

---

# NEW TECHNOLOGY FOR THE COLLECTION OF ASSET CONDITION DATA

Bill Woodcock – General Manager, Government and Business Services

Gordon Hooper – Senior Designer/ Project Manager

COMPLETE Urban Pty Ltd, NSW

---

## Synopsis (Paper Summary)

The implementation of ever-changing and more sophisticated technology can dramatically improve productivity, reduce costs and allow us to complete complex tasks that seemed almost impossible a few years ago.

This paper will provide advice and information on a number of Council case studies whereby asset condition data was digitally acquired in the field, including digital photographs, and then linked to Geographical Information Systems and Asset databases. The final product results in an integrated system and process allowing greater analysis and reporting in order to more competently manage Council assets.

---

### 1. Introduction

In today's world information is everything. As a community we expect to be able to search for and acquire information almost instantly. Technology has evolved to meet this demand and as such the way we collect and store that information has changed markedly in recent years.

In the technical based world of Public Works we need to carefully assess what information is required and then determine the most effective way to obtain, store and display that information in a meaningful way. Comprehensive, reliable and readily accessible data is critical to enable us to make informed decisions on behalf of the Community and Council.

This heavy reliance on large data sets is best illustrated by the field of Asset Management.

Councils today are being challenged to obtain more and more information by the State Government. The amount of data required

seems to grow exponentially. With the introduction of "Componentisation" in AASB 116 in 2009, almost overnight asset data sets began to grow and grow.

Councils are now faced with collecting huge volumes of data in order to responsibly manage and maintain Community assets. Thankfully the development of asset data collection technologies has also advanced at a rapid rate.

Technology is almost omnipresent; from fuzzy logic in washing machines, to iPads, to OPAL cards on the trains, to apps on your phone that can count how many steps you take, calculate how many Kilojoules you have burnt and advise you whether your sleep patterns are OK!

We have choices.

We can remain as Luddites and pretend the ever changing technological revolution is not happening or we can embrace it and realise

the gains in efficiency and accessibility it can bring.

A word of warning though.

The adoption of new technologies needs to be done strategically. There are minefields out there. It is important to gauge exactly what your organisation needs and determine the cost benefit ratio is in your favour.

Expert advice can assist in avoiding the pitfalls. Alternatively, Councils can obtain the technological services of an industry specialist either as a turn key operation or as a discrete data acquisition service.

This paper explores this context, develops some options and finalises with some practical case studies.

## 2. Current legislative obligations on Councils.

Since the introduction of the LG Act in 1993, NSW councils have been required to report on asset condition in a template format in their annual reports. Section 428(d) of the LG Act requires councils to report in their annual financial statements on the “Condition of Public Works” (Special Schedule 7) under their control.

The condition report focuses on the estimate of the amount of money required to bring council infrastructure up to a satisfactory standard and must include estimates of the following for each asset class.

- Cost of the asset;
- Written down value;
- Depreciation rate;
- Depreciation expense;
- Accumulated depreciation;
- An estimate of asset condition;

- Estimated cost to bring to a satisfactory standard;
- Estimated annual maintenance expense; and
- Program maintenance works.

Councils must also comply with the requirements of “Integrated Planning and Reporting” (IPAR) as defined by the Office of Local Government.

The underlying obligations are also mentioned and required in the Australian Accounting Standards Board Section 116 (AASB 116).

All of this adds up to an increasing need to monitor, measure, count and record all of Councils assets. A substantial task,

To achieve this Councils must build and maintain a complex database containing details including, but not limited to, asset type, location, condition, remaining life and valuation. Data requirements are further complicated by the introduction of “Componentisation”, that is, the individual components that make up an asset, i.e. the road sub base, base, seal and wearing surface.

## 3. Large numbers, counting all the assets and capturing their condition

When undertaking an assets survey for a Council the sheer number and variety of items can be enormous. If you consider the magnitude of assets on the streets then multiply this by the variety of data required to be captured for each, the amount of individual pieces of data can be quite overwhelming. Note that a typical Council could have assets in the magnitude of \$1Bn. With capital values of this order and the massive quantity of information needed to maintain it, it is highly desirable to do the inspections thoroughly first time and in a cost and time efficient manner.

#### 4. Using technology to improve productivity

If the current crop of technology and devices can be used to cut this problem down into a manageable size it is worth investigating. Furthermore if this new technology can add value to the manual data acquisition methods then this is definitely worth pursuing.

Amongst the technologies available are:

- Ruggedized Tablets
- Laptops
- GPS
- Geographic Information Systems (GIS)
- High Definition digital photos
- High Definition video
- Customised data bases
- Vehicle mounted systems
- Laser profilers

#### 5. Benefits of Productivity improvements

Traditionally asset data collection has been done by hand. Technicians would go into the field with a combination of clipboards, paper plans and checklists. Information would be recorded manually, with a series of measurements, observations and condition assessments carried out and noted down. Perhaps a photograph was also taken. This process was slow and cumbersome. Technicians could be hampered by the limitations of the base plans, by weather and by the amount of equipment they needed to lug around. The quality and consistency of collected data could also vary greatly.

Even with all going well the gathered information then needed to be manually

entered into some form of digital database back in the office. Assets would need to be geo-located manually into either a CAD or GIS based mapping system. Photos would also need to be linked manually. This necessity for double (or even triple) handling was not only hugely time consuming but increased the risk of errors creeping in. The complexity of this process may have lead to these projects grinding to a halt or just not getting done at all.

This has all changed.

Today there exists the exciting opportunity of using the recent advancement in technology to our advantage. A number of new mobile devices and softwares are available that allow the co-ordinated, controlled and efficient collection of asset data information. Gone are the piles of folded paper plans. Technicians can now carry a ruggedized, shock and water proof tablet containing digitized mapping of the Local Government Area. Existing digital asset records, such as GIS tables, can be loaded and verified on site. Alternatively entirely new datasets can be created on the fly. In built GPS allows the accurate positioning of assets. Preset and customisable drop down menus ensure data is recorded precisely, eliminating errors and omissions. High definition photos taken using the same device are instantly linked to each record and reduce the need to carry extra equipment. The addition of mobile data means that collected information can be uploaded and seen almost instantly by other users. The information gathered can then be very quickly transferred straight into existing digital data systems without the need of double handling.

Councils can enable their staff to gain a productivity improvement through the use of these new technologies or alternatively outsource the data acquisition process to specialists with the experience and the sophisticated equipment to complete the work in a regimented and effective manner. Improved productivity and methods directly translates to reductions in cost and time. Superior databases with enhanced

accessibility and reporting capabilities allow more asset classes to be considered, give greater impudence to Asset Management Plans and permit Councils to make more informed decisions for the benefit of the Community.

## 6. Case Studies Outcomes

Over the past 11 years COMPLETE has undertaken a number of varied Asset Data Collection projects for Councils throughout Australia. Each project has provided its own unique set of challenges. Over time the method of data collection has evolved through commercial necessity, the advancement of technology and the desire to provide a superior service and end product to Council.

### - Mosman (clip boards !)

This project involved a Council wide survey of all of the transport assets in the road reserve, parks and reserves. This massive undertaking was carried out some time ago using a combination of GIS data, paper plans and clipboards!! Amongst the data collected was the location and condition of footpaths, signs (including all regulatory and parking signs), bollards, street furniture, retaining walls and steps. Once collated, checked and manually input the resultant spreadsheets exceeded 100 Mb!

This proved to be an extremely time consuming and resource hungry exercise. The audit produced countless pages of site plans and checklists all needing to be manually collated. Aligning the numerous data sets and the consolidation of a number of different systems proved problematic.

### - Hawkesbury Parks Assets

In this case Council required a schedule of all parks equipment and furniture for their Parks Asset Management Plan. This included play equipment, seats, park shelters, BBQ's, litter bins, fencing and bollards.

Incorporating lessons learnt during the Mosman project COMPLETE investigated ways to improve the data collection process. Following a period of research and testing COMPLETE designed and built a custom data collection system utilising the mobile capabilities of the Apple iPad. This relatively simple system allowed the user to record an asset's type and location (using in built GPS). A series of pick lists were developed to record description, condition, dimensions, and a notes section. Finally a digital photo was taken of each asset.

This new system was decidedly quicker but still had some limitations. The user interface was somewhat 'clunky' and there was no ability to link photos to the record without manual intervention. The iPad screen was also not good in bright daylight and not weather resistant. Despite these limitations the project was a success and a marked improvement on previous methods.

This project was recognised by the IPWEA Excellence Award for Innovation in 2012.

### - Queensland Bus Stop Audit

In 2010 Logan City Council approached COMPLETE to carry out an asset audit to determine State Government and DDA Compliance of existing Bus Stops.

COMPLETE modified the newly developed iPad application to record all bus stops, plot their topography and undertake an assessment of BCA and Public Infrastructure Manual compliance. The collected data was used to assist in devising a priority based Capital Works Program. The Logan Project had to comply with the strict requirements of the State Government and Translink. COMPLETE developed an application that automated this process of audit, photos and geolocation and facilitated the design of the required stops.

### - Bathurst CPTED Lighting Audit

In 2013 Bathurst Regional Council obtained a grant to assist in improving public safety

within it's LGA. As part of this Council commissioned an audit and CPTED report on existing street lighting in three specific crime hot spots.

