



## ASSET CENTRIC MAINTENANCE AND “LEVELS OF SERVICE ” DEFINED.

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### **Abstract** (100-300 words):

In the past, the maintenance of the community's infrastructure has been done on a reactive basis and "Levels of Service" have been ill defined. This approach is not sustainable in regards to Intergenerational Equity and does not support sound long term asset management. Using the AUS-SPEC maintenance systems, Councils can now link a quantifiable and measurable "Level Of Service" across a number of activities and asset classes with the individual budget allocation for roads and road components and other Council assets. By ensuring risks are minimised, liability is almost eradicated and sound Asset Management is facilitated. This system's approach has major benefits for Councils Australia wide.

When developing a strategic approach to asset management it is necessary to quantify the "Level of Service" to comply with reporting requirements. The information and data developed in the AUS-SPEC maintenance system provides valuable data you need as a foundation for asset management.

Based on logical systems, this system is now used by Councils throughout Australia including Cairns, Townsville, Toowoomba, Onkaparinga, Parramatta, Penrith, Rockdale, Bankstown and many more. (Note. an early excellent paper on this topic was presented at the Hobart International IPWEA Conference by Tom Yelland from Bankstown City Council).

In this paper we will explore primarily road reserve maintenance from Parramatta City and Penrith City Councils from Sydney. In the above Councils, building and parks maintenance is also covered using the same systems approach and the same principles apply.

This data and information has been used to define "Service Levels" linked to the maintenance budget into the NAMS.PLUS system.

The system can now be supported by mapping GIS systems so defects are listed and recorded in time and space for future record.

This allows Councils to better scale the level of service for any combination of funding scenarios in a way that is measurable in terms of the "defect need recording level", "response time" and



“compulsory intervention level” (Levels of Service” . This then becomes more meaningful to the community showing how their rates are being spent on their assets.

This AUS-SPEC maintenance system is consistent with the current legislative need for improved Local Government Asset reporting and defining “Levels of Service”.

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## 1. Introduction

Historically the bulk of road reserve maintenance has been reactive, relying on the community report to us where the road and footpath failures are.

It has been considered to complex to manage pro actively for many asset owners. In the current day, it is no longer considered appropriate to rely upon the community individual ratepayer to report failures and effectively prioritise maintenance work on what sometimes can be a multimillion dollar, complex asset.

Many asset owners now use a systems approach to break down a complex problem into manageable sized portions.

In taking this approach, the asset owner needs a system that will quantify asset condition, in easily understood terms, as well as the associated “Levels of Service”

Two Councils have started down this journey with quite astounding results and a great potential to “CONTROL” the system and not be lead by it.

Both Hans Meijer from Penrith City Council and Andy Ling from Parramatta City Council have provided the benefit of their experience in swapping from a REACTIVE” system to a “PROACTIVE system and show the overall cost savings and the reduction in the number of reactive complaints as well as the ease with which asset maintenance reporting can be provided.

Some basic steps are necessary to achieve this result. They are all based on common

sense and all are described in the AUS-SPEC maintenance documentation.

The concepts of “Intervention Level”, “Response Time” and “Compulsory Intervention level” are universally accepted as some of the basic building blocks of a systems approach to asset maintenance. Along with a Maintenance Management Plan (MMP) which defines the processes and a Maintenance Defect Register (MDR) which is a standardised recording format of defects, a system is well on its way to creating a pro active approach to asset management.

The system described here and the subject of the two case studies from Parramatta City Council and from Penrith City Council is based on some fairly logical and straight forward principles.

These are:

Proactive inspection and intervention.

Pre determined and quantified intervention levels based on the existing budget and a Council based risk profile.

Pre determined precinct based areas to reduce unnecessary travel between jobs.

Uniform Work Method Statements for each of the tasks involