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University of Southern Queensland  
Faculty of Engineering and Surveying

**DEVELOPMENT OF AN ASSET  
MANAGEMENT STRATEGY FOR  
THE CITY OF MANDURAH WA**

A dissertation submitted by

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In fulfilment of the requirements of

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## ABSTRACT

Over the past decade there has been an increasing national focus on improving the efficiency and accountability of Local Government organisations, particularly with respect to their critical role in the management and operation of public infrastructure assets. Australia’s economic, social and environmental sustainability depends heavily on the ability of municipal authorities to effectively manage the infrastructure assets for which they are ultimately responsible. The Community at large now expect government and private agencies to deliver cost efficiency and life cycle affordability in the provision and maintenance of public infrastructure.

Planning for the sustainable provision of essential Community infrastructure has become a key issue now facing the Local Government sector in Australia. In meeting this challenge most municipal authorities have developed corporate level strategies to enhance internal business practices and demonstrate cost efficiency and lifecycle affordability in the management of infrastructure assets. Corporate goals and objectives have been aligned to reflect changing Community expectations with respect to infrastructure provision, management and financial sustainability.

This research project examines the steps taken in the preparation of an Asset Management Improvement Strategy for the City of Mandurah in Western Australia. The strategy is intended to guide the development of existing management processes, systems and data required to support the production and implementation of detailed Asset Management Plans for major infrastructure asset groups. Through the adoption and ultimate implementation of this strategy Council can approach the future with confidence in their ability to provide the Mandurah Community with “*sustainable*” service delivery through efficient management and operation of the City’s infrastructure asset portfolio.

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## **CERTIFICATION**

I certify that the ideas, designs and experimental works, results, analyses and conclusions set out in this dissertation are entirely my own work, except where otherwise indicated and acknowledged.

I further certify that the work is original and has not been previously submitted for assessment in any other course or institution, except where specifically stated.

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## NOMENCLATURE AND ACRONYMS

The following abbreviations have been used throughout the text and bibliography:-

AAS27	Australian Accounting Standards 27, 1993
ALGA	Australian Local Government Association
AM	Asset Management
AMG	Asset Management Working Group
AMIS	Asset Management Improvement Strategy
AMP	[Total] Asset Management Plans
ARRB	Australian Road Research Board
BAP	Best Appropriate Practice
BIP	Best Industry Practice
CapEX	Capital Expenditure
CCSP	Community Charter and Strategic Plan
COM	City of Mandurah WA
DLGRD	Dept. of Local Government and Regional Development WA
EMG	Executive Management Group
FMECA	Failure Mode Effects and Criticality Analysis
HMS	Huefner Management Systems – Adelaide
I.E.Aust	Institute of Engineers Australia
I.P.W.E.A	Institute of Public Works Engineers Australia
I.T	Information Technology
IIMM	International Infrastructure Management Manual
LGAQ	Local Government Association of Queensland
LG	Local Government
NAMS	National Asset management Steering Committee – NZ
NAMS.au	National Asset Management Steering Committee Australia
O & M	Operating and Maintenance Expenditure
M2	Area – Square Metre

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MAV	Municipal Association of Victoria
MRWA	Department of Main Roads WA
PDA	Personal Digital Assistant
PMS	Pavement Management System
POS	Public Open Space
RCP	Reinforced Concrete Pipe
RMA	Road Management Act – Victoria
SALGA	South Australian Local Government Association
TAMI	Tasmanian Asset Management Improvement Program
WAAMI	West Australian Asset Management Improvement Program
WALGA	West Australian Local Government Association

## CHAPTER 1 INTRODUCTION

The City of Mandurah is a medium sized regional municipality located within the Peel Region approximately 72km to the south of Perth, the capital of Western Australia. The City's administrative area covers 173.5 square kilometres and forms a narrow, curving band less than ten kilometres wide, flanked by the Indian Ocean to the west and for most of its length by the Peel-Harvey Estuary to the east. The City makes up the coastal component of the Peel Region, which also includes the Shires of Boddington, Murray, Waroona and Serpentine-Jarrahdale. The following diagram shows the locality of Mandurah in relation to Perth.

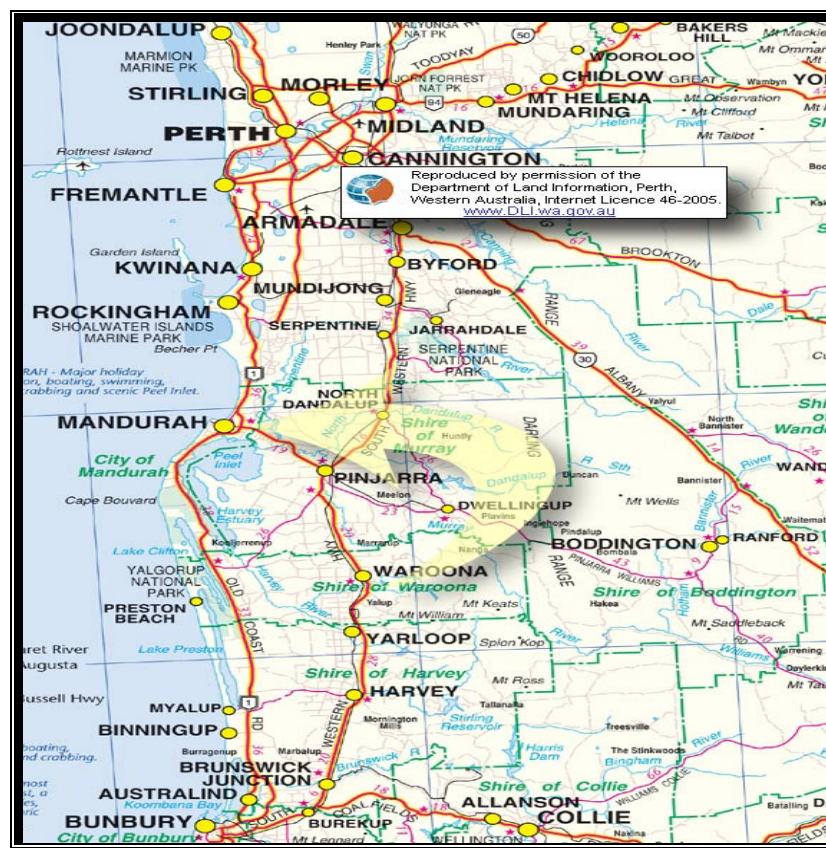


Figure 1-1 Locality of Mandurah Western Australia

Mandurah is a thriving coastal community with a current population of over 65,000 permanent residents. Over the past 12 years the City has experienced an unprecedented population boom with a consistent growth rate averaging approximately 5.3% per annum (ABS 2005). When compared to the national average of 1.2 % over the same period, Mandurah now rates as one of the fastest growing regional areas in Australia. This rapid growth presents a number of unique challenges for the City Council in terms of planning for the provision and management of the infrastructure assets required to support the delivery of municipal services to the expanding community.

### **1.1. The Research Problem**

Over the past decade there has been an increasing national focus on improving the efficiency and accountability of local government organisations with respect to their role in the provision, management and maintenance of public infrastructure assets. This trend is largely attributable to increasing community expectations; changes in federal government legislative and financial frameworks and a pronounced shift in competitive and commercial pressures acting on local government.

The concept of asset management (AM) has now been widely adopted throughout Australia, with most public works authorities endeavouring to enhance their asset management capacity in order to optimise cost efficiency and life cycle affordability in the operation of their infrastructure. It is recognised that Australia's long term economic, social and environmental sustainability is heavily dependant on the ability of local government organisations to effectively manage the infrastructure assets for which they are responsible.

Mandurah City Council currently own and operate a diverse portfolio of public infrastructure assets with a total value in excess of \$ 800 Million. This significant infrastructure portfolio represents a major economic and social investment by past and present generations.

Arguably an investment of this magnitude requires sound strategic management and business decision making to ensure that assets are appropriately managed to deliver an optimum level of benefit to the community and other stakeholders. The level of service currently enjoyed by Mandurah residents would not be sustainable if Council did not undertake to manage and maintain their assets in a financially viable and cost effective manner.

A key objective of Council's community charter and strategic plan 2005-2008 relates to the improvement of organisational efficiency in the provision and management of infrastructure assets. Councils adopted strategy (*Prosperity Objective No 6*) states that Council will "*Actively plan, manage and expand the city's infrastructure to cater for current and future economic growth*" (City of Mandurah, 2006). However, at this point in time the City lacks an adopted framework to direct the development and integration of asset management practices within the organisation. Therefore in order to deliver these key strategic objectives the City has identified the need to develop and implement an appropriate tactical improvement plan to enhance asset management capability and drive future decision making in providing for the rapidly changing needs of the Mandurah community.

## **1.2. Project Objectives**

The broad aim of this project is to prepare, document and implement a corporate level strategy and improvement plan to guide the development and implementation of improved infrastructure management practices at the City of Mandurah.

The primary focus of the strategy is to develop a strategic framework and robust tactical plan to support the development of improved asset management capability within the organisation. The strategy will assist Council in determining the immediate and long term actions required to provide sustainable service delivery through effective management and operation of the Community infrastructure portfolio.



This dissertation outlines the steps taken and results achieved in the preparation of the Asset Management Improvement Strategy (AMIS). The resulting strategy document represents the compilation of a series of staff interviews, workshops and in depth organisational research undertaken to define current capability and further document the City's future vision for achieving best appropriate practice asset management. The "gap" between current and best appropriate practice will be addressed through the subsequent implementation of key improvement projects to be identified as part of this study.

### **1.3. Project Methodology**

The broad methodology used in completing the project is outlined as follows:

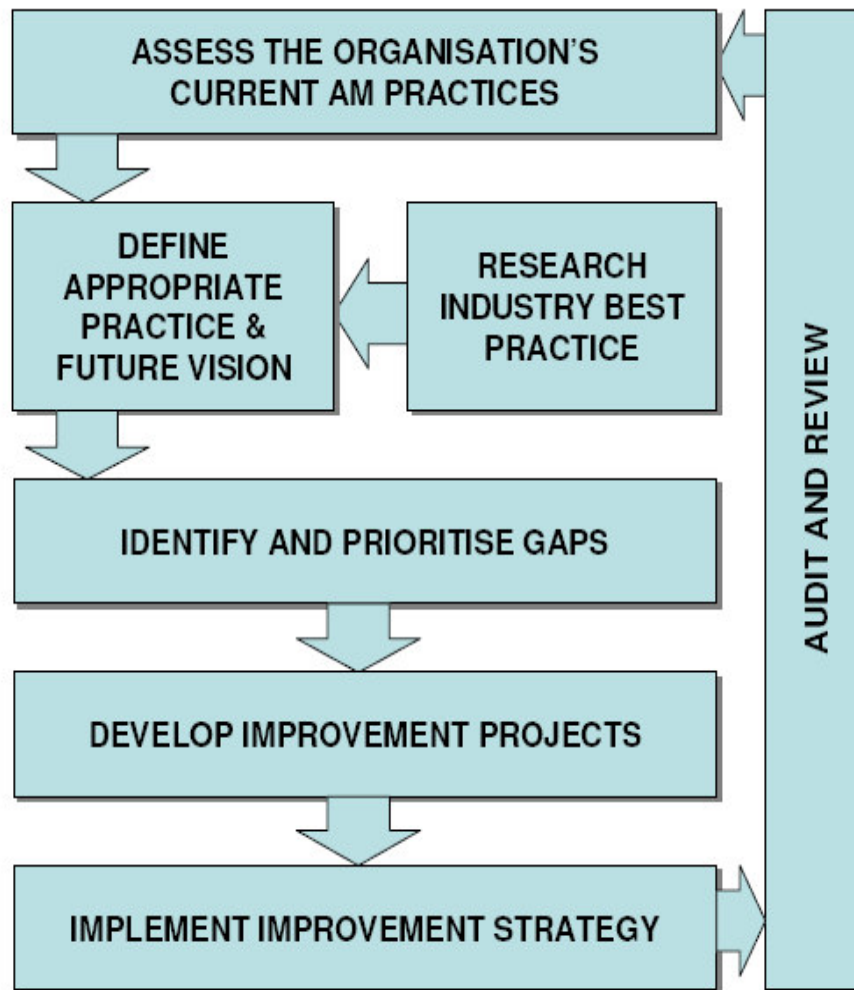
Complete a literature and industry review of current asset management issues and define best practice approaches within Australian local government;

Research, describe and define the existing management practices currently in place at the City of Mandurah;

Carry out a detailed investigation into existing management systems and identify key areas for business improvement using "gap analysis" techniques;

Prepare a detailed Asset Management Practice Improvement Strategy defining recommended improvement projects and incorporating a robust cost/benefit analysis.

The flow diagram depicted in Figure 1-2 provides a graphical representation of the processes involved with development and implementation of an Infrastructure Asset Management Improvement Strategy.



**Figure 1-2 Project Methodology Flow Diagram**

#### **1.4. Dissertation Outline**

The project dissertation has been divided into several chapters outlining the key stages involved with the development of the asset management improvement strategy. The objectives and content of each chapter are summarised below.

1. **Background – Asset Management:** a review of previous literature and examination of current asset management trends in Australia and overseas.
2. **Asset Management Improvement Planning:** Defines the principal objectives of an asset management improvement strategy, outlines the need for the strategy and provides an introductory overview of the improvement planning process.
3. **Assessment of Current Status:** Presents an outline of the audit and review procedure used to determine the City’s asset management status and provides a detailed description of current practices for major infrastructure groups.
4. **Best Appropriate Practice – Future Vision:** Outlines the results of the work undertaken to identify the key business drivers that influence the City’s decision making policies, defines the future vision for asset management at the City and specifies the standard of practice considered to be appropriate for the organisation at this point in time.
5. **Gap Analysis:** Presents the results of the “gap analysis” assessment process undertaken to quantify the gap between the City’s existing and desired level of asset management capacity.
6. **Improvement Projects:** Develops a series of key improvement projects centred around the key improvement areas identified in the gap analysis process.
7. **Cost / Benefit Analysis:** Defines the potential benefits achievable through implementation of the strategy using a simplistic model to predict return on investment and benefit to cost ratios.
8. **Summary and Conclusions:** Summarises the intent and outcomes of the research project, highlights the key results to date and outlines the scope for future work in this area.

## CHAPTER 2 ASSET MANAGEMENT

### 2.1. Introduction

The following literature review provides a brief background to the historical development of asset management on an international level. The latter part of this chapter looks at some of the key factors that have influenced the wider adoption and formalisation of the asset management concept by public works authorities in Australia.

### 2.2. What is “Asset Management”

The word asset is derived from the Latin term *ad satis*, meaning *sufficiency*. The term was initially used within the accounting fraternity to denote real property of *sufficient* value to offset a debt or liability held by an individual or organisation (Stapelberg, 2006).

Assets in general are classified according to their purpose and can be either *physical*, or *financial* in nature. Physical assets (non financial) may have a physical or tangible form such as road pavement, buildings or machinery, or they may also be intangible in the form of intellectual property or computer software. Financial assets generally refer to cash or other investments of a *financial* nature. Most current accounting practices also sub-classify assets according to their estimated useful life. Generally assets having an enduring value beyond the current financial term are referred to as *non-current* assets, whereas short life assets that are not expected to generate service potential beyond 12 months are classified as *current*.

In the context of this study the term asset refers to *non current physical infrastructure assets* acquired and managed for the sole purpose of supporting Local Government service delivery.

The Department of Victorian Communities describes infrastructure assets as typically large, interconnected networks or portfolios of composite assets, comprising components and sub components that are usually renewed or replaced individually to continue to provide a required level of service from the network. They are generally long lived, fixed in place and have no enduring market value. (Dept. of Victorian Communities, 2003).

Typically physical infrastructure assets under the control of Local Government organisations in Australia can be incorporated into the following broad categories or asset classes.

- Local Road Networks
- Bridges (and other transport structures)
- Stormwater Drainage Networks
- Water Storage and Reticulation Infrastructure
- Sewerage (Wastewater) Networks
- Parks and Recreation Infrastructure (Reserves and Playgrounds)
- Property Assets (Civic Buildings, Library's, Halls, Swimming Pools)
- Flood Mitigation Infrastructure
- Coastal and Marine Infrastructure

There are numerous definitions in common use that attempt to explain the “asset management” paradigm, all of which generally have a specific significance or relevance to the organisation promulgating the definition. The following Figures list a number of published definitions for asset management compiled from asset owners and management organisations from around the world (Garvin M.J, 2000, pg. 9).

<b>Source</b>	<b>Definition</b>
American Public Works Association Asset Management Task Force	Assets management is a methodology to efficiently and equitably allocate resources amongst valid and competing goals and objectives. An assets management system is more an integrator, a system that can interact with and interpret the output coming from many dissimilar systems and provide deciders with reliable and tested data.
New Zealand National Asset Management Steering Group and Institute of Public Works Engineering of Australia	The goal of infrastructure asset management is to meet a required level of service in the most cost-effective way through the creation, acquisition, maintenance, operation, rehabilitation, and disposal of assets to provide for present and future customers. The key elements of infrastructure asset management are: taking a lifecycle approach; developing cost-effective management strategies for the long term; providing a defined level of service and monitoring performance; managing risks associated with asset failures; sustainable use of physical resources; continuous improvement in asset management practices.
Organization for Economic Cooperation and Development	A systematic process of maintaining, upgrading and operating assets, combining engineering principles with sound business practice and economic rationale, and providing tools to facilitate a more organized and flexible approach to making the decisions necessary to achieve the public's expectations.
U.S. Federal Highway Administration	Asset management is a systematic process of maintaining, upgrading, and operating physical assets cost-effectively. It combines engineering principles with sound business practices and economic theory, and it provides tools to facilitate a more organized, logical approach to decision-making. Thus, asset management provides a framework for handling both short- and long-range planning.

**Table 1 - Various Definitions of Asset Management**  
(Garvin M.J., 2000)

**Figure 2-1 Asset Management Definitions (Garvin M J, 2000)**

Source	Definition
U.S. Department Transportation, Federal Highway Administration, Office of Asset Management	A systematic process of maintaining, upgrading, and operating physical assets cost effectively. It includes preservation, upgrading and timely replacement of assets, through cost effective management, programming, and resource allocation decisions. It has provided a solid foundation from which to monitor the transportation system. Asset management combines engineering principles with sound business practices and economic theory, and provides tools to facilitate a more organized logical approach to decision making.
The American Public Works Association Asset Management Task Force	A methodology needed by those who are responsible for efficiently allocating generally insufficient funds amongst valid and competing needs.
Strategy for Improving Asset Management Practice, AUSTRROADS	A comprehensive and structured approach to the long-term management of assets as tools for the efficient and effective delivery of community benefits.
Organization for European Cooperation and Development Working Group, Asset Management Systems, Project Description	Asset Management...goes beyond the traditional management practice of examining singular systems within the road networks, i.e., pavements, bridges, etc., and looks at the universal system of a network of roads and all of its components to allow comprehensive management of limited resources. Through proper asset management, governments can improve program and infrastructure quality, increase information accessibility and use, enhance and sharpen decision-making, make more effective investments and decrease overall costs, including the social and economic impacts of road crashes."
Asset Management Task Force, New York State Department of Transportation	A systematic process of operating, maintaining and upgrading assets cost-effectively. It combines engineering and mathematical analyses with sound business practice and economic theory. The total asset management concept expands the scope of conventional infrastructure management systems by addressing the human element and other support assets as well as the physical plant (e.g., highway, transit systems, airports, etc.).

**Table 1 (Cont.) - Various Definitions of Asset Management**

**Figure 2-2 Asset Management Definitions (cont.)**

Source	Definition
Asset Management Task Force, New York State Department of Transportation	Asset management systems are goal-driven and, like the traditional planning process, include components for data collection, strategy evaluation, program development, and feedback. The asset management model explicitly addresses integration of decisions made across all program areas. Its purpose is simple—to maximize benefits of a transportation program to its customers and users, based on well-defined goals and with available resources.
Federal Highway Administration (FHWA) / American Association of State Highway and Transportation Officials (AASHTO)	A systematic process of maintaining, upgrading, and operating physical assets cost-effectively. It combines Engineering principles with sound business practices and economic theory, and it provides tools to facilitate a more organized, logical approach to decision-making. Thus, asset management provides a framework for handling both short- and long-range planning. Asset management is a systematic process for maintaining, upgrading and operating the physical assets of a transportation system. Asset management employs engineering principles, economic theory, sound business practices, and information systems to determine short and long term resource allocations.
UK Highways Ministry ( <a href="http://www.mrutc.org/definitions.htm">http://www.mrutc.org/definitions.htm</a> )	The systematic process of maintaining, upgrading, and operating assets, combining engineering principles with sound business practices and economic rationale.
Minnesota Department of Transport ( <a href="http://www.mrutc.org/definitions.htm">http://www.mrutc.org/definitions.htm</a> )	An integrated set of processes and systems to achieve optimal and cost-effective use of assets throughout their service life, including identification of the need for an asset, acquisition enhancement of assets, utilization-operation, maintenance, and improvement, and disposal of assets. Asset management is not only an engineering tool but it provides an opportunity for both vertical and horizontal integration within the agency, as it involves finance, planning, engineering, personnel, and information management. The challenge lies in bringing together all these perspectives to achieve an integrated asset management system.

**Table 1 (Cont.) - Various Definitions of Asset Management**

**Figure 2-3 Asset Management Definitions (cont.)**



In order to understand the concept of asset management more fully it is helpful to look at some of the commonalities discernable in most of the popular definitions. The most obvious themes evident within the common definitions relate to an organised *process or methodology* for *planning, operating and maintaining* assets, to optimise *service potential* in the delivery of *service level objectives*.

The International Infrastructure Management Manual (IIMM, 2006) produced by the Institute of Public Works Engineers Australia (IPWEA) will be used as a basis for development of the Asset Management Strategy for the City of Mandurah. This manual defines asset management as “*The combination of management, financial, economic, engineering and other practices applied to physical assets with the objective of providing a required level of service in the most cost effective manner*” (IIMM, 2006, pg. xii).

### **2.3. Historical Development of Asset Management**

The concept of “asset management” was first formally adopted within the engineering profession during the privatisation of water utilities in Great Britain in the 1980s (Stapelberg, 2006). As the benefits of implementing asset management systems became clearer a growing worldwide interest in the development of asset management practices became evident. Initial applications of the concept within most organisations were based primarily on accounting principles aimed at the management of investment portfolios, whereby financial assets were “managed” through a portfolio structure designed to maximise the return on investments. However significant developments in the meaning and application of the concept have been made since this time, particularly in relation to the application in the engineering and technical management of physical infrastructure assets.

The first organisations to take up the concept in Australia were the various State treasuries, followed by other Government bodies and major industry sectors. Over the past decade much work has been done by the IPWEA to advance asset management concepts beyond pure financial accounting mechanisms. Asset management theory has grown to include the management of physical assets with the aim of maximising useful lives, optimising whole of life cost of owning and operating infrastructure, and thus optimising service delivery potential.

Although the AM concept has now been formally recognised and significant advancements have been made towards improving asset management practice within individual authorities, there is still some way to go before asset management in its more complex form is fully understood and integrated into the various organisational frameworks that make up the public works industry. However it is now clear that the heightened focus on accountability and future infrastructure sustainability generated by the evolution of asset management theory has led to the development of asset management as a major economic and social issue now facing Australia.

## **2.4. The International Perspective**

### **2.4.1. New Zealand Experience**

The country of New Zealand is considered to be a world leader in the development of asset management education, standards and practices at the Local Government level. Over the past decade New Zealand has seen a number of major changes that have enhanced the asset management focus and capability of Councils in planning, managing and maintaining their infrastructure assets. This significant change in ideology can be largely attributed to the work of the New Zealand National Asset Management Steering group (NAMS). This national body was formed in 1995 and is made up of representatives from the following major infrastructure related associations in New Zealand.

- INGENIUM—Association of Local Government Engineering NZ
- SOLGM—Society of Local Government Managers NZ
- Local Government Association of New Zealand
- Office of the Auditor-General
- New Zealand Water and Wastes Association
- New Zealand Recreation Association
- Association of Local Government Information Managers

Perhaps the most important benefit achieved through the work of the NAMS committee is the development of a consistent national approach to asset management within the country. The New Zealand Central Government have also been active in driving legislative changes aimed at enhancing the asset management capability at the regional and Local Government level. The simplified intergovernmental relationship resulting from the two tiered government structure in New Zealand has also contributed to the significant advancement in asset management practice at the national level.

#### **2.4.2. United States of America**

Whilst some progress has been made in the development of asset management practices within the United States, the Country has yet to develop a nationwide view of and approach to the management of its infrastructure assets. In relation to the U.S experience Stapelberg (2006, pg 38) asserts that *“There is a defined need for an agency/entity to provide the guidelines and draw policy about asset management”*. As such, asset management is still an emerging trend and the work of embedding asset management philosophies into the various statutory and private bodies responsible for public infrastructure assets is ongoing. It is perhaps the lack of a coordinated national approach that has hindered the progress of asset management in this country to date.

## **2.5. Asset Management Trends in Australia**

Australia has also been at the forefront of the worldwide development of asset management within the public works industry. Asset management is now firmly embedded in the Australian public works lexicon and much work is currently being done to advance the status of AM within municipal authorities. The following headings outline some of the key factors that have influenced the development of asset management in Australia and further relate some of the current trends involving state level strategies for improving asset management capability across the country.

### **2.5.1. Changing Legislative Environment**

The changing legislative environment has had a significant impact on the adoption of asset management concepts by public works authorities in Australia. In 1993 the Australian Accounting Standards Board introduced the Australian Accounting Standard 27 (AAS27). Under this legislation local governments were required to capitalise and depreciate their infrastructure assets as opposed to the more traditional methods of expensing capital expenditure against earnings or income. The introduction of AAS27 dramatically changed the way municipal authorities viewed the management of their infrastructure assets, financial accounts and reporting mechanisms.

The AAS27 legislation is widely considered to be an initiating force behind the development of detailed asset data and knowledge within the Australian Local Government sector. In response to the introduction of the legislation many authorities in Australia undertook large scale asset data collection exercises for the first time in an effort to quantify and value their infrastructure portfolio to ensure compliance with the new standards.

Initially the principal purpose of the data collection exercise related to statutory compliance and improving financial management techniques, however it was soon realised that the data collection process associated with asset valuations also provided the opportunity to record detailed condition and performance information. This provided organisations with extended functionality in terms of providing a structured framework on which to base engineering related decisions including works programming and capital renewal prioritisation.

A more significant change for Local Government occurred in 2001 after a landmark decision was handed down by the Australian high court in relation to the case of Brodie -v- Singleton Shire Council. On the 31 May 2001 the high court deemed that Singleton Shire Council had failed to act with due care in relation to the inspection and maintenance of a timber bridge structure that had collapsed when traversed by Mr Brodie, and had in fact been negligent in its failure to provide a safe public roadway system.

This judgement set a legal precedent that effectively eradicated the longstanding rule of “non-feasance” immunity for Australian Councils with respect to responsibility for monitoring and maintaining infrastructure assets after construction. Howarth (2001) noted that “*many road authorities are no doubt deeply concerned at the changes brought about by the removal of non-feasance as a defence and its replacement with an uncertain common law framework*”. The loss of non-feasance immunity has had a significant impact on Australian Local Government agencies and the results of the Brodie –v- Singleton case have tended to act as a catalyst for a number of key improvements in asset maintenance and management practices over the past 5 years.

A key outcome from the abolition of the non-feasance rule was the introduction of the Victorian Road Management Act (RMA) in 2004. The introduction of the Road Management Act has brought about major Local Government reform in relation to road asset management practices in Victoria.

The act basically requires that all Victorian road authorities prepare a Road Asset Management Plan identifying key responsibilities, maintenance standards and inspection regimes required to manage the authority's civil liability with respect the road network. Section 50 of the Act (RMA, 2004) states that;

*“The purposes of a road management plan are having regard to the principal object of road management and the works and infrastructure management principles –*

*(a) To establish a management system for the road management functions of a road authority which is based on policy and operational objectives and available resources; and*

*(b) To set the relevant standard in relation to the discharge of duties in the performance of those road management functions.”*

In essence the road management plan requires Councils to demonstrate that the organisation is responsibly managing all road assets within its control. The introduction of the RMA has forced many Victorian local governments to formalise their asset management planning and documentation and this has been a major driver for asset management improvement within the State. Whilst at this point in time other Australian States have decided not to pursue or enact legislation to enforce best practice road management, it is anticipated that similar legislative frameworks will be implemented on a national scale in the near future.

### **2.5.2. Financial and Economic Issues**

The question of economic and financial sustainability has also been a key factor in the development of asset management concepts within Local Government. Outputs from the AM planning process enable Council's to lobby for the funding required to provide sustainable service delivery to the Community.

A particular point of concern relates to the perceived abrogation of responsibility for providing and maintaining public infrastructure or “Cost Shifting” by the various State Governments.

A federal government inquiry into cost shifting was undertaken in 2003 (Hawker, 2003) with the findings indicating that Local Governments were increasingly expected to provide community infrastructure and services without due recognition of the funding required to provide these services. However the report also highlighted that in order for Councils to remain viable there was a defined need to demonstrate economic “responsibility” in the management of their assets. It would not purely be sufficient to increase funding to Local Government without first looking at the manner in which the funding is expended to ensure that Councils are capable of delivering best value in relation to asset and financial management (Hawker, 2003).

Following a recommendation put forward in the Hawker inquiry a review of the distribution of financial assistance grants has recently been commissioned by the Federal Government to identify possible improvements in funding allocations and the mechanisms used to distribute grants to Local and State Government agencies. The outcomes of this review are not known at this stage; however it is thought that any future reform of these funding mechanisms is likely to include a direct linkage to the asset management capability of recipient organisations.

In essence Councils would need to demonstrate an adequate standard of asset management capability and practice in order to justify their funding requirements and meet prerequisites for allocation of Federal grants. It is widely considered that reform of this nature is inevitable and this has been a key driver for many organisations to work at improving their infrastructure management capability. Much work has also been done in recent years in an effort to identify the current condition of Australia’s infrastructure assets and attempt to quantify the funding levels required to manage and maintain these assets into the future.

Over the past 5 years various studies into the “asset renewal gap” have been undertaken in the eastern states, however perhaps the most comprehensive attempt at quantifying the state of infrastructure on a national level is the Australian Infrastructure Report Card project commenced by the Institute of Engineers Australia in 1999.

This project examined the condition of the nation’s infrastructure as a basis for estimating the future funding required to ensure that sustainable service delivery objectives could be met. The project methodology used a scorecard approach to rank the performance of individual asset classes across each State. The final results were aggregated to produce a national report card outlining the current state of the nation’s infrastructure assets. The results of the individual State and Territory report cards are depicted in Figure 2-4.

### Infrastructure Report Card Results

Infrastructure Type Category	Sub-category	AUS 2005	AUS 2001	AUS 1999	NSW 2003	QLD 2004	VIC 2005	SA 2005	NT 2005	WA 2005	TAS 2005	ACT 2005
Roads	National	C+	C	C	C+	C+	C	C	B-	B-	B	
	State	C	C-	C-	C+	C	C-	C-	C-	B-	C	
	Local	C-	D	D	C-	C	C-	D	C-	C+	D+	
	Overall	C	C-	C-	C	C	C-	C-	C	B-	C	B
Rail		C-	D-	D-	D	C+	C-	C	A	C+		
Electricity		C+	B-		B	D+	C	B-	B-	B-	B-	B
Gas		C+	C			C	C	B+	A	B+		A-
Ports		C+	B			B-	C		B+	B-	B	
Water	Wastewater	C+	C-	D-	C-	C+	B	C	C	B-	D+	B
	Potable Water	B-	C	C-	C	B	B	C+	B-	B-	D+	C
	Stormwater	C-	D		D	C	C-	D	C+	C+	C-	C
	Irrigation	C-	D-			C+	D		B	C+		
	Overall	C	D+	C-	C-	C+	B-	C-	C+	C+	D	C+
Airports		B	B			B			B+			B
<b>Overall Rating</b>		<b>C+</b>	<b>C</b>	<b>D+</b>	<b>C-</b>	<b>C+</b>	<b>C</b>	<b>C</b>	<b>B</b>	<b>B-</b>	<b>C-</b>	<b>B-</b>

**Figure 2-4 Infrastructure Report Card Results (I.E. Aust 2006)**



The infrastructure report card results presented in the above table provide a clear picture of where the deficiency's lie in relation to the management and maintenance of Australia's infrastructure. This information has served as a catalyst for the development of asset management practices within Australia and has resulted in a broader recognition of the need to improve the asset management capability of organisations responsible for managing the nations infrastructure.

### **2.5.3. Coordinated Approach – State-wide Improvement Frameworks**

In 2003 the Municipal Association of Victoria (MAV) initiated the STEP asset management improvement programme. The primary objective of this programme was to provide a structured "step by step" framework by which individual local Councils could improve their overall AM capability. The programme was designed to be run over a 2 year period and has since been implemented in all Victorian Councils. The basic STEP programme framework was put together and delivered by a panel of experienced consultants commissioned by the MAV. The intentions behind the development of the programme primarily related to the introduction of aforementioned Victorian Road Management Act. Through participation in the programme Councils were assisted to comply with the new legislative requirements involving the production and implementation of Road Management Plans.

Since the introduction of the STEP programme various other state bodies have worked towards implementing similar structured improvement models at the State level. These include the South Australian Local Government Association (SALGA) Programme, the Tasmanian Asset Management Improvement (TAMI) Programme, the Local Government Association of Queensland (LGAQ) Asset Management Improvement Programme and the West Australian Asset Management Improvement (WAAMI) Programme. The background to the development of the WAAMI programme is outlined in more detail under the following heading.

#### **2.5.4. WA Asset Management Improvement (WAAMI) Programme**

In response to the recognised need for integrated asset management planning at a state-wide level, and following on from the success of similar programs in other states, the IPWEA W.A Asset Management Committee has undertaken to develop a West Australian Asset Management Improvement framework. In February 2005 the Institute convened a steering committee to facilitate the development and implementation of the WAAMI programme at the State level. The committee structure included representatives from the IPWEA, West Australian Local Government Association (WALGA), The Department of Local Government and Regional Development WA (DLGRD), and 6 major West Australian local Councils, being the City of Mandurah, and Cities of Bunbury, Gosnells, Swan, Cockburn and Belmont.

The committee has since engaged consultants to draft a preliminary framework document and implementation plan. In order to test and refine the delivery mechanisms a pilot implementation was initiated within the 6 member Councils, commencing in June of 2005. The pilot is now nearing completion and the steering committee is currently developing a suitable framework to deliver the programme to the 144 Local Government authorities within the State.

The WAAMI framework seeks to develop the capacity of Western Australian local government through embedding asset management principals and concepts at the Elected Member and Executive Management levels. By raising awareness and communicating the importance of asset management planning at the corporate management level, it is more likely that future improvement strategies will be appropriately resourced and effectively implemented. The City of Mandurah has been heavily involved with the development and pilot implementation of the WAAMI programme over the past 12 months. This has been a key factor in Councils decision to pursue the development and implementation of a corporate level Asset Management Improvement Strategy.

## **CHAPTER 3 AM IMPROVEMENT PLANNING**

### **3.1. Introduction**

The following Chapter examines the need for improvement in asset management practice at the City of Mandurah and identifies some of the key business drivers influencing Councils decision to develop and implement an Asset Management Improvement Strategy. The principal objectives of an AMIS are also discussed, with an introduction to the generic planning process used in this project to develop a strategy that specifically addresses the current needs of the organisation.

### **3.2. The Need for an Improvement Strategy**

As outlined in the preceding chapter the concept of infrastructure asset management has gained significant international attention over the past decade. There is now a global trend for Local Government to facilitate community sustainability through an enhanced focus on the effective management of their infrastructure assets. Infrastructure management now assumes a key role in underpinning municipal service delivery, and there is an increasing demand on Council's throughout Australia to demonstrate a minimum standard of capability and competence in relation to the sustainable provision and management of infrastructure assets.

Mandurah City Council currently manage and operate a diverse portfolio of public infrastructure with a total value in excess of \$ 800 million. The City's asset portfolio represents a significant economic and social investment by past and present generations. Arguably an investment of this magnitude requires sound strategic management and business decision making to ensure that an optimum level of benefit is returned to the community and other stakeholders.

It is becoming increasingly apparent that the quality and range of services enjoyed by the Mandurah community may not be sustainable if Council does not undertake to develop and maintain an acceptable standard of asset management practice. The level of asset management capacity appropriate for the organisation should be relative to the value of its infrastructure portfolio and the level of business risk involved with owning and operating these assets. In this sense there is a distinct need for strategic level guidance to improve current infrastructure management practices within the organisation and ensure that assets are acquired and managed in an economically and environmentally sound manner.

In planning for the future sustainability of Community infrastructure, the City has decided to develop and implement an asset management improvement strategy. The strategy will define the future vision and direction for asset management in an effort to address the key business drivers outlined under the following heading.

### **3.3. Organisational Context – Key Business Drivers**

There are a number of key business drivers that form an integral basis for planning and implementation of a corporate level AMIS at the City of Mandurah. The principal drivers relate to the external business environment in which the organisation currently operates. These external drivers exert a significant influence on the City's strategic planning and decision making policies. There are also a several internal or organisational issues that further highlight the need to initiate planning for asset management change and improvement. These business drivers represent causal factors that determine the manner in which asset management is approached within the organisation and therefore must be addressed during the strategy development phase.

In order to identify the predominant business drivers for the organisation, a series of in depth interviews were carried out with the City's Executive Management Group

(EMG) and other senior management staff. The results of these interviews have been compiled to produce a list of principal business drivers as described below.

### 3.3.1. External Factors

- **Rapid population growth** (sea change phenomenon). The sustained growth of the City’s population has placed increasing pressure on existing assets to meet expanded service delivery requirements. This hyper growth is largely attributed to the widely recognised and researched “sea change phenomenon”. “Sea change” is a phrase coined to describe the current social trend for people to move closer to the coast for a number of reasons including lifestyle and affordability.
- **Recognisable deterioration in the condition of existing infrastructure assets** and the levels of service the Council is able to provide. As the population and hence demand for asset consumption continues to rise, existing infrastructure assets are stretched well beyond original design capacity. Therefore levels of service have been declining.
- **High community expectations** associated with a shift in demographic and social trends. Recent modelling undertaken by the City indicates that Mandurah’s population is changing in terms of demographic composition. What used to be a sleepy fishing village populated predominantly by retirees and holiday makers has now become a major regional centre with an influx of resident’s of higher socio-economic standing.
- **High visitor or service population** (seasonal tourist loads). There is a defined need to provide and maintain infrastructure assets aimed at tourist markets as tourism represents an important business and economic driver for the City.

- **Significant environmental issues** and constraints associated with the City's coastal location and its key role in managing diminishing natural bushland and a major regional waterway system. The City is also adjacent to several national parks and world (Peel Harvey Estuary).
- **Possibility of legal reform** and increased statutory obligations: There is an increasing pressure on Councils to demonstrate due process in asset management and operations as a result of a recent shift in the legal standing with respect to non-feasance immunity. The possibility of future reform of Federal Government funding models is also a growing concern for the City. The Australian Local Government Association (ALGA) is now highlighting a push towards national standards for financial and asset management with Councils AM capacity to be linked to eligibility for financial assistance. This trend is in response to the findings highlighted by recent financial sustainability inquiries commissioned by LG associations in various States.
- **Skills Shortage** – there is currently a shortage of skilled staff across the Country. The lack of skilled technical and management staff makes it difficult to implement programs aimed at improving asset management practices within the organisation.

The external drivers described above have a direct bearing on Mandurah City Council in both an operational and strategic sense. These factors define the business environment in which the City must operate and are will therefore influence the future directions for the City in terms of strategic planning improve asset management capability.

### 3.3.2. Internal Factors

- **Lack of a corporate level policy** and direction to guide the development and integration of business practices to facilitate integrated AM planning across the organisation. Whilst existing systems and practices attempt to optimise available funding in the operational management of infrastructure assets, not enough work is being done to integrate and develop organisational systems to achieve long term strategic objectives.
- **Inability to properly quantify the extent and condition of the asset portfolio** – the organisation does not have the required asset information to make appropriate decisions regarding future asset renewal funding requirements. Current service level standards and asset performance cannot be calculated with any certainty.
- **Lack of awareness of asset management issues** at the elected member and executive management level. Without fundamental data to generate management reports on the current situation with asset management it is difficult to build a case and gain support for improvements at the Councillor and Executive Management level.

The internal organisational factors outlined above represent roadblocks to achieving good governance through improving asset management within the organisation. It is important to consider these issues in developing and implementing the AMIS.

The key business drivers outlined above form the basis for developing the future vision for improved asset management practice in support of the City's Community Charter and Strategic Plan 2005-2008 (CCSP) objectives. By addressing these key drivers in the strategy development process, the improvements in AM efficiency gained through implementation of the AMIS will be directly aligned to support the City's overall vision and strategic direction.

### **3.4. Objectives of the Improvement Strategy**

Whilst the objectives for developing and adopting an asset management strategy can vary considerably, the predominant purpose is to provide a central focus and structured framework by which the organisation can improve infrastructure management practices, with the aim of achieving best practice over a set period of time.

The scope and context of the improvement strategy can be as unique or as complex as the organisation itself, however it is considered essential that the strategy projects a central theme that addresses the core aspects of the business operations (IIMM, 2006). The improvement plan and implementation programme should be consistent with the overall strategic direction of the organisation and demonstrate a clear linkage to higher level corporate goals and objectives. The strategy should also give due consideration to the nature and scale of the organisations asset portfolio, current and future operational tactics and the more importantly the level of resources available to implement improvement actions.

The core tactical objective of the strategy is the development of management practices and enabling processes required to support the function and implementation of detailed long term Asset Management Plans (AMP). Detailed asset management plans define planned strategic and operational management and maintenance activities for each asset or service group and therefore form the basis of the best practice asset management approach. If an organisation does not yet have long term asset management plans in place, the strategy should initially focus on the development of “first cut” plans as a priority. Subsequent improvements to the plans can then be made as the strategy is implemented and the organisational enabling processes develop further.



In order to expand and support the AM planning functions within the organisation the strategy should seek to develop the four principal management areas that govern the inputs and outputs of an effective asset management plan (IIMM, 2006). These four primary inputs and outputs are:

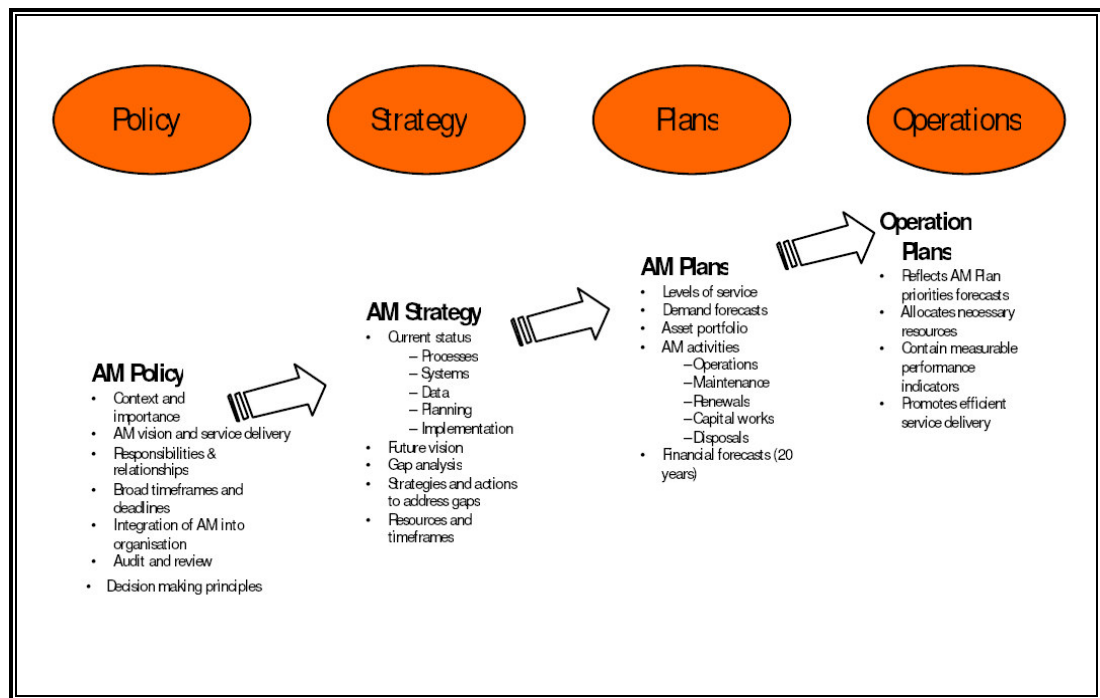
1. AM Processes and Planning
2. AM Information Systems
3. Asset Data and Knowledge
4. AM Plan Implementation Tactics

By developing capability in each of these key areas, improvements can be made in the quality of the asset management plans themselves resulting in enhanced strategic and operational planning capability and optimised decision making within the organisation.

With respect to the improvement planning process the West Australian Asset Management Improvement Framework (WAAMI, 2005) states;

*“There are four basic steps that form the foundation for improving asset management. As a minimum, Council needs to have an Asset Management **Policy / Position** and an **AM Improvement Strategy** to provide direction and guidance for asset management planning. The **Asset Management Plans** provide more detail and long term projections and the **Operations** arrangements cater for the delivery of asset management [outcomes].”*

The following flow diagram depicts these four principal steps and highlights the role of the Asset Management Strategy in improving an organisations asset management practices.



**Figure 3-1 Asset Management Flowchart (WAAMI, 2005)**

### 3.5. The Improvement Planning Process

Implementing a strategic asset management improvement programme within a local government authority can be a complex, time consuming and resource intensive exercise. To ensure the success of the improvement programme it is beneficial to follow a structured and measurable planning process aimed at prioritising effort and optimising available resources to deliver maximum improvement benefits. Undertaking a structured improvement planning process can assist an organisation to avoid some of the potential failure mechanisms and ensure that asset management programs continue to support the organisations principal corporate objectives.

There are a number of established guidelines and processes which can be successfully adapted to assist in developing a tailored improvement programme for public sector organisations. The improvement planning process used in this project is based on the framework published in the International Infrastructure Management Manual (IIMM, 2006 pg 2.21).

The improvement planning and strategy development process generally begins with a detailed analysis and review of the organisations current capacity with respect to best appropriate practice asset management. Developing a clear future vision for asset management and defining an *appropriate* level of practice given the organisations current business drivers forms the second integral component of the planning process. Once the gap between existing capacity and the desired level of practice has been identified, measured and understood, it is then possible to develop targeted improvement projects aimed at bridging this gap. In general terms the improvement planning process seeks to provide answers to the following 3 questions:

1. What is the organisations current level of asset management capability?
2. What level is appropriate for the organisation in the future? and;
3. What actions should be taken to ensure the organisation achieves these objectives?

The WAAMI framework document which has been based on the IIMM model describes the typical contents of an asset management improvement strategy as follows:

- A description of the current status of asset management practices within the organisation. this includes asset knowledge and data, asset information systems, asset planning and management processes and AM plan implementation tactics.
- A definition of the future vision for asset management within the organisation.
- A description of the “appropriate” asset management capabilities required to achieve this vision.
- Identification of the gap between existing practice and the future vision [gap analysis]
- Identification of the broad actions required to close the gaps, including resources and timeframes.

However whilst it is possible to follow a generic model or process in developing an improvement strategy for an organisation, it is important to remember that every organisation will start out from a different point and will inevitably have a different set of key business drivers. For this reason this project attempts to develop a custom process aimed at maximising early benefits for the City of Mandurah and ensuring that necessary foundational change elements of the improvement program are developed and institutionalised.

### **3.5.1. Scope of the Strategy**

The AMIS developed for the City of Mandurah as part of this project is focused solely on long-life infrastructure or built assets. The strategy does not consider short life asset portfolios such as mobile plant and fleet vehicles, IT equipment or other non tangible assets such as human resources, corporate image and goodwill.

Infrastructure assets under the control of the City of Mandurah are classified under the 6 broad infrastructure categories outlined as follows:

- 1. Road and Transport Network**
- 2. Stormwater Drainage Network**
- 3. Bridges and Transport Structures**
- 4. Parks and Reserves and Landscape**
- 5. Buildings and Facilities**
- 6. Coastal and Marine Infrastructure**

Each of these broad asset groups can be further divided into of a number of asset components that make up the asset class. The common sub components for each of major asset groups are outlined below:

**Roads and Transport:**

- Road pavement (formation and sub layers)
- Road surfacing (includes aggregate seals, asphalt, brick-paving etc)
- Concrete kerbing
- Footpaths, walkways and cycle paths
- Signs, lines and roadside furniture (bus stops, signage, line-marking etc)
- Street Lighting
- On and off street ground level car parking.

**Stormwater Drainage:**

- Underground pipe network
- Collection pits
- Access chambers
- Pollutant traps and other devices
- Above ground conveyance systems (lined and unlined drains, swales etc)
- Detention and disposal systems (sumps, leach tanks and Atlantis cells etc)

**Bridges and Transport Structures:**

- Traffic bridges.
- Pedestrian bridges.
- Road culverts and underpass structures.

**Parks, Reserves and Landscape:**

- Active reserves
- Passive reserves
- Nature and foreshore reserves
- Landscaping - verges medians and roundabouts
- Landscaping – Buildings and Facilities

**Buildings and Facilities:**

- Community Halls, libraries and other public use buildings
- Recreation Centres and Swimming Pools
- Public ablution facilities
- Marina chalet park
- Administration and civic buildings

**Coastal and Marine Infrastructure:**

- Boardwalks, jetties, fishing platforms
- Boat ramp facilities
- Seawall revetment
- Rock groynes and breakwaters
- Marina infrastructure – boat pens
- Canal wall structures
- Canal waterways

## **CHAPTER 4 CURRENT STATUS ASSESSMENT**

### **4.1. Introduction**

As described in the previous chapter the important first step in developing an asset management improvement strategy is to undertake a review process aimed at defining the current status of asset management within the organisation. This review provides the basis by which improvements can be planned, implemented and re-measured to monitor progress. In order to provide meaningful information by which to develop future improvement projects the assessment process must be structured to allow for the systematic analysis of the “gap” between current and best appropriate practice.

The following chapter outlines the assessment process undertaken for the City of Mandurah and presents the results of this review with reference to the six core infrastructure asset groups defined in the previous Chapter.

### **4.2. The Assessment Process**

#### **4.2.1. Assessment Structure – Quality Elements**

There are a number of different quality audit and review structures currently used to assess the asset management capability of Local Government organisations in Australia and overseas. Most of the common review methods utilise a hierarchical set of assessment criteria to determine organisational capacity in relation to the fundamental elements of effective lifecycle asset management. The improvement framework defined in the International Infrastructure Management Manual outlines four core lifecycle management elements that support the primary asset management plan inputs and outputs.

The manual promulgates the use of these criteria as a baseline for assessing an organisations asset management capability. Most capacity audit and assessment systems developed by various organisations in Australia and overseas are based on these core lifecycle asset management elements and can therefore be considered derivations or adaptations of the IIMM framework and methodology.

The assessment structure developed to describe the current asset management capability for Mandurah City Council represents a compilation of various existing methods used by private and Local Government infrastructure agencies in Australia and New Zealand. Several core elements of best practice lifecycle asset management have been compiled to form a customised set of assessment criteria, considered to be suitable in the context of the City’s organisational structure; its asset portfolio and principal business drivers. The criteria adopted for the City of Mandurah have been developed from existing assessment structures used by the organisations listed below:

9. North Shore City Council, New Zealand – Road Asset Management Plan
10. GHD – AM Quality Audit Model
11. WALGA – WAAMI Programme Framework

The following list outlines some of the core elements of best practice asset management by which the City of Mandurah’s capability has been assessed and described. These elements represent the core facets of lifecycle asset management.

1. **Asset Knowledge:** The extent to which the organisation understands the asset portfolios for which it responsible, the level of information recorded for these assets and processes by which the asset information is stored and reported on.
2. **Data Management:** The processes by which asset and financial data is managed to ensure it remains correct, current and valid.



3. **Valuation, depreciation and effective lives:** The systems used to assign values to infrastructure assets, the method of depreciation applied and the basis for determining effective service lives.
4. **Level of Service Specification and Measurement:** The processes by which the service levels supported by assets are specified and measured, including Community and stakeholder consultation.
5. **Strategic Planning:** Long term AM plans for the management of infrastructure assets, including the basis on which the plans have been developed and the level of confidence in their content / reliability.
6. **Asset Operations and Works Management:** The implementation of the strategic asset management plans, including how renewal and maintenance programs are implemented to ensure compliance with specifications, budgets and timelines.
7. **Asset Information Systems:** The hardware, software and other information systems used to support both strategic planning and day to day asset operations and management.
8. **Implementation Tactics:** The commercial tactics employed in the implementation of asset management plans to ensure desired best value outcomes are achieved. This includes testing of unit costs against external providers to determine the viability of service delivery options.
9. **Organisational and People Issues:** The organisational structure and resources in place to support the management of infrastructure assets across the organisation. People issues include the level of asset management expertise and skill sets available within the organisation to deliver strategic planning objectives.

Strategic plans are considered meaningless if the organisation lacks qualified people through which they can be implemented.

The parent elements listed above can be further disaggregated into various tertiary level sub-elements to provide for a more detailed analysis of current practice. The individual sub criteria form the basis of the gap analysis assessment system described further in Chapter 6 of this dissertation. As such they will not be discussed at length here.

#### **4.2.2. Cross Functional Workshop Process**

In order to prepare an accurate and informed evaluation of Councils current asset management practices across the organisation an internal Asset Management Working Group (AMG) was convened, to provide input to the assessment process. The working group involved representatives from key asset related service areas within the organisation. The cross functional, multidisciplinary structure of the working group is outlined in Table 4-1.

<b>Service Area</b>	<b>Representative</b>
Executive Management	Director Works and Services (Chair)
Asset Management	Asset Management Engineer
Finance	Manager Finance
Engineering Services	Manager Engineering Services
Operations / Maintenance	Manager Operations Services
Planning and Sustainability	Manager Planning and Sustainability
Recreation Services	Manager Recreation Services
Community Services	Manager Community Services
Risk Management	Legal and Compliance - Risk Manager
Information Services / GIS	IT / GIS Manager

**Table 4-1 Asset Management Working Group Structure**

After convening the group and providing a briefing on the assessment structure, two half day facilitated staff workshops were organised. The group workshops enabled current practice to be openly discussed and recorded amongst the working group participants and other asset operations staff in attendance. The methodology used in the current status assessment workshops was intended to support subsequent visioning, appropriate practice definition and improvement planning steps of the strategy development process.

In facilitating this cross-functional workshop process it was noted that, whilst the activity as a whole proved extremely beneficial in terms of promoting inter-unit communication across directorates, it was difficult to extract meaningful data from the process due to the number of participants involved. Staff had a tendency to focus solely on operational asset management issues specific to their individual sections, as opposed to examining organisational practices in the “big picture” sense. More efficient planning, briefing and group facilitation skills may have helped overcome this problem making the process more productive in terms of documented outcomes.

Following compilation and analysis of the preliminary results from both workshops it was deemed necessary to conduct a series of follow up interviews with individual service staff to validate the information obtained during the group process and extract further information specific to each individual service area.

### **4.3. City of Mandurah – Current Status**

The following headings detail the results of the staff workshops and interview process. Each of the City’s major infrastructure groups has been examined individually to provide an overall description of current asset management status.

### 4.3.1. Road and Transport Network

#### Knowledge of Assets

The City of Mandurah is currently responsible for approximately 685 km of sealed local road network. The principal asset components included in the roads infrastructure class are:

- Road Pavements and Seals
- Concrete Kerbing
- Footpaths Walkways and Bike Paths
- Non-regulatory signage
- Ground level parking (on and off street)

Typical road network asset components are depicted in Figure 4-1.



**Figure 4-1 Typical Local Road Network Infrastructure**

The City currently stores all its road asset data electronically within the pavement management system HMS Road-PAK. Detailed attribute data is also linked to a spatial centreline file stored in Councils GIS system MapInfo via a unique identification number. Initial data collection for the road network was completed in 1995. Since this time the system has been updated annually with Council's renewal and construction works. New assets vested from subdivisional development have also been added. Basic visual condition information has been collected and recorded for the major road components of pavement, seal and kerbing.

The road network is recorded by individual segments, which generally run from intersection to intersection or are created to reflect a substantial change in the physical dimensions or type of the principal road components (e.g. change in pavement width or kerb type etc). Intersections are recorded as separate entities with corresponding attribute data applied. On and off street car parks and embayment's are also recorded as separate entities within RoadPAK and have similar attribute data to the road network. Primary attribute data currently available for the road network is listed below:

- Road Segment Length and Area
- Pavement Type and Condition
- Surface Type and Condition
- Kerbing Type and Condition

In the absence of reliable measured condition data such as traffic, roughness, cracking and surface texture information, the City's annual renewal and resurfacing programs are currently determined based on visual condition ratings held in the system, and officer knowledge of relative renewal priorities.