Again a tablet based system was customised to undertake the task. Advances in GIS were utilised along with an improved user interface. Over 1,000 street lights were categorised and rated with respect to their luminaire type, mounting height, condition, effectiveness and lighting compliance. Survey was carried out during the day and again at night in order to assess lighting levels, functionality and safety. Sample Lux readings in each area were recorded in accordance with AS1158.3.1.

A full report with audit results and recommendations was made in record time and fully complied with the Council requirements.

This audit was done in a fraction of the time of previous methods and the data quality was far superior and more user friendly.

#### - **Unley (SA)**

In early 2014 COMPLETE carried out a comprehensive audit of all street lights in the whole of the City of Unley involving some 4,500 lights. To undertake this task COMPLETE moved to a ruggedized tablet system using specialised GIS based software.

Ten different categories of information were collected for each and every light in the subject area along with a digital photo of each. Despite the large amount of data to be collected the audit was completed quickly and with a high level of accuracy. The data was easily translated to GIS software allowing detailed assessment and investigation.

The subsequent report to Council presented the number, location and condition of the existing street lighting infrastructure and commented on energy use, relation to Australian Standards and cost effectiveness.

It went on to highlight energy efficient solutions to improve street and footpath lighting as well as opportunities to reduce capital and operational expenditure.

#### - **Campbelltown (SA)**

Following the successful City of Unley audit COMPLETE were asked to carry out a similar audit and report for Campbelltown City Council in Adelaide.

The methods used in Unley were again implemented with great success. In this case nearly 6,000 lights were located and assessed resulting in the collection of more than 60,000 pieces of data.

#### - **Port Macquarie Signs audit**

COMPLETE recently undertook a comprehensive audit of all regulatory, parking, guidance, information, wayfinding and advertising signage within the Port Macquarie Town Centre for Council.

The systems used so successfully in Unley and Campbelltown were easily adapted to this task allowing the audit to be completed quickly and precisely. Signs were assessed on a number of criteria including size, condition, suitability and adherence to standards. Following the audit COMPLETE prepared a comprehensive report for Council outlining all findings and making a number of recommendations on required repairs and upgrades.

A further audit of all light poles, flags and banner poles was also completed for Council using similar methods.

#### - **AUS-SPEC Maintenance**

The IPWEA joint venture AUS-SPEC Maintenance system covers asset maintenance of Roads, Buildings and Facilities and Parks and Recreation Areas. A pro active systems approach to Maintenance, as used by Councils Australia wide. The system sets prioritised intervention levels, response time and compulsory intervention

levels for all of the various components maintained by Local Government. A standard activity specification establishes the parameters involved and supplied information facilitates the process. This is being transposed to a Tablet based system to automate the process.

Interested parties should contact the presenter.

**7. Conclusion**

Today our thirst for more and more information is never ending and this is as relevant to Local Government as anywhere else. Councils are now obligated to acquire and maintain comprehensive and up to date records of all assets they are responsible for.

Fortunately the advent of new technology has made the once onerous task of asset data collection substantially more achievable and efficient.

By embracing this new technology Councils can meet their recording obligations whilst achieving productivity increases and cost savings. Furthermore greater accessibility, analysis and reporting functions can greatly enhance Councils ability to manage their assets and ultimately permit more informed decision making to the benefit of both Council and the wider Community.

**Author Biography**



Bill Woodcock

Mr Woodcock has 41 years experience in Local Government, Engineering and Management. He has experience at Kogarah, Bankstown, Concord, Blue Mountains City, Marrickville and Rockdale City Councils and has also provided Local Government consultancy services at Statewide Roads, Sinclair Knight Merz and Currently COMPLETE Urban as well as having carried out Operational Quality Audits for the Roads and Traffic Authority, NSW. In these roles Bill has worked on some very large projects including an \$8M dredging and reclamation project in Botany Bay, a \$4M Emergency Operation Centre and various large stormwater Drainage design and construct projects. He has also chaired various Local Traffic Committees for some 20 years and was an original co Author of the AUS-SPEC Specification series.

Bill is a Board Member of the IPWEA.



Gordon Hooper

Gordon is an enthusiastic and experienced Design Project Manager for COMPLETE Urban with a background in large and small infrastructure projects both in Australia and the UK. Gordon's grounding as a surveyor has instilled in him the quality of strong attention to detail, a quality that makes a good project into a great project. At COMPLETE his responsibilities include all aspects of project management, client liaison, team management and civil design.

Author postal address: 10 Regent St, Chippendale, NSW, 2008

Author email address: bill\_woodcock@completeurban.com.au

Gordon\_hooper@completeurban.com.au

Author phone number: 02 9282 9900

Author mobile number: 0402 026 917

0414 575 966