THE IMPORTANCE OF CONDITION ASSESSMENT IN EFFECTIVE ASSET MANAGEMENT

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Abstract
The authors completed a number of Asset Management projects for different Councils in NSW and Victoria over the last three years. The projects included varying levels of asset data collection, condition assessment, and preparation of Asset Management Plans for various asset classes including road pavement, parks and open space, and building assets.
Asset renewal forecasts were developed based on an assessment of asset life and remaining useful life. Long term financial forecasts were developed in order to provide guidance for future management of the assets.
Projects that included collection and consideration of more comprehensive asset data and condition information, combined with subsequent careful technical analysis, resulted in extremely robust asset renewal and budget forecasting. Completion of these projects provided the Councils with comprehensive information and a high level of confidence about the assets they manage. The information generated provides the Councils with a solid foundation on which to base asset management decisions.
Importantly the data collection, condition assessment, and subsequent asset management development work was completed in a very cost effective and timely manner by experienced engineers.

Key Words: Assets, management, roads, parks, buildings, condition assessment, budgets, financial forecasting, renewal.

Introduction

The management of assets commenced as soon as humans acquired assets eg spears and cutting tools required sharpening and stone blades required replacement. There may have even been some level of sophistication about how these assets were managed, even in relation to condition of assets.
It is interesting to ponder how far (or how little) and how fast (or slow) asset management has progressed over the ages.
In modern times, local government has always “managed” its assets but in days gone by (not too far back), processes were often not well documented (if at all), systems were very basic (often paper based) and there was minimal reporting on existing assets and costs.
With changing government requirements in the 1990’s regarding valuation, depreciation and reporting on assets, processes and systems had to be developed, if for nothing else to obtain some consistency in the information being developed and reported.
The early steps in this process largely produced information that was not particularly useful for the long term management of assets (ie accounting based valuation and depreciation). The information was largely based on generic asset lives, with little relationship to, or understanding of asset condition and performance.
During the 1990’s asset management evolved and gained increasing status and importance (some call the 1990’s the start of the asset management revolution). Many managers and organisations have been dabbling with and grappling with asset management implementation particularly over the last decade.
Asset managers, and some organisations, have realised or are realising the importance of understanding asset condition in effectively and properly managing assets.
However, often asset managers and organisations shy away from undertaking any significant or appropriate level of asset condition assessment because of the time and costs involved. Often organisations have limited, if any programs in place for ongoing asset condition data collection.
This paper aims to highlight some of the key issues and lessons learnt from recent

projects, particularly relating to asset condition assessment.
Further the paper addresses how a very cost effective, rapid, and practical approach to data collection and condition assessment was implemented to achieve meaningful results.
Understanding the more we can about the assets we have, helps us better plan for sustainable management of assets, importantly for the benefit of future generations.

Overview of Recent Asset Management Projects

The authors recently completed a number of Asset Management projects for different Councils in NSW and Victoria. The projects included varying levels of asset data collection, condition assessment and preparation of Asset Management Plans for various asset classes including road pavement, parks and open space, and building assets.
Key steps involved in each of the projects included:

(a) Collecting as much available existing asset data and information as possible;
(b) Collecting asset data to appropriate asset type/component level (the extent of data collection undertaken varied for different projects between 10 to 20% to 100% of the asset base);
(c) Undertaking comprehensive asset condition assessment associated with the asset data collection process;
(d) Assessing Asset Life and Remaining Useful Life;
(e) Determining asset renewal requirements for each asset based on Remaining Useful Life, nature and type of renewal work, and estimation of renewal costs involved;
(f) Developing short, medium and long term asset renewal programs – considering work type and estimated cost.

