobstructed waterways. Intangible benefits are difficult to measure, but are likely to be felt by the community.

In order to effectively deliver assets that meet community expectations, each service owner must aim to ensure that all Council assets, people and processes work in a manner that supports delivery of desired service objectives.

4.3 Relevant Service Planning Documents

The Traffic & Transport team generally considers the demand for Council's road and path networks. Decisions regarding the road and path networks have implications for demand for bridges and culverts. Strategic documents that guide transport planning are listed below.

- Integrated Transport Plan
- Bicycle Plan
- Pedestrian Plan.

The current versions of these documents consider the promotion of sustainable transport options as well as broadly identifying missing links. These documents do not specifically detail the following important elements:

- Demand for bridges, which may arise as missing links in the path and road networks
- Desired levels of service.

It is expected that future reviews of these documents may provide more details regarding demand and Council's current and desired levels of service.

4.4 Levels of Service

Levels of service essentially act as management targets that facilitate decision making. They define the standard at which Council aims to provide assets for community use. The setting of service levels enables Council to balance conflicting priorities and assess the performance of Council's asset management strategies.

In recent years, the Local Government and Planning Ministers' Council has developed a nationally consistent framework for asset planning and management. Framework 2 (Asset Planning and Management) highlights the Federal Government's intention for State and Territory governments to develop mechanisms to ensure that local Councils:

- Define levels of service in consultation with the community
- Establish cost and quality standards for services delivered from Council assets
- Regularly review services in consultation with the community to determine the financial impact of a change in service levels.

To support delivery of the National Framework objectives, the IPWEA International Infrastructure Management Manual (IIMM) (2011) describes levels of service as a mechanism that sits between higher level corporate objectives and feeds down into more operational objectives. It defines levels of service as indicated below and recommends defining both *customer* and *technical* performance measures to monitor delivery.

- **Levels of Service** – What the organisation intends to deliver
- **Customer performance measures** – How the customer receives or experiences the service. These measures are generally those that would be used in public documents and should be aimed at the lay person.
- **Technical performance measures** – What the organisation does to deliver the service. These measures support customer measures and tend to be used internally to measure performance against service levels.

The IIMM suggests that effective level of service statements:

- Describe the outputs the organisation intends to deliver to customers
- Commonly relate to service attributes such as quality, reliability, responsiveness, sustainability, timelines, accessibility and cost
- Should be written in terms the end user can understand and relate to
- Should drive the selection of performance measures.

It is recognised that defining the level of service for the services that Council's bridge assets support is difficult. The level of service that can ultimately be provided by Council is affected by factors such as:

- Legislative requirements
- Council's strategic mission and objectives (as discussed in Chapter 1)
- Availability of resources and financial constraints

To date, Council has not documented *customer* service levels. It is expected that future revisions of Council's service planning documents will incorporate customer service levels in a manner consistent with the objectives of the National Framework and be guided by the IIMM.

Current *technical* service levels for bridges and culverts have been documented and are discussed in Chapter 5. They are limited to inspection and maintenance service standards that have been documented in Council's Road Management Plan (and reproduced in Attachment 3). Performance regarding delivery of these service levels is monitored via internal annual audits that randomly assess compliance with all aspects of the Knox Road Management Plan.

4.5 External Stakeholders

Effective asset management requires Council to gain an understanding of what all key stakeholders value and to use this information to provide a balanced response to the needs of all.

Table 17 outlines key community stakeholders that affect the provision, management and use of Council's road and path network and in doing so affect the provision, management and use of Council's bridges, boardwalks and major culverts. Each group has different needs and expectations and is likely to use different parameters when judging Council's performance.

Stakeholder	Influence on Management of Bridges, Boardwalks & Major Culverts
Local residents and businesses	Influence standard of maintenance undertaken, advocate for new or upgraded structures and report safety/hazard concerns
People passing through the municipality	Report safety/hazard concerns
Council's Insurers	Require Council to inspect, maintain and repair Council assets in a manner consistent with the Road Management Plan
Neighbouring Councils VicRoads Parks Victoria Melbourne Water	Demarcation agreements are in place to ensure maintenance and renewal responsibilities for all bridges are clearly defined including bridges and culverts that have been constructed: <ul style="list-style-type: none"> • at the municipal boundary • on land managed by Parks Victoria or Melbourne Water • on land where VicRoads is the responsible authority

Table 17 – External Stakeholders

4.6 Approach to Understanding Community Expectations

The Victorian Auditor-General's report *Management of Road Bridges* suggests that at the most basic level, the community expects bridges to provide the means to make journeys that pass over obstacles such as rivers and railway lines. Road users also want bridges to be:

- Available – designed and maintained so they remain open
- Safe – structurally sound and configured in a way that adequately manages the risk of crashes, injuries and deaths
- Free from congestion – having sufficient width to carry vehicles without making them slow or queue
- Suitable for efficient freight movement – strong, wide and high enough to carry all legal trucks
- Environmentally sustainable – minimise the adverse effects on the environment
- Cost-effectively maintained – delivering required levels of service for the lowest practical cost for present and future road users

Other drivers of community satisfaction with regard to Council bridges, boardwalks and major culverts are assumed to include:

- Council's responsiveness to asset repair issues raised
- Asset condition
- Aesthetics

Council investigates community expectations in a number of ways:

- Informal interactions between Council officers and the community as part of normal daily activities.
- Review of community requests regarding maintenance and the connectivity of Council paths and roadways
- Community consultation undertaken during the development of strategic documents

4.6.1 Investigation of Community Needs

Missing transport links are largely addressed in related planning documents and refer to either the road or pathway asset classes (rather than bridges specifically). Many community requests regarding new bridges are typically referred to the Traffic & Transport team.

Council's approach to investigation of community needs regarding bridges can be summarised via the Henderson Road Bridge assessment example. In this particular case, the bridge was identified as a possible 'missing link' in the late 1990s. It was subsequently recommended, as a result of community consultation, in the Rowville-Lysterfield Integrated Local Plan (2003). Capital works business cases were prepared in 2003, 2004 and 2006 (under Road & Bridge Construction and Major Projects) in an attempt to secure funding. To date, significant construction costs (currently estimated at \$3.5M) have prevented this project from attaining Council funding approval. Reassessment of demand is now required.

Similarly, a missing link in the Principal Bicycle Network between Eastlink and Dandenong Creek has resulted in demand for a shared path and pedestrian bridge along Burwood Highway. At the request of VicRoads, Council has submitted a prioritised listing of Arterial Road Projects for funding consideration. This particular

pathway and bridge project was scoped and submitted under the Bicycle Facilities program. The total project is estimated at \$1.1M, with the bridge constituting approximately \$250,000.

4.6.2 Analysis of Customer Request Trends

The table below summarises the history of customer requests for maintenance.

Issue Identified by	No. Issues Identified				
	2007	2008	2009	2010	2011
Road Bridge Maintenance (B&C-REA-072)					
Customer Request (including After Hours Call-outs)	0	3	3	2	1
Pedestrian Bridge & Boardwalk Maintenance (B&C-REA-073)					
Customer Request (including After Hours Call-outs)	11	5	4	8	14
TOTAL:	11	8	7	10	15

Table 18 – Customer Requests for Maintenance

Data source: Work Order System (LifeCycle) January 2007 to December 2011

The low number of community requests (particularly for road bridge maintenance) can be interpreted as an indication of community satisfaction with the current maintenance service levels.

It is worth noting that the requests for Pedestrian Bridge & Boardwalk Maintenance have been increasing since 2009, although still low in the context of all Council assets. The majority of requests relate to issues with the timber bridge decking (eg. missing/broken boards) or slippery surfaces. Council's approach to addressing these issues is discussed in Chapter 5.

The review of customer requests suggests a generally a high level of satisfaction with Council's bridge network. Issues that do arise are typically readily resolved and are not of significant structural concern.

4.7 Current Approach to Predicting Future Demand

Council delivers services and manages its asset portfolio within a complex operating environment which influences its approach to the provision and management of bridges, boardwalks and major culverts within the municipality.

Council's Integrated Transport Plan (and to a lesser degree its Bicycle Plan and Pedestrian Plan) demonstrate Council's current approach to considering the factors that influence the service of Transport and Traffic. Given that the municipality is largely established, Council does not formally predict demand for bridge assets.