Details on the City's footpath and cycle path networks have generally been recorded in the Road-PAK system and identified as existing on the left or right of an individual road segment.

Some map based (GIS) data exists for cycle and foot paths that are not located directly adjacent to the roadway, however this information is limited. Footpath renewal and replacement is currently carried on a needs basis, with maintenance activities being triggered by ad-hoc visual inspection and customer complaints.

Whilst the RoadPAK system does incorporate a module for recoding street signage, lighting and miscellaneous roadside furniture items, no data currently exists for these assets. Funding has been made available in the 2007 budget to collect video survey data which will allow Council to locate and record roadside assets. Similarly no information is recorded on the type, location or condition of the City's road line marking. The current approach to renewal of line marking is ad-hoc, and is generally determined by officer experience and available budget.

Traffic data is collected using the Metro-Count system via a PDA. Traffic count information is stored in an excel spreadsheet, identified by road name and approximate location. No formal traffic count program currently exists and counts are generally commissioned on a needs basis to support project planning and design as opposed to network level pavement analysis and pavement deterioration modelling.

### **Data Management**

At present there are no clear documented guidelines outlining the organisational process for acquisition, recording and management of road data. At the current time new asset data is generally added the RoadPAK system based on previously established ad-hoc conventions. The asset hierarchical structure is implied and reasonably understood by those undertaking road asset management activities. As-constructed plans for all road projects carried out by Council since 2003 have been archived and are linked to the relevant road segment.

At this point the City has complete and accurate inventory, visual condition and valuation data for the critical components of the road network. However there are currently no systems in place for recording of maintenance and operating history, or asset performance, utilisation and capacity details.

### **Valuation, Depreciation and Effective Lives**

Details of the City's road network were originally captured in 1995 and entered to the HMS RoadPAK system. Aggregate infrastructure valuations were also prepared at this time to comply with the introduction of AAS27. Road infrastructure is currently valued directly within the RoadPAK system using unit rate costing methods. Each asset sub-component is given a corresponding dimension within the system. An appropriate unit rate cost is then applied to the dimensional component to determine an overall replacement cost for the road segment. Unit rates are updated annually using project cost information provided by the Operations Services. These rates are averaged against contract rates received from subdivisional development consultants.

Road renewals and construction carried out under Council's capital works program and development infrastructure vested to the City have been entered into the RoadPAK system and capitalised against the total existing valuation. The entire road network is re-valued annually using the RoadPAK system based on variations in unit rates. As such road assets are carried at fair replacement value rather than at cost.

Effective lives of road component assets were established under Council policy at the time of original valuation. Effective lives have been based on estimated rather than historical condition and depreciation data. Current policy applies the following effective lives to road assets: Road Pavement – 40 years, Asphalt Surfacing – 15 years, Aggregate Seals – 12 years, Kerbing, Footpaths and Cycle ways – 20 years. Current capitalisation thresholds for roadwork's and resurfacing are \$ 10,000 and \$ 2,000 respectively.

Road assets are depreciated on a straight line basis from the date of acquisition or commission. Actual or observed condition is not currently considered as a basis for depreciation and as such written down values have no real significance as a measure of asset consumption or remaining service potential. From comparison of depreciation charges against annual budget allocations it is evident that Council does not fully fund the depreciation of its road assets.

### **Level of Service Measurement**

Levels of service for the road network are not currently set in relation to technical measurement criteria. Certain standards are implied, and indeed expected by the principal stakeholders, however there is currently no real means of measuring road network performance against expectations.

Levels of service provided for all road assets are primarily dictated by available funding and budgets. Renewals and resurfacing budgets are a reflection of previous allocations with an allowance for CPI increases over time. Political imperatives may influence the budget allocations for certain assets, however budgets and therefore service levels are for the most part based on historical rather than whole of lifecycle asset management principles.

Council's budget process identifies projected annual acquisition, renewal and maintenance expenditure for roads assets, however allocations are not linked to specific service standards for these assets. Therefore annual works programs are generally prioritised based on available visual condition information with assets replaced according to available funds. Ancillary road assets such as roadside furniture, line marking and signage are generally programmed annually on a needs or project related basis.



## Strategic Planning

The City's Infrastructure Services section currently produce a rolling 5 year works program for road rehabilitation and resurfacing based on visual condition data held in the RoadPAK system. The program is generated from the PMS then validated and costed at the project level before being presented to Council for adoption. Generally only about 35% of the recommended renewal works are funded annually. The Directorate of Works and Services have produced a strategic planning document however this has not been reviewed since 2003. The Transport and Road Safety components of the strategy outline the Directorate objectives for the management of road assets as:

*“To provide an integrated and safe transport system for our Community”*

*“To develop, encourage and implement actions to reduce the instances of injury and property damage”*

*“To provide an asset preservation program to optimise the economic life of Council assets.*

*“To ensure the rate of asset replacement is matched to the rate of asset consumption”*

*“To maintain all assets in an acceptable condition”*

The City has also nominated two road segments as trial sites for a sealed road deterioration modelling research program undertaken by the Australian Road Research Board (ARRB). This research is expected to conclude early in 2008, with localised deterioration algorithms being made available to Council as a basis for conducting network level deterioration analysis and works programming.

## **Works Management – Renewals and Maintenance**

Most capital, acquisition, renewal and maintenance works on the local road network are carried out by the Operations Services - CityWorks section. Sub contractors may be utilised to complete components of larger projects depending on project timing and available resources, however responsibility for project delivery remains with Operations Services. All road surfacing works are carried out under contract. Unplanned or reactive maintenance requests are received and logged through Council's Centre-Point Customer Service System and forwarded to operations for action. At the current time there is no formal works order system in place for maintenance and operating activities.

### **4.3.2. Stormwater Drainage Network**

#### **Knowledge of Assets**

The City is currently responsible for approximately 280 km of underground pipe network, 15,000 collection and access pits, over 300 outlets and sumps, lined and unlined swale and table drains and various other stormwater related assets. The principal asset components included in the Stormwater Drainage infrastructure class are:

- Underground Pipes (Predominantly RCP)
- Grated Collection Pits
- Access Chambers and Leach Tanks
- Above ground infiltration (Sumps and Basins)
- Pollutant traps and bio retention filters
- Lined and unlined conveyance systems (swales, table drains etc)

Typical stormwater pipe and pit assets are depicted in Figure 4-1.



**Figure 4-2 Typical Stormwater Drainage Infrastructure Assets**

Information on the stormwater drainage network is stored electronically within the asset management system HMS PipePAK. Spatial data for stormwater drainage is held in MapInfo. The mapping of the stormwater system was carried out in 1999, and corresponding attribute information was entered to PipePAK for each pit and pipe or drain segment. The spatial elements in MapInfo and attribute information stored in PipePAK were not linked at that time of data acquisition.

Attribute data recorded in PipePAK includes, pit type and measured depth, upstream / downstream pipe types, length and diameter, and unit rate cost information. Additional data includes estimated construction dates, and invert levels, however this information is incomplete and unreliable. Asset location and connectivity is described using an alphanumeric branch and reach labelling system. At the time of data acquisition no conventions were established to ensure uniformity in recording of connectivity within the network. Whilst the PipePAK system currently allows for accurate valuation of stormwater assets, without linkage to spatial location its functionality is limited as the data cannot be readily accessed or manipulated. The City currently has a project officer working on linking and validation of attribute information in PipePAK with the spatial mapping data recorded in MapInfo.

## **Data Management**

The City's stormwater drainage network was surveyed between 1999 and 2000 using a differential GPS system mounted on a motorised scooter. Structural reference points or pit locations and connecting pipes were mapped electronically within the City's CAD package MicroStation. The CAD based mapping data was transferred to MapInfo in 2003. No updates to mapping were carried out during the period 2000 – 2003. Significant development assets have been acquired over this period so the spatial data is considered to be out of date. The principal reason for mapping was to facilitate valuation and production of network maps for operations crews.

Data for new stormwater drainage infrastructure vested to Council through the development process is currently sourced in digital format and imported directly to MapInfo. Detailed attribute information is entered to PipePAK and records are linked to a corresponding spatial element in the GIS via unique identifier. There is an ad-hoc procedure in place to update the PipePAK system when renewals are carried out through Council operations. The infrastructure services section have published a standard pro-forma for recording of this information, however this is not utilised to a great extent by operations staff and work crews responsible for the completion of stormwater drainage works.

There is no documented data standard in place for recording of stormwater asset information; however this knowledge is retained with key staff responsible for the collection and entry of stormwater asset data.

## **Valuation, Depreciation and Effective Lives**

Aggregate infrastructure valuations were prepared using the PipePAK system at the time of original survey to comply with the introduction of AAS27. Stormwater drainage assets in PipePAK are currently valued directly using a unit rate cost basis. Each asset sub-component is given a corresponding dimension within the system.

An appropriate unit rate cost is then applied to the dimensional component to determine an overall replacement cost for the pipe segment or pit structure. Unit rates are updated annually using project cost information provided by Operations Services. Unit rates are derived from actual project costs and contract supply rates.

Renewal works completed under Council's capital works program and new assets vested from developers are entered into the PipePAK system and capitalised annually. Revaluation of the network is carried out annually to account for changes in the network structure (existing assets added to or removed from the system during data validation) and variations in unit rates. As with roads, stormwater assets are carried at fair- value rather than at cost. Effective lives of stormwater assets were established under Council policy at the time of original valuation. A nominal 75 year life is applied to all stormwater asset components. The capitalisation threshold for drainage infrastructure is currently set at \$ 10, 000. Due to a lack of reliable condition information stormwater assets are depreciated linearly.

### **Level of Service Measurement**

The City conforms to an implied level of service standard for stormwater drainage infrastructure, in relation to addressing localised flooding issues. However there are no documented standards or measurement criteria currently in place. Inspections are carried out following resident complaints and works are scheduled according to the relative need as determined by the inspecting officer – generally the Design Engineer. The Operations Services team respond to flooding issues where they are likely to impact on adjacent property. Temporary alleviation measures are installed as appropriate.

Levels of service for all stormwater assets are again dictated by available funding and budgets. Flood mitigation measures involving capital works are scheduled annually as per the funding available. Budgets are generally a reflection of previous allocations with an allowance for CPI increases over time.

Political imperatives may influence the budget allocations for certain assets, however budgets and therefore service levels are for the most part based on historical expenditure rather than whole of lifecycle asset management principles.

### **Strategic Planning**

To date there has been little work done on strategic planning for existing stormwater drainage infrastructure. Stormwater assets are generally repaired or renewed on a needs basis through the City Works maintenance budget. Capital works projects involving new infrastructure are put forward for consideration under the annual budget process. Works are prioritised for inclusion in budget using a simple 1-5 scale. A program of retrofitting existing catchment areas with new water sensitive stormwater treatments is currently underway. This is primarily driven by the need to protect the fragile Peel Harvey inlet system. This program is currently prioritised using officer knowledge and no detailed analysis has been undertaken to determine treatment priority. The drainage component of the Works and Services Strategic Plan outlines the objectives for stormwater management as:

*“To provide stormwater drainage and disposal systems to ensure there is no residential or commercial property damage, due to flooding for a one in ten year flood event”*

### **Works Management – Renewals and Maintenance**

Most capital acquisition, renewal and maintenance works for stormwater assets are carried out by the Operations Services – City Works section. Sub contractors may be utilised to complete components of larger projects, however responsibility for project delivery remains with Operations Services. Unplanned reactive maintenance requests are received and logged through Council’s Centre-Point Customer Service System and forwarded to Operations for action. At the current time there is no formal works order system in place to track maintenance and operating activities.

### 4.3.3. Bridges and Transport Structures

#### Knowledge of Assets

The City is currently responsible for approximately 29 individual bridge structures. This includes large span traffic bridges, smaller canal crossing structures, pedestrian footbridges and underpasses. The principal components included in the bridges and transport structures asset class are: includes large span traffic bridges, smaller canal crossing structures, pedestrian footbridges, culverts and underpasses.

Information on bridge structures is stored electronically within an excel spreadsheet maintained by Infrastructure Services. Attribute information is limited to generic location information and valuation data such as age and historic cost. Bridges are mapped by point location in MapInfo.

The Department of Main Roads WA (MRWA) are responsible for the inspection and recording of information for bridges on local roads within Western Australia. As such the need for Councils to keep detailed bridge management systems is limited. MRWA provide local authorities with recommended capital renewal works programs based on detailed structural inspections; however responsibility for routine maintenance and inspection rests with Local Government.

An example of typical bridge and transport structure assets under the control of the COM is shown in Figure 4-3.



**Figure 4-3 Typical Bridge Infrastructure Assets**

### **Data Management**

The City is responsible for advising MRWA of new bridge acquisitions, including the provision of as-constructed design drawings and location / inventory information. This process is currently undertaken as new bridges or structures are acquired from developers. Bridges are assigned a unique structure number by MRWA and this number is provided back to Councils for structure identification purposes. The City currently has detailed design drawings for most bridge structures, however no maintenance or operating data is currently recorded.

### **Valuation, Depreciation and Effective Lives**

Bridge valuations are based on historic costs as recorded within the excel spreadsheet. A revaluation of bridge assets has been carried out in 2006 to update current replacement costs for each individual bridge structure. The revaluation is based on a simple area (m<sup>2</sup>) unit rate of \$ 4500. This rate has been provided by MRWA.



Bridges are depreciated linearly based on a nominal 100yr life for concrete and steel structures and 60yrs for timber structures.

Renewal works completed under Council's capital works program and new assets acquired from developers are capitalised against the existing valuation total each year. The capitalisation threshold for bridge works is currently set at \$ 10, 000.

### **Level of Service Measurement**

Levels of service standards for bridges do not currently exist. There are no documented standards or measurement criteria currently in place to determine the service provided by bridge assets. Inspections are carried out annually to determine routine maintenance requirements and to satisfy risk management criteria. Works are scheduled according to the relative need as determined by the inspecting officer.

Bridge renewals are not linked to service standards at this point, however the City does have a bridge reserve fund which has recently been started to cover replacement costs of the Old Mandurah Traffic Bridge. This structure is now at the end of its useful life and replacement will be required within 5 years. Maintenance and operating budgets are determined based on previous allocations.

### **Strategic Planning**

The city has recently commenced strategic planning for replacement of the Old Mandurah Traffic Bridge. This structure has been scheduled for replacement in the 10 yr Capital works Program. No renewal or replacement program exists for other structures within the bridge portfolio. The WA State Government allocates grant funding for most bridge projects identified under the MRWA bridge preservation program. Councils are required to fund replacement works where an upgrade in service capacity is required. Routine general repairs and minor maintenance works are carried out on a needs basis through the City Build maintenance budget.

## **Works Management – Renewals and Maintenance**

Capital renewal works are programmed by the MRWA as part of their 10 year bridge preservation program. Council are advised of the need to carry out works on their structures in advance so that funding can be sought through the State Government grants program. Most capital acquisition, renewal and programmed maintenance works for bridges are carried out by specialised contractors. The Operations Services – City Build section are responsible for inspection and minor or routine maintenance activities on bridge structures. There is currently no system for tracking of bridge maintenance costs.

### **4.3.4. Parks and Reserves**

#### **Knowledge of Assets**

Parks inventory and property information is currently stored in both Authority and the parks management system HMS ParkPAK. ParkPAK is a specialised parks inventory and management system linked to the other HMS packages. At this point ParkPAK contains minimal inventory attribute information for some 170 individual park assets. Park data was collected in 1998 and no updates have been carried out since this time. Estimates indicate that the City's park asset inventory has grown by over 40% since the original survey due to subdivisional development acquisitions. Attribute information stored within ParkPAK includes:

- Property / Reserve number and identification information (street names).
- Areas of various components. (active / passive areas).
- Assets located within the reserve – (e.g paths, reticulation, trees).

Figure 4-4 depicts typical parks and reserve asset components.



**Figure 4-4 Typical Parks and Reserves Infrastructure Assets**

A separate playground equipment inventory is maintained in an access based management system called Playground Manager. A playground audit was conducted in 2004 and relevant inventory data has been entered to this system. Playground Manager is capable of recording management and operational data for risk management and maintenance tracking purposes; however this functionality is not utilised due to lack of staff knowledge and resources. Hardcopy plans are available for more recent reticulation installations, however this is not mapped within the GIS.

Street and verge trees are a major maintenance generator for Operations Services, with respect to overhang, footpath damage and dangerous limbs. For this reason a street tree inventory is currently being prepared through the Infrastructure Services Section. About 15% of the City's trees have now been located and recorded within MapInfo. This data collection program is ongoing.

### **Data Management**

At this point there is no formal system for capture of new parks and reserves assets from subdivisional development, or recording of renewals and maintenance works in the ParkPAK system.

Hardcopy plans from developers are kept by the Horticultural Services sections; however the city's own construction and renewals are not captured at all. For this reason, reinvention of the ParkPAK system and development of data standards for recoding of park asset information in a central location has been identified as a priority for the City.

### **Valuation, Depreciation and Effective Lives**

Parks and reserve land and buildings located within reserves are valued when general revaluation is undertaken via the State Government Valuer Generals office. Component assets located within parks, including footpaths, minor structures, playgrounds equipment, landscaping, reticulation and public art are not valued at this point in time. A nominal valuation figure of \$ 14 million was applied to the parks asset class at the introduction of AAS27 however no subsequent data collection or revaluation exercise has been carried out since this time. It is generally accepted that parks and reserves are currently being carried at well below replacement value. This is of major concern to the Finance Section and the City's financial auditors.

Renewal works completed under Council's capital works program are capitalised against the existing valuation total each year. Actual budget expenditure of a capital nature is included. The capitalisation threshold for park assets is currently set at \$ 10, 000. Parks asset acquisitions from the subdivisional development process have not been capitalised at all since the introduction of AAS27.

Based on the rate of development over the past 8 years it is estimated that an additional \$60-\$70 million in parks assets have been vested to Council over this period. The City's annual report and financial statements do not show the true value of parks assets and hence operating, maintenance and renewal requirements cannot be quantified with any certainty.

## **Level of Service Measurement**

Strategic service levels for parks and reserves assets have not been formally documented. There is a general desire within the community for Council to undertake regular irrigation and maintenance mowing to maintain aesthetic appearance. This has been the driving force behind a capital program to install a new telemetric reticulation system for major parks and reserves.

Park mowing is carried out by the Operations Services CityParks unit. Mowing is carried out cyclically with frequencies determined by officer knowledge, public request and available funding. Maintenance pruning and street tree care is also carried out on a needs basis or in response to customer requests. Tree inspections are not carried out to determine routine maintenance requirements or to satisfy risk management criteria. Tree pruning and maintenance works are scheduled according to the relative need as determined by the CityParks or Horticultural Services officers. Parks and reserves renewal works are not programmed beyond annual budgets. Maintenance budgets are applied based on historical allocations.

## **Strategic Planning**

Council does not have an overarching long term strategic plan for parks and reserves development, although various master plans have been prepared and implemented for a number of major reserves. Master plans are used as a basis for annual capital works programs.

The Parks and Reserves component of the Works and Services Strategic Plan outlines the objectives for parks and reserves as:

*“To provide reasonable and convenient community access to well maintained, safe and attractive parks and gardens.”*

*“To conserve, protect, manage and enhance the biodiversity of natural conservation reserves and provide managed access for the general public.”*

*“To preserve and diversify the overall streetscape of our City”*

Action plans stemming from these strategic planning objectives are not documented and works to improve or maintain the current standards are currently driven through the Horticultural Services section based on community feedback and a general knowledge of the City and its relative requirements.

Horticultural Services are active in influencing planning proposals for new developments within the City, and a number of strategic management factors are considered in granting approval for subdivisional development. However input from the Operations Services section regarding possible access issues or maintenance requirements is not sought or provided at this point.

### **Works Management – Renewals and Maintenance**

Capital renewal works are programmed by CityParks based on officer knowledge of relative priorities and customer request. Formal condition inspections of parks and reserve components are not completed.

Routine inspection of playground equipment in parks is carried out monthly and routine maintenance works requests are raised through this process. The CityParks unit are responsible for inspection and minor or routine maintenance activities within parks and reserves, however cleaning of ablutions and BBQ areas is carried out under schedule of rates contract.

Maintenance costs are allocated to major parks areas through a timesheet recording system, with minor works allocated to broader areas or precincts.

### 4.3.5. Buildings and Facilities

#### Knowledge of Assets

Council's principal buildings and facilities are loosely classified according to the following structure:

- Community halls
- Sporting and recreation centres
- Libraries
- Council administration and Civic buildings
- Public ablution facilities
- Commercial and residential use

Figure 4-5 depicts some of the typical buildings and facilities assets operated by Council.



**Figure 4-5 Typical Building and Facilities Infrastructure Assets**

Information held on buildings and facilities assets is currently recorded in both hardcopy and electronic format. A register of buildings and facilities exists within the Authority system and a separate excel spreadsheet records further location and functional information. Detailed attribute and component information for buildings and facilities is unavailable at this stage.

Some drawings and plans of buildings are available in hardcopy format. However plans are stored at various locations no central plans register exists, therefore the accuracy and completeness of these drawings is unknown.

### **Data Management**

No formal system for capture of new buildings and facilities infrastructure, or recording of renewals and maintenance works currently exists within Council. Building asset information is maintained by various sections including CityBuild, Finance, Legal and Compliance Services and Infrastructure Services.

### **Valuation, Depreciation and Effective Lives**

Buildings and facilities are re-valued every 5 years by the Valuer General for the purpose of calculating insurance premiums. Depreciation for buildings is linear based on a nominal effective life of 40 years regardless of the building type or location. Individual building components such as air conditioning plant, floor covering, fittings and fixtures are not recorded or valued separately.

Building cost and expenditure data is currently recorded in the Authority system as a separate line item under the parent building or facility. Renewal works completed under Council's capital works program are capitalised annually against the existing valuation for the parent building. Actual project cost figures are used. The capitalisation threshold for building related works is currently set at \$ 5, 000.



### **Level of Service Measurement**

Strategic service levels for building and facilities assets are not formally recorded or measured. Separate implied or assumed service level standards exist for the various types of building assets, however service level parameters are yet to be documented. For example public buildings such as the Council Administration Centre are maintained to a higher standard than ablution blocks. Key measurement criteria to monitor performance of these assets against specific standards are not yet in place.

### **Strategic Planning**

In 2005 Council engaged a consultant to prepare a 15 year maintenance and renewals programs for Council's building and facilities assets. The second stage of this program is now complete and a structured renewals and programmed maintenance plan has been documented. The program includes cyclical maintenance requirements such as painting and major programmed maintenance and renewal activities such as roof refurbishment or air conditioning replacement.

An assessment of current and future building utilisation has not been carried out, and there no systems for rationalising the building portfolio based on usage and need at this point. However rising land values have raised questions as to the viability of maintaining older structures located on prime sites.

The Works and Services Strategic Plan does not include a strategic vision statement or defined objectives for the management of building and facilities assets.

### **Works Management – Renewals and Maintenance**

Councils building and facilities assets are now renewed on a semi-programmed basis in line with the 15 year maintenance and renewals strategy. Work is undertaken by

CityBuild and schedule of rates contractors. Contract specifications are relatively loose and follow generally accepted industry design and maintenance standards.

To date no system exists to capture information or data relating to renewal or maintenance activities carried out on buildings. For example information such as when a building was last painted is generally gleaned from officer knowledge.

Requests for building or facilities maintenance are generated through the CentrePoint customer service system and are responded to by CityBuild staff or maintenance contractors as appropriate. New building works are generally listed on the 10 year capital works plan and are based on allocation of funding through the annual budget adoption process.

#### **4.3.6. Coastal and Marine Infrastructure**

##### **Knowledge of Assets**

Coastal and Marine assets are not currently recorded in a formal register or management system. Hardcopy plans and other information are available for some recent marine structures, however the location of this information varies and it is not possible to utilise the data for lifecycle asset management at this stage.

An informal inventory of boardwalks, jetty structures and fishing platforms is maintained by the CityBuild section. CityBuild are currently responsible for maintaining these structures.

The location of the City's boat ramps has been recorded in GIS however no attribute information is stored for these structures.

Rock walls, groynes and seawall revetments typically have limited routine maintenance requirements and hence are not captured in any format.

Figure 4-6 depicts some of the typical coastal and marine assets operated by Council.



**Figure 4-6 Typical Coastal and Marine Infrastructure Assets**

### **Data Management**

The City does not currently have a system in place for the capture of new coastal and marine infrastructure. Existing information on these assets is held and maintained by various sections including CityBuild, Finance, Mandurah Ocean Marina and Infrastructure Services.

### **Valuation, Depreciation and Effective Lives**

Coastal and Marine Infrastructure has been recognised and assigned a value in 2004 following the acquisition of a new rock groyne valued at \$ 1 million. To date the valuation only includes assets constructed after 2004 and does not recognise existing infrastructure acquired before this date.

Coastal and marine assets are not depreciated due to the lack of information on these assets and the limited scope of the current valuation. New acquisitions are capitalised against the existing valuation, based on actual project cost. Renewal works completed under Council's capital works program are also capitalised at cost.

## **Level of Service Measurement**

Service levels for coastal and marine infrastructure vary considerably due to the difference in component asset types. No level of service standards currently exist for coastal or marine type assets.

## **Strategic Planning**

In 2005 Council appointed a waterways manager to take over operation and maintenance of the Mandurah Ocean Marina and the City's canal waterway systems. This role has recently expanded to encompass responsibility for formulation of strategic planning documentation for coastal and marine infrastructure assets. The Works and Services Strategic Plan does not include a specific strategic vision statement or defined objectives for the management of coastal and marine assets.

## **Works Management – Renewals and Maintenance**

Coastal and marine assets are renewed on a needs basis only. In the case of jetties, boardwalks and fishing platforms, work is generally undertaken by CityBuild section or schedule of rates maintenance contractors. Risk inspections are carried out on pedestrian access areas on boardwalks, platforms and jetties. Defects are repaired as they are noted in accordance with available budget. No prioritisation of maintenance activities currently occurs.

### **4.3.7. Finance Systems**

#### **Asset Valuations and Depreciation**

The bulk of Council's infrastructure assets were identified and valued through a data gathering exercise undertaken over the period 1996 to 2000. This data has been stored in various forms and systems.

A formal data structure and collection / recording procedures were not established prior to embarking on the data collection exercise.

Capital works have since been capitalised against the original or revaluation totals depending on the asset class and information available. Road and stormwater drainage assets are valued at the component level within their respective systems; however Parks, Buildings, Bridges and Coastal / Marine assets are all valued at the aggregate asset level.

Likewise assets for which component information exists are depreciated separately using component effective lives. The written down position for all infrastructure is determined using straight line depreciation methods over the effective lives of the asset. Condition based depreciation is not currently calculated for any asset class.

### **Conclusions for Financial Asset Management**

There is generally a lack of confidence in accuracy and usefulness of the asset financial data held in the Authority system for key asset classes. It would be beneficial to remove all infrastructure assets from within the Authority Finance system and generate asset valuation and depreciation information from within separate HMS packages. This will allow Council to move towards condition based depreciation for those assets with complete and accurate condition information.

Each year various projects are capitalised in the Authority system by Finance officers after discussion with relevant Project officers. There is significant scope for misleading information to be conveyed in relation to the true capital cost of the assets as project costs often do not reflect the actual tangible asset value. For example land acquisitions and costs associated with service relocation should not be included in asset capitalisation figures as they distort the true cost of replacing these assets.

#### **4.3.8. Asset Acquisition and Handover**

City of Mandurah has experienced a major development boom over the past 8 years. Since this time the road, drainage, parks and bridge asset portfolios have at least doubled in size. The City has struggled to keep up with recording new assets as they are handed over from development. Council currently has internal systems in place for providing engineering related input to planning approvals process. Councils planning and development section receive development applications and these are forwarded to Infrastructure Services for comment and conditioning. Subdivisional guidelines do exist within the Infrastructure Service section however the guidelines are not currently made available to consultants or prospective developers. A review of these guidelines is currently underway. Supervision of subdivisional works is carried out by Council compliance staff to ensure that vested assets are constructed to agreed standards. Compliance officers currently coordinate the receipt of as-constructed and other asset information.

Plans for stormwater drainage and road assets are forwarded to the Asset Management section for storage and input of asset details to the relevant management system. At this stage only roads and drainage information is provided. Electronic plans have only been collected since 2002. Electronic plans are stored on a separate asset management server, used to house the asset databases and HMS software. New subdivisional assets vested to council An ad-hoc procedure exists for the recording of as constructed data for internally constructed road and drainage projects.