Asset data collection, condition assessment and general project approaches varied. Examples include the following:-

<u>Road Pavement Assets</u>

Data collection and condition assessment was undertaken at two Sydney Councils – one involving approximately 2,500 roads (6 million sqm) and the other involving approximately 500 roads (1.85 million sqm). The process undertaken was as follows:-

(a) Use of existing plans and asset databases to define location and extent of assets including length and width;
(b) Liaison with Council officers regarding knowledge about the history and performance of assets including specific assets (this aspect is important as it assists in evaluating the need for and extent of any major structural testing program);
(c) Visual inspection of every road, undertaking and noting the following:
    - Type of surface course/seal;
    - Verifying/assessing road pavement structure;
    - Condition assessment based on a 1 to 10 scale, for both the pavement structure and the surface treatment considering structural, functional and service condition;
    - Identifying and assessing defects;
    - Identifying immediate repair/renewal requirements eg approximate area for heavy patching and length of kerb and gutter repair;
    - Forecast of renewal treatment/ works required;
    - Forecast of the year the renewal treatment is required (supporting remaining useful life analysis);
    - Obtaining unit cost rates from the Council for standard treatments, and identification of what treatments Council accepts/should adopt;
    - Obtaining existing maintenance, renewal and re-sheeting/ reseal programs and annual budgets (and other related information including advice about the likelihood of increased funding);
    - Applying the treatments to each road segment, estimating the costs per segment, and reviewing likely required

annual budgets for the next 15 years (in spreadsheet format). Re-evaluating and optimising programs and forecasts by considering different treatments (see Appendix A for a brief condensed example);
- Developing programs and costs for the first 4, 10, and 15 year timeframes to establish fixed annual budgets;
- Calculating the replacement value, depreciation, and written down current cost, for the road pavement and the seal;
- Providing a broad summary of the overall condition of the road network, ie % Excellent to Good, Average, & Poor.

(d) A Road Pavement Evaluation Manual was prepared to guide this process and was issued to the Council as part of the project.

(e) Recommendations were made regarding deflection testing where there was any uncertainty about visual inspection results. Generally no more than 5% to 10% of the network required testing. (It must be stressed that generally the need for sub-grade analysis, ascertaining pavement thickness, and structural assessment over a large section of the network would be highly unlikely. Also, once 'typical' pavements on certain sub-grades and under certain traffic loadings are deflection tested, this information is used as a guide for other similar pavements).

Indicatively the fee for the road pavement asset data collection, condition assessment exercise, and budget forecasting as outlined above worked out at approximately $80 to $100 per centreline km of road for small road networks. The fieldwork takes about 4 to 5 weeks per 200km (based on one data collector/ assessor).

<u>Public Building Assets</u>

Data collection and condition assessment was undertaken at several Councils (one Council in Melbourne -180 buildings, and several Councils in Sydney – up to 180 buildings).

The Melbourne project involved detailed data collection, and condition assessment for all of the buildings and associated assets down to asset type and component level as appropriate.

The Sydney projects involved data collection and condition assessment to build upon and in some cases verify existing asset information.

The process undertaken was as follows:-

(a) Use of existing plans and asset databases to define location, nature and extent of assets, and to obtain as much asset specific data as possible;

(b) Liaison with Council officers and Council contractors, and tradespersons regarding knowledge about the history and performance of assets;

(c) Visual inspection of buildings and associated assets undertaking/noting the following:
- Location and extent of assets to asset type and in some cases asset component level;
- Condition assessment based on a 1 to 10 scale – considering structural, functional, visual and service condition;
- Identifying and assessing defects;
- Identifying immediate repair/ renewal requirements eg roof guttering, floor covering, wall fabric repairs/renewal, including approximate quantities;
- Forecasting renewal treatment/ works required;
- Forecasting the year the renewal treatment is required (supporting remaining useful life analysis);
- Preparing a spreadsheet of all the collected data, estimates of cost and annual program and budgets (see Appendix B for a brief example);
- Developing a summary spreadsheet indicating types of work per year for each building and the estimated

cost for each eg all carpet replacement projects for 2010;
- Calculating the replacement value, depreciation, and written down current cost, for each asset and building;
- Providing a broad summary of the overall condition of the building portfolio, ie % Excellent to Good, Average, & Poor.