Council's Strategic Asset Management Plan makes informal comment on the potential future demand for boardwalks as a means of providing pedestrian and/or shared paths through significant vegetation areas. The provision of these structures continues to be assessed on an as needs basis. This asset management plan

attempts to build on the preliminary work presented in the Strategic Asset Management Plan and presents a broader understanding of potential demand drivers for these assets.

4.7.1 Review of Asset Utilisation Data

Council does not proactively measure the traffic volumes across Council bridges and culverts. Measurement occurs only when investigations are undertaken in response to traffic concerns raised by the public. To date, such investigations have not demonstrated a need to adjust the assets.

4.7.2 Factors Influencing Demand

Council recognises that community expectations and demand are affected by changes in the operating environment. The table below highlights how some factors that may affect demand for the roads and pathways that bridges and culverts support. It is expected that future revisions of Council's service planning documents will consider these factors and their implications in more detail.

Factor	Description	Expected Impact
Built Environment		
Increasing Dwelling Density	<p>Increasing density of dwellings resulting from subdivision of residential lots and Government policy (Melbourne 2030 & Melbourne @ 5 million plans)</p> <p>(ABS Forecast provided by ID Consulting predicts a 17% increase in the number of dwellings in the City of Knox between 2010 and 2030. The number of dwellings is predicted to increase from 55,993 to 65,556)</p>	<p>Increasing numbers of people, bikes and vehicles will be using the roads and paths within the municipality.</p> <p>Additional links to improve connectivity and reduce peak traffic flows may be required. In some instances, near the creek corridors, bridges would be required.</p>
Ageing Assets	Deteriorating condition of assets	Increased demand for timely asset renewal and upgrade as assets begin to show increasing signs of wear and tear.
Technology Changes	<p>Increasing numbers of people are able to work from home and have a lesser reliance on the road network.</p> <p>Improvements in computer software and construction materials and methods</p>	<p>Reduced morning and evening peak traffic loads.</p> <p>Improvements in ability to monitor asset performance and analyse data.</p> <p>Potential improvements in the durability, life and aesthetics of new assets.</p>
Natural Environment		
Climate Change	More intense and frequent storms and more severe drought periods.	More challenging conditions for the maintenance of Council assets.

Factor	Description	Expected Impact
		<p>Increased potential for scouring around the foundations and approaches of bridges and structures during long periods of drought and intense storm events.</p> <p>Potential for trees to fall and damage existing structures during significant storms.</p>
Social & Cultural Environment		
Population Growth	Uneven growth, with increases focused in the suburbs of Scoresby and Knoxfield.	<p>Increasing numbers of people, bikes and vehicles will be using the roads and paths within the growth areas of the municipality.</p> <p>Additional links to improve connectivity and reduce peak traffic flows may be required in some suburbs. In some instances, near the creek corridors, bridges would be required.</p>
Environmental Health & Wellbeing Awareness	Increasing awareness of the health, fitness & environmental benefits associated with walking & cycling	Increasing popularity and demand for alternative modes of transport may result in reduced traffic loads on road bridges and increased demand for pathways. In some instances, near the creek corridors, bridges would be required.
Legal & Political Environment		
National Asset Management Assessment Framework	<p>Introduction of National Reporting Frameworks:</p> <ul style="list-style-type: none"> • Criteria for Assessing Financial Sustainability • Asset Planning and Management • Financial Planning and Reporting 	<p>Increased asset reporting requirements.</p> <p>Council will need to demonstrate improved asset knowledge and asset data management.</p> <p>There is an expectation that Council can demonstrate clear links between service levels and current and future community expectations.</p>
Road Management Act	Places obligations on Council as a responsible road authority to inspect repair and maintain public roads and	Ongoing inspections, maintenance and repair of bridges in an auditable way to meet legislative requirements

Factor	Description	Expected Impact
	road related assets in accordance with its Road Management Plan	

Table 19 – Summary of Factors Influencing Demand

4.8 Demand Management Strategies

Demand management is the notion that asset solutions (ie. building new infrastructure) are not necessarily the only way to satisfy community demand. Modifying customers’ demands, and hence funding requirements, can be achieved by optimising the utilisation of existing assets or through the consideration of operations, regulations, incentives, education or substitution.

In order to improve the local environment and influence demands on the municipal road network (and associated bridges and culverts) Council is involved in community education campaigns to encourage car pooling, walking and cycling and advocates for improved public transport options. The Draft Open Space Plan recommends the use of way-finding signage to guide movement through the existing paths in the municipality.

Given that there are no apparent (or reasonably foreseeable) capacity issues regarding Council’s bridge assets, demand management strategies, specifically related to this asset class, are not considered necessary at this time.

Chapter 5 Integrated Service & Asset Lifecycle Management

5.1 Introduction

The Service Delivery Lifecycle Model, illustrated in Figure 7 below, forms part of Council's Asset Management Policy. The model aims to demonstrate the integrated relationship between service and asset management. It highlights the fact that Council assets are only required to support services that exist to address community needs. A coordinated approach to managing all phases of the service and asset lifecycles is considered necessary to enable delivery of outcomes that feasibly and sustainably meet community expectations.

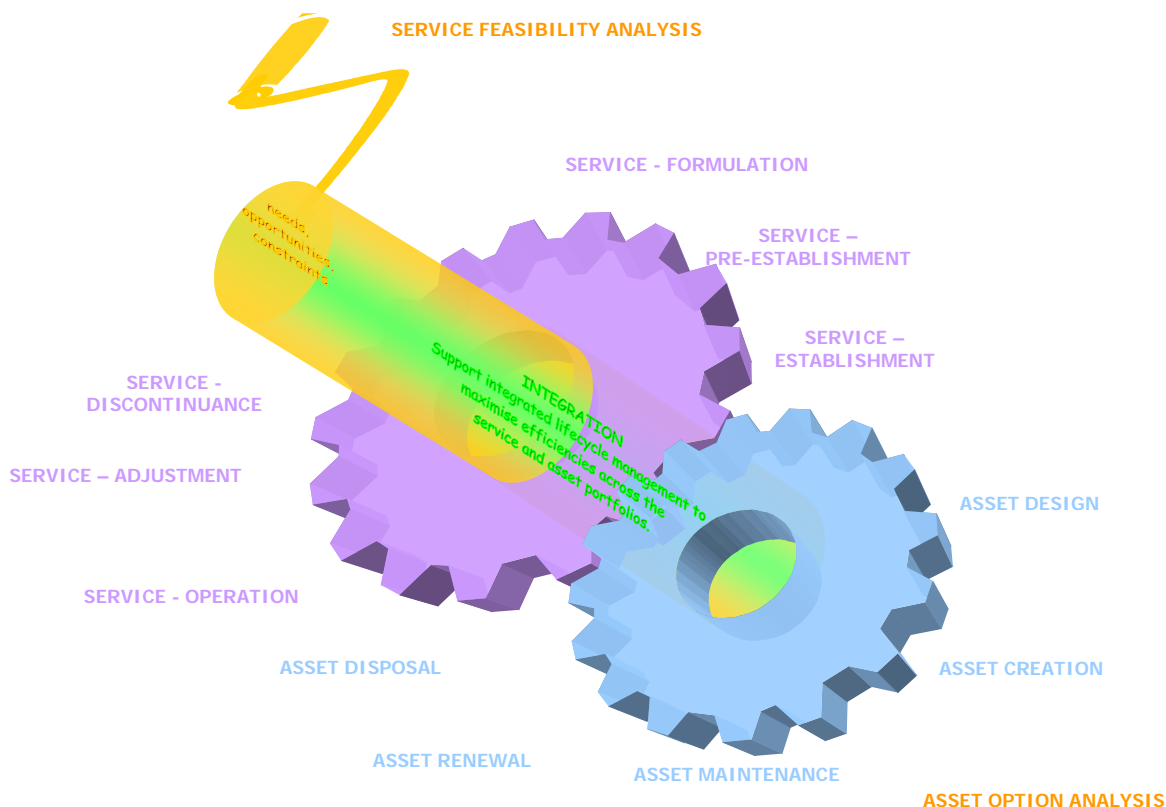


Figure 7 – Service Delivery Lifecycle Model

In this Chapter, the lifecycle model is used as a framework for the assessment of Council's current approach to the management of bridges and culverts. Opportunities to improve current work practices are identified with a view to improving the outcomes experienced by the community.