#### **4.3.9. Information Systems**

Council currently utilise the following information technology systems to assist with the management of infrastructure assets:

### **General Ledger, Property and Rates, Purchasing and Supply**

- Civica Authority System

### **Computer Aided Drafting and Design / Geographic Information System**

- AutoCad 2006,
- Bentley MicroStation,
- CivilCad
- MapInfo / Intramaps (MapInfo web front end)

### **Infrastructure Asset Management Systems**

- Roads – HMS RoadPAK / MapInfo
- Stormwater Drainage – HMS PipePAK / MapInfo
- Bridges – Excel and MapInfo
- Parks and Reserves – HMS ParkPAK / MapInfo / Playground Manager
- Buildings and Facilities – Excel and Authority
- Coastal and Marine – Excel and Authority

#### **4.3.10. Organisational Issues**

City of Mandurah has developed an appropriate organisational structure to operate infrastructure assets on a day to day basis. However there is currently a lack of defined responsibility for the strategic management of each key infrastructure group, and the responsibility for various strategic and operational functions of asset management is currently spread over different areas of the organisation.

For example the Asset Management team operate under the Infrastructure Services section and are currently responsible for preparation of 5 year and annual road renewal and resurfacing programs. Stormwater programs are delivered through Design Services and Building asset programs are put together by the Operations Services section. Responsibility for bridge and coastal marine asset programs is not currently defined.

The current organisational focus does not look beyond the preparation of annual budgets and works programs. All asset programs generated from various sources are combined in a draft budget document for prioritisation and funding allocation. No priority comparisons are currently possible across the various asset classes in terms of service level impacts.

An attempt has been made to establish an effective service purchaser, service provider model within the Works and Services directorate; however key asset management responsibilities under the current structure are not clearly articulated or understood across the directorate or organisation. This is a product of the rate at which the organisation has grown and the need to develop and maintain functional operational structures, at the expense of effective strategic management capability.

In terms of strategic planning there is a need to provide some structural or organisational improvements to support a higher level view of asset management requirements to support service delivery objectives. A clear linkage needs to be developed between corporate planning objectives, through to asset management strategies and individual business unit action plans. A structured strategic framework will provide the necessary means by which each of the asset program managers can assess and address the needs of their respective portfolios.



#### **4.3.11. People Issues**

Over the past 10 years the City of Mandurah has grown rapidly into a large Local Government organisation. Due to the City's geographic location as a semi regional centre in close proximity to the metropolitan area, it has been difficult to attract and retain the right people.

This issue reinforces the vital need from an organisational perspective for appropriate systems to be implemented to capture knowledge and experience that staff have acquired during the course of their employment. Council has standard position description and staff training programmes in place, however these lack a focus on the portfolio based management of key infrastructure assets. Most training and development programs have been directed towards enhancing specific skill sets such as systems usage or technical skills in particular areas.

Overall organisational culture is good and most staff involved with infrastructure management see the benefits of advancing asset management capabilities. However there is a perception that the problem is too big and given current workloads it will be impossible to make any advancement in the short term. This can result in despondency and lack of motivation to continue with asset management programs. For this reason it is considered important that "quick wins" are identified so the benefits of advancing asset management capability can be seen.

## **CHAPTER 5 BEST APPROPRIATE PRACTICE**

### **5.1. Introduction**

In order to prepare and implement an effective asset management strategy it is essential to first establish a clear direction and future vision for achieving a desired level of asset management practice within the organisation. In defining the future vision the organisation should develop a clear and unambiguous understanding of the level of asset management sophistication considered to be “appropriate” given the organisation’s current business drivers and external influences. The following chapter examines the process used to define the future vision for AM the City of Mandurah. The concept of best “appropriate” practice required to assist the organisation to achieve this vision is also discussed and developed.

### **5.2. Asset Management – Future Vision**

To provide a starting point for defining the future vision for the City of Mandurah further industry research was conducted to document the level of asset management proficiency that constitutes “best industry practice” (BIP) for similar local government agencies in Australia. The best practice approach generally involves implementing specific AM processes that guide corporate decision making, supported by robust asset data and information systems. The concept of BIP can be defined by reference to a set of key criteria describing specific asset management competencies.

Typically, an organisation carrying out best appropriate practice asset management should be able to make the following claims (WAAMI, 2005):

1. We know what we own or have responsibility or legal liability for.
2. We have recorded these assets in a register down to an identifiable level.
3. We monitor the condition, performance, utilisation and costs of assets down to the managed component level and can aggregate this data up to give outputs of cost and performance at the following levels:
  - Asset
  - Facility
  - Sub system or
  - Full system / programme
4. We thoroughly understand and have recorded the current levels of service provided by our assets in terms of quantity and quality of service.
5. We understand the likely future levels of service required based on population growth, demographic changes and community expectations.
6. We understand the long term (20 year) infrastructure funding needs of our municipality to meet these customer expectations in both capital and recurrent expenditure.
7. We monitor and report on the condition, performance and functionality of our assets against prescribed service levels and regulatory requirements.
8. We have uniform processes across our whole organisation for the evaluation of any investment in:
  - Capital works
  - Maintenance
  - Operations

9. The prioritisation process involves an assessment of the relative risks and benefit costs of these investments.
10. We only make decisions on individual projects when all service programmes have completed these outputs and the funding needs of the whole organisation are known together with the knowledge of their impact on rates and charges.
11. We always approve the necessary renewal programmes to sustain the existing levels of service before other works, providing they are justified through the relevant processes.
12. We only approve capital expenditure for new works and services with the commitment of the necessary recurrent expenditure required to operate, maintain and renew the assets over the effective lifecycle.
13. We assess the indirect or ancillary cost impacts of inadequate asset condition or performance on the community in terms of the economic consequences of failing to meet our agreed standards or service levels.
14. We link our corporate goals to our investments and ultimate business unit asset management action plans.
15. Our financial plan and the outcomes of our Asset Management Plans are intrinsically linked.

The above statements define the level of practice and capability considered to be industry best within Australia at the current time. From the research and benchmarking conducted it was evident that very few Australian Councils, if any can claim to have systems in place that fully address all of the best practice criteria listed above.

### 5.2.1. Defining the Vision

In order to define and document the asset management vision for the City of Mandurah a second series of staff workshops were organised. The objective of these workshops was to establish a broad set of criteria that described an appropriate level of asset management capability for the City of Mandurah at the current time. The workshops were organised in a similar format and structure to the first workshop in which the current status of the asset management capability was established.

Using the above concept of best practice as a guide and considering the external influences currently affecting the organisation, the workshop group was able to formulate and define the future direction for asset management at the COM. The principal objective of this process was to develop and document the level of asset management capability that staff considered to be “appropriate” for the organisation.

Unanimous consensus amongst workshop participants highlighted that the future vision for asset management was *“for Council to have sufficient knowledge and information on infrastructure assets to enable elected members to make “informed” decisions to maintain community service delivery standards whilst optimising the whole of lifecycle cost of owning infrastructure assets”*.

To achieve this level of asset knowledge and decision making sophistication, the organisation will need to develop effective and efficient asset information management and reporting systems. Minimum asset information should include physical asset inventory data as well as condition and performance data for all asset classes. It is also necessary to recognise the resources involved with maintaining this significant investment in asset information for an indefinite period.

The future vision as described above can be encapsulated by the following statements:

- a) *Infrastructure assets are planned, acquired, operated, maintained and disposed of at optimal “whole of life” cost to the Community.*
- b) *Assets are maintained throughout their useful life in a manner commensurate with the level of resources available and the maximum productive output achievable, whilst ensuring lifecycle economy and Community safety as a priority.*
- c) *Council knows the current condition, performance capacity and value of all infrastructure assets and fully understands the long term renewal funding required to match asset deterioration over time.*
- d) *Asset maintenance and operations are undertaken in a structured manner, utilising coordinated and intelligent systems and procedures appropriate to the value of the asset portfolio and level of risk involved.*

The future vision for asset management as defined above should demonstrate a direct linkage to the organisations strategic plan and core business objectives.

### **5.3. City of Mandurah – “Appropriate” Practice**

Whilst the concept of best practice is considered highly desirable for the City of Mandurah to achieve over a period of time, it was recognised that, as with many other Councils in Australia, the City is facing a number of various issues which impact significantly on the organisations ability to achieve “best practice” within the near future. Best practice may not necessarily constitute a prerequisite to good practice, therefore it is appropriate to define a best “*appropriate*” level of capability specific to the organisation and the key business drivers currently influencing the Council.

Having established the parameters that define best industry practice, the outcomes from the visioning workshops were compiled into a set of key statements that describe the level of asset management capacity perceived to be appropriate for City, given current AM capability, core strategic objectives and external business drivers. The principal statements defining appropriate practice for Mandurah are highlighted below:

- Knowledge of “all” existing infrastructure assets.
- Knowledge of physical condition and lifecycle position.
- Knowledge of asset performance (Cost, Reliability, Capacity and Utilisation)
- Ability to measure current and agreed levels of service.
- Ability to predict future demand for assets and services.
- Ability to prioritise works to optimise available funding across all programs.
- Ability to program future maintenance and operational activities.
- Ability to manage the processes of asset creation, handover and commissioning (internal & external).
- Effective processes for asset rationalisation and disposal.
- Effective processes, information systems and data available to facilitate “informed” decision making and good corporate governance.

## **CHAPTER 6 GAP ANALYSIS**

### **6.1. Introduction**

The previous chapters have defined the current status of asset management practices at the City of Mandurah, and have outlined the level of practice deemed appropriate for the City given current corporate objectives and key business drivers. Having established these fundamental components of the improvement planning process it is now possible to measure or quantify the gap between best appropriate practice and current status. Through the use of gap analysis techniques, the gap between the current and best appropriate practice quality levels are rated against the criticality of various issues to the Council as a whole. This provides for the identification of key improvement areas required in both the short and long terms. Quantitative measurement of the “gap” is achieved using a structured and repeatable scorecard process. The results of the gap analysis assessment for the City of Mandurah are outlined in the following Chapter.

### **6.2. The Gap Analysis Process**

The object of the gap analysis is to develop a structured and repeatable assessment process designed to quantify or measure the “gap” between existing asset management capability and the level of practice considered appropriate for the City at this point in time. In order to appropriately measure the gap a customised scorecard assessment system has been developed based on the core and sub-elemental criteria identified in the current status review outlined in Chapter 4. It was considered important that a customised process be developed for Mandurah as this enabled the assessment criteria to be tailored to suit the specific needs of the organisation thereby ensuring that understanding and ownership of the assessment process and results could be fostered throughout the project.



McPherson (2006) notes that when designing a gap analysis process or quality audit for assessing the management capacity of an organisation it is important to ensure that the process is:

1. Logically structured and repeatable to facilitate future review and monitoring of progress or decline in asset management practice.
2. Undertaken with a no fault approach. Focussing on view to encouraging improvement, not blaming past management or performance.
3. Structured in a manner that easily identifies the maximum benefits for the organisation in a “whole of business” sense.
4. Structured to facilitate input, involvement and ownership by key staff involved with the management of assets within the organisation.

### **6.2.1. Asset Management Quality Elements**

As detailed in Chapter 4 there are a number of core elements of lifecycle asset management that can be used to assess the current level of asset management sophistication within an organisation. The principal measure of an organisations asset management capability is the quality and complexity of the asset management plans that can be produced via the various enabling processes that provide input to the plans. The quality of practice in relation to these core elements will ultimately dictate the quality or level of confidence that can be placed in the asset management plans produced. For the purposes of completing a structured gap analysis process the following 5 quality elements of best practice asset management have been considered.

1. Asset Management Processes and Planning
2. Asset Information Systems
3. Commercial Tactics
4. Organisational Issues
5. People Issues

These elements form the top level of the review structure and are supported by various sub-elements which provide the basis for detailed assessment. Figure 6-1 lists the 5 primary quality elements used (in bold) and their related secondary elements.

<b>Asset Management Quality Elements and Subcomponents Utilised in the Gap Analysis Process</b>	
<b>1.00</b>	<b>Asset Management Process and Planning</b>
1.01	Knowledge of Assets
1.02	Data Standards and Management
1.03	Asset Valuation, Depreciation and Effective Lives
1.04	Service Levels - Specification and Measurement
1.05	Strategic Planning Life Cycle
1.06	Work Management (Renewals and Maintenance)
1.07	Total Asset Management Plans
1.08	Capital Processes
1.09	Review Audit (Continuous Quality Improvement)
<b>2.00</b>	<b>Asset Management Information Systems</b>
2.01	Asset Registers / Systems
2.02	Strategic Planning Systems
2.03	Works Management Systems
2.04	Asset Costing Systems
2.05	Customer Management / Service Systems
2.06	Plans and Records Management Systems
2.07	Spatial Mapping Systems
2.08	Systems Integration and Usability
<b>3.00</b>	<b>Implementation Tactics</b>
3.00	Core/Non-core Activities Identified
3.01	Packaging of Contracts
3.02	Specification Quality
3.03	Information and Data Availability
3.04	Contract Supervision (Performance Monitoring)
3.05	Contractor Selection and Assessment
<b>4.00</b>	<b>Organisational Issues</b>
4.01	AM Policy and Corporate Commitment
4.02	Accountability - AM Structure and Sponsorship
4.03	Asset Management Roles and Responsibilities
4.04	Corporate AM Steering Committee
4.05	AM Planning - Business Asset Management Teams
4.06	Corporate Vision and Commitment
<b>5.00</b>	<b>People Issues</b>
5.01	Skills/ Age Profiles
5.02	Organisational Culture
5.03	Change Management
5.04	Appropriate Skills and Resourcing
5.05	Training Issues
5.06	Corporate Knowledge Management

**Figure 6-1 Gap Analysis Quality Element Structure**

### 6.2.2. Scorecard Assessment System

A scorecard assessment structure has been used to provide an organised, hierarchical framework by which to assess the individual quality elements and related best appropriate practices. The scorecard assessment provides a powerful tool for measuring the confidence level embedded in the organisations asset management decision making environment. This confidence level represents a measure of the quality of asset management practices employed by the CoM. Table 6-1 (overleaf) depicts a typical completed scorecard used to assess the organisational capability in relation to criteria 1.01 – Knowledge of Assets. The individual scorecards completed as part of the analysis have been included at Appendix C.

The results of the gap analysis scorecard assessment as shown in Figure 6-2 (overleaf) represent a compilation of the individual scorecard results which have considered over 150 individual practices associated with best practice or advanced asset management. The results of this assessment are discussed more fully under a subsequent heading, however the gap analysis results chart is mentioned here illustrate the concept of the scorecard assessment process.

The rows on the gap analysis chart define a progressive level of asset management practice, starting from “innocence” and ascending upwards through “awareness” and “competence” to “excellence”. Each scale increment represents better data, information, organisation and knowledge about the decisions made by Council with respect to infrastructure assets. By advancing up this scale Council is able to demonstrate more robust confidence levels relating to the predictability of projected outcomes from CapEX and O&M investments. This results in transparency of process and greater confidence of stakeholders and the Community in Council’s ability to provide a sustained level of service in the most cost effective manner.

The first row at the bottom of the gap analysis chart (Current Score) represents the aggregate confidence level assigned to each of the criteria listed in the columns. This figure is extracted from the total shown on the relevant assessment scorecard. The second row (Appropriate Score) represents the level of confidence considered appropriate for the City given the future vision developed in Chapter 5. The third column (Gap) represents the difference between the current assessment score and the BAP score.

The key inputs used to gather information to support the gap analysis scorecard process included structured interviews with executive management and key staff representing various asset related service areas, a third staff workshop undertaken with the Asset Management Working Group, an objective assessment of existing systems and practices used within the organisation by the author and a review and assessment of various strategic organisational reports and operating documentation.

<b>KNOWLEDGE OF ASSETS</b>				
<b>Max Score</b>	<b>Sub Element</b>	<b>Element Description</b>	<b>Score</b>	<b>BAP Target</b>
10	<b>Asset Hierarchy</b>	Processes for defining the structure of the asset registers and level of asset data collected and managed down to component or MMI level. Can data be aggregated up to reflect facility / system information?	5	10
20	<b>Asset Attribute Information</b>	Does a documented process exist for the collection and management of asset attribute information? Is there a data structure standard in place?	10	15
20	<b>Asset Condition</b>	Documented process for undertaking regular condition assessments to determine the potential residual life of assets. Is the condition data of sufficient level and quality to predict condition based failure?	10	20
15	<b>Asset Age / Effective Life</b>	Process for recording asset creation dates. Is asset age info recorded for all assets? Is there a sound, documented process for establishing effective lives of assets to component (MMI) level based on condition vs. performance information?	12	15
10	<b>Asset Location</b>	Do asset registers record sufficient asset location information. Can asset locations can be represented in a spatial format (GIS)	8	10
15	<b>Asset Performance / Utilisation</b>	Are there effective processes in place to measure and record asset performance, capacity and utilisation data and report on performance, capacity and utilisation?	5	12
10	<b>Lifecycle Cost Data</b>	Asset register records sufficient cost information (creation, maintenance and renewal) to allow for analysis of optimal long term management scenarios and lifecycle cost reporting.	5	8
<b>100</b>			<b>55</b>	<b>90</b>

**Table 6-1 Example Gap Analysis Scorecard**



### **6.3. Gap Analysis – Results Summary**

The gap analysis assessment results depicted in Figure 6-2 represent the organisations perception of the difference between current practice and the appropriate level of practice for COM as developed through the workshop and structured interview process.

The findings of the gap analysis assessment, along with the ratings in each category, and the projected 12 months targets were presented to the Asset Management Group and Executive Management Group in order to prioritise the results and assign specific actions to address the gap over a set period of time. The AMG and EMG were in general agreement with the findings presented in the gap analysis. It was felt that the summary thermometer graph painted an excellent visual picture of the areas in need of improvement within the organisation.

As noted in Figure 6-2 the lifecycle asset management component with the largest gap related to Processes and Planning Total Asset Management Plans. The low score in this area is due to the fact that the organisation does not yet have documented asset management plans for any of the infrastructure asset groups. The development of these plans will therefore become a primary improvement project to be implemented under the strategy.

## CHAPTER 7 IMPROVEMENT PROJECTS

### 7.1. Introduction

Having established and prioritised the principal areas for asset management improvement using the gap analysis assessment it is now possible to develop a set of improvement projects to address the specific enabling process that will assist the organisation in working toward its asset management vision. The following Chapter outlines the asset management improvement projects considered appropriate for the City of Mandurah. These projects are prioritised for implementation over a 5 year period.

### 7.2. Project Development

To establish a level of priority in relation to addressing the identified gaps, a weighting factor was assigned to each lifecycle AM component. This weighting factor numerically describes the relative importance of the specific quality elements in relation to the City's key business drivers and future vision for asset management practice. This product of the gap score and the applied weighting factor (4<sup>th</sup> row) gives the weighted gap score (5<sup>th</sup> row) which has been used to determine the relative priority for improvement (6<sup>th</sup> row).

The next stage of the strategy development process involves the identification of individual improvement projects or actions targeting the specific priority areas defined in the gap analysis assessment. A rough draft of suggested improvement actions was formulated as a basis for group discussion and input. It was considered important that the AM working group and management team play a role in developing these projects, as responsibility for future implementation will ultimately rest with management



A third half day workshop involving the AMG and EMG was convened to discuss the proposed projects individually and determine their suitability for implementation within the organisation. Following in principal agreement to the draft program a list of 44 individual projects was developed. Further research was then undertaken to summarise the broad scope and objectives of each improvement task in relation to the AM aspects being developed. The resources and timeframes required for implementation were also estimated based on advice received from industry consultants and the technical supervisor for this project.

This information has been collated and written up into individual project briefing forms. It is intended that project briefs be handed allocated to relevant officers for implementation in the appropriate program year, once funding allocations have been approved.

### **7.3. Summary of Key Projects**

Table 7-1 provides a summary of the improvement projects identified. Projects have been grouped according to the specific AM quality element that they address. The 44 projects have been ranked according to priority and programmed for implementation over the 5 year period between 2006 and 2011. Full details on each project, including principal objectives, costs and resources involved have been outlined in the set of project briefing sheets prepared for inclusion in the final strategy document.

At the time of writing this dissertation, the project sheets are still being finalised and are therefore incomplete, however they have been included here to demonstrate the improvement project concept. Further refinements are necessary prior to insertion in the final strategy document. A copy of the draft briefing sheets has been included at Appendix D.

<b>ASSET MANAGEMENT - IMPROVEMENT PROJECTS</b>	
<b>Knowledge of Assets</b>	
Project 1	Review and Document Asset Definitions and Hierarchy / Data Structure (to MMI) - All Asset Groups.
Project 2	Document Procedures Manual for Asset Data Collection and Management - All Asset Groups
Project 3	Establish + Document Routine Condition Inspection and Revaluation Programme - All Asset Groups
Project 4	Data Collection / Mapping of Property Assets to Component Level (BuildingPAK)
Project 5	Data Collection / Mapping for Parks and Reserves Assets (ParkPAK Facilities)
Project 6	Data Collection / Mapping for a Street Tree Register (ParkPAK Trees)
Project 7	Data Collection / Mapping for Footpaths / Cycleways (RoadPAK Footpaths)
Project 8	Data Collection / Mapping of Street Signs and Furniture (RoadPAK Misc) - Video Survey
Project 9	Complete RoadPAK Condition Rating and Update ROMAN data.
Project 10	Representative CCTV Condition Assessment - Stormwater Assets
<b>Asset Valuation and Financials</b>	
Project 11	Review + Document Asset Valuation and Capitalisation Procedures - All Assets
Project 12	Revise Infrastructure Valuation and Financial Reporting Policy
Project 13	Develop process to separate CAPEX into Renewal, Upgrade or Expansion in Budget.
Project 14	Link Project Account No's to Unique Asset Identifier in Budget
<b>Levels of Service</b>	
Project 15	Document Asset Service Level Standards and Define Performance Measures (Consultation)
Project 16	Implement Annual Performance Measurement and Reporting Framework - All Assets
<b>Strategic Planning</b>	
Project 17	<b>Develop "fist cut" Total AM Plans (All Asset Groups)</b>
Project 18	Document Annual Update / Review Procedures for AM Plans
Project 19	Analyse Existing Data and Establish 5 year Renewal / Refurbishment Programs - All Assets
Project 20	Review the Process for Evaluating Treatment Options
Project 21	Implement Resource Allocation Model / Capital Evaluation System - RAMP
Project 22	Complete Structured Demand Models Based on ID-Data Demographic Modelling. - All Asset Groups
<b>Asset Creation and Renewals</b>	
Project 23	Develop Procedures for New Asset Acquisition
Project 24	Project Supervision Requirements for Asset Creation or Renewals
<b>Maintenance Management</b>	
Project 25	Review / Document Asset Maintenance Information Requirements - All Assets
Project 26	Develop an Annual Programmed and Routine Maintenance Schedule (All Assets)
Project 27	Develop a 10 year Asset Maintenance Plan (All Classes)
Project 28	Implement Works Management System (HMS)
Project 29	Establish Maintenance Data Aggregation and Reporting System - Link to Authority and HMS
<b>Process Issues</b>	
Project 30	Review Budget Development Process
Project 31	Develop Web-based Capital Project Request System - Linkage to RAMP
<b>Information Support Systems</b>	
Project 32	Purchase and Installation of BuildingPAK
Project 33	Develop Linkage Between Financial System (Authority) and Corporate Asset Registers (HMS)
Project 34	Develop Linkage Between Customer Service System and Works Management System (WMS)
<b>Organisational Issues</b>	
Project 35	Confirm the Charter and Role of the AMG
Project 36	Convene AMG Subgroups and Deliver AM Plan Workshops / Training.
Project 37	Review Directorate Structure & Dedicated AM Resourcing
<b>People Issues</b>	
Project 38	Training in Data Management and Associated Systems
Project 39	Training in Strategic Planning and Budget Preparation
Project 40	Training in Works Management System
Project 41	Training in MapInfo
Project 42	Elected Members Asset Management Training Course (IPWEA, WALGA)
<b>Review, Audit and Continuous Improvements</b>	
Project 43	Establish + Implement Continuous Review Process for AM Plans and Strategy
Project 44	External Audit of AM Plans and Improvement Strategy

**Table 7-1 Asset Management Improvement Projects**

## CHAPTER 8 COST / BENEFIT ANALYSIS

### 8.1. Project Costs

Figure 8-1 (overleaf) summarises the projects identified for implementation at the City of Mandurah and the associated project budgets for the 5 year period from June 2006. It is recognised that Council has already adopted its final budget for the 2006-2007 financial year, therefore the projects listed for this period are restricted by available funding under the adopted budget. For this reason many of the projects may begin during the current period but will not be fully funded until the 2007-2008 budget process has been completed, providing Council agree to commit the recommended funding as highlighted in the strategy.

The project costs and resources shown in Figure 8-1 represent the best estimates based on current industry rates for provision of the type of professional services involved with these projects. The project budgets are based on the assumption that external resources will be utilised to deliver the project objectives where it is not possible for internal staff to complete the project in the required timeframe. Obviously significant input will be required from internal staff to administer, manage and provide information to support project delivery by external consultants.

Many of the costs shown represent an ongoing cost to the organisation as they involve the collection of physical asset data and condition information for a broad range of assets. Asset data collection is not a once of cost and suitable resources must be applied to maintain data accuracy, integrity and currency. Given the rate at which the City is acquiring infrastructure assets from subdivisional development, these costs are likely to escalate over the next 5 years. One of the key projects included in the strategy (Project 3) involves the determination of condition inspection frequencies and revaluation programs for all asset classes.

This project will identify the costs and resources associated with maintaining the City's asset data, however for the purposes of the strategy the ongoing costs have been estimated at around \$ 120 / year, per \$ million replacement value. Given current infrastructure value estimates this equates to a cost of approximately \$ 96,000 per annum across all asset classes.

<b>ASSET MANAGEMENT - IMPROVEMENT PROJECT SUMMARY</b>							
<b>Knowledge of Assets</b>		2006/07	2007/08	2008/09	2009/10	2010/11	
Project 1	Review and Document Asset Definitions and Hierarchy / Data Structure (to MMI) - All Asset Groups.	AMG	\$2,500				
Project 2	Document Procedures Manual for Asset Data Collection and Management - All Asset Groups		\$8,000	\$8,000			
Project 3	Establish + Document Routine Condition Inspection and Revaluation Programme - All Asset Groups		\$9,500				
Project 4	Data Collection / Mapping of Property Assets to Component Level (BuildingPAK)		\$35,000	\$20,000			
Project 5	Data Collection / Mapping for Parks and Reserves Assets (ParkPAK Facilities)		\$20,000	\$25,000	\$25,000	\$10,000	
Project 6	Data Collection / Mapping for a Street Tree Register (ParkPAK Trees)		\$20,000	\$20,000	\$10,000	\$10,000	
Project 7	Data Collection / Mapping for Footpaths / Cycleways (RoadPAK Footpaths)		Int (DS)	\$25,000	\$15,000		
Project 8	Data Collection / Mapping of Street Signs and Furniture (RoadPAK Misc) - Video Survey		\$24,000				
Project 9	Complete RoadPAK Condition Rating and Update ROMAN data.		\$35,000	\$12,000	\$12,000	\$12,000	
Project 10	Representative CCTV Condition Assessment - Stormwater Assets		\$10,000			AMO	
<b>Asset Valuation and Financials</b>							
Project 11	Review + Document Asset Valuation and Capitalisation Procedures - All Assets		\$3,500				
Project 12	Revise Parks and Reserves Infrastructure Valuation		\$2,000				
Project 13	Develop process to separate CAPEX into Renewal, Upgrade or Expansion in Budget.		\$8,000				
Project 14	Link Project Account No's to Unique Asset Identifier in Budget			\$10,000			
<b>Levels of Service</b>							
Project 15	Document Asset Service Level Standards and Define Performance Measures (Consultation) - All Assets		\$15,000	\$15,000			
Project 16	Implement Annual Performance Measurement and Reporting Framework - All Assets		\$2,500	\$2,500	\$2,500	\$2,500	
<b>Strategic Planning</b>							
Project 17	<b>Develop "fist cut" Total AM Plans (All Asset Groups)</b>	AMG	\$15,000	\$15,000	\$15,000	\$15,000	
Project 18	Document Annual Update / Review Procedures for AM Plans	AME					
Project 19	Analyse Existing Data and Establish 5 year Renewal / Refurbishment Programs - All Assets	Int (AME)	\$15,000	\$8,000	\$8,000		
Project 20	Review the Process for Evaluating Treatment Options						
Project 21	Implement Resource Allocation Model / Capital Evaluation System - RAMP		\$18,000				
Project 22	Complete Structured Demand Models Based on ID-Data Demographic Modelling. - All Asset Groups			\$15,000			
<b>Asset Creation and Renewals</b>							
Project 23	Develop Procedures for New Asset Acquisition		\$8,000				
Project 24	Document Project Supervision / Management Requirements for Asset Creation or Renewals		\$3,000				
<b>Maintenance Management</b>							
Project 25	Review / Document Asset Maintenance Information Requirements - All Assets		\$5,000				
Project 26	Develop an Annual Programmed and Routine Maintenance Schedule (All Assets)		\$5,000	\$5,000	\$5,000	\$5,000	
Project 27	Develop a 10 year Asset Maintenance Plan (All Classes)			\$15,000			
Project 28	Implement Works Management System (HMS)		\$45,000	\$10,000	\$10,000		
Project 29	Establish Maintenance Data Aggregation and Reporting System - Link to Authority and WMS				\$7,000		
<b>Process Issues</b>							
Project 30	Review Budget Development Process			\$12,000			
Project 31	Develop Web-based Capital Project Request System - Linkage to RAMP			\$8,000			
<b>Information Support Systems</b>							
Project 32	Purchase and Installation of BuildingPAK		\$25,000	\$15,000			
Project 33	Develop Linkage Between Financial System (Authority) and Corporate Asset Registers (HMS)				\$20,000		
Project 34	Develop Linkage Between Customer Service System (Centrapoint), and Works Management System (WMS)				\$15,000		
<b>Organisational Issues</b>							
Project 35	Confirm the Charter and Role of the AMG	Int (AME)					
Project 36	Convene AMG Subgroups and Deliver AM Plan Workshops / Training.	Int (AME)	\$5,000				
Project 37	Review Directorate Structure & Dedicated AM Resourcing	Int (DWS)		\$5,000			
<b>People Issues</b>							
Project 38	Training in Data Management and Associated Systems		\$2,000	\$8,000		\$5,000	
Project 39	Training in Strategic Planning and Budget Preparation				\$5,000		
Project 40	Training in Works Management and AM Systems			\$8,000		\$5,000	
Project 41	Training in Mapinfo			\$5,000	\$5,000		
Project 42	Elected Members Asset Management Training Course (IPWEA, WALGA)			\$7,800		\$7,800	
<b>Review, Audit and Continuous Improvements</b>							
Project 43	Establish + Implement Continuous Review Process for AM Plans and Strategy	Int (AME)	\$1,500	\$1,500	\$1,500	\$1,500	
Project 44	External Audit of AM Plans and Improvement Strategy					\$5,000	
TOTAL = \$ 868, 100			\$139,000	\$334,300	\$222,000	\$133,800	\$39,000

**Figure 8-1 Improvement Project Program and Cost Summary**

## 8.2. Project Benefits

There are many benefits, both tangible and intangible that can be derived through implementation of improved asset management practices within an organisation. Some of the more direct and obvious benefits for the City of Mandurah include:

- Reduction in decision-making time required for Council to prioritise capital and recurrent expenditure.
- Introduction of formal condition assessment techniques that assess the key distress criteria of the asset can save time spent in the office analysing the results and defining appropriate intervention strategies.
- Development of a formal procedure for justifying and ranking proposed capital works projects based on benefits and costs in net present value terms allows projects to be prioritised and will simplify decision making processes. Considerable savings in management time can be achieved in setting and approving capital works programmes for future years.
- By developing asset management plans covering all key infrastructure assets (following a documented process for their preparation), Council can determine the minimum expenditure requirement necessary to maintain the current levels of service provided to the Community. This knowledge was not available in the past and expenditure has largely been reactive or politically driven.
- Council will develop a better understanding a view of the longer-term cash flow necessary to maintain service delivery. This provides adequate forewarning of future funding requirements allowing early action to be taken, thus providing the Community with assurance that current services will remain sustainable.

- The risk exposure involved with inadequate knowledge of true asset condition and the expenditure required to meet service delivery objectives are dramatically reduced. This reduction is ongoing and will continue over time.
- Service delivery statements outline the services and the expected quality of delivery will be defined and measured. This allows Council to assess if the desired service level is in fact being delivered and if this service meets customer expectations. Historically the services offered have largely been assumed and not formally defined or measured.
- A sophisticated asset management system will assist all levels of staff gain quicker access to more accurate information regarding the assets they manage. This will deliver savings in time and money in decision making plus deliver an enhanced service to customers.
- Data held on assets will be subjected to scrutiny and in many cases either rationalised or augmented to ensure it meets the level of information required to effectively manage the asset portfolio.
- Benefits will be derived from reduced data management costs and/or savings realised through a reduction in time spent defining what action should be taken to rectify asset non performance issues.
- Having a greater understanding of the condition valuation and life cycle position of infrastructure assets will enable Council to minimise its annual depreciation expense whilst providing sufficient supporting evidence to satisfy external scrutiny via audit and financial reporting requirements.

In order to undertake an objective cost benefit analysis process the potential benefits achievable through implementation of the improvement projects identified above must be properly quantified. To do this the potential benefits have been divided into two categories to assist with the benefit assessment process. The following headings describe the benefits achievable in relation to these key areas.

### **8.2.1. Strategic Planning Benefits**

Strategic planning benefits relate to the development of formalised total asset management plans and the subsequent incorporation of these plans into the 10 yr and annual capital works programs for the City. By developing and adopting AM plans it is expected that lower cost asset renewal and replacement options will be identified. At this point the City does not yet have the right processes, systems and asset knowledge in place to ensure that optimal renewal options are implemented in all cases.

By applying strategic AM planning the effective lives of infrastructure assets can be extended. This is achieved through regular condition monitoring and the development (and funding) of programs that optimise timing of renewal and maintenance interventions. By applying this analogy it is estimated that Council could extend the life of certain assets by up to 10% of the original life expectancy.

To properly define the potential strategic planning benefits for the City's asset portfolio it would be necessary to assemble all available asset data and cost information to carry out a robust assessment of each individual asset class. This is considered beyond the scope of this research and as such will not be completed as part of this project. However it is possible to provide an indication of potential strategic planning benefits in an economic sense, by examining the current macro level infrastructure valuations contained within the annual reports compiled by Finance Services.

These reports indicate that the City's current annual depreciation charge for infrastructure assets is in the order of \$ 8.85 million per year. Ideally this figure should represent the total consumption of infrastructure service potential within that year. Therefore in theory the depreciation charge should be matched by on equal terms by a capital renewal or replacement program to maintain status quo.

Most Council's across Australia do not currently match their capital expenditure with the renewals program defined via asset life expectancies. Infrastructure assets are kept in service well beyond their intended design or service life. By allowing this to happen, Council runs the risk of generating excessive unplanned maintenance expenditure and missing opportunities to minimise whole of life costs.

The asset quantity and current valuation data available to Council has been analysed to determine the difference between current renewal requirements and the level expected under BAP asset management conditions. An estimate of potential benefits in relation to the following 2 criteria has also been made to help quantify savings potential achievable through strategic AM planning:

1. Extension in infrastructure asset service lives (capital deferral) that can be achieved through implementing asset management plans, and
2. The reduction in capital expenditure from the introduction of treatment option evaluation procedures as part of asset management plans.

By applying the estimated savings of capital deferral and rehabilitation to existing valuation and depreciation calculations, as identified above, there is an expectation that the annual capital or renewals expenditure requirement will fall from \$8.85 million to about \$ 7.6 million across all infrastructure classes. This represents a reduction in renewal costs of approximately \$ 1.25 million or 14 % per annum.



However, the City does not currently operate at zero efficiency in terms of asset management capability. Various ad-hoc practices are in place at the operational level and significant asset management improvements have been made over the past 10 years. Some of these practices have been highlighted in the current status assessment outlined in Chapter 4. Using the calculated “gap” scores generated in this assessment it is possible to quantify the average “gap” or remaining potential for efficiency improvements, beyond the current capability. Table 8-1 summarises the current status score and the target score expected once improvement projects have been implemented.

<b>Potential Benefits</b>	<b>Portion of Total Benefit</b>	<b>Current Status Score</b>	<b>BAP Score</b>
<b>AM Process/ Practice</b>	50 %	42%	88 %
<b>Information Systems</b>	20 %	51 %	87 %
<b>Commercial Tactics</b>	10 %	55 %	80 %
<b>Organisational Issues</b>	5 %	45 %	75 %
<b>People Issues</b>	15 %	45 %	90 %
<b>TOTAL</b>	<b>100 %</b>	<b>48 %</b>	<b>84 %</b>

**Table 8-1 Potential Benefits Achievable**

It is estimated that through implementation of the improvement program the City is capable of realising an additional  $(84 \% - 48 \%) = 36 \%$  of the potential benefits associated with best appropriate practice asset management. When put into economic terms, this translates into 36 % of the difference between zero strategic planning renewal expenditure (\$ 8.85 million) and best appropriate practice planning (\$ 7.6 million). Using this analogy it is possible to achieve approximately **\$450,000** in renewals saving per annum.

However this saving will not be an instantaneous reduction in capital expenditure. The investment in improved asset management practices will take some years to be fully realised and results will obviously depend on the level of aggressiveness applied to achieving these savings. Conversely it may well be possible to achieve efficiency improvements greater than those identified through the benefit cost assessment process

### **8.2.2. Maintenance Management Benefits**

The maintenance management benefits achievable through implementation of the strategy planned maintenance programmes for each asset group

As outlined in the current status assessment the City has applies nominal asset life expectancies to many of its assets. This information is used to define the annual depreciation rate for the assets and identify the anticipated time when the asset will reach the end of its service life.

In defining these asset lives Council has drawn on industry practice and local experience, of asset life expectancies. These effective lives are premised on the application of sound programmed maintenance practices, and optimal intervention for renewal or refurbishment. Logically then, if assets are not maintained in accordance with optimal intervention practices, they will not to reach their full potential life expectancy.

By applying a planned maintenance approach to each infrastructure group the asset life expectancy is likely to be achieved. The alternative is to “do nothing” and maintain the current reactive maintenance approach (that is correct maintenance problems as they are identified).

This approach often leads to premature asset failures and damage to assets that could otherwise have been avoided. Unplanned maintenance typically costs more than

planned maintenance and usually has some detrimental effect on the remaining life of the asset. Additionally, customer service is typically reduced due to the higher rate of asset repairs.

In an effort to quantify the economic impact of not having a planned maintenance programme in place, an assessment has been made on the reduction in life expectancy likely to be experienced within each of the asset types. A lack of planned maintenance will have differing impacts depending on the asset type being considered. For example, there is likely to be a greater impact on stormwater drainage as this is out-of-sight and generally only reported for reactive maintenance once a serious problem occurs, such as flooding damage or a collapse. By maintaining a regular cleaning and pipe inspection programme these failures can be largely avoided. Other asset types such as air conditioning systems must be maintained in accordance with a planned maintenance regime or they may need major overhaul or renewal well short of their life expectancy.

Assets such as footpaths and road pavements are highly visible and problems are usually reported to Council before they have a serious impact on the overall asset life. Additionally the planned maintenance activities that are applicable to these asset types have a limited effect on the overall life expectancy. Assets such as playgrounds and public toilets are predominantly controlled by public health and vandalism issues when defining the level of maintenance expenditure. Essentially these assets types will benefit from a planned maintenance regime however they generally will not be the governing factor for the overall asset life expectancy.

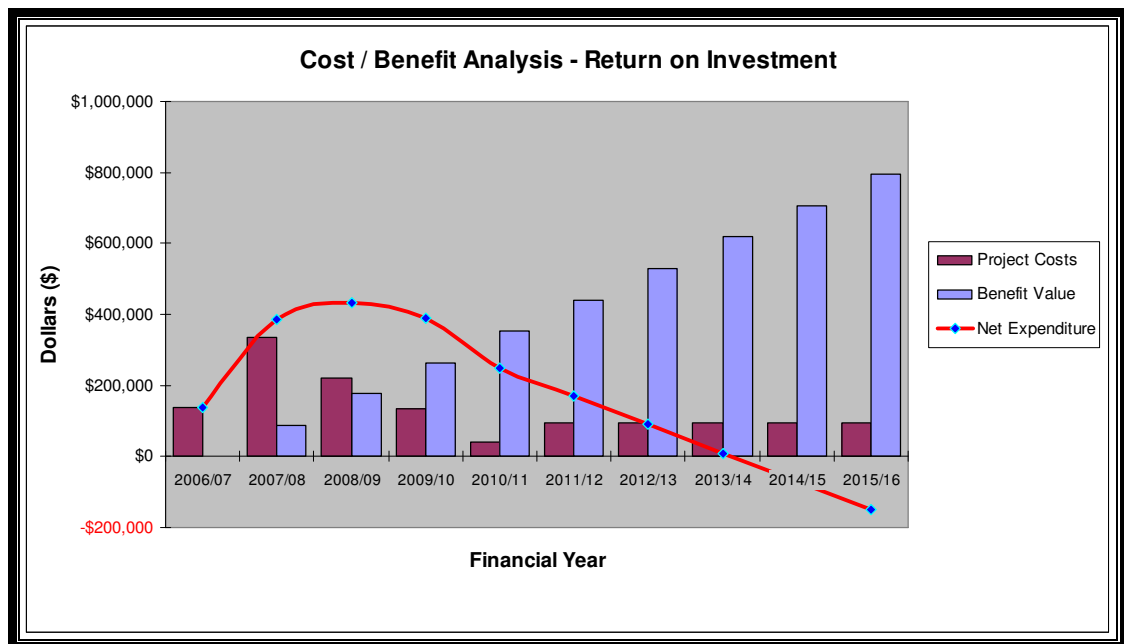
By applying this logic to Council's asset base it is expected that if only a reactive maintenance approach is adopted then the annual required renewals expenditure is expected to increase from **\$8.8 million** to **\$10 million**. This represents an increase in annual renewal expenditure of \$1.2 million on top of the exiting renewals gap.

As calculated above the City is expected to incur only **36%** of this increase due to its current level of sophistication. This translates to **\$432,000** per annum additional renewals expenditure.

The maintenance management benefit is considered to be separate from and additional to the benefits achievable from implementing strategic AM planning or asset management plans. By implementing asset management plans to optimise the capital strategies applicable to assets, longer-term savings in renewals expenditure can be achieved. However, these benefits are based on a life expectancy that assumes a planned maintenance environment is in place. By removing a planned maintenance environment, or not implementing it to an appropriate level, the life expectancy of assets is reduced which tends to cancel out the savings achievable through introducing asset management plans. Therefore strategic renewals planning and maintenance management can be viewed as interdependent entities. In order to realise the potential benefits of sound asset management planning to be achieved, optimal maintenance management practices must also be implemented.

### **8.3. Cost Benefit Assessment**

Project Costs identified above come to a total of **\$868,100** over four financial years. In addition, an estimate of \$96,000 has been added from 2004/05 as an estimate to cover the costs involved with ongoing condition assessments. Benefits have been estimated at \$ **450,000** potential saving in renewals expenditure achieved through the implementation of asset management plans. An additional **\$432,000** pa in renewals expenditure can be avoided through implementing a programmed maintenance environment. Depending on resources applied it is estimated that the full potential benefits will be fully realised after 8 – 10 years. These costs and benefits are expressed in the following return on investment graph.



**Figure 8-2 Projected Return on Investment**

The above graph highlights that the asset management improvement programme is expected to have a pay back period of approximately seven to eight years. The net expenditure line represents the difference between the cumulative improvement programme costs and the estimated economic benefits. After the year 2013 / 2014 the City is expected to be operating at or near best appropriate practice and will therefore be realising maximum renewal benefits and achieving optimum economic efficiency in terms of infrastructure management.

## **CHAPTER 9 SUMMARY AND CONCLUSIONS**

As identified in the introductory Chapter of the dissertation, the challenge now facing Local Government authorities in Australia is to ensure that appropriate strategic management and operational business systems are implemented in order to optimise the whole of life cost of owning and operating infrastructure assets from acquisition through to ultimate disposal. Corporate goals and objectives must be reviewed and aligned to reflect the changing Community expectations in terms of infrastructure management and sustainability. The Community at large now expects that Local Government organisations seek to deliver cost efficiency, sustainability of service and life cycle affordability in the ongoing provision and maintenance of public infrastructure.

This research project has examined the current asset management practices employed by the City of Mandurah in Western Australia and has outlined the key steps taken in the preparation of an Asset Management Practice Improvement Strategy for the City. The project has looked at the current status of AM practice within the organisation and used this as a basis for determining a future vision for achieving a level of asset management capacity considered to be appropriate for the City in terms of its key business drivers.

The key objective of the strategy is to assist Council to enhance the management processes, systems and data required to support the development and implementation of detailed Asset Management Plans for all infrastructure assets. It is anticipated that through the ultimate adoption and implementation of this strategy the City will move towards its vision of achieving best appropriate practice asset management over a period of time.

Through improving internal asset management practices Council can approach the future with confidence in the ability to provide the Mandurah community with “*sustainable*” and efficient service delivery through the effective operation and management of its infrastructure asset portfolio.

## **9.1. Recommendations**

In relation to the Asset Management Improvement Strategy developed through the work undertaken in course of this research project, the following recommendations are put forward:

That Mandurah City Council adopt the future vision and 44 improvement projects developed through this research project and embark on a program to implement the various improvement tasks identified over the coming 5 years.

Following an executive review of the strategy and the completion of more detailed scoping / costing of improvement projects, Council commit the required funding to the 5 year implementation programme as identified in the Strategy.

That projects be delivered with external support from qualified asset management consultants were required, such that the program can be implemented without undue pressure on existing internal resources.

The Strategy be utilised by Council as a live document being updated and improved upon as the organisation grows, business drivers change and AM capacity is enhanced.

## **9.2. Limitations**

### **9.2.1. Cost Benefit Analysis**

Whilst the cost benefit analysis described in this project provides a subjective means by which Council can measure the viability of the improvement plan, the basis used to construct the cost benefit analysis is considered by the author to be inadequate at this point in time. The principal reasons for this conclusion are outlined as follows. .

There is a distinct lack of confidence in the existing asset financial information available within the organisation at this point in time. As such it was necessary to construct best estimates of financial benefits and asset depreciation rates. Whilst the need for more accurate and reliable asset financial information and reporting mechanisms is addressed in the improvement plan the figures used in developing the cost benefit assessment are considered rubbery at best.

For the purposes of direct comparison with project costs the assessment considers potential benefits purely in financial or economic terms and does not attempt to quantify other potential intangible or indirect benefits such as community and stakeholder satisfaction, organisational efficiency and staff satisfaction, transparency in governance and improved public perception of Council or ongoing benefits to future generations and broader economy. Some of the additional intangible benefits to the organisation include:

- Improved asset knowledge and reduction of risk exposure.
- Flow on cost reduction opportunities from improved processes, systems and knowledge.



- Improved cash-flow management through reduction in funding spikes and fluctuations between years which may lead to excessive borrowings.
- Improved position and possibility of premium reductions with insurance companies as a result of improved risk management.

### **9.3. Further Work**

The development of the strategy itself represents a significant step forward in working towards the improvement of the organisations asset management capability. Through participating in the development process the City has gained a better understanding of some of the key issues and barriers to effective asset management planning and as such is now in a position to address these issues in due course. The next phase of the asset management journey for the City of Mandurah will involve implementation of the key improvement projects identified within the strategy. The success of this critical phase in the strategic improvement lifecycle will depend largely on the resources allocated to the programme and the level of project management and supervision applied to the implementation of the tactical plan.

A key project identified within the improvement plan is the development of “first cut” asset management plans for all infrastructure asset classes. The processes involved with development of these plans presents an excellent opportunity for further work to be done in this area, in terms of conducting the required organisational research and planning to assemble a reliable long term asset management plan for particular asset groups. It is suggested that development of a Road Network Asset Management Plan for the City of Mandurah would be an interesting and rewarding project topic for a student to undertake in the future. Work undertaken in this area would also be of great benefit to the City as identified in this project.

The strategy also includes recommendations for audit and review. The audit and review process will be centred around the customised gap analysis and capacity assessment framework developed as part of the research project. Repetition of the gap analysis workshops and revision of the strategy document to reflect changing business drivers and organisational trends presents an opportunity for further related work to be undertaken in the future. This work will determine if the strategy has in fact achieved its objectives and will provide a sound basis for refining tactical direction and developing subsequent actions to ensure continuous improvement. In addition the audit and review function will continue to promote a culture of asset management excellence at all levels within the organisation.

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**APPENDIX A**  
**PROJECT SPECIFICATION**

ENG 4111/ 4112 - RESEARCH PROJECT 2006

## PROJECT SPECIFICATION

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<b>TOPIC:</b>	DEVELOPMENT OF AN ASSET MANAGEMENT IMPROVEMENT STRATEGY FOR THE CITY OF MANDURAH
<b>AUTHOR:</b>	MICHAEL J GUNTON
<b>SUPERVISORS:</b>	DR DAVID THORPE – USQ (Principal Supervisor) ASSOC. PROF. RON AYERS – USQ (Assoc. Supervisor) MR ALLAN CLAYDON – CITY OF MANDURAH (Technical Advisor)
<b>SPONSORSHIP:</b>	CITY OF MANDURAH WA
<b>REVISION:</b>	<b>ISSUE A.</b> 15 <sup>TH</sup> MARCH 2006

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### PROJECT OBJECTIVE

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The primary objective of this project will be:

- To research and document a detailed corporate strategy outlining key improvement measures aimed at enhancing the infrastructure asset management capacity of the City of Mandurah.


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### FRAMEWORK / METHODOLOGY

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The following methodology will be used in conducting the research and documenting the Asset Management practice improvement strategy.

- 1) Carry out a literature and industry review of current asset management issues and best practice approaches within Australian Local Government;
- 2) Research, describe and define the existing management practices currently in place at the City of Mandurah;
- 3) Carry out a detailed investigation into current management systems and identify key areas for improvement using “gap analysis” techniques;
- 4) Prepare a detailed Asset Management Practice Improvement Strategy defining recommended improvement projects and incorporating a detailed cost / benefit analysis.
- 5) Compile and present a report on the proposed strategy and implementation plan to City of Mandurah Executive Officers and Council.
- 6) Prepare a dissertation of the project work summarising outcomes of the strategy for submission to USQ.
- 7) Prepare and deliver a 15 minute oral presentation summarizing the outcomes of the project to a peer group forum.
- 8) If time permits – begin working with City of Mandurah management team on the implementation of key projects identified within the strategy.

Signed:  (student) Dated 21 / 03 / 2006

Signed:  (supervisor) Dated 21 / 3 / 06

**APPENDIX B**  
**MAP OF THE PEEL REGION –WA**





## PEEL REGION KEY FEATURES



Produced by the Geological Survey of Western Australia.  
Map product is to be used for broad based planning only.  
© Western Australia 2005  
September 2005

DATA DIRECTORY		
THEME	SOURCE	DATE
Cultural	DI/DaIR	1998
Transport	DI	1998
Hydrography	DI	1998
Tenure	CALM	Mar 2005
LGA Boundaries	DI	2004
Aboriginal Communities	Department of Indigenous Affairs	2004
Important Resource Projects	DaIR – modified from MINEDEX and WAPMS databases	Nov 2004

**APPENDIX C**

**GAP ANALYSIS SCORECARD SYSTEM**

<b>KNOWLEDGE OF ASSETS</b>				
<b>Max Score</b>	<b>Sub Element</b>	<b>Element Description</b>	<b>Score</b>	<b>BAP Target</b>
10	<b>Asset Hierarchy</b>	Processes for defining the structure of the asset registers and level of asset data collected and managed down to component or MMI level. Can data be aggregated up to reflect facility / system information?	5	10
20	<b>Asset Attribute Information</b>	Does a documented process exist for the collection and management of asset attribute information? Is there a data structure standard in place?	10	15
20	<b>Asset Condition</b>	Documented process for undertaking regular condition assessments to determine the potential residual life of assets. Is the condition data of sufficient level and quality to predict condition based failure?	10	20
15	<b>Asset Age / Effective Life</b>	Process for recording asset creation dates. Is asset age info recorded for all assets? Is there a sound, documented process for establishing effective lives of assets to component (MMI) level based on condition vs performance information?	12	15
10	<b>Asset Location</b>	Do asset registers record sufficient asset location information. Can asset locations can be represented in a spatial format (GIS)	8	10
15	<b>Asset Performance / Utilisation</b>	Are there effective processes in place to measure and record asset performance, capacity and utilisation data and report on performance, capacity and utilisation?	5	12
10	<b>Lifecycle Cost Data</b>	Asset register records sufficient cost information (creation, maint and renewal) to allow for analysis of optimal long term management scenarios and lifecycle cost reporting.	5	8
<b>100</b>			<b>55</b>	<b>90</b>

<b>DATA STANDARDS AND MANAGEMENT</b>				
<b>Max Score</b>	<b>Sub Element</b>	<b>Element Description</b>	<b>Score</b>	<b>BAP Target</b>
10	<b>Asset Classification</b>	Asset Categorisation. (eg. Ability to group assets by type, location, material, facility etc. for reporting and manipulation.)	5	10
10	<b>Asset Heirarchy</b>	Asset Hierarchical Structure. (eg. The level to which asset information is collected and the ability to amalgamate asset costs and performance from MMI to parent asset.)	5	10
10	<b>Spatial Location</b>	Asset Spatial Data. (eg. Spatial data stored within the GIS. Especially, all distributed linear assets and locations of larger facilities.)	6	10
15	<b>Basic Attributes</b>	Basic physical attributes. (eg. Size, material, installation date, model etc.)	8	15
7	<b>Condition Data</b>	Asset condition data. (eg. Rating of asset condition data.)	2	7
7	<b>Valuation Data</b>	Asset valuation data. (eg. Current asset replacement values / historical value and written down depreciated values.)	4	7
5	<b>As constructed Data</b>	Drawing / Plans. (eg. Drawings and plans of assets and facilities.)	1	3
3	<b>Detailed Attributes</b>	Detailed physical attributes. (Manufacturer, spare parts and numbers etc.)	1	1
3	<b>Performance Data</b>	Asset performance data. (eg. Recording and rating of asset performance.)	0	1
5	<b>Maintenance History</b>	Maintenance History Data. (eg. Detailed maintenance history including activity and timing.)	1	5
5	<b>Operations History</b>	Operations Data. (eg. Operations history and data on failure consequences management.)	1	3
5	<b>Works Management</b>	Works and / or resource management data. (eg. The data related to the resource elements of work order history including labour, plant and materials work performed, in both capital and recurrent activities.)	1	3
5	<b>Risk Data</b>	Risk Assessment Data. (eg. Risk assessment data including probability and consequence of failure, and the subsequent business risk exposure.)	2	5
5	<b>Cost History</b>	Cost history data. (eg. Full cost history of maintenance and operation activities together with depreciation and capital charges where applicable.)	1	5
5	<b>Unit Costs</b>	Data for costing of options. (eg. Cost summary for standard construction and rehabilitation techniques, maintenance and operational activities.)	2	5
<b>100</b>			<b>40</b>	<b>90</b>

<b>VALUATION, DEPRECIATION AND EFFECTIVE LIVES</b>				
<b>Max Score</b>	<b>Sub Element</b>	<b>Element Description</b>	<b>Score</b>	<b>BAP Target</b>
<b>25</b>	<b>Asset Valuation</b>	Processes for undertaking asset valuations. (eg. Are asset valuations undertaken and is the method documented? Is there a method to assess the quality of that valuation?)	10	20
<b>20</b>	<b>Effective Service Lives</b>	Processes for determining the effective lives or residual economic lives of all assets in the register. (eg. Are these lives based on real local and historical performance data?)	10	18
<b>15</b>	<b>Asset Operational Costs</b>	Processes for tracking and reporting operational costs. (eg. Are operating and maintenance costs recorded against each asset to MMI level and can they be reported on at the asset group or facility level ?)	0	15
<b>15</b>	<b>Asset Renewal Liability</b>	Do processes exist for determining future renewal expenditure liabilities? (eg. Is the long term projected future expenditure on assets known and reported on?)	8	15
<b>15</b>	<b>Age / Risk Management</b>	Processes for determining residual business risk exposure. (eg. Is predicted operational risk exposure due to decay in facilities or assets calculated?)	3	10
<b>10</b>	<b>Historical Cost Analysis</b>	Are historical renewal and operating costs collected, recorded and archived for individual assets. (eg. Can all the historic costs associated with a critical asset be analysed and reported on ?)	4	7
<b>100</b>			<b>35</b>	<b>85</b>

<b>SERVICE LEVELS SPECIFICATION AND DEMAND MEASUREMENT</b>				
<b>Max Score</b>	<b>Sub Element</b>	<b>Element Description</b>	<b>Score</b>	<b>BAP Target</b>
10	<b>Understanding Demand</b>	Processes for breaking up demand into key drivers and understanding of the influences on demand. (eg. Does the organisation understand the impacts of stakeholder relationships, regulations and demographic changes, etc)	5	10
15	<b>Stakeholder Consultation</b>	Processes for undertaking, analysing and responding to community / customer and stakeholder surveys. (eg. Are surveys conducted and reported on?)	10	15
25	<b>Service Standards</b>	Processes for defining levels of service. (eg. How are Customer Charters and service level agreements developed and maintained? Are customer survey results used to set levels of service?)	8	20
25	<b>Performance Measurement</b>	Processes for determining level of service and performance measurement criteria.	5	20
10	<b>Service Level Review</b>	Processes for regular measurement and review of service level standards based on customer consultation and feedback.	5	10
15	<b>Demand Prediction</b>	Processes for predicting future trends in demand for services based on historic and external influences. (eg. Does the organisation undertake demand predictions based on scenario planning?)	7	15
<b>100</b>			<b>40</b>	<b>90</b>

<b>STRATEGIC PLANNING FUNCTIONS</b>				
<b>Max Score</b>	<b>Sub Element</b>	<b>Element Description</b>	<b>Score</b>	<b>BAP Target</b>
5	<b>Failure Mode Analysis</b>	Processes for predicting failure modes of assets. (eg. The way in which the organization predicts the likely failure modes for individual assets or its components.)	0	3
5	<b>Risk Assessment</b>	Processes for undertaking risk assessments of asset failure for inclusion within the planning process. (eg. What is the likelihood and consequence of a particular asset failing?)	2	5
15	<b>Optimised Renewal</b>	Processes for making optimized asset renewal decisions by choosing the most economical solution time to renew / replace an asset. (eg. Does the process include all options for life extension including non asset solutions using life cycle cost analysis?)	8	15
10	<b>Lifecycle Costing</b>	Processes for assessing the life cycle cost of new assets where spent costs and existing configuration has no influence on the final solution. (eg. Are capital, maintenance and operational costs accounted for?)	4	10
5	<b>Efficiency Review</b>	Processes to identify cost reduction or service level improvement opportunities. (eg. Is this a random process or is it systematic?)	3	5
25	<b>Total Asset Management Plans</b>	Processes for producing Asset Management Plans from a strategic perspective. The quality of AM plans are looked at under a separate element. (eg. Is there a systematic structure and efficient process for producing and reviewing AM plans ?)	10	25
15	<b>Customer Consultation</b>	Processes for working with customers, regulators and other stakeholders during long term strategic planning. (eg. Informing, seeking and incorporating feedback.)	10	15
15	<b>Works Prioritisation</b>	Processes for budget rationalisation. (eg. The matching of the asset plan and forecasted expenditure with available financial resources and the process by which the work is prioritized.)	5	12
5	<b>Asset Rationalisation</b>	Processes for rationalizing the existing asset portfolio and disposal of unwanted assets. (eg. Identifying assets for disposal, mothballing or transfer to improve business effectiveness to reduce cost and release funds for other purposes.)	3	5
<b>100</b>			<b>45</b>	<b>95</b>

<b>WORKS MANAGEMENT (Renewals and Maintenance)</b>				
<b>Max Score</b>	<b>Sub Element</b>	<b>Element Description</b>	<b>Score</b>	<b>BAP Target</b>
8	<b>Operating Procedures</b>	Processes for developing and maintaining operating procedures. (eg. Are new assets automatically included and how often are they reviewed?)	2	5
5		Quality of the actual Operating Procedures, which relate to the successful operation of all assets in relation to normal and emergency operations. (eg. Do these exist, cover all areas and assets down to the maintenance managed item level?)		5
5		Processes for handling customer and stakeholder complaints. (eg. Are these tracked through the business from receipt to resolution? Is the customer kept informed of the progress of their complaint?)	2	3
5	<b>Operations Manuals</b>	Processes for developing and maintaining operation manuals. (eg. Are new assets automatically included and how often are they reviewed? How should operators update the manuals when procedures change?)	2	3
3		Quality of the actual Operating Manuals and Standards. (eg. What form should do they take and does the manuals cover all assets	1	3
5	<b>Emergency Response Planning</b>	Processes for the development and maintenance of Emergency Response Plans, including for what events, against what level and criticality of asset should these be completed. (eg. Are new assets automatically included and how often are they reviewed and what triggers the need for upgrades?)	4	5
5		Quality of the actual Emergency Response Plans. (eg. Do these exist and cover all asset services? Are they to the appropriate level of detail?)	3	5
5	<b>Maintenance Policy</b>	Is there a maintenance policy that defines the organisations priorities for undertaking maintenance of its assets? (eg. Does a corporate wide policy exist and is it related to business goals and cost analysis?)	0	5
5	<b>Maintenance Planning</b>	Processes for maintenance planning. (eg. Is there a process for defining how each asset / asset type will be maintained? What is the basis for determining the maintenance procedure or activity for a single asset? Does this process cover all assets?)	2	5
5	<b>Maintenance Scheduling</b>	Processes for maintenance scheduling. (eg. How does the organization determine the maintenance schedule or intervals for the prescribed maintenance activity?)	2	5



5	<b>Maintenance Reporting</b>	Processes for monitoring and controlling the maintenance program. (eg. Is there adequate reporting and feedback from field staff and information systems to enable the complete understanding of what is happening to the assets?)	2	5
5	<b>Maintenance Costing</b>	Processes for recording and reporting maintenance costs down to the maintenance managed item level. (eg. Are asset costs reported and accessible? Is there a clear policy on what is required?)	2	5
5	<b>Maintenance Manuals</b>	Processes for developing and maintaining contents of the Maintenance Manuals and Instructions. (eg. Are new assets automatically included and how often are they reviewed? What is the process by which the responsible staff can update them? Is the format specified?)	2	5
5		Quality of the Maintenance Manuals and Instructions. (eg. Do these exist and cover all business units/divisions and assets types?)	2	5
3	<b>Maintenance Programs</b>	Processes for reviewing and analysing maintenance programs. (eg. Is this a systematic process? Are the trigger points and processes understood by all?)	1	3
5	<b>Maintenance Strategies</b>	Processes for developing maintenance strategies that incorporate the overall business drivers for maintenance, capital and system performance. (eg. Is there a corporate wide approach to developing maintenance strategies that covers all assets and amalgamate to higher levels?)	1	3
3	<b>Resource Management and Work Orders</b>	Processes for matching skills to the demand for services / activities and allocating resources across the organization. (eg. What is the process for matching resource demand with available supply? Is it across the organisation?)	2	3
5		Processes for prioritizing work orders. (eg. Are work orders allocated an rating or criticality score? Are these based on the risk to the business?)	2	5
3		Processes for managing larger projects that involve multiple tasks and tracking of those costs. (eg. Processes for the financial control and timely delivery of a group of work orders.)	2	3
5		Processes for controlling inventory or stock. (eg. Are work orders linked to the required spare parts? Are these spare parts ordered in advance of completing the work order?)	3	4
5		Processes for planning future work load and required resources. (eg. Does the organization predict and balance future work load for different skills and numbers of staff for all life cycle functions?)	3	5
100				40

<b>TOTAL ASSET MANAGEMENT PLANS</b>				
<b>Max Score</b>	<b>Sub Element</b>	<b>Element Description</b>	<b>Score</b>	<b>BAP Target</b>
15	AMP's	Does the organisation have long term Asset Management Plans (AMP's) for each major infrastructure group used to provide services? (eg. Separate plan for Road Network, Stormwater Drainage, Parks / Reserves, Buildings / Facilities etc.)	2	15
10	Level of Service	Do the AMP's include a record of current standards and level of service. (eg. Are these documented?)	0	10
10	Asset Knowledge	AMP's detail existing knowledge of the assets. (eg. Can the reader quickly ascertain the extent of the asset base including age, condition, performance, value, cost and location? The entire asset portfolio should be included.)	5	8
10	Future Demand	AMP's include projected (future) demands and levels of service. (eg. Does the organisation have a vision of the future demands including growth / decline and levels of service? Are the key impacts identified?)	1	7
5	FMECA	AMP's include predictions of failure modes. (eg. Are all failure modes identified including growth, renewal (reliability and mortality structural integrity), failing levels of service, and business efficiency?)	0	3
5		AMP's include the consequences of failure if the assets are not maintained and renewed. (eg. Are consequences of not maintaining or renewing assets adequately quantified and summarized?)	0	3
10	Forward Works Program	AMP's include optimal renewal strategies to extend the life of individual assets, facilities and systems. (eg. Are renewal strategies identified and future funding requirements predicted?)	4	10
5	Asset Acquisition Program	AMP's include the capital works necessary to service new works or customers. (eg. What new works will be undertaken, when and how much will they cost? Has the program been validated?)	2	3
10	Operating / Maintenance Program	AMP's include operations and maintenance programs. (eg. Are the operational and maintenance strategies, and predicted costs rolled into this plan?)	3	8
5	Alternative Delivery Options	AMP's should include the most cost effective option for asset improvements. (eg. Have all asset options been considered, including non-asset solutions and the 'do nothing' option?)	0	5

<b>10</b>	<b>Stakeholder Consultation</b>	AMP's should include reference to customer or stakeholders for consultation clearly showing them the future sustainable cost and levels of service over a period of at least 30 years. (eg. Are customer / stakeholders consulted with this information and is	3	8
<b>5</b>	<b>Linkage to Strategic Plan</b>	AMP's include links to the business goals which should be related to customer and stakeholder expectations. (eg. How does the plan demonstrate that it is meeting these business goals and customer expectations?)	0	5
<b>100</b>			<b>20</b>	<b>85</b>

<b>CAPITAL PROCESSES</b>				
<b>Max Score</b>	<b>Sub Element</b>	<b>Element Description</b>	<b>Score</b>	<b>BAP Target</b>
10	<b>Project Identification</b>	Processes for the successful Program Management of the asset, renewal creation or acquisition program. (eg. Process for the tracking of projects from the strategic planning stage (project identification) through to the final service delivery/ commissioning and handover.)		8
10	<b>Project Management</b>	Processes for Project Management. (eg. Processes for the financial cost control and timely delivery of a project and the mitigation of risks involved in this area.)	8	10
5	<b>Design Construction Standards</b>	Processes for ensuring appropriate construction standards and quality control is achieved in all asset creation and acquisition work. (eg. Are contractor audits and other quality control mechanisms used?)	2	5
5	<b>Design Review</b>	Processes that ensure the optimum maintainability / operability of new assets is achieved. (eg. Are design reviews by the operations and maintenance staff undertaken prior to final design and are these carefully assessed?)	1	3
10	<b>Project Monitoring / Control</b>	Are contracts evaluated on price /quality as appropriate to the value or risk involved. Are levels of supervision and performance set for capital works projects? Are development processes well managed and controlled to ensure vested assets are constructed to Council standards.	5	10
5	<b>Asset Handover</b>	Does the organisation have clear procedures and documentation for asset commissioning and handover? (eg. Is all the required information collected at time of commissioning to match the data standards, including as-constructed drawings and operations/maintenance procedures and manuals? Is the initial performance of the asset assessed?)	3	5
10	<b>Project Classification</b>	Processes for categorising the cause of expenditure. (eg. Are capital expenditure projects categorised into growth, renewal, regulations / levels of service and business efficiency investment categories	5	10

15	CapEX Evaluation	Policy for the evaluation of capital expenditure projects. (eg. Does a corporate wide / uniform policy and clear process exist? Does it ensure a commercial / business like approach to this decision making? Does it define roles and responsibilities for key activities?)	8	15
5		Processes for linking the sophistication and extent of the evaluation processes to the level of expenditure and the risk it represents to the organisation. (eg. Are more extensive evaluation techniques used for larger investments and risks to the business?)	1	3
5		Processes for linking service demand and the level of expenditure (necessary to achieve this sustain ably) and determine the income / benefits generation needed. (eg. Has the business developed a funding model that allows each project to be reported in terms of its impact on the business in terms of meeting demand and income generation?)	1	5
5		Processes for evaluating supply or program delivery options. (eg. Are various methods of delivery considered and evaluated for each project? Internal or external resources, private / public partnerships, design and construct, BOOT.)	1	3
5		Processes to ensure the appropriate quality of operation and maintenance expenditure cost estimates (budgets) used in capital expenditure evaluation. (eg. How are life cycle maintenance and operation costs projected?)	2	5
5		Processes for investigating and recording alternative options to the lowest life cycle cost option for capital expenditure projects for use in budget rationalisation activities. (eg. Are 'do nothing', reduced capital, manage the risk and 'non-asset' solutions considered and recorded as options?)	1	3
5		Processes for economic evaluation of all capital and recurrent investment projects, including a clear policy by which each project should be evaluated. (eg. Are Net Present Value's, Internal Rate of Return, etc considered for all projects?)	2	5
100				40

<b>AUDIT and REVIEW - CONTINUOUS IMPROVEMENT</b>				
<b>Max Score</b>	<b>Sub Element</b>	<b>Element Description</b>	<b>Score</b>	<b>BAP Target</b>
15	<b>Quality Manual</b>	Quality Manual for Asset Management Practice - a knowledge management system that contains all the processes and practice materials described previously. (eg. Does a manual exist? Does it cover all life cycle Asset Management functions?)	0	10
20	<b>Improvement Planning</b>	Does the organisation have a documented AM Improvement Strategy which clearly articulates improvement objectives.	20	20
15	<b>Process Mapping</b>	Asset Management Process Diagrams and Flowcharts. (eg. Are internal Asset Management processes mapped? Do they cover all Asset Management functions? Are they readily available to staff? Role Clarity - Are asset management responsibilities included in all position descriptions )	5	15
15	<b>Internal Quality Audits</b>	Processes for internal quality assurance. (eg. Internal audit processes that ensure the best appropriate practices adopted by the business are followed across all business units.)	2	10
10	<b>Benchmarking</b>	Processes for externally auditing and benchmarking Asset Management practices for both input (process) and output (cost activity) benchmarking. (eg. Does the organization undertake external input and output benchmarking?)	0	5
10	<b>Efficiency Reviews</b>	Processes followed for identifying cost reduction opportunities. (eg. Is this a random or systematic process? Does the organization have a process by which new ideas and suggestions are reviewed?)	5	10
15	<b>Progress Monitoring</b>	Processes for implementing and reporting on the progress achieved with approved Asset Management improvement programs. (eg. Does the organisation develop and track the progress of these programs?)	3	10
<b>100</b>			<b>35</b>	<b>80</b>

<b>ASSET REGISTERS / SYSTEMS</b>				
<b>Max Score</b>	<b>Sub Element</b>	<b>Element Description</b>	<b>Score</b>	<b>BAP Target</b>
20	<b>Roads and Transport</b>	Roads and Transport Asset Register / System	18	20
10	<b>Bridges and Structures</b>	Bridges and Structures Register / System	7	10
15	<b>Stormwater Drainage</b>	Stormwater Drainage Register / System	13	15
20	<b>Parks and Reserves</b>	Parks and Reserves Asset Register / System	7	20
20	<b>Buildings and Facilities</b>	Buildings and Facilities Asset / Register System	10	20
15	<b>Coastal and Marine</b>	Coastal and Marine Asset Register / System	0	10
<b>100</b>			<b>55</b>	<b>95</b>

<b>STRATEGIC PLANNING SYSTEMS</b>				
<b>Max Score</b>	<b>Sub Element</b>	<b>Element Description</b>	<b>Score</b>	<b>BAP Target</b>
15		Knowledge Management System. (eg. System to store papers, guidelines, manuals, policies in relation to life cycle Asset Management of the organisation asset portfolio etc.)	0	10
15		Predicting Asset Capacity and Utilization. (eg. Capacity modelling tools for determining / simulating current asset capacity, eg. Pipeline capacity / road traffic models etc.)	3	10
15	<b>Condition Monitoring</b>	Condition Assessment Records System. (eg. System to store condition data, and to analyse this with respect to the parameters or required levels of service.)	5	15
20		Risk Assessment Information System. (eg. System used for undertaking and storing risk assessments for both the consequences of failure and probability of failure.)	10	15
15		Life Cycle Cost Modelling System. (eg. System for modelling the life cycle costs of different asset options and solutions for new assets where no spent costs are involved. It allows all supply options to be considered.)	7	10
20		Data Warehouse. (eg. System to store, manage and report on data from other information systems. This system should complete basic manipulation and produce regular reports.)	10	15
<b>100</b>			<b>35</b>	<b>75</b>

<b>WORKS / MAINTENANCE MANAGEMENT SYSTEMS</b>				
<b>Max Score</b>	<b>Sub Element</b>	<b>Element Description</b>	<b>Score</b>	<b>BAP Target</b>
20	Maintenance	Maintenance Management System. (eg. System to manage maintenance activities including activities / work orders / scheduling / controlling and costing for all assets down to maintenance managed item level.)	0	15
20	Project Management	Capital Project Management System and support tools. (eg. Tools for tracking the timing and costing of multiple tasks / resources to produce the deliverables required.)	15	20
10	Document Control	Operations and Maintenance Manuals Storage System. (eg. Electronic System to store and track operations and maintenance manual materials.)	0	7
20	Works Management	Job Resource Management System. (eg. System to create and track work orders covering labour, plant, specialist tools and materials.)	7	20
10	Emergency Response	Emergency Response Plans Information System. (eg. System to store and track emergency response plans, linked through to the asset register in accordance with the data standard.)	5	8
5	Mobile Computing	Mobile Computing Facilities. (eg. Pocket PC's, laptops and tablets PC's to be used by field operations and maintenance staff for rapid data entry and live access and updating of work orders.)	0	5
15	Stores Inventory System	Inventory Spares and Purchasing System. (eg. System to track quantity and purchasing of materials / stores. This system is linked to the construction and maintenance / operations systems and staff needs.)	8	15
<b>100</b>			<b>35</b>	<b>90</b>

<b>ASSET COSTING SYSTEMS</b>				
<b>Max Score</b>	<b>Sub Element</b>	<b>Element Description</b>	<b>Score</b>	<b>BAP Target</b>
60	Corporate Finance System	Financial System. (eg. The system to store asset costing information. Chart of accounts, general ledger etc. Is this linked to asset registers and works management systems)	45	55
40	Asset Valuation System	Systems provide for the valuation and depreciation of assets based on age, condition and effective lives.	10	40
<b>100</b>			<b>55</b>	<b>95</b>



<b>CUSTOMER MANAGEMENT / SERVICE SYSTEMS</b>				
<b>Max Score</b>	<b>Sub Element</b>	<b>Element Description</b>	<b>Score</b>	<b>BAP Target</b>
70	<b>Property Management</b>	Customer and / or Property Records System. (eg. System to track customer and related served property details.)	50	60
30	<b>Customer Service</b>	Customer Service / Complaints or Enquiries System. (eg. System to store the details and track customer complaints and enquires from receipt to conclusion. Is this system linked to the Asset Management Systems)	25	30
<b>100</b>			<b>75</b>	<b>90</b>

<b>PLANS / RECORDS MANAGEMENT SYSTEMS</b>				
<b>Max Score</b>	<b>Sub Element</b>	<b>Element Description</b>	<b>Score</b>	<b>BAP Target</b>
100	<b>Plans and Drawings</b>	Plans and Drawings Information System. (eg. System to manage, store and access the detailed drawings of all facilities, buildings and other infrastructure.)	25	80
<b>100</b>			<b>25</b>	<b>80</b>

<b>SPATIAL MANAGEMENT SYSTEMS</b>				
<b>Max Score</b>	<b>Sub Element</b>	<b>Element Description</b>	<b>Score</b>	<b>BAP Target</b>
65	<b>Corporate GIS</b>	Geographic Information System. (eg. System to spatially store asset locations and key attributes for all distributed and linear / networked assets including the base locations of assets.)	55	65
25	<b>Asset Location</b>	Are asset registers linked to the GIS system?	12	20
10	<b>Functionality</b>	Can the GIS system be used for collection, recording and input /extraction of asset data.	8	10
<b>100</b>			<b>75</b>	<b>95</b>

<b>SYSTEMS INTEGRATION / USABILITY</b>				
<b>Max Score</b>	<b>Sub Element</b>	<b>Element Description</b>	<b>Score</b>	<b>BAP Target</b>
<b>35</b>	<b>Usability</b>	Usability of information systems. (eg. Are information system interfaces easy to use, quick to learn and make data input / extraction easy?)	15	30
<b>35</b>	<b>Systems Integration</b>	Are information Systems are well integrated across the organisation. (eg. The information systems are linked and data can be accessed from different access / entry points, eg. GIS /CSS/AMS. Only one point of data update is required.)	15	25
<b>15</b>	<b>Response Times</b>	Access and Response to Information Systems. (eg. Are the systems appropriately accessible and are system response times acceptable for both data entry and update.)	10	10
<b>15</b>	<b>Corporate IT Strategy</b>	Information Technology / Systems Strategy. (eg. Does a corporate strategy exist? Is it comprehensive and include Asset Management systems? Does it accommodate expected usage and the growth in Asset Management data and information, access and system response times etc.)	10	15
<b>100</b>			<b>50</b>	<b>80</b>

<b>COMMERCIAL TACTICS</b>				
<b>Max Score</b>	<b>Sub Element</b>	<b>Element Description</b>	<b>Score</b>	<b>BAP Target</b>
10	<b>Core Business</b>	Core and non-core activities identified. (eg. Process to identify which activities are core and not core to the business.)	4	10
10	<b>Service Delivery Evaluation</b>	Does the organisation critically evaluate all service delivery options. (eg. Is external delivery supported if services can be delivered more efficiently through an external provider)	3	7
5	<b>Contract Packaging</b>	Are projects / contracts packaged to achieve economic efficiencies in the short and long term. (eg. Does the organisation optimise its contracts / tenders to achieve lowest overheads and service delivery cost. Are panel contracts used)	3	5
10	<b>Contractual Documentation</b>	Are contracts and service agreements of adequate quality and proportionate to the level of risk involved. (eg. Do contract docs specify the full requirements of the organisation and are they regularly reviewed and updated?)	4	8
10	<b>Contract Support</b>	Processes for ensuring contractors have access to the required information and data. (eg. Can external contractors efficiently access data required to perform their tasks, with the integrity of the data protected?)	5	10
20	<b>Information Management</b>	Do processes exist for ensuring good feedback of data and knowledge back into the business from all contracted (external) and in-house (internal) service providers. (eg. Are service providers regularly providing feedback into the business? What is the quality of that information including completed work orders?)	10	20
20	<b>Quality Control Systems</b>	Processes for monitoring the performance of sub-contractors. (eg. Are regular audits completed? Does the organisation have a system to do this and link to performance based contract payments?)	10	15
5	<b>Procurement Management</b>	Processes for assessing and selecting contractors. (eg. Is there a systematic process for different sized jobs? Is more than cost taken into account? Are best value principals used)	8	10
10	<b>Contract Administration</b>	Information and communication systems to support contract administration. (eg. The organisations information systems create an efficient environment in which contract scopes, approvals and payments are significantly automated?)	8	10
<b>100</b>			<b>55</b>	<b>95</b>

<b>ORGANISATIONAL ISSUES</b>				
<b>Max Score</b>	<b>Sub Criteria</b>	<b>Description</b>	<b>Score</b>	<b>BAP Target</b>
20	<b>Policy and Corporate Commitment</b>	Is there a clearly demonstrated organisational commitment to Asset Management? (eg. Does the organisation have a documented / adopted corporate AM policy and business plans. Are organisational objectives and mission statements defined in such a way as to show the importance of AM to the Council and the Community?)	7	17
20	<b>Organisational Accountability</b>	Does the organisation have an accountable AM sponsor - A single executive manager with responsibility for delivering all aspects of integrated Asset Management? (eg. Is it clearly documented who has the responsibility for asset related decision making within the organisation? Are the roles and responsibilities clearly defined throughout the org structure?)	10	20
10	<b>Role Clarity</b>	Asset Management roles and responsibilities. (eg. Are AM roles clearly defined both across and down the organisational structure? Are they linked to individual position descriptions?)	2	10
20	<b>Corporate AM Steering Committee</b>	Asset Management Coordinating Group or Steering Committee. (Is there a high level cross-functional Asset Management Steering Committee with links to Elected Members and Executive Management?)	15	20
20	<b>AM Planning Business Units</b>	Does the organisation have Asset Management Planning Teams or Coordinating Business Units. (eg. Are business units in place with articulated responsibility for production and continuous review of AM plans for key infrastructure groups? Is there a dedicated AM Coordinator for each business unit or group ? )	8	18
10	<b>Vision and Commitment</b>	Does the corporate vision reflect a commitment to achieving best appropriate practice in Asset Management? (eg. Does the organisation communicate and promote a documented vision for integrated Asset Management outcomes to the organisation and Community?)	3	10
<b>100</b>			<b>45</b>	<b>95</b>

<b>PEOPLE ISSUES</b>				
<b>Max Score</b>	<b>Sub Criteria</b>	<b>Description</b>	<b>Score</b>	<b>BAP Target</b>
10	Skills Profile	Functional knowledge of the profile of the organisations staff skills and ages. (eg. Does the organisation maintain a documented skills and age matrix outlining the level of Asset Management capability available to deliver strategic outcomes?)	2	10
20	Organisational Culture	Positive organisational attitude and culture. (eg. Does the organisation demonstrate and foster a 'can do' rather than 'to hard' attitude? Is the staff culture and attitude / enthusiasm treated as a critical element by management )	12	16
10	Change Management	Do established processes exist to manage and implement change throughout the organisation? (eg. How does the organisation respond to change? What mechanisms have been put in place to assist the change process and make it part of the culture?)	4	8
20	Appropriate Skills and Resourcing	Processes for reviewing whether the appropriate skills and staff numbers are available. (eg. Can the required skills be accessed in both Asset Management and project work? Do you have a process to justify staffing levels from best appropriate Asset Management practices?)	12	20
10	HR Management / Succession Planning	Processes for managing human resources across the business. (eg. Staffing skills and numbers are known and predictions are made of future needs? New staff are inducted and trained in Asset Management to suit needs? Succession planning is catered for?)	5	10
20	Training Issues	Processes for the development and implementation of training programs. (eg. Are regular asset management training sessions held? Have skill deficiencies been identified? Is training matched to the business needs?)	6	18
10	Knowledge Management	Processes for the management of knowledge throughout the business. (eg. How does the business update and manage critical business and industry sector knowledge? How is this disseminated to staff?)	4	8
<b>100</b>			<b>45</b>	<b>90</b>

**APPENDIX D**

**DRAFT PROJECT BRIEFING SHEETS**

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## **Knowledge of Assets**

The following projects relate to improving the overall knowledge and understanding of the infrastructure asset portfolio managed by the City.

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## CITY OF MANDURAH KNOWLEDGE OF ASSETS PROJECT No. 1

**Project 1:**      ***Review / Document Asset Definitions and Hierarchical Data Structure***

**Objective:**

To formalise an asset hierarchy for each asset group such that asset data is recorded consistently and can be used at all levels within the organisation.

**Description:**

An asset hierarchy needs to be in place for each asset group so that relevant data is available at various levels to meet the needs of each key asset management activity. For example the valuation of buildings may relate to the whole building for depreciation and insurance purposes however the value of the key components within the building needs to be known including their condition to allow for effective forward planning for renewal. Maintenance activities need to be assigned to the component levels (maintenance managed items) such as AC Unit #.1 whilst others may be assigned to the whole site, eg. landscape maintenance. Additionally some of these tasks may span a number of buildings or locations.

It is therefore important to establish a suitable data hierarchy so that one corporate structure can be utilised for all applications. This will assist in reducing data duplication and will save costs and resources. The asset data hierarchy will define the levels at which outputs such as depreciation costing, facility costing, service costing, and maintenance activities will be deployed and level at which data collection will proceed to support the required outputs. The approach to this project should be to conduct a review of the information needs within each asset group (subgroup consultation) then define an appropriate asset hierarchy to support this. The outcome of this review may identify additional data needs other than those identified by the asset management review and may also require the analysis and manipulation of data currently held within the organisation to align with the desired hierarchy.

**Benefits:**

- Establishes a framework for corporate data management and usage activities, which represents an essential component of advanced asset management practices.
- Provides a clear explanation of data standards and structure such that all staff understand the current levels of data available, along with its intended use and potential future expansion to incorporate advanced corporate functionality.