Indicatively the fee for the building asset data collection and condition assessment exercise outlined above worked out at approximately $300 to $400 per building (average spread of large/complex and small buildings in established urban environment). The fieldwork takes about 3 to 4 weeks per 100 buildings (based on one data collector/ assessor).

Open Space Assets

Data collection and condition assessment was undertaken at several Councils (one Council in Melbourne -150 open space/park areas, and several Councils in Sydney – up to 180 open space/park areas).

The Melbourne project and one of the Sydney projects involved detailed data collection and condition assessment for all of the Council open space assets, for all asset types.

The other Sydney projects involved data collection and condition assessment to build upon and in some cases verify existing asset information.

The process undertaken for the more comprehensive data collection and condition assessment projects was as follows:-

(a) Use of existing plans and asset databases to define location, nature and extent of assets and to obtain as much asset specific data as possible (generally we found minimal data available);
(b) Liaison with Council officers regarding knowledge about the history and performance of assets;
(c) Visual inspection of and data collection for open space areas undertaking/ noting the following:
    - Location (including spatial) and extent of assets to asset type level;
    - Condition assessment based on a 1 to 10 scale – considering structural, functional, visual and service condition;
    - Identifying and assessing defects;
    - Identifying immediate repair/ renewal requirements eg for footpaths, play equipment, shelters, signs, etc including approximate quantities;
    - Forecast of renewal treatment/ works required.
    - Forecast of the year the renewal treatment was required (supporting remaining useful life analysis), including estimates of cost.

Indicatively the fee for the open space asset data collection and condition assessment exercise outlined above worked out at approximately $200 to $400 per open space area (average spread of large/complex and small park/open space areas in established urban environment) or $5 to $10 per asset. The fieldwork takes about 3 weeks per 100 park/open space areas (based on one data collector/assessor).

The data collection exercise utilised various methods of data collection, varying from manual systems to use of data loggers and GPS systems. One exercise involved manual field data collection but use of MapInfo in a desktop exercise to “pinpoint” and download spatial coordinates of assets from base aerials.

Key Issues and Lessons Learnt

Key issues and lessons learnt included:

(a) The robustness of and level of confidence in renewal projections and financial forecasting is directly related to the quality and extent of asset data and condition information collected and available (and also related to the quality of technical assessment provided);
(b) We would suggest that if very limited asset data is available and limited field work is undertaken then renewal and financial forecasts will likely be of low confidence level, whilst when a comprehensive data collection and condition assessment exercise is properly undertaken as part of the project then the level of confidence

may be considered to be very high (especially important when advocating for asset programs and budgets with executive management and politicians);

(c) Asset data collection and condition assessment can be completed reasonably cost effectively and efficiently, provided appropriate methods and processes are employed;

(d) Data collection and condition assessment should be carried out by technicians who have relevant experience, qualifications and training;

(e) Asset data must be managed in consolidated asset management databases and an asset manager or coordinator must be assigned responsibility for management of the *total* asset database and data/ information;

(f) Asset data needs to be regularly updated to reflect and capture data for asset renewal works and new assets created (at least annually);

(g) There must be a program in place for cyclical data collection and condition assessment to keep asset data and information up to date and "current" (we would suggest a cycle covering 20%-25% of assets per year is desirable – at a minimum);

(h) There needs to be standard processes and methodologies in place for data collection and condition assessment including relating to asset identification, data collection methods, and condition rating scales;

(i) Understanding and obtaining more information over time about the lifecycle aspects of assets will help to improve robustness and confidence in projections and forecasting, eg understanding how an asset deteriorates over time.

(j) With the above processes, a consequent robustness and level of confidence in the data and renewal forecasts/estimates is established.

Conclusion

From our experience as senior engineering managers at small, medium, and large Sydney Councils spanning three decades in the latter part of the 20th century, we considered that we knew what was broadly required to provide for effective and practical management of assets.