5.2 Lifecycle Management

In this section of the Plan, the management objectives for each phase of the service and asset lifecycle are presented with a view to identifying gaps in Council's current approach.

5.2.1 Horizon Scanning

Gain an understanding of Council's internal and external environment. Use this knowledge to define current service demand, community needs and expectations and predict future changes.

Horizon scanning information is formally reported by the Corporate Planning & Performance department to Council management, at a high level, as part of Council's annual planning process. When developing annual business plans, all managers are expected to consider the implications of the information provided. Informally, officers at all levels of the organisation scan the environment within the sector they operate and reactively adjust their work processes and services accordingly.

As noted in the previous chapter, Council's Integrated Transport Plan (and to a lesser degree its Bicycle Plan and Pedestrian Plan) demonstrate Council's approach to considering the factors that influence Transport and Traffic. The Knox Stormwater Drainage Strategy and the Knox Water Sensitive Urban Design & Stormwater Management Strategy demonstrate Council's approach to considering the factors that influence Integrated Water Management.

5.2.2 Service Lifecycle

The service lifecycle phases are illustrated in Figure 8. Management objectives for each phase are outlined in Table 20. It is not the intention of this Plan to act as a service planning document.

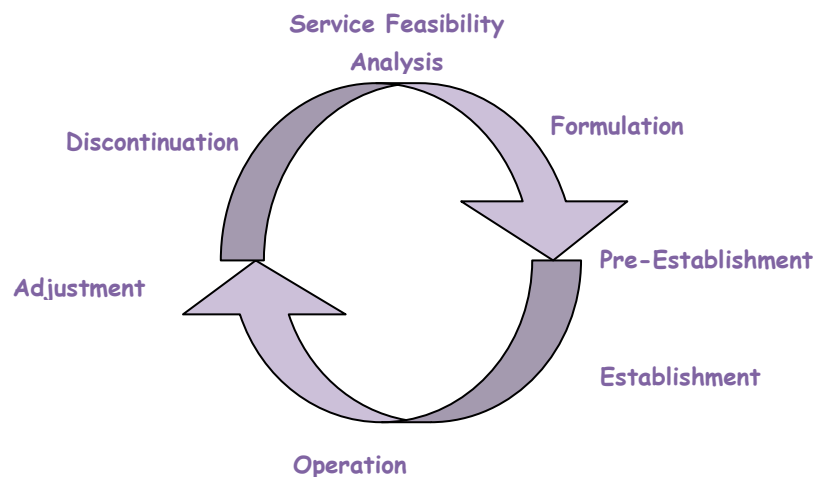


Figure 8 – Service Lifecycle

Phase	Objectives
Service Feasibility Analysis	<p>Assess the appropriateness of current services.</p> <p>Determine the best approach for Council to meet current and future community needs. Define service objectives so that analysis can be undertaken to compare a range of options including:</p> <ul style="list-style-type: none"> ▪ Introduction of a new service ▪ Alteration of an existing service (or aspects of a service) ▪ Discontinuation of an existing service (or aspect of a service)
Formulation	Broadly define all requirements to enable service delivery. Translate detailed service requirements into physical asset needs and measurable service standards and targets.
Pre-establishment	<p>Design the organisation structure, systems, standards, skill sets, and performance measures required for operation and monitoring of the service.</p> <p>Communicate service delivery objectives to all stakeholders.</p>
Establishment	Set up/ revise the operating structure, systems, standards, resources and performance measures required to enable operation and monitoring of the service.
Operation	Operate and monitor delivery of the service to sustainably meet community needs.
Adjustment	<p>Undertake a service feasibility analysis to determine whether the current service is still aligned with community expectations and the operating environment.</p> <p>Identify service and asset adjustments required to ensure service objectives are met.</p> <p>Adjust internal service agreements, organisation structure, systems, resources and performance measures to ensure service objectives can be monitored and met.</p> <p>Communicate adjustments to affected parties.</p>
Discontinuation	Ensure Council has a considered approach to the termination of services (or aspects of a service) no longer required in a manner that minimises community disruption.

Table 20 – Service Lifecycle - Management Objectives

In the context of the service lifecycle, it is fair to say that the current services of Integrated Water Management and Transport and Traffic have been established and are primarily in the operation phase. Formulation, establishment and adjustment of these services has been informal.

Council's Drainage Asset Management Plan refers to Council's approach to the management of the service of Integrated Water Management, which sometimes includes the use of culverts that support Council's road and path network.

The Corporate Planning team is currently in the process of developing a template to assist all service managers with the preparation of service plans. It is expected that when service plans have been developed and revised in future years they will document Council's current and desired approach to the management of each phase of the service lifecycle.

5.3 Asset Lifecycle Management

Figure 9 below, illustrates the asset lifecycle. This section of the Plan describes Council’s current approach to bridge, boardwalk and major culvert asset management with a view to identifying improvement opportunities. Current technical service levels are also indicated.

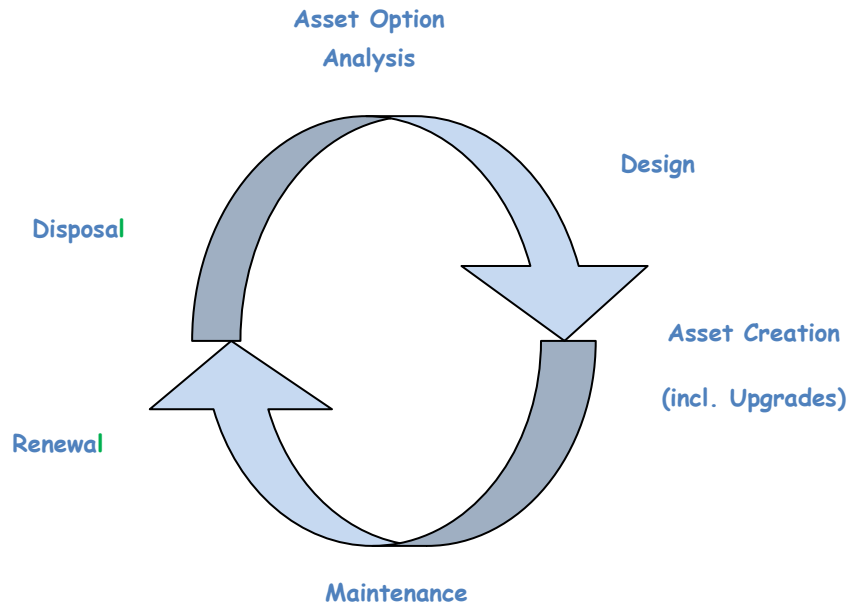


Figure 9 – Asset Lifecycle Phases

5.3.1 Asset Management Roles & Responsibilities

Table 21 below, summarises the Sustainable Infrastructure department’s understanding of current asset lifecycle responsibilities.

Asset Class	Current - Responsible Team/Unit					
	Asset Lifecycle Phase					
	Asset Option Analysis	Design	Creation (incl. Upgrades)	Maintenance	Renewal	Disposal
Bridges	Traffic & Transport Urban Planning (external)	Project Delivery Urban Planning (external)	Project Delivery Urban Planning (external)	Works Services	Construction	-
Major Culverts	Project Delivery Urban Planning (external)	Project Delivery Urban Planning (external)	Project Delivery Urban Planning (external)	Works Services	Construction	-
Boardwalks	Open Space & Landscape Design Urban Planning (external)	Open Space & Landscape Design Urban Planning (external)	Parks Services Urban Planning (external)	Works Services Parks Services	Construction	-

Table 21 – Asset Lifecycle – Current Asset Management Responsibilities

a) Asset Option Analysis

Management Objective – Consider the asset requirements necessary to support objectives of all relevant services. Undertake analysis to ensure the best asset solutions are provided to meet service needs within physical, financial, legislative and other constraints.

Council creation of a new bridge, boardwalk or culvert (that acts to support a road or pathway) is rare. As a result, there is currently no prescribed approach for undertaking Asset Option Analysis.