**Project Budget:**            **\$2,500**  
**Program Year:**            **2007/08**  
**Resources Involved:**    **AMG Subgroups / AM Coordinator**

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**CITY OF MANDURAH  
KNOWLEDGE OF ASSETS  
PROJECT No. 2**

**Project 2:        *Document Procedures Manual for Asset Data Collection and Management***

**Objective:**

To undertake a detailed review of the data needs of the organisation, the form that data should take and how it shall be managed. The manual should provide a clear framework for all sections involved in the use or provision of asset data.

**Description:**

A detailed review of should be undertaken to define physical asset data needs for each section within the organisation covering the following issues:

- Data requirements – what information is required by various users, what will it be used for, how often will it be used?
- Data quality - accuracy, hierarchical level, priority, process and responsibility for collection of asset data (eg what level of accuracy is required for location of street furniture, how detailed should the information be, when should it be collected relative to other data needs, who is responsible for funding and ensuring that the data is accurate and maintained in appropriate format).
- Data identification - rules for data identification and classification (eg what common identifiers are to be used, what field sizes should be used for attribute information and what identification segments are considered most appropriate).
- Data storage and accessibility - means of storing asset data and other relevant information (eg systems used for storing the data and data sharing between systems.)
- Data updating - frequency of condition assessment and / or revaluation of assets (eg how often should footpaths be re-valued and inspected for condition to define renewals)
- Data maintenance - responsibility and procedures for data maintenance (eg who is responsible for stormwater data and how will changes to the register be effected. Also how will controls regarding access to information set? (eg who can amend the data and who can access it in a read only format)

The above information is to be translated into a concise set of policy and procedures for the management of City of Mandurah asset data.

**Benefits:**

- Risk exposure from unknown asset condition addressed.
- Reliable information on future expenditure liability for the assets identified
- Enhanced capability to model deterioration and determine the life expectancy of assets.

<b>Project Budget:</b>	<b>\$8,000</b>	<b>\$8,000</b>
<b>Program Year:</b>	<b>2007/08</b>	<b>2008/09</b>
<b>Resources Involved:</b>	<b>Consultant / AMG Subgroups / AM Coordinator</b>	

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**CITY OF MANDURAH  
KNOWLEDGE OF ASSETS  
PROJECT No. 3**

**Project 3:       *Establish & Document Routine Condition Inspection & Revaluation Programme***

**Objective:**

To put in place, and document forward planning and funding mechanisms to deliver a cyclical programme of data collection required to maintain asset condition and valuation data essential for forward works and renewals planning.

**Description:**

This project involves a review of the condition assessment and revaluation approaches taken for each asset group. The outputs include the identification of the most appropriate methodology to apply to the asset group being considered and the frequency of assessment required, taking into account budget restrictions and audit / risk management requirements. The timing of formal cyclic condition assessments should be staggered to balance out funding requirements and then be scheduled into the forward operating budget projections.

**Benefits:**

- Provides for the regular assessment of asset condition and revaluation of asset portfolios. Asset condition assessments represent a principal operational task that must be given an appropriate level of importance when considering annual operating budgets.

**Project Budget:**               **\$9,500**  
**Program Year:**               **2007/08**  
**Resources Involved:**       **Consultant / AMG Subgroups / AM Coordinator**

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**CITY OF MANDURAH  
KNOWLEDGE OF ASSETS  
PROJECT No. 4**

***Project 4: Data Collection / Mapping of Property Assets to Component Level (Building-PAK)***

**Objective:**

To consolidate and expand the electronic asset data held on buildings and facilities assets and their principal components. This will provide greater corporate asset knowledge and enhance strategic and maintenance planning capabilities.

**Description:**

This project involves the initial identification and mapping of all buildings and facilities assets currently recorded within various existing systems (Authority, AM excel inventory, lease register, Tungsten report etc). Once identified building assets should be entered to Building-PAK to provide a corporate wide base asset inventory. Individual buildings should then be visited individually to determine accuracy of existing attribute data and collect additional information as required, in accordance with hierarchy determined in Project 2.

Building assets should be recorded to component or MMI level for valuation and renewals planning. Buildings can still be valued at the whole of building / facility level in accordance with the adopted hierarchy; however the contents should be divided into the key components that would typically be replaced separately during the life of the asset. (eg. Air-conditioning, roofing, floor coverings, etc). This will allow life cycle costs to be tracked against key components. Building-Pak provides this functionality.

The asset register should then comprise a parent asset for valuation and other purposes (being the building or site itself), underpinned by a group of component or child assets that can be each given valuations, residual lives and technical data attributes. Maintenance histories can then be captured against these components if desired. Component assets can be then be depreciated individually in accordance with their individual effective lives.

This approach should be adopted for medium to large sized buildings where various component assets per parent asset can be identified. Small buildings (ablutions etc) may only require one or two component assets if at all. A threshold for materiality should also be established (say \$5,000).

This project is to include all Council building and facility sites to identify key components valuations, residual lives and technical attribute and maintenance data.

**Benefits:**

- Provides greater corporate knowledge of building contents
- Provides for improved planning for key building component renewals and maintenance.
- Allows maintenance histories to be tracked against key components eg. HVAC, Mech etc.

<b>Project Budget</b>	<b>\$35,000</b>	<b>\$20,000</b>
<b>Duration:</b>	<b>2007/08</b>	<b>2008/09</b>
<b>Resources Involved:</b>	<b>Building Coordinator / AM Projects Officer</b>	

**CITY OF MANDURAH  
KNOWLEDGE OF ASSETS  
PROJECT No. 5**

**Project 5:      *Data Collection / Mapping for Parks & Reserves Assets  
(Park-PAK Facilities)***

**Objective:**

To provide the organisation with an accurate and current register of all parks and reserves assets owned or maintained by the City. This will enhance operations and maintenance programming / costing efficiency and will facilitate strategic planning for capital renewals. Existing ad-hoc inventories maintained by various sections of the organisation will should be consolidated into one corporate wide parks and reserves asset inventory.

**Description:**

Data contained in the ParkPAK system has not been updated since 1999. The asset base has grown by an estimated 40% over the last 7 years due to the acquisition of vested P.O.S areas from the subdivisional development process. At present the true extent of the parks and reserves asset base is not known. It is essential for the organisation to have at the very least a corporate register that defines the parent park / reserve asset areas maintained by Council. Additional park component and attribute information should be collected and entered to ParkPAK as part of the inventory validation and update process.

**Benefits:**

- Revaluation requirements met
- Risk exposure from unknown asset condition addressed.
- Better picture of future expenditure liability for these assets identified
- Provides for improved planning for key parks component renewals and maintenance.

<b>Project Budget:</b>	<b>\$20,000</b>	<b>\$25,000</b>	<b>\$25,000</b>	<b>\$10,000</b>
<b>Program Year:</b>	<b>2006/07</b>	<b>2007/08</b>	<b>2008/09</b>	<b>2009/10</b>
<b>Resources Involved:</b>	<b>Am Coord/ Hort Coord / Parks Coord / AM Projects Officer</b>			



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**CITY OF MANDURAH  
KNOWLEDGE OF ASSETS  
PROJECT No. 6**

**Project 6:      *Data Collection / Mapping for a Street Tree Register  
(Park-PAK Trees)***

**Objective:**

To provide Horticultural Services, CityParks, and Environment and Sustainability with a register of street trees to enable the monitoring of growth rates over time plus providing data for maintenance programming and costing, risk management and streetscape enhancement projects.

**Description:**

Council has identified some significant problems with mature trees impacting on Council's infrastructure assets such as kerbing, footpaths and road pavements. Location and attribute information for existing street trees is also required to support planning for streetscape enhancements and to provide data for maintenance management.

The establishment of street tree register will facilitate improved planning for pruning programmes, monitoring of growth and development rates and identification of future renewals or replacement plantings as street trees reach the end of their life or become redundant. Typical data to be captured includes: Location, Species, Size, Condition / Health, Life Expectancy, Maintenance Requirements etc.

There are estimated to be some 60,000 street trees in the city of Mandurah. At an estimated \$3.50 per tree a total data collection would be around the \$210,000 mark. Condition inspection would need to be repeated approximately every five years. As some \$ XX k per annum is invested in tree pruning / management an appropriate condition assessment and register is desired, however the data collection costs to develop a tree register by conventional survey methods are considered excessive.

It is recommended a register be established using video data capture methods as per the roadside assets register. This is a much cheaper and efficient option and should allow the development of a structured tree renewals programme on a block-by-block basis. In addition to this a register of individual trees of significance should be established to monitor individually the health and risk exposure of these trees. This will need to be coordinated though E & S. It is estimated that a reliable street tree inventory could be established for \$ 60, 000 - \$ 70,000.

**Benefits:**

- Improved understanding of future work required in terms of maintenance and renewals.
- Improved programming of work and relationship to programme budgets.

<b>Project Budget:</b>	<b>\$20,000</b>	<b>\$20,000</b>	<b>\$10,000</b>	<b>\$10,000</b>	<b>\$10,000</b>
<b>Program Year:</b>	<b>2006/07</b>	<b>2007/08</b>	<b>2008/09</b>	<b>2009/10</b>	<b>2010/11</b>
<b>Resources Involved:</b>	<b>Consultant / Hort Coord / Parks Coord / AM Projects Officer</b>				

**CITY OF MANDURAH  
KNOWLEDGE OF ASSETS  
PROJECT No. 7**

**Project 7:      *Data Collection / Mapping for Footpaths / Cycleways  
(RoadPAK Footpaths)***

**Objective:**

To extract existing footpath data from the Road-PAK Roads module and reformat, update and validate the information for import to Road-PAK footpaths. Mapping of the entire footpath and cycleway network within the GIS and linking this data to Road-PAK records will also forms part of this project.

**Description:**

Data on footpath type and condition for assets adjacent to roadways currently exists within the RoadPAK system. This data is not really useable from an organisational perspective and needs to be extracted, validated and reformatted for upload in to RoadPAK footpaths module.

Some mapping of existing footpaths has been carried out previously for the CBD area, however the data is incomplete and requires review and tidying up. Completion of the mapping project should proceed concurrently with the data review. Asset attribute information should be linked to spatial elements as they are mapped in the GIS. Following the mapping and validation of footpath data a program of independent condition rating should be undertaken to confirm stored data and record current condition of path segments. The condition rating inspection should also serve the dual function of a maintenance / risk inspection. The assessment any emergency of maintenance repairs identified by the inspector and a prioritised list of defects for rectification should be provided to the City-works maintenance section.

**Benefits:**

- Complete map based data on footpaths and cycle-ways network.
- Condition data allows for works programming and calculation of future expenditure requirements
- Reduced risk exposure through maintenance management resulting in a safer more efficient path network.

<b>Project Budget:</b>	<b>\$25,000</b>	<b>15,000</b>
<b>Program Year:</b>	<b>2007/08</b>	<b>2008/09</b>
<b>Resources Involved:</b>	<b>Asset Management Tech Officer</b>	

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**CITY OF MANDURAH  
KNOWLEDGE OF ASSETS  
PROJECT No. 8**

**Project 8:        *Data Collection / Mapping of Street Signs, Lighting and Furniture (Road-PAK Misc)***

**Objective:**

To create a register of street signage, bus stops, bench seats, lighting and other roadside furniture so that their condition can be formally tracked and Council's risk exposure minimised.

**Description:**

This project involves the establishment of an asset register of signs through video survey and subsequent desktop mapping and recording. Council has budgeted \$ 25000 for a video data capture survey and purchase of the Cardno DRIVE software. This will allow assets to identified, mapped and recorded directly within GIS from the desktop. The project will involve defining proformas and libraries for recording of asset attribute information within MapInfo, in a format ready for direct upload to the Road-PAK Miscellaneous module. These assets can then be valued and depreciated within the system and used to track maintenance and operating expenditure associated with these assets. This will provide enhanced works programming and risk management functionality.

Attribute data to be collected for roadside furniture assets should be determined in consultation with the Asset Management Coordinator and the Road Asset Subgroup.

**Benefits:**

- Council's risk exposure has increased due to the abolition of nonfeasance immunity by the high court. Partial blame may be levelled at Council if signage, lighting and other roadside assets are maintained to an acceptable standard.

**Project Budget:**                    **\$24,000**  
**Program Year:**                    **2006/07**  
**Resources Involved:**            **Consultant / Asset Management Project Officer**

**CITY OF MANDURAH  
IMPROVEMENT PLAN PROJECTS  
PROJECT No. 9**

**Project 9:      *Complete Road-PAK Condition Rating & Update ROMAN Data***

**Objective:**

To update the current visual and measured condition data for the City's road network as recorded in Road-PAK.

**Description:**

The City's road network has not been inspected in its entirety for over 6 years. Current works programming is based on unreliable visual condition assessments carried out by various inspectors over time. Resources need to be allocated to a complete visual condition rating exercise. Network level measured condition criteria, such as roughness, deflection testing, and

**Benefits:**

- Allows for accurate generation of 5 year and annual works programs.
- Pavement deterioration modelling can be carried out to determine long term programs and funding estimates.

<b>Project Budget:</b>	<b>\$35,000</b>	<b>\$12,000</b>	<b>\$12,000</b>	<b>\$12,000</b>
<b>Program Year:</b>	<b>2006/07</b>	<b>2007/08</b>	<b>2008/09</b>	<b>2009/10</b>
<b>Resources Involved:</b>	<b>Asset Management Officer / Works Supervisor</b>			

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**CITY OF MANDURAH  
KNOWLEDGE OF ASSETS  
PROJECT No. 10**

***Project 10: Representative CCTV Condition Assessment – Stormwater Assets***

**Objective:**

To undertake a sample inspection of stormwater assets to obtain an appreciation of the overall system condition and address the lack of corporate knowledge about stormwater assets.

**Description:**

Little data is held on the condition of stormwater mains and pits and hence it is recommended that a technique be established to undertake inspection of a sample of the more critical or higher risk assets. This inspection programme should then be ongoing to cover an acceptable proportion of the network. In addition flags need to be established that highlight stormwater assets requiring closer attention. For example during pit cleaning programmes the general condition of assets should be noted with poor assets referred for further inspection. This should allow coverage of those assets not already formally inspected.

There is an estimated 280km of stormwater mains recorded in PipePAK and MapInfo. At an estimated \$6/m for CCTV inspection work in Mandurah, it would be a very expensive and cost prohibitive exercise to inspect the entire stormwater network. The approach most other Council's around Australia have adopted is to inspect only a sample of critical and representative mains and pits. It is recommended 5% of the network be inspected initially and if significant problems are identified then additional inspections should be programmed along with the identified remedial works. It is recommended that an initial allocation of \$10k be applied to determine the benefits of the CCTV survey and refine procedures for recording data. If considered viable the remainder the project should proceed to capture at least 5% of the existing network. Representative areas should be determined in consultation with the drainage Supervisor, AME and Infrastructure Services Manager.

Survey inspection should follow the SewRat condition assessment methodology and data should be supplied in spreadsheet form along with all video footage.

**Benefits:**

- Risk exposure from unknown asset condition addressed -potential issues identified prior to failure.
- Better picture of future expenditure liability for these assets identified.
- More accurate assessment of life expectancy for hidden / underground stormwater assets.

**Project Budget:** \$10,000  
**Program Year:** 2007/08  
**Resources Involved:** CCTV Contractor / Drainage Supervisor

## **Financials**

The following projects relate to improving the financial management of assets within the organisation.



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**CITY OF MANDURAH  
FINANCIALS  
PROJECT No. 11**

**Project 11:     *Review / Document Asset Valuation & Capitalisation Procedures***

**Objective:**

To provide a more appropriate framework for the valuation and capitalisation of assets that divests some ownership / responsibility for this task to the responsible asset managers.

**Description:**

This project involves the review of documentation available on how assets are valued and capitalised. A key element of the review will be to establish key steps where either project officers or group managers identify what works are to be capitalised and the division of that capitalised amount against key assets.

Clear direction and documentation is required to identify what works need to be capitalised and this is to be communicated to those deciding on capitalisation works.

In addition data management procedures established to maintain the extensive data sets captured by Council should be taken into consideration when defining capitalisation rules so that asset valuation information remains relevant.

This project links strongly with Project 1 - Asset Hierarchy and Project 2 - Data Management. Once these have been completed the valuation and capitalisation project should be fairly straight-forward.

**Benefits:**

- Clear policy and documentation on the valuation and capitalisation procedures of Council and alignment with asset data management procedures and requirements.

**Project Budget:**                    **\$ 3,500**  
**Program Year:**                    **2007/08**  
**Resources Involved:**            **Consultant (Auditor) / Finance/ AME / Director W and S**

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**CITY OF MANDURAH  
FINANCIALS  
PROJECT No. 12**

***Project 12: Revaluation of Parks / Reserves Assets***

**Objective:**

To re-value the parks and reserves asset portfolio such that the carrying value identifies subdivisional assets not yet valued and better reflects fair replacement cost of the portfolio. This project should be completed prior to the 2007-2008 financial audits.

**Description:**

The following outlines the approach to achieving an acceptable revaluation within the timeframe available. Improvements on this data may be required to achieve compliance with future asset financial reporting guidelines. As more complete and accurate asset data becomes available through implementation of Project 5 identified above, the accuracy of the parks and reserves asset valuation should also improve. Parks and reserves assets should be re-valued annually based on spreadsheet estimates until the data in ParkPAK is of sufficient quality to support component level valuation and depreciation.

**Methodology:**

- Establish asset hierarchy and classification system for Parks Assets (as per Project 1)
- Source existing spreadsheet inventory data held by CityParks section. Augment this with approximate year the asset was constructed or acquired estimated from the suburb construction era. (This information is available via Intra-maps / GIS).
- Update the register with new assets since 1999. This information is currently held by Horticultural Services in excel.
- Source valuation unit rates and effective lives estimates from CityParks supervisors. Use the year constructed date, effective life and valuation rate to determine a written down value for each asset at parent level. Unit rates should allow for estimated average component content in each park.
- Prepare valuation report

**Benefits:**

- Achievement of consistency in reporting and compliance with audit requirements
- Improved understanding of parks and reserves assets by value and class
- Improved asset data to assist with works programming and management.

**Project Budget:** \$ 2,000  
**Program Year:** 2007/08  
**Resources Involved:** CityParks Coord / Horticultural Coord / Consultant

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**CITY OF MANDURAH  
FINANCIALS  
PROJECT No. 13**

**Project 13:     *Develop Process to Separate CAPEX into Renewal, Upgrade or Expansion***

**Objective:**

To establish a process that clearly identifies maintenance / operating, capital renewal, capital upgrade and capital expansion expenditure within the budget development system.

**Description:**

Capital expenditure is currently lumped together within the annual budget and 10 yr capital plan documents. Currently, it is not possible for Council to readily determine which projects represent committed expenditure (existing assets) or what percentage of overall CapEX is applied to the acquisition of new assets.

The annual budget development process and documentation needs to be reviewed to allow for disaggregation of CapEX totals into the 3 primary components. A web based capital project requisition and data entry form should be established to collect sufficient project information to determine CapEX components for proposed projects.

Project requisitions can then be submitted for inclusion in draft budgets. Financial and asset decisions can be made based on the project merits in terms of whether they address or compound the infrastructure renewal gap. Essentially capital renewal should represent committed expenditure, whereas upgrade or expansion represents discretionary expenditure. By clearly articulating the CapEX composition, Council can make informed decisions as to which projects to fund.

The revised budget format should also clearly articulate the ongoing lifecycle operating, maintenance and renewal expenditure required for capital upgrade or expansion projects.

**Benefits:**

- Better project prioritisation information to support informed decision making.

**Project Budget:**                    **\$ 8,000**  
**Program Year:**                    **2008/09**  
**Resources Involved:**            **Finance / AMC /Consultant**

**CITY OF MANDURAH  
FINANCIALS  
PROJECT No. 14**

***Project 14: Link Project Account No's to Unique Identifier in Asset Registers***

**Objective:**

To link Council's project accounting system with the external asset registers to enable project costs to be recorded and carried against a particular asset or component.

**Description:**

By developing a chart of accounts structure that utilises unique asset identifiers to generate project account numbers, it will be possible to develop a "service history" for assets and track operating and maintenance costs associated with each asset. This will provide useful data to assist asset managers in terms of reporting actual expenditure attributed to a specific asset or component. Asset performance / cost relationships can then be established.

**Benefits:**

- Allows for tracking and reporting of capital expenditure and maintenance costs against a particular asset or component.

**Project Budget:** \$ 10,000  
**Program Year:** 2008/2009  
**Resources Involved:** Finance / IT / AMG

## **Levels of Service**

The following projects relate to the definition of asset standards or service levels and the measurement of those standards.

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**CITY OF MANDURAH  
LEVELS OF SERVICE  
PROJECT No. 15**

***Project 15: Document Asset Service Level Standards & Define Performance Measures***

**Objective:**

To establish the levels of service to be provided for each asset group (asset standards) and to determine the current performance of assets relative to adopted standards.

**Description:**

A core objective of Council is the delivery of Services and the ability to cost those services so that they can be tailored to the funds available and the Community's willingness or ability to pay. To be able to achieve this, Council needs to clearly define the levels of service it intends to provide to its customers, the performance targets it hopes to achieve and how the level of service will be measured. Using performance measures service departments can monitor performance trends over time and modify their strategies to suit the nature of these trends. In terms of infrastructure assets, levels of service need to be expressed as asset standards so that assets not achieving the standard can be singled out for attention. Outcomes from the measurement of these service standards will then feed into the development of asset treatment (renewals and maintenance) plans and ultimately an asset management plan.

An example of a service level for infrastructure assets could be "Footpaths will have no more than 5 trip hazards greater than 10mm in any 100m section". Measuring performance against this service level would require condition information to an appropriate scale and may result in a programme of work to address the segments that do not meet the specified standard.

To achieve documentation of minimum service standards the following activities should be undertaken:

- Education of the business as to what is required, when it is required and what purpose it shall be used for.
- Identify and document existing levels of service being delivered to customers.
- Translate those levels of service into required asset standards such as minimum condition, performance, reliability or maximum costs. In the case of City of Mandurah an effective starting point will be to use minimum condition.

- Once asset standards are identified they need to be measured. Identify an acceptable method of measuring asset performance. This may involve collection of data over the year or a one-off assessment every year depending on the capture costs and data availability.
- The next task is to then implement the steps necessary to ensure data will be gathered and an annual review is undertaken to determine asset performance against each performance measure.
- As this is a relatively new and difficult concept for the organisation to easily and fully understand it is proposed an Asset Management Consultant facilitate the production of these asset standards.
- Ultimately these asset standards will be individually costed so that Council has the ability to identify the cost impact by varying the standards.

**Benefits:**

- Allows Council to measure its performance and ability to meet the service levels specified.
- Allows Management (and Elected Members) to focus on service levels rather than specific projects relating to asset renewals. This helps to remove political imperatives and provides a transient basis by which to allocate funding.
- Allows the easy identification of required expenditure levels to fund the continued delivery of a consistent service level and hence enhances management information when making decisions on varying service levels or new investments that enhance service delivery.

<b>Project Budget:</b>	<b>\$15,000</b>	<b>\$15,000</b>
<b>Program Year:</b>	<b>2007/08</b>	<b>2008/09</b>
<b>Resources Involved:</b>	<b>Consultant / AM Coordinator / AM Subgroups</b>	

**CITY OF MANDURAH  
LEVELS OF SERVICE  
PROJECT No. 16**

**Project 16: *Implement Annual Performance Measurement & Reporting Framework***

**Objective:**

To establish a means of annually measuring the performance of Councils assets against the level of service standards specified through implementation of project 15.

**Description:**

This project is dependent on the performance measures specified against each of the service levels and those measures that Council already has in place to capture asset performance data. If, for example, the performance of footpaths is to include knowledge on the utilisation of the pathway and this information is not available, then steps need to be taken to establish this. This may involve either the letting of a contract or by capturing data using internal resources. Some of the performance measures will become available as other improvement projects are implemented such as asset based costing. For these, a programme needs to be identified as to when the data will become available for use in performance measurement.

The efforts required to establish the performance measures are therefore largely unknown and have not been costed here. What has been costed is the effort required to assemble performance data for use in preparation of an asset management plan. This figure should reduce as information reporting becomes more streamlined over coming years. In addition, not all service standards may be possible to measure in the first couple of years (such as maintenance costs) and thus these parameters may be phased into the performance measurement process as they become available.

**Benefits:**

- Provides Council with an ongoing mechanism to measure its performance and ability to meet the service levels specified.
- Permits easy identification of required expenditure levels to fund the continued delivery of a consistent service level and hence enhances management information when making decisions on new investments that enhance service delivery.
- Provides a means of measuring and reporting the change in service levels over time.

<b>Project Budget:</b>	<b>\$ 2,500</b>	<b>\$ 2,500</b>	<b>\$ 2,500</b>	<b>\$ 2,500</b>
<b>Program Year:</b>	<b>2007/08</b>	<b>2008/09</b>	<b>2009/10</b>	<b>2010/11</b>
<b>Resources Involved:</b>	<b>Consultant / AM Coordinator / AM Subgroups</b>			



## **Strategic Planning**

The following projects relate to improving the strategic planning process applied by Council for the continued delivery of existing services.

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**CITY OF MANDURAH  
STRATEGIC PLANNING  
PROJECT No. 17**

***Project 17: Develop “first cut” Total AM Plans (All Asset Groups)***

**Objective:**

Development of asset management plans is an annual review process used in preparation for capital and budget submissions and aims at providing the holistic picture for an asset portfolio.

**Description:**

This project involves the development of an asset management plan for each of the asset areas of Council. This project will utilise the outputs of other projects as they become available to improve the quality of the asset plan output. Each asset management plan should contain:

- An overview of the levels of service and associated asset standards being provided to customers.
- An overview of the current and expected future demand for the service over the next five years
- A summary overview of the assets available to deliver the service
- The results of the performance assessment of assets to achieve the desired standards highlighting those assets or asset areas that fail to achieve the standards both now and over the next five years.
- For those assets or asset types that fall below the desired standards what options have been considered to restore or address the issue. These should include non asset solutions such as changing demand, reducing the service standards as well as the typical direct asset options of replace, rehabilitate etc.
- The analysis of options on a costs and benefits basis (if considered appropriate for the asset or asset type)
- The selection of the preferred solution and the reasons why.
- The aggregation of all costs associated with the asset group including operations and maintenance to provide the complete picture of budget requirements.

The final section should include summary details on what improvements should /will be made to the data, systems or processes to improve the quality of the asset management plan when it is next reviewed. These costs should also feed into the budget process unless already committed.

Following the input of this information to the budget development and adoption process the section should verify the outcomes of that process and identify what has made the programme and what has been deferred.

Often the first asset management plan has significant weakness in data and provides mainly a high level view of asset needs. As more information becomes available and the asset management improvement projects are established, the quality of the plan improves markedly. The plan involves the documentation of current and future expenditure requirements and how these figures were derived. It also links strongly to the service levels offered. In addition, the plan should include an overview of how improvements will be made to refine the present outputs. More emphasis should be placed on this in the early years of development.

**Benefits:**

- Provides sound business management information for effective decision making
- Processes significant information in the most cost effective manner to achieve desired outputs.
- Provides a zero based budgeting platform that has validity behind all proposed expenditures.
- Allows development and enhancements to suit organisational direction and needs.
- Develops open and understandable methodology
- Strengthens budget submissions case.

**Project Budget:** TBA - estimate 15 k per annum x 4  
**Program Year** 2007 / 2008  
**Resources Involved:** AMG Subgroups / AM Coordinator / Director W and S

**CITY OF MANDURAH  
STRATEGIC PLANNING  
PROJECT No. 18**

***Project 18: Document Annual Update / Review Procedures for AM Plans***

**Objective:**

This project is a continuous improvement programme that provides for continuous update of the Asset Management Plans. By improving the data, information systems and processes input to the plans the level of confidence in the plan outputs is enhanced.

**Description:**

TBC

**Benefits:**

- Provides for continuous improvement in the quality of the outputs derived from the Asset Management Plans.

**Project Budget:** NA  
**Program Year:** 2006/2007  
**Resources Involved:** AME

**CITY OF MANDURAH  
STRATEGIC PLANNING  
PROJECT No. 19**

**Project 19:**     *Analyse Existing Data & Establish 5 year Renewal /  
Refurbishment Programs*

**Objective:**

**Description:**

TBC

**Benefits:**

<b>Project Budget:</b>	<b>\$15,000</b>	<b>\$ 8,000</b>	<b>\$ 8,000</b>
<b>Program Year:</b>	<b>2007/08</b>	<b>2008/09</b>	<b>2009/10</b>
<b>Resources Involved:</b>			

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**CITY OF MANDURAH  
STRATEGIC PLANNING  
PROJECT No. 20**

***Project 20: Review the Process for Evaluating Treatment Options***

**Objective:**

To establish a framework for all asset program managers to follow when considering options to overcome service delivery “failure”.

**Description:**

This project involves the establishment of a procedure to identify, analyse and report on options considered to correct assets that are not performing at better than the minimum standard (eg condition). The introduction of this process is essential for determining the optimal strategy to be applied to an asset or group of assets over their lifetime. Typically the development of the optimal strategy is restricted to capital projects in excess of a predefined minimum amount. This project however should look at all asset types as well as high value single items.

The optimal blend between capital and maintenance expenditure will be a key deliverable of this project and hence the information received from the service provider (Operations or Contractors) on the costs associated with maintaining assets will be a key input to the process. This project should incorporate life cycle costing for each asset type. An example of an application of this process may be developing a common treatment strategy for typical road assets over their lifecycle. Eg Resurface at 15 years, rehabilitate at 40years, reconstruct at 60years.

**Benefits:**

- Expenditure minimisation or optimisation for all assets and linked to current and future budgetary restrictions.
- Sound technical and financial cases for expenditure
- Easily modified as parameters change (eg. Budget cuts/increases)
- Provides a strong platform for arguing for the calculated budget.
- Expenditure determined based on needs rather than historic practices.

**Project Budget:** TBA  
**Program Year:** TBA  
**Resources Involved:** TBA

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**CITY OF MANDURAH  
STRATEGIC PLANNING  
PROJECT No. 21**

**Project 21: *Implement Resource Allocation Model / Capital Evaluation System - RAMP***

**Objective:**

To complete the organisation wide roll out of the Curtin Resource Allocation Modelling process originally implemented to prioritise the 10 year Capital Works Program. The Ramp model will provide a project justification system by which to rank potential capital works projects competing for funding.

**Description:**

The Curtin University Graduate School of Business RAMP model has initially been implemented within the Finance section, as a means of evaluating projects included in the draft 10 year Capital Plan. Further work needs to be done with the model to define strategic benefit factors and develop an implementation strategy to roll the system out to other areas of the organisation. The strategic benefits assessment should consider the areas of social, environmental, sustainable development, legal and community benefit issues.

**Benefits:**

- A corporate wide accepted approach to project justification
- The ability to rank projects based on cost / benefit ratios
- The ability to allocate funds based on a greater understanding of relative priority
- Improved information and validation supporting capital submissions
- Submissions linked to actual service delivery objectives
- Reduction in staff inputs for budget submission process compared with current practice.
- The ability to review priorities and weightings annually according to Council's changing strategic priorities

**Project Budget: \$18,000**

**Program Year: 2007/08**

**Resources Involved: Finance Section / Consultant / AMG / EMG / Elected Members**

**CITY OF MANDURAH  
STRATEGIC PLANNING  
PROJECT No. 22**

***Project 22: Complete Structured Demand Models Based on ID Data Projections***

**Objective:**

TBC

**Description:**

TBC

**Benefits:**

TBC

**Project Budget:** \$15,000

**Program Year:** 2008/09

**Resources Involved:**



## **Asset Creation and Renewals**

The following projects relate to improvements in the procedures associated with creating new assets, renewing existing assets or receiving vested assets through the development process.

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**CITY OF MANDURAH  
ASSET CREATION & RENEWALS  
PROJECT No. 23**

***Project 23: Develop Procedures for New Asset Acquisition***

**Objective:**

To develop policy and procedures for acquisition of new capital projects or contributed assets

**Description:**

This project should set in place procedures for the formal sign off and responsibility for:

- Planning/Design standards
- Development contributions eg Public Open Space
- Establishing documented engineering standards and guidelines
- Ensuring development compliance with established standards
- Accepting development completion and handover
- Holding/release of maintenance / performance bonds
- Storing of plans and other information
- Notification of relevant parties – eg Operations Services, Customer Services

**Benefits:**

- Improved design and construction standards and quality of decision making in respect to such assets
- Guarantee that all necessary parties are notified of new capital projects or contributed assets
- Clarification of responsibilities when dealing with such assets

**Project Budget:** \$ 8,000  
**Program Year:** 2006/2007  
**Resources Involved:** AMG / AMG Subgroups / Coord Eng Development

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**CITY OF MANDURAH  
ASSET CREATION & RENEWAL  
PROJECT No. 24**

***Project 24: Project Supervision Requirements for Asset Creation or Renewals***

**Objective:**

To develop and document the necessary project management / supervision requirements for asset creation or renewals.

**Description:**

This project involves the development of protocols and procedures for supervising new asset or renewals projects. These should include:

- PRECONSTRUCTION issues such as responsibility for: Approvals & Permits, Design Schedule
- CONSTRUCTION issues such as responsibility for: Detailed Construction Schedules Subcontract Administration
- POST CONSTRUCTION issues such as responsibility for: Final Cost Reviews (Actual vs Budget), Contract Close-out, Move in & Start up Activities, Records of Drawings or Plans, Operation & Maintenance Manuals.

**Benefits:**

- Improved quality and construction standards for new development and quality of decision making in respect to such assets
- Guarantee that all necessary records and manuals are obtained and distributed as appropriate
- Clarification of responsibilities when dealing with such assets

**Project Budget:** \$ 3000  
**Program Year:** 2007/2008  
**Resources Involved:** Design / AM/ Operations Services

## **Maintenance Management**

The following projects relate to improving the maintenance management activities of Council.

**CITY OF MANDURAH  
MAINTENANCE MANAGEMENT  
PROJECT No. 25**

**Project 25: *Review / Document Asset Maintenance Information Requirements***

**Objective:**

To review maintenance information requirements needed for each asset group and service area.

**Description:**

This project will involve the review of the information required to be captured against maintenance activities in order to improve business activities and identification of possible cost reduction opportunities. The review should not only cover the requirements for good maintenance planning and management but also consider information required for measuring the performance of assets against service standards. The aim of this project is to augment and develop existing asset maintenance / operations manuals to incorporate asset management principals.

**Benefits:**

- Establishment of maintenance information to be captured for each asset or asset group that supports all Council's requirements.
- Ensures relevant, fit for purpose data is collected to enable programmed maintenance analysis.

**Project Budget:** \$5,000  
**Program Year:** 2007/08  
**Resources Involved:** Consultant / Operations Services / AME

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**CITY OF MANDURAH  
MAINTENANCE MANAGEMENT  
PROJECT No. 26**

***Project 26: Develop an Annual Programmed & Routine Maintenance Schedule***

**Objective:**

To develop and document an annual maintenance program for each asset group, to produce an estimate of resource requirements and establishment of information feedback systems for maintenance analysis and history reporting.

**Description:**

This project will involve the development or review of the planned (operating) maintenance programme for each asset group. Following the capture of sufficient maintenance data, analysis can be undertaken to refine the programme further and identify possible cost reduction opportunities. The maintenance plan should include the task name, skills required, resources required, task duration, and cost estimate. The purpose being to ensure assets are maintained to an appropriate standard commensurate with customer expectations and to ensure that assets reach the life expectancy identified in the original project evaluation. (For example stormwater mains are expected to last 75 years. What planned (routine) maintenance is being done to ensure this occurs?)

An important element of this review includes the establishment of processes to facilitate information feedback from field staff on work performed. This should include an estimate of the time taken, resources used, cause of faults and assets worked on.

For some asset types the review would concentrate on the contractual arrangement Council has with external service providers. This would establish process to address issues such as asset performance standards, how service delivery is described (prescriptive work directions or performance based outputs) and the information / feedback being provided by the service provider to the service purchaser.

The implementation of appropriate maintenance systems, to support better planned maintenance has not been costed here. It is proposed that the HMS Works Management System be employed for this function. This is described under a separate Project (28).

**Benefits:**

- Establishment of an environment when more productive planning is implemented through enhanced knowledge of upcoming work requirements.
- Balancing of annual workloads
- Development of maintenance / operating histories
- Data capture necessary for maintenance practice analysis and optimisation.

<b>Project Budget:</b>	<b>\$ 5,000</b>	<b>\$ 5,000</b>	<b>\$ 5,000</b>	<b>\$ 5,000</b>	<b>\$ 5,000</b>
<b>Program Year:</b>	<b>2006/07</b>	<b>2007/08</b>	<b>2008/09</b>	<b>2009/10</b>	<b>2010/11</b>
<b>Resources Involved:</b>	<b>Operations Services / AME /Subgroups</b>				

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**CITY OF MANDURAH  
MAINTENANCE MANAGEMENT  
PROJECT No. 27**

***Project 27: Develop a 10 year Asset Maintenance Plan (all classes)***

**Objective:**

To develop and document a 10-year maintenance strategy for each asset group. This will formulate a key component of the Asset Management plan for each asset class.

**Description:**

This project involves the development of a 10-year maintenance strategy for each asset group. The project should identify the major maintenance expenditure anticipated over the forecast period. This represents programmed maintenance expenditure which should be considered exclusive of the annual (operating) maintenance program. Items such as refurbishments occurring every few years should be included initially, but will need to be checked to ensure they are not duplicated under the capital works programme. Often those maintenance activities that are not annual activities get caught in the grey area between capital and maintenance. Clear definition of capital and maintenance work is required (from an engineering rather than financial perspective). The maintenance program should demonstrate an understanding of the effective lives applied to each asset and the maintenance tasks required to achieve that life.

For example: road pavements have been given a 40 year life. Generally this could only be achieved if the pavement is resurfaced twice over that period. In this sense reseals would be classified as maintenance as they do not improve the service capacity / potential of the road asset the restore service to an appropriate level (Similar to painting a building). The key purpose of this project is to develop systems to ensure that major asset maintenance expenditure is anticipated and programmed for over the long term.

**Benefits:**

- Establishment of an environment when improved planning is implemented based on enhanced knowledge of upcoming major maintenance requirements.
- Ability to plan financially over the long term and smooth the rates / charges curve.
- Develops a clear understanding of the linkage between capital and maintenance dollars.

**Project Budget:** \$15,000  
**Program Year:** 2008/09  
**Resources Involved:** Operations Services / AMG



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**CITY OF MANDURAH  
MAINTENANCE MANAGEMENT  
PROJECT No. 28**

***Project 28: Implement Works Management System (HMS)***

**Objective:**

To implement a suitable works management system to streamline / control the delivery of capital and maintenance work programs and record works and maintenance activities

**Description:**

The HMS asset inventory systems currently used by Council are designed to integrate with the HMS Works Management System. Implementation of the WMS will facilitate scheduling and recording of maintenance and capital program activities. Data collected through the system can be used for reporting of maintenance histories and costs against key assets. For each asset group, the asset manager should determine the asset level to which individual maintenance tasks are attached (MMI). Data contained within the HMS asset registers should be tailored to suit this purpose. Feedback on maintenance / works tasks can then be identified and linked to individual assets according to the asset hierarchy level adopted.

The initial costs involved include the purchase and implementation of the WMS software. Training of staff in the use of the work order system will also be required however this is identified as a separate project.

- The key aspects of this project other than software training will be:
- Building a library of work activities and resources and loading this into the WMS software.
- Trialling the use of software within the City Works area. (Roads / Drainage inventories are the most accurate and already recorded to MMI level)
- Review outcomes of the trial and refinement of approach and required data.
- Implementation within OPS and rollout across all infrastructure assets.
- Linking to Customer Service System and Authority.

**Benefits:**

- Following the successful implementation of work orders, paper timesheets for operational staff may be eliminated. (Future project)
- The development of accurate unit costing or activity based costing will be possible when the work order system is operational. This will allow internal performance monitoring and external benchmarking to be undertaken.

<b>Project Budget:</b>	<b>\$45,000</b>	<b>\$10,000</b>	<b>\$10,000</b>
<b>Program Year:</b>	<b>2007/08</b>	<b>2008/09</b>	<b>2009/10</b>
<b>Resources Involved:</b>	<b>Finance /Operations / AME / Director W and S</b>		

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**CITY OF MANDURAH  
MAINTENANCE MANAGEMENT  
PROJECT No. 29**

**Project 29: *Establish Maintenance Data Recording / Reporting System – Authority & WMS***

**Objective:**

To review captured maintenance data to identify possible trends and cost reduction opportunities.

**Description:**

As maintenance data becomes available (following implementation of WMS) a review of the data can be undertaken to identify opportunities for optimisation or works and minimisation of costs. The maintenance history data needs to identify:

- The activity performed
- The asset it was performed on and location of the asset
- Was it was planned or unplanned
- The root cause of unplanned events
- The resources employed to complete the task (labour, materials etc)
- The costs or cost estimates for each individual activity

With the above information it is possible for program managers to analyse data and identify possible cost reduction opportunities. It is also possible to stage the development of the optimisation. If data is currently unavailable investigation can draw information out of experienced staff and point towards possible cost reduction opportunities. As additional data becomes available the optimisation can be refined.

**Benefits:**

- Cost reduction opportunities identified
- Maintenance costs minimised / optimised.
- Asset performance trends identified

**Project Budget:** \$ 7,000  
**Program Year:** 2009/2010  
**Resources Involved:** Operations / AMG Subgroups

## **Process Issues**

The following projects address issues relating to organisational management systems and operational processes related to infrastructure asset management.

**CITY OF MANDURAH  
PROCESS ISSUES  
PROJECT No. 30**

***Project 30: Review Budget Development Process***

**Objective:**

To review and improve the current process used for development of annual budgets within the Works and Services Directorate.

**Description:**

TBC

**Benefits:**

- Provides for the structured and organised delivery of asset and works programs through efficient development of annual budgets.

**Project Budget:** \$12,000  
**Program Year:** 2008/09  
**Resources Involved:** Finance / Director W and S / W and S Managers / AME

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**CITY OF MANDURAH  
PROCESS ISSUES  
PROJECT No. 31**

***Project 31: Develop Web-based Capital Project Request System –  
Linkage to RAMP***

**Objective:**

To develop a user friendly electronic system for capturing the necessary project related data required to facilitate proper evaluation and ranking of capital projects using the RAMP model. This will also streamline the budget development process and ensure consistency is achieved in budget preparation across the organisation.

**Description:**

TBC

**Benefits:**

- Allows for projects to be prioritised consistently and fairly across the organisation.
- Automates the process of draft budget collation and separation of projects into relevant program
- Supports a budget format that clearly distinguishes CapEX composition e.g- renewal, upgrade or expansion.
- Provides consistency in budget development and reporting.
- Forces program managers to consider whole of lifecycle costs and long term funding implications in preparing projects for submission and evaluation.
- Provides for collection of required data to support informed decision making at the Elected Member Level.

**Project Budget:** \$ 8,000  
**Program Year:** 2008/2009  
**Resources Involved:** IT / Finance / AME

## **Information Support Systems**

The following projects relate to improvements in information support systems and associated data management.

**CITY OF MANDURAH  
INFORMATION SUPPORT SYSTEMS  
PROJECT No. 32**

**Project 32: Purchase & Installation of BuildingPAK**

**Objective:**

To implement an appropriate corporate asset register for buildings and facilities assets capable of meeting council's current and future data and asset management needs.

**Description:**

There is a need to have a central repository of corporate asset data on building assets in order to eliminate stand-alone systems and duplication of data and effort. The HMS BuildingPAK asset register would hold information for use by all staff and particularly data for use by the mapping, financial and works management systems. The first task involves the preparation of a specification for implementation of the Building system. This specification should ensure the following areas are adequately addressed:

- Software functions/capabilities
- Specialist functions /add-ons
- Software operational effectiveness / user friendliness / customisation
- Software support/user group
- System implementation effectiveness including costs to install, train and support.

At this stage the Council is looking for data storage and management register that has the capacity to have specialist reporting and works programming modules added as the sophistication of Building asset data develops. Future interface with systems such as Authority and the Centre point Customer Service system should also be considered at the time of installation and implementation.

**Benefits:**

- Improved management, storage and accessibility of Building inventory and condition data
- Improved facilities management capabilities.
- Provides a central system and point of access thereby removing duplication of data and minimising propensity for error and wasted resources.

<b>Project Budget:</b>	<b>\$25,000</b>	<b>\$15,000</b>
<b>Program Year:</b>	<b>2006/07</b>	<b>2007/08</b>
<b>Resources Involved:</b>	<b>Buildings Coordinator / AMG Subgroup / Operations</b>	



**CITY OF MANDURAH  
INFORMATION SUPPORT SYSTEMS  
PROJECT No. 33**

***Project 33: Develop Linkage Between Financial System & Asset Registers (HMS)***

**Objective:**

Utilise the existing capabilities of HMS asset registers and the Authority system to facilitate the exchange asset financial data. This will enable enhanced valuation, reporting and capture of asset expenditure information

**Description:**

TBC

**Benefits:**

- Better management, storage and accessibility of Corporate asset and financial data
- Improved asset management practices through use of integrated information systems.
- Removing duplication of data, hence minimising propensity for error

**Project Budget:** \$20,000  
**Program Year:** 2009/2010  
**Resources Involved:** Finance / AME

**CITY OF MANDURAH  
INFORMATION SUPPORT SYSTEMS  
PROJECT No. 34**

***Project 34: Develop Linkage Between Customer Service & Works Management System***

**Objective:**

To provide for the seamless integration and tracking of maintenance activities generated through the existing customer request system

**Description:**

This project should be undertaken once the Works Management systems has been implemented and integrated into the organisation.

At the present time most request for asset maintenance are generated through the City's customer service system CentrePoint.

**Benefits:**

**Project Budget:** \$15,000  
**Program Year:** 2009/2010  
**Resources Involved:** AME / AMG / Mang Info Services, Mang Ops Services

## **Organisational Issues**

The following projects relate to improvements in organisational and business structure type issues.

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**CITY OF MANDURAH  
ORGANISATIONAL ISSUES  
PROJECT No. 35**

**Project 35: Confirm the Charter and Role of the AMG**

**Objective:**

To provide terms of reference to guide the operations of the Asset Management Steering Committee

**Description:**

- This project involves establishing the powers of the AMG, how it is to operate, and how often it should meet. The types of responsibilities which could be vested in the AMG include:
- Preparation of corporate policy and guidelines on asset management practices and procedures for the City for adoption by Council.
- Coordination, implementation and monitoring of all asset management improvement projects.
- Education and the raising of organisational awareness as to the benefits of proper asset management.
- Ensuring that the organisations asset management programs are developed implemented and reviewed in a logical and structured manner.
- Management oversight of the adopted asset management program.
- Identification and coordination of training associated with asset management
- Ensuring that Council's statutory obligations with respect to asset management are met.
- Review of asset management process, software purchases/updates etc.

**Benefits:**

- Ensures a cross-functional organisation wide approach to the management of infrastructure assets at the strategic /corporate level.

**Project Budget:** NA  
**Program Year:** 2006/2007  
**Resources Involved:** AME / AMG / EMG

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**CITY OF MANDURAH  
ORGANISATIONAL ISSUES  
PROJECT No. 36**

**Project 36: *Convene AMG Subgroups & Deliver AM Plan Workshops / Training***

**Objective:**

To establish an organisational structure aimed at driving the development and implementation of detailed Asset Management Plans for all infrastructure asset classes.

**Description:**

AMG subgroups for each infrastructure class have already been identified by the AMG. The groups will need to be convened individually and briefed on the purpose and intent of the subgroup structure and the organisations AM Planning objectives. Individual roles within the subgroups will also need to be identified along with the appointment of a group coordinator to take responsibility for delivery and implementation of the plans.

Training should be delivered in-house by an experienced external training provider or consultant. This will assist those staff who are involved with the development of Asset Management Plans (AMG subgroups), to gain a better understanding of the lifecycle AM planning process and how their involvement with AM planning fits into the bigger organisational AM picture.

**Benefits:**

- Facilitates the development of Asset Management Plans for all asset groups.
- Enhances the organisations strategic planning capability and delivers cost efficiency and sustainable service delivery in the management of infrastructure assets.

**Project Budget:** \$12,000  
**Program Year:** 2007/2008  
**Resources Involved:** AMG / Subgroups / AME / EMG

**CITY OF MANDURAH  
ORGANISATIONAL ISSUES  
PROJECT No. 37**

***Project 37: Review Directorate Structure to Support AMP Implementation***

**Objective:**

To examine the existing structure of the Works and Services Directorate to establish opportunities for enhancing operations and supporting effective implementation of the Asset Management Plans.

**Description:**

TBC

**Benefits:**

- Provides for review of existing service delivery systems and organisational structure - aligns the organisation to deliver corporate objectives identified through Asset Management Plans.

**Project Budget:** \$ 5000  
**Program Year:** 2008 /2009  
**Resources Involved:** Dir. W & S / EMG / WS Mangers / AME

## **People Issues**

The following projects relate to improvements in staff skills and knowledge in relation to the management of Council's physical assets.

**CITY OF MANDURAH  
PEOPLE ISSUES  
PROJECT No. 38**

***Project 38: Training in Data Management and Associated Systems***

**Objective:**

To provide training of staff in data management procedures and associated systems including AM Systems, Works Management Systems and financial systems.

**Description:**

This project involves training staff in the processes involved with data management:

- Prepare appropriate data hierarchies for particular asset groups
- Identify the appropriate level and accuracy of data necessary for evaluation and reporting purposes
- Understand the relationship between good data and the management of assets.
- Be aware of the technology options available with respect to the efficient and effective collection and recording of data
- Utilise data management software and systems to store, interrogate and program data and information for asset management purposes.
- Be aware of adopted policies and procedures with respect to data management

It is recommended that an external consultant is engaged to deliver data management training. Data management training should be provided as a precursor to the asset register and WMS training should follow directly follow the implementation of Project 1. - Data structure / Hierarchy, Project 2 – Data collection and recording procedures, Project 23 – Asset creation and handover and Project 11- Asset capitalisation.

**Benefits:**

- Improved knowledge of the most efficient and effective means of collecting necessary data and managing its use
- Understanding of policies and procedures involved with data management
- Minimising the cost of data collection and management
- Improvement of staff knowledge, understanding and commitment to collecting and maintaining appropriate data

<b>Project Budget:</b>	<b>\$ 2,000</b>	<b>\$ 8,000</b>	<b>\$ 5,000</b>
<b>Program Year:</b>	<b>2006/07</b>	<b>2007/08</b>	<b>2009/10</b>
<b>Resources Involved:</b>	<b>Consultant / AME / AMG</b>		



**CITY OF MANDURAH  
PEOPLE ISSUES  
PROJECT No. 39**

***Project 39: Training in Strategic Planning & Budget Preparation***

**Objective:**

To provide training of key staff in the strategic and operational elements of best appropriate practice asset management.

**Description:**

- This project involves training the Asset Management Group and program managers in the major principles of asset management such as:
- Knowledge of Assets – the assets owned or managed, what asset information is recorded, and how that information is stored and reported.
- Data Management – the procedures and practices followed to ensure that data is correct, current and valid.
- Valuation, depreciation and effective lives – the approach to valuing assets, the method of depreciation applied, and the basis for assigning effective lives to asset groups.
- Service Level Specification and Measurement – how asset service standards are specified and measured.
- Strategic Planning – the long-term plans that are in place for asset management, the basis on which these plans have been developed, and the level of confidence in each plan's contents.
- Works Management – how renewals and maintenance programs are implemented to ensure that programs are delivered to specification, on time and within budget.
- Asset Information Systems – what systems both soft and hard are in place to support both strategic planning and day-to-day asset management?
- Commercial Tactics – what tactics are employed to deliver the desired outcomes including the testing of unit costs against external suppliers?
- Organisational and People Issues – what structure is in place to support the management of assets and what skill sets exist within Council?

An appropriately experienced external consultant should be engaged for the delivery of such training.

**Benefits:**

- Improved staff knowledge, understanding and commitment to asset management
- Framework established for production of first asset management plans
- Long term cost savings and improved levels of service as a result of improved asset management practices

**Project Budget:** \$ 5,000  
**Program Year:** 2007/08  
**Resources Involved:** AMG / AMG Subgroups

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**CITY OF MANDURAH  
PEOPLE ISSUES  
PROJECT No. 40**

***Project 40: Training in HMS Works Management and AM Systems***

**Objective:**

To provide training for relevant staff in the use of the HMS Works Management System and Asset management Systems / Registers.

**Description:**

Nominated staff to be trained as “power users” who would be responsible to train and advise others in the use of the software. The software supplier should provide this training.

**Benefits:**

- Improved staff knowledge and understanding of the benefits of using the AM and WMS software in terms of strategic planning and enhanced operational efficiency.
  
- Develops a greater organisational understanding of unit / activity costing, job management and effective asset management planning.

<b>Project Budget:</b>	<b>\$8000</b>	<b>\$5000</b>
<b>Program Year:</b>	<b>2007/08</b>	<b>2009/2010</b>
<b>Resources Involved:</b>	<b>AME / Software Provider</b>	

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**CITY OF MANDURAH  
IMPROVEMENT PLAN PROJECTS  
PROJECT No. 41**

**Project 41:    *Training in MapInfo***

**Objective:**

To provide training of relevant staff in the use of the MapInfo Geographic Information System

**Description:**

This project involves training relevant staff in the use of the MapInfo Geographic Information System. Two nominated staff members should be provided with advanced training as the “power user” who would be responsible for system management and detailed enquiries on MapInfo. The software supplier would normally provide the training.

**Benefits:**

- Improved staff knowledge and understanding of the benefits and means of using the software
  
- Staff involved in the issuing of work orders or requests or interrogating the information could use it efficiently.

**Project Budget:**        \$ 5,000     \$25,000  
**Program Year:**        2007/08     2008/09  
**Resources Involved:**  IT

**CITY OF MANDURAH  
PEOPLE ISSUES  
PROJECT No. 42**

**Project 42: *Elected Members Asset Management Training Course  
(IPWEA, WALGA)***

**Objective:**

To provide elected members training in basic lifecycle asset management principles so that they are fully aware of the background, validity and derivation of the information provided to them in terms of supporting the process of “informed / transparent” decision making. In addition training shall be given in how the improvements and changes being implemented by the range of improvements set out in this report should be handled and managed by Elected Members

**Description:**

This project involves training elected members with respect to:

- General asset management principles
- Their responsibilities as custodians of the community’s assets
- Laws involved and the risks involved if assets are not adequately maintained
- The need to adequately fund depreciation
- That asset management is a corporate rather than a technical issue

This training is delivered through the IPWEA and WALGA and can be arranged as an in-house presentation.

Follow up training should also be scheduled each year prior to the budget review process to accommodate changes in business process, asset knowledge etc to be communicated to Elected Members. This will also ensure that current information is provided and the process becomes independent of election cycles.

**Benefits:**

- Improved knowledge of elected members of their responsibilities in respect to asset management
- Provides for more informed decision making in respect to Council’s assets
- Improved likelihood of agreement to rationalise surplus assets

<b>Project Budget:</b>	<b>\$ 7,800</b>	<b>\$ 7,800</b>
<b>Program Year:</b>	<b>2007/08</b>	<b>2009/10</b>
<b>Resources Involved:</b>	<b>Consultant</b>	

## **Review, Audit and Continuous Improvement**

The following projects relate to improving the procedures associated with periodic internal and external reviews (benchmarking) and audits of asset management related activities in order to maintain a process of continuous improvement.

**CITY OF MANDURAH  
REVIEW, AUDIT & CONTINUOUS IMPROVEMENT  
PROJECT No. 43**

**Project 43:**     *Establish & Implement Continuous Review Process for AM Plans & Strategy*

**Objective:**

To establish and document an organisational process for annual review the improvement strategy document.

**Description:**

TBC

**Benefits:**

- Provides for continuous improvement in AM improvement planning.

<b>Project Budget:</b>	<b>\$ 1,000</b>	<b>\$ 1,000</b>	<b>\$ 1,000</b>	<b>\$ 1,000</b>
<b>Program Year:</b>	<b>2007/08</b>	<b>2008/09</b>	<b>2009/10</b>	<b>2010/11</b>
<b>Resources Involved:</b>	<b>AME</b>			

**CITY OF MANDURAH  
REVIEW, AUDIT & CONTINUOUS IMPROVEMENT  
PROJECT No. 44**

***Project 44: External Audit of AM Plans & Improvement Strategy***

**Objective:**

To determine the organisations current level of sophistication in asset management planning / operations relative to the industry best practice. This will assist with identifying further opportunities for improvement to be targeted over the period 2010 to 2015.

**Description:**

The audit and review / benchmarking process should be carried out by suitably qualified external consultants with experience in Local Government asset management practice.

**Benefits:**

- Provides an opportunity to reflect on the improvements made, and identifies opportunities to further refine AM practices to ensure the organisation is operating at an acceptable level in relation to the future industry environment.

**Project Budget:** \$5,000  
**Program Year:** 2010/2011  
**Resources Involved:** AME / AMG / Consultant