However what we lacked was a strategic approach and methodologies, systems and processes to develop a long term, rather than a short term, robust asset management outlook.

The challenge was traditionally about how to collect and compile the data, and how to convert the data to information for use strategically. Equally difficult, but a discussion for another day, was the challenge to effectively convey the information and strategies to higher management, elected officials and the community.

Understanding how to go about the strategic asset management process seemed always problematic. Getting the right resources, particularly funding for asset management "initiatives", always seemed beyond reach.

Have we advanced very far in the past ten to twenty years? Strong methodologies, and the systems and processes have been developed and are generally available to us all. Whilst there are many organisations that are well and truly on the asset management journey, there are many that are still contemplating the journey, in some cases giving only token attention to strategic asset management.

The evidence of inadequate asset management, or at least inadequate funding to support asset management, can be seen with our own eyes (poor road condition, dilapidated buildings, deteriorating stormwater systems, electricity failures, etc).

Whilst a basic problem appears always to be lack of funding for asset management and asset renewal, we suggest that contributing to the problem is the lack of robustness and level of confidence about asset management information, strategies and advocacy.

Good strategic asset management starts with a solid understanding of the assets that we manage. The robustness of and level of confidence in asset planning and renewal strategies, including financial forecasting, is directly related to the quality and extent of asset data and asset condition information collected and available.

In the context of the value of Council assets and even in the context of the meagre asset

management budgets that many of us are used to, expenditure on a comprehensive data collection and condition assessment program is considered within reach and more than justified.

We contend that asset data collection and condition assessment can be completed very cost effectively and efficiently provided appropriate basic methods and processes are utilised.

Once the hard work is done upfront with data collected, and databases and systems established, it is a relatively less complex exercise for Council staff to update databases and maintain and extend forward plans, schedules, and annual budgets on an ongoing basis. It would entail less than two person weeks/annum for an average size urban Council.

As we learn more about asset management, in some ways the challenge gets harder, and in some ways it gets easier. Knowing what assets we have and what condition they are in provides a solid foundation for asset management strategy and decision making. Knowing what we have today enables us to better plan for tomorrow. For the benefit of our children, it is about time we developed some robustness about our sustainable asset management strategies and delivered for the next generation.

Author Biography

Paul Ritchie

Paul was employed at three medium to large Sydney Councils from 1964 to 2003, mostly as a senior engineering manager, including Assistant Director and Asset Co-ordinator. Paul is experienced in every facet of urban local government engineering at technical, strategic and management level. Since 2003, Paul has been working Director of Ritchie Civil Engineering Pty Ltd, largely engaged by various Councils to act in senior engineering positions, to carry out asset management and re-organisation projects, and to manage engineering aspects and assessment of development projects. Also Paul is an agent for a Private Certifier and reviews subdivision Construction Certificate submissions and undertakes construction certification. Paul's major areas of experience are in asset management, project management, and contract management, and road pavement design and evaluation.

Guy Creber

Guy has over 30 years experience in transport planning, civil engineering, contract administration, project management, asset management and organisation management. Guy held a range of engineering and management positions in local government in Sydney from the mid 1970's through to 2000, with 10 years at Director level. Guy also worked for the National Capital Development Commission and an engineering consultancy. Since 2000 Guy has been working Director of G Creber and Associates Pty Ltd. The company specialises in civil engineering consultancy, project management and management consulting work. The main focus of Guy's work since 2000 has been project management of infrastructure projects for NSW State Government departments, and management consulting including asset management for local government in NSW, Victoria and New Zealand.

Guy has a Bachelor of Engineering (Civil) Degree with 1st Class Honours, a Graduate Diploma in Local Government Management and an MBA. Guy is a Fellow Institution of Engineers Australia, a Fellow Institute of Public Works Engineering Australia, a Member Australian Institute of Project Management, and a Member Australian Institute of Traffic Planning and Management.