The decision regarding whether a culvert, bridge or boardwalk is preferable at any given location, is generally governed by the functional and structural load requirements of the associated road or path. Aesthetics, hydraulic and environmental factors are also considered. From a stormwater management perspective, bridges are generally considered to have less impact. However, they are also typically more expensive to design, construct and maintain. As a result, culverts are generally considered to be the most cost-effective option.

b) Design

Management Objective – Prepare requisite documentation to ensure delivered assets meet service needs, match expected service life and are able to be created, maintained and renewed in a sustainable manner.

Technical Service Levels – There are currently no technical design standards. Each bridge asset is considered unique and designed accordingly. Standard culvert designs from VicRoads guidelines and manufacturers' charts are utilised.

As noted previously, Council creation of a new bridge, boardwalk or culvert is rare. When it occurs, it is generally a part of an open space improvement or pathway improvement project. Contributed bridge assets (through subdivisional developments) are also rare. In the case of contributed assets, the design is approved by Council through the planning referral process. In this way, relevant stakeholders (eg. Open Space & Landscape Design, Parks Services, Asset Preservation) have the opportunity to review the design drawings and specifications.

When constructed by Council, bridge design is generally funded via the capital works program. It involves two distinct phases:

- Strategic/Preliminary Concept Design
- Advanced/Detailed Design

Both phases tend to be managed by the program coordinator responsible for the relevant capital works program. Design is either outsourced (most bridges) or undertaken by internally by Project Delivery (other structures).

In the case of boardwalks, the concept design phase tends to involve master planning, which occurs for high profile sites, such as the development of Stamford Park. The current process includes considerable consultation with internal and external stakeholders.

Depending on the complexity of the project, the detailed design documentation may include engineering drawings and specifications. It is rare for the designs to include detailed consideration of future maintenance needs and lifecycle costs.

Although there are currently no design standards for Council's bridge assets (as they are generally unique in nature), a recent review of Council's bridge inspection data has revealed that surface slipperiness is a common issue that could be addressed via the introduction of a design standard.

Works Services (in conjunction with Traffic & Transport) is currently testing a means of reducing slipperiness by way of a product applied to the deck at a number of sites that are heavily shaded. These test sites include B26 (Blind Creek – High Street), B67 (Manson Reserve, Wantirna) and B69 (Bayswater Park). It is recommended that results of these test sites be presented to the Standards Committee and be used as a trigger to adjust Council design standards for new structures, if appropriate. A possible solution may be the introduction of fibreglass grating for pedestrian bridge decks in particular locations. Successful results of the trial may also justify the need for an increase to bridge maintenance funding to undertake these works on a regular basis.

c) Creation (incl. Upgrades)

Management Objective – Ensure acquired and constructed assets fit with service needs within physical and financial constraints.

New assets are created as a result of developer contributions or Council's capital works program.

Developer Contributions

Given the extent of existing development, new bridges, boardwalks and major culverts are rarely contributed by private developers. In the instances of contributed assets, information is provided via the existing subdivision handover process.

Capital Works Program

Bridges, major culverts and boardwalks may be created and upgraded as a result of capital works projects delivered under the following programs:

- 4006 – New Footpath Construction Program and Pedestrian Facilities
- 4007 – Road and Bridge Construction
- 4009 – New Bicycle/Shared Paths
- 4014 – Unstructured Recreation
- 4015 – Place Management

Project ranking criteria have been established for all programs that may involve the creation of a bridge. Ranking is undertaken by the relevant program coordinator and funding decisions are made by Council as part of the annual budgeting process.

Two new pedestrian bridges are being constructed during 2011/12 as part of shared path and footpath upgrades. When projects are completed, the Asset Strategy team records new assets in Council's asset register and GIS. The current process relies on asset handover information being provided to the Asset Strategy team by the capital works program manager in accordance with Council's capital works handover process (refer Attachment 2).

Since 2009, implementation of Council's Asset Management Policy and Untied Funding Allocation Policy has meant that Council's capital works process includes project ranking and ensures lifecycle funds are allocated to enable sustainable future maintenance and renewal of created and upgraded assets.

d) Maintenance

Management Objective – Preserve assets to ensure they continuously meet service expectations. Routinely inspect the asset for defects and act to repair assets to mitigate potential risks and ensure the asset is able to achieve its expected useful life

Technical Service Levels – Inspection and Maintenance service levels for bridges, boardwalks and major culverts are documented in Council's Road Management Plan and reproduced in Attachment 3.

Maintenance and inspection activities and frequencies have been developed using risk management principles defined in Council's Road Management Plan. Works Services is responsible for the inspection of all Council bridges, boardwalks and major culverts located within the municipality. The Works Services team is also responsible for the maintenance of these assets with the exception of those found in the Arboretum (which has a dedicated maintenance budget and crew with responsibility for all assets on this unique site).

In addition to undertaking the hazard inspections, using Council's Works Order System (Lifecycle) in accordance with Council's Road Management Plan, Council's Works Services team also completes the VicRoads Level 1 hardcopy inspection forms – as such, there is some duplication of effort. There is also the risk of hazards being documented on the paper based VicRoads Level 1 inspection forms and not being recorded electronically (hence preventing Work Orders from being created to address the issues identified). To address this risk, Council's inspectors should be instructed to ensure that all issues identified on hardcopy forms must be entered into the Work Order System in order to trigger the requirement for an asset repair (or Level 2 inspection). In recognition of the fact that Council's hazard inspections essentially meet the requirements of VicRoads Level 1 inspections (as already agreed at the time of the last Road Management Plan review), Council should consider ceasing the hardcopy reporting of Level 1 inspections.

As noted previously, recent inspections and customer complaints have identified a number of sites that were considered to be slippery when wet. This potential hazard is not included in the current Road Management Plan inspection program. It is recommended that it be added when the Plan is reviewed in 2013. In the interim, it is recommended that the defect be added to the defect list that is provided in the Work Order System and used by Council's routine hazard inspectors when undertaking inspections

A review of condition audit data collected in 2011, and summarised in Chapter 3, suggests that there is some opportunity to expand on the current maintenance activities managed using Lifecycle. It is recommended that consideration be given to the introduction of routine and/or reactive maintenance activities to be undertaken by the Parks Services team for:

- Clearing of debris and vegetation in waterway
- Batter Erosion management

e) Renewal

Management Objective – Monitor asset condition. Replace assets in a timely manner to ensure expected asset condition and functionality is continuously provided throughout the life of the service.

Technical Service Levels – There are currently no technical service levels relating to renewal. Proposed outcomes are detailed in this section.

Bridges, major culverts and boardwalk renewals are funded under the Capital Renewal Program 1000: Bridges. The program is administered and delivered by the Construction team.

As discussed previously, condition data is collected via Level 2 Vicroads Bridge Inspections. These inspections are currently scheduled to occur on a two year cycle. If warranted based on the audit results, higher level inspections are undertaken as recommended by the auditor.

To date, Level 3 inspections have not been required.

Council's renewal program is driven by the results of the Level 2 Inspections – which include recommended works and timelines for completion of each recommended action. Renewal ranking criteria for bridges have not been fully developed and utilised in the past.

The table below proposes an updated set of renewal ranking criteria to incorporate hierarchy, condition, remaining life and presence of guardrail issues in order to prioritise expenditure within budget constraints. The primary intention of these criteria is to address bridge components that are in condition state 3 or 4 (according to the VicRoads standards) and in the process, optimise the life of these assets. In essence, this summarises Council's technical service level relating to renewal – to ensure bridge components continue to be maintained in condition state 1 and 2.

Renewal Ranking Criterion¹	Score
1. Hierarchy A	
Road Bridge	15
Road Culvert	12
Pedestrian Bridge	10
Pedestrian Boardwalk	10
Pedestrian Culvert	6
2. Hierarchy B	
Link Road	15
Collector Road	14
Commercial Footpath	14
Shared Path	14
Industrial Road	12
Key Footpath	12
Reserve Footpath	12
Access Road	10
Unsealed Road	10
Local Footpath	10
Industrial Footpath	10
3. Remaining Life	
≤ 5 years	15
> 5 years	0
4. Average Percentage of components in Condition State 4	
>30%	30
25–30%	25
20–25%	20
15–20%	18
10–15%	16
5–10%	12
0.1–5%	10
0%	0
5. Average Percentage of components in Condition State 3	
>30%	20
25–30%	18
20–25%	15
15–20%	12
10–15%	9
5–10%	6
0.1–5%	3
0%	0
6. Guardrail Issues²	
Yes	5
No	0
TOTAL	100

Table 22 – Proposed renewal ranking criteria

Notes:

1. If a Level 3 inspection is required for any bridge, the recommendations resulting from a Level 3 inspection will be given priority and override the prioritisation calculated using the above ranking criteria

2. The audit identified a number of guardrail issues in 2011. This criterion has therefore been added to the renewal ranking criteria to ensure that these issues are addressed when other bridge renewal works are undertaken.

Disposal

Management Objective – Ensure assets that have no current (or foreseeable future use) are removed from Council's asset portfolio.

Financial sustainability requires a balance between the maintenance, renewal and disposal of existing assets and the delivery of new and upgraded assets. The purpose of asset disposal is therefore to ensure Council resources are not spent on maintaining and renewing assets that are no longer required. Effective asset disposal enables Council to use its limited resources for maximum community benefit.

In practice, disposal of bridges, boardwalks and major culverts does not occur as these assets are considered essential to the connectivity of Knox's road and path network.

Council's Asset Management Policy is due for review in 2013 and it is expected that Council's policy on asset disposal (including bridges) will be expanded further in this document.

Chapter 6 Financial Sustainability

6.1 Introduction

In pursuit of good governance, Council must ensure all bridges and boardwalks are managed in a way that influences and caters for community demand. Funding allocations at each stage of the lifecycle impact the standard to which Council assets perform.

6.2 Lifecycle Cost Components

Councils are expected to have the capacity to manage their existing infrastructure into the future. Sustainable asset management is therefore focused on the provision of adequate renewal and maintenance funding.

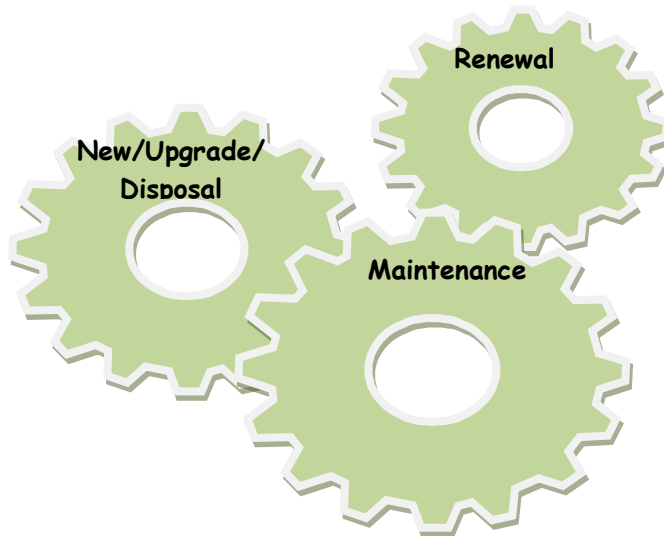


Figure 10 – Lifecycle Cost Components

Financial sustainability requires a balance between the delivery of new assets and the maintenance, renewal or disposal of existing assets. Increasingly, Councils are required to demonstrate that their asset portfolio is commensurate with community demand for the services that the assets support. Identified surplus assets should therefore be disposed, to reduce exposure to liabilities associated with asset ownership. Retained assets must be maintained and renewed to provide the desired level of service.

6.3 Funding Sources

Council has access to a number of funding sources to support delivery of this Bridge Asset Management Plan. Funding sources include:

- Rates
- Federal and State Government Grants
- Private and Public Partnerships
- Special Charge Schemes
- Borrowings
- Earnings from Asset Disposals

Council's Asset Management Policy recommends that Council proactively seek grants and partnership opportunities, as well as consider the disposal of surplus or obsolete assets, to supplement investment in asset provision and management.

6.4 Financial Model

The financial model compares existing funding arrangements with two alternative scenarios. The purpose of the model is to analyse the appropriate level of funding required to deliver these assets to the community safely and to the level of service expected. The model is most critical from the perspective of renewals. Using the present condition distribution of the asset as a starting point, the model calculates the renewal expenditure required to retain a desired minimum asset condition (in this case, to ensure bridge components remain in VicRoads condition state 1 or 2). The following assumptions have been made:

- Time Period – the model analyses asset performance over a 20 year period
- Asset Growth Rate – 0%
- Maintenance Costs – the starting point for prediction of annual maintenance funding requirements is the current maintenance expenditure level of \$20,912 (based on 2011/12 financial figures)

The table below summarises the scenarios modelled.

Service Delivery Standard			
	Scenario 1 – Status Quo	Scenario 2 – Medium	Scenario 3 – High
New/ Upgrade	Fund in accordance with Long Term Financial Strategy and Capital Works Program (adjusted for inflation). Assumes funding for Corhanwarrabul Creek design in 2012/13 and no forecast funding thereafter.		
Renewal	Fund in accordance with Long Term Financial Strategy and Capital Works Program (adjusted for inflation).	Fund the following: <ul style="list-style-type: none"> • Address all components in condition state 4 in 2 years (and allow for same future rate of repair) • Address all components in condition state 3 in 4 years (and allow for same future rate of repair) • Address all guardrail issues in 3 years (one off funding) 	Fund the following: <ul style="list-style-type: none"> • Address all components in condition state 4 in 2 years (and allow for same future rate of repair) • Address all components in condition state 3 in 3 years (and allow for same future rate of repair) • Address all guardrail issues in 2 years (one off funding)

Service Delivery Standard			
	Scenario 1 – Status Quo	Scenario 2 – Medium	Scenario 3 – High
Maintenance	Fund in accordance with Long Term Financial Strategy (adjusted for inflation). Assumes no change to current maintenance funding levels.	Status quo funding plus: <ul style="list-style-type: none"> Allow for introduction of annual activity to apply non-slip products to timber deck surface Allow for introduction of maintenance activities to clear debris and maintain batters 	Status quo funding plus: <ul style="list-style-type: none"> Allow for introduction of annual activity to apply non-slip products to timber deck surface plus additional funding over 3 years to address backlog Allow for introduction of maintenance activities to clear debris and maintain batters
Operation	No change	Fund to allow introduction of all Improvement projects over a 3 year period. Projects to be absorbed internally except where external resources are specifically required.	Fund to allow introduction of all Improvement projects over a 3 year period, with extra external resources assumed for all projects.

Table 23 – Summary of Model Funding Scenarios

Scenario 1 – Status Quo

This scenario involves Council continuing to fund all phases of asset management in accordance with its current Long Term Financial Strategy, Capital Works Program and existing expenditure profiles.

Scenario 2 – Medium

The medium scenario makes no recommendation for any new or upgraded bridges.

The rate of asset renewal under this scenario has been based on the assumption that a similar magnitude of components will be identified in future audits as being in condition state 3 or 4. In this instance, it is difficult to undertake traditional asset degradation modelling, as bridge renewal typically constitutes the renewal of individual components rather than entire structures. As a means of verification, the data has also been modelled in the Moloney renewal modelling software (as used by the MAV STEP program). This approach essentially assumes each component of a structure deteriorates at the same rate, so it too is not an ideal tool. Comparison of renewal projections can be seen in Figure 13.

This medium funding scenario also assumes that all guardrail issues raised during the 2011 audit will be addressed as a safety issue over a 3 year period, and that there will be no future guardrail issues beyond that point.

In terms of maintenance, funding under this scenario has been increased to allow an additional \$12,000 per year to assist in the proactive reduction of slippery deck surfaces. This amount is based on the assumption that there are 10 bridges subject to treatment, with each treatment costing \$6000 and lasting 5 years. An additional \$5,000 per year has been included to allow for the introduction of maintenance activities to clear debris and maintain batters.

A modest increase to operational funding is recommended in this scenario to allow external support for the delivery of some improvement projects.

Scenario 3 – High

The high scenario makes no recommendation for any new or upgraded bridges.

The rate of asset renewal under this scenario has been based on the assumption that a similar magnitude of components will be identified in future audits as being in condition state 3 or 4. The high scenario has aimed for a faster rate of addressing these issues than the medium scenario.

The high funding scenario also assumes that all guardrail issues raised during the 2011 audit will be addressed as a safety issue over a 2 year period, and that there will be no future guardrail issues beyond that point.

In terms of maintenance, funding under this scenario has been increased to allow an additional \$12,000 per year to assist in the proactive reduction of slippery deck surfaces. This has been increased to \$20,000 for the first 3 years to address the backlog and get on top of the issue. As per the medium scenario, an additional \$5,000 per year has been included to allow for the introduction of maintenance activities to clear debris and maintain batters.

A more substantial increase to operational funding is recommended to allow external resources to be engaged for all improvement projects.

6.5 Financial Model Results

Financial information presented in the graphs and tables below represents the best available data to model future provision and maintenance of Council's bridge and culvert assets. Future updates of the model will supersede existing data and be used to inform decision making. Due to the assumptions made in the development of the model, it is important that it is updated every 2 years on receipt of new audit data so that renewal projections can be recalculated and verified. As can be demonstrated from the forecast calculations, the long term sustainable level of asset management funding is generally less than what is currently budgeted by Council. The following figures are nominal (adjusted for inflation).

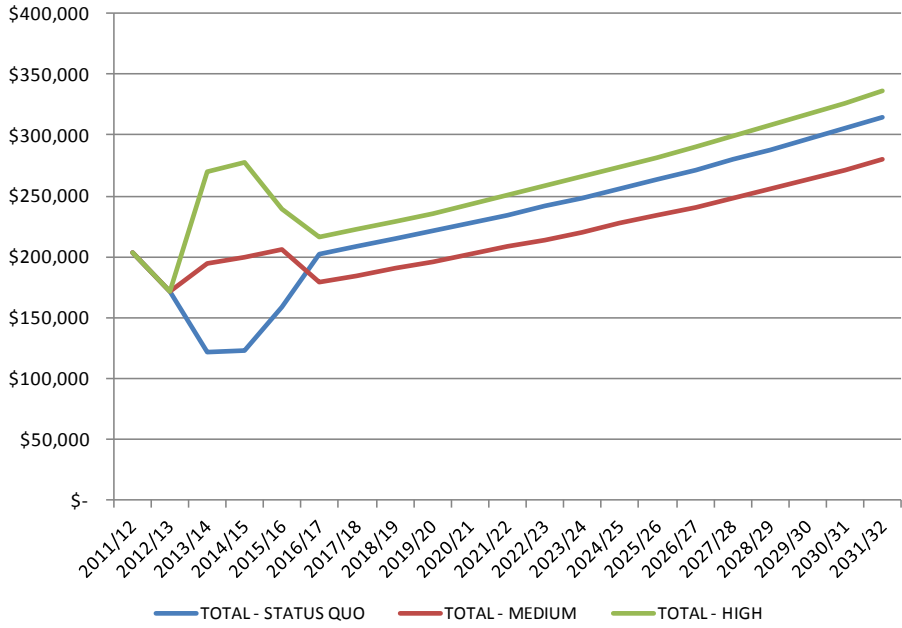


Figure 11 – Predicted Lifecycle Costs (Total)

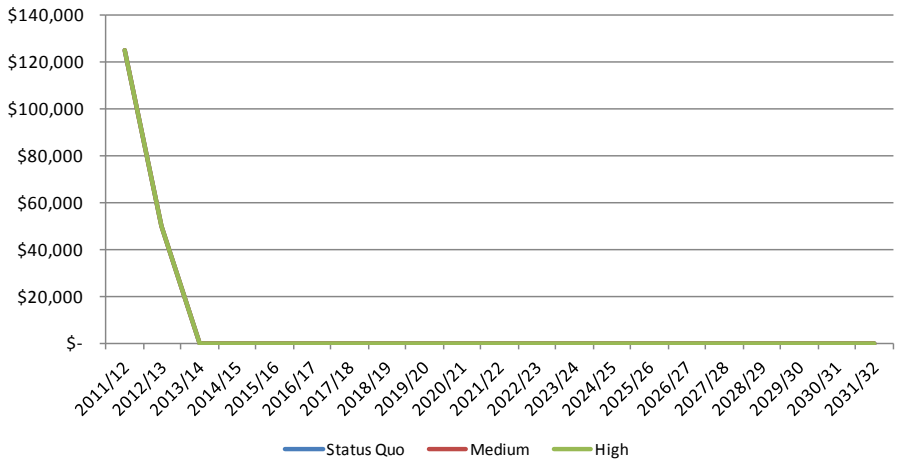


Figure 12 – Predicted New/Upgrade Costs

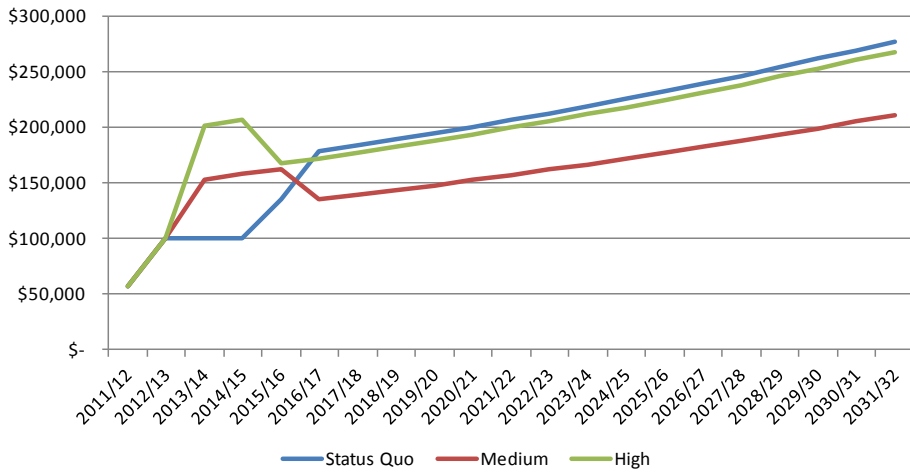


Figure 13 – Predicted Renewal Costs

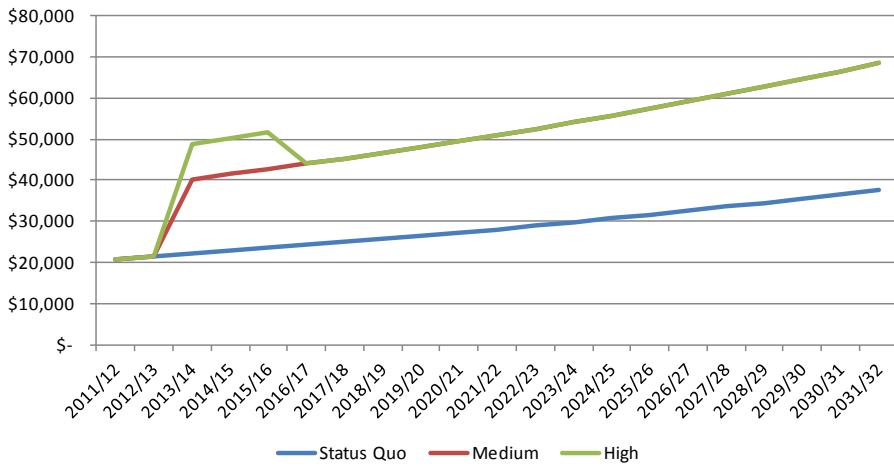


Figure 14 – Predicted Maintenance Costs

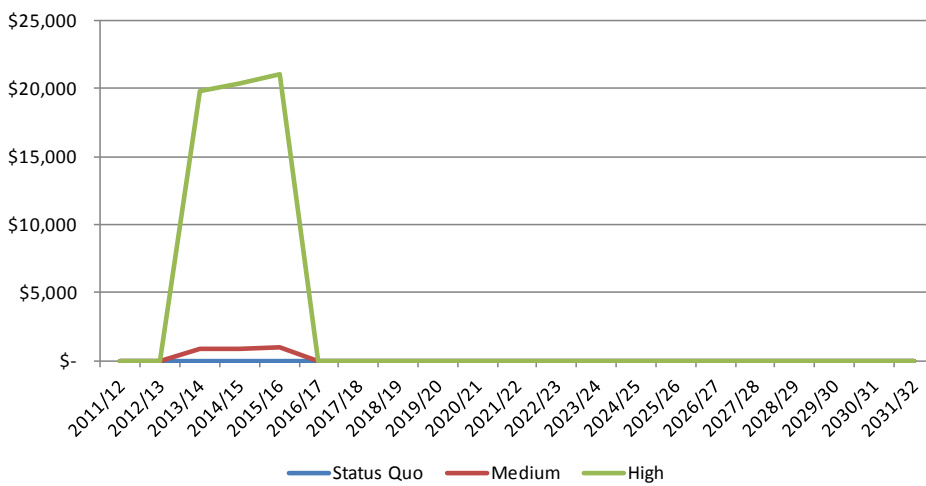


Figure 15 – Predicted Operational Costs

Renewal funding

The following graph demonstrates the level of renewal funding projected over the different scenarios. Moloney renewal modelling has also been undertaken to assist in the validation of the renewal modelling. Costs in this graph are represented in real terms (today's dollars). It is clear from the medium funding scenario that Council requires on average \$120,000 (in today's dollars) annually to sustainably manage the bridge renewal program.

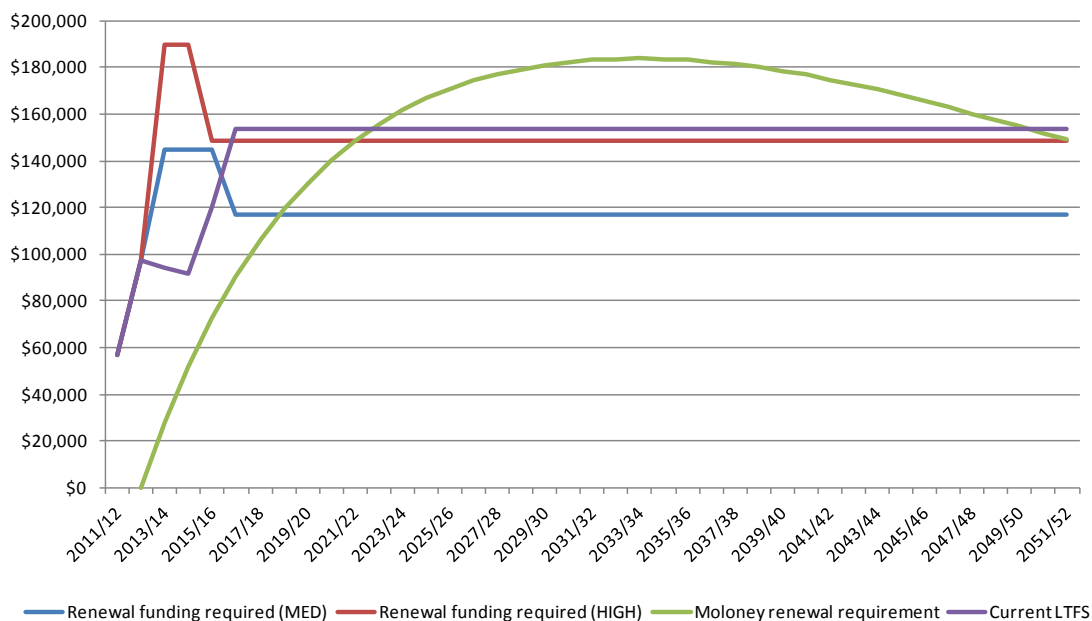


Figure 16 – Renewal Modelling Comparison

6.6 Recommended Funding Levels

To achieve improved asset management outcomes, a sustained commitment to the provision of adequate funding for asset renewal and maintenance is required. The funding targets necessary to deliver sound asset management for the next five years based on delivery of the *medium* scenario, described above, is summarised in Table 24. This table also compares the current funding levels set out in the Long Term Financial Strategy (LTFS) to the recommended optimal levels and identifies the annual funding shortfall in both the capital and operating budgets.

Funding decisions should be based on information that justifies initial expenditure and demonstrates the longer term benefits and costs. It must be noted however that sound asset management and sustainability are not solely reliant on the provision of funds. Continual assessment and improvement of Council's asset management practices is required to ensure assets deliver the required level of service in the most cost effective manner.

PROPOSED (MEDIUM) FUNDING – BRIDGES (\$'000)					
	2012/13	2013/14	2014/15	2015/16	2016/17
Capital Works – New/Upgrade					
Upgrades	\$50	\$0	\$0	\$0	\$0
LTFS / Status Quo	\$50	\$0	\$0	\$0	\$0
Funding Shortfall	\$0	\$0	\$0	\$0	\$0
Capital Works – Renewal					
Renewal (incl. Disposal)	\$100	\$153	\$158	\$163	\$135
LTFS / Status Quo	\$100	\$100	\$100	\$135	\$178
Funding Shortfall	\$0	\$53	\$58	\$28	-\$43
Operating Budget – Maintenance					
Maintenance	\$22	\$40	\$41	\$43	\$44
LTFS / Status Quo	\$22	\$22	\$23	\$24	\$24
Funding Shortfall	\$0	\$18	\$18	\$19	\$20
Operating Budget – Operational Improvements					
Improvement Projects	\$0	\$1	\$1	\$1	\$0
LTFS / Status Quo	\$0	\$0	\$0	\$0	\$0
Funding Shortfall	\$0	\$1	\$1	\$1	\$0

Table 24 – Recommended Funding

Under the recommended funding scenario it is important that the objectives of Council's Asset Management Policy are applied. Although no new or upgrade projects have been specifically recommended, appropriate lifecycle funding for maintenance and operation must be determined and committed within the operational budget upon approving any new or upgrade capital works project,. It is therefore important that Council staff have the necessary skills to estimate the lifecycle costs for all new and upgrade projects.

Attachment 4 provides a summary of bridges that are expected to be renewed as a result of funding in accordance with the medium funding scenario prioritised using the ranking criteria presented in Chapter 5.

Chapter 7 Recommended Improvement Projects

7.1 Introduction

The improvement projects presented in this Chapter are the result of research and feedback as part of this Plan's development – they are intended to enable Council to move toward best practice asset management. Bridges, boardwalks and major culverts will be efficiently and effectively managed in a manner that is aligned with community expectations.

It is recommended that the Medium funding scenario presented in the previous Chapter be adopted. The financial model includes an allowance for progressive implementation of all the improvement projects. It is expected that via changes in work practices and priorities, and minimal use of external resources, all recommended improvement projects can be progressively delivered over the next three years.

7.2 Improvement Recommendations

Project 1. Develop a Demarcation Agreement with Parks Victoria

It is considered important that a demarcation agreement be developed for the four bridges located within the Dandenong Valley Parklands along Council's western boundary. The Monash-Knox boundary agreement, included in Council's Road Management Plan, indicates that both the Cities of Monash and Knox have agreed that Parks Victoria is the responsible authority for these structures. Formal confirmation has not yet been obtained from Parks Victoria.

It is therefore recommended that Council's Sustainable Infrastructure department (with assistance from Operations) document Council's current understanding of the demarcation for these four bridges, then arrange for the agreement to be discussed and ultimately signed off by representatives of Parks Victoria.

(Refer Chapter 2)

Project 2. Review Knox Road Management Plan – Bridge Inspection & Maintenance Activities

In order to improve Council's processes regarding inspection and maintenance of Council bridges, boardwalks and minor culverts, it is recommended that the next revision of the Knox Road Management Plan (RMP) (due to be completed in 2013) give due consideration to: the condition audit results, hazard inspection results and hierarchy documented in this Plan.

It is recommended that the revised RMP include review and adjustment of the following technical service levels:

- Scope and frequency of bridge, boardwalk and major culvert hazard inspections to ensure they are consistent with the Vicroads Level 1 Bridge Inspection standard, and capture issues such as slipperiness.
- Routine and reactive maintenance activities and response time frames

Following adoption of the RMP, Council's Work Order System (Lifecycle) must be updated to reflect all changes made to the RMP.

(Refer Chapters 2, 3, 5)

Project 3. Continue Level 2 Bridge Inspections on a 2 year cycle

Given that the deterioration rate of bridges, boardwalks and major culverts cannot be predicted with any certainty, it is considered essential that Council continue to

provide funding for Level 2 bridge inspections to be undertaken on a cycle of no more than 2 years.

The results of each audit must be used to adjust the financial model presented in this document and inform renewal requirements in Council's Long Term Financial Plan and Annual Budget.

(Refer Chapters 3, 6)

Project 4. Forecast Demand & Define Levels of Service in Strategic Service Planning Documents

An understanding of community expectations and service levels enables Council to better balance competing priorities and align its activities with community needs. It is therefore recommended that all future strategic service planning documents for the following services:

- Transport and Traffic
- Integrated Water Management

and all future reviews of existing strategic service planning documents (including the Knox Integrated Transport Plan, Bicycle Plan and Pedestrian Plan) include:

- extensive community consultation
- detailed assessment of: predicted demand for bridges, boardwalks and major culverts
- definition of levels of service that capture the outcomes that are important to road, path and waterway users
- incorporate targets and measures to assess performance with regard to delivery of desired levels of service

(Refer Chapter 4)

Project 5. Develop a Consistent Approach for Asset Option Analysis

Council's service delivery model, which is documented in Council's Asset Management Policy and Chapter 5 of this Plan, suggests that asset option analysis is a key phase of the asset lifecycle.

The objective of asset option analysis is to consider the asset requirements necessary to support objectives of all relevant services and undertake analysis to ensure the best asset solutions are provided to meet service needs within physical, financial, legislative and other constraints.

Given that Council does not currently have a consistent approach to undertaking this type of analysis, it is recommended that a consistent approach be developed for use by all officers responsible for this lifecycle phase.

(Refer Chapter 5)

Project 6. Incorporate maintenance & renewal requirements and lifecycle costs in design processes/ standards

It is recommended that all design and construction standards developed for bridges, boardwalks and major culverts include information to support the calculation of average annual lifecycle costs necessary to maintain the assets throughout their serviceable life.

All future master plans and concept designs, that form part of Council business cases for capital works funding, should provide information regarding maintenance and

renewal service standards and an estimate of average annual lifecycle costs necessary to maintain the created and upgraded assets.

(Refer Chapter 5)

Project 7. Update design standards/Routine Maintenance Activities to address slipperiness of timber decking

It is recommended that results of anti-slipperiness product testing currently underway by the Works Services team (in conjunction with Traffic & Transport) at test sites B26 (Blind Creek – High Street), B67 (Manson Reserve, Wantirna) and B69 (Bayswater Park) be presented to the Standards Committee. Via consultation with the standards committee, the test results should be used as a trigger to develop a new design standard for new structures. A possible solution may be the introduction of fibreglass grating for pedestrian bridge decks in particular locations.

Successful anti-slipperiness product testing results may also justify the need for an increase to bridge maintenance funding and the introduction of a new routine maintenance activity to enable an anti-slipperiness coating to be applied to bridges on a regular basis. The Works Services team should seek new initiative funding to undertake these works in accordance with the Medium funding scenario presented in Chapter 6.

(Refer Chapter 5)

Project 8. Cease Hardcopy Recording of Level 1 Inspections

To improve the current approach to documentation of routine hazard inspections, it is recommended that the Works Services team cease hardcopy recording of the Level 1 Bridge Inspections and use the Work Order System to record the routine hazard inspections as detailed in the Knox Road Management Plan (RMP).

In order to facilitate this transition, it is recommended that the Asset Strategy team adjust the hazards listed in the work order system to include a new hazard “Slipperiness”. This hazard should also be added to the RMP document when it is reviewed in 2013.

(Refer Chapter 5)

Project 9. Introduce new maintenance activities

Given that the recent condition audit identified a number of issues relating to: debris and vegetation in waterway and batter erosion, it is recommended that two new routine maintenance activities be developed:

- Clearing of debris and vegetation in waterway
- Batter Erosion Management

The Parks Services team is considered best placed to defining the scope and frequency of these proposed new activities. When defined, the Asset Strategy team is expected to ensure that they are detailed in the revised Road Management Plan and reflected in Council’s Work Order System (Lifecycle).

(Refer Chapter 5)

Project 10. Adopt revised renewal ranking criteria

It is recommended that the Construction team adopt the revised renewal ranking criteria presented in the Table 20, Chapter 5. After each bridge condition audit (Level 2 Inspection), all bridges should be rated using this criteria. Bridges assigned the highest score should be given renewal funding priority.

It must be noted however, that in the event that a higher order audit (i.e. Level 3 Inspection) is required for any Council bridge, boardwalk or major culvert then the recommendations resulting from a Level 3 inspection must be given priority and override the prioritisation calculated using the ranking criteria presented here.

(Refer Chapter 5)

Project 11. Determine bridge load capacities and signpost bridges

It is recommended that the load capacity of Council bridges, boardwalks and major culverts be determined when future condition audits are undertaken.

Priority should be given to determining the load rating of road bridges, followed by bridges associated with shared paths, particularly those that are driven on by maintenance crews when undertaking works within Council's public open space sites.

(Refer Chapter 2 & Appendix 5)

Project 12. Provide Lifecycle Cost Training

Given the importance of ensuring that Council's operating budgets are sufficient to maintain Council assets at a standard that is safe, and meets other community expectations, it is considered important that all Capital Works Program/Delivery Managers have a good understanding of the importance of accurate lifecycle cost estimation. It is therefore recommended that the Sustainable Infrastructure department educate all relevant staff. If necessary the capital works planning process should also be reviewed and adjusted in a manner that ensures Program Managers allocate sufficient time/resources to the task of lifecycle cost estimation.

(Refer Chapters 5, 6)

Project 13. Invest in Service Planning

The Corporate Planning team is currently in the process of developing a Service Planning Framework to assist all Service Managers with the preparation of first generation Service Plans.

In future years, when these initial service plans are due to be revised, it is expected that they will be expanded and document Council's current and desired approach to the management of each phase of the service lifecycle:

- Service Feasibility Analysis
- Formulation
- Pre-establishment
- Establishment
- Operation
- Adjustment
- Discontinuation

(Refer Chapter 5)

7.3 Implementation of Improvement Recommendations

Attachment 6 summarises the improvement recommendations. It highlights the following:

- Related Projects
- Expected Project Benefits
- Risk Assessment

- Expected Extent of Impact on Efficiency
- Organisation Dimension (Structure, Strategy, Processes, Skills)
- Responsible Directorate
- Recommended Project Leader (Department Manager)
- Council teams to be consulted during project implementation
- Preliminary cost and resource estimates

Each Project Leader has responsibility for incorporating delivery of the project into their annual business plan. Further work is therefore required by each Project Leader to define the scope of nominated projects and review the project delivery costs and resource requirements, which are all estimates at this stage.

To prioritise implementation, the consequence of not undertaking each project was assessed by the Asset Strategy team. Council's Integrated Risk Management Framework was used for this assessment. It is envisaged that the relevant Project Leader will use the risk rating to prioritise the inclusion of the improvement projects into their annual business plan.

Given that a number of the recommended improvement projects are interdependent, it is expected that nominated Project Leaders will seek to combine the delivery of related projects. In the event that multiple stakeholders are expected to be required to contribute to the successful delivery of an improvement project, it will be incumbent on the Project Leader to define the scope, estimate the hours required to complete the works and communicate this information to all stakeholders to ensure they too allocate appropriate time and resources to work collaboratively on the improvement project.

For some projects, it may be necessary for the nominated Project Leader to prepare a business case submission to seek additional funding for the delivery of the improvement project. Consideration for funding of new initiatives occurs on a biannual basis either during the development of the budget or at mid year reviews.

7.4 BrAMP Implementation & Review

All internal stakeholders have a significant role to play in the delivery of sustainable asset management and the implementation of improvement recommendations.

The Asset Strategy team is responsible for the review and update of this Plan.

Implementation of the improvement projects, set out in Attachment 6, should be monitored on an annual basis and used to inform business planning activities and budget priorities in subsequent years.

Review of this Plan should occur at 5 year intervals and focus on updating asset performance, the model and the applicability of outstanding improvement projects. The model presented, in Chapter 6, should be updated to reflect impacts of new works and improvements in Council's asset knowledge. Updates of the financial model should incorporate:

- Future condition audit results
- Changes to the improvement project priorities and expected costs
- Asset changes resulting from renewal works
- Asset changes resulting from capital upgrades
- New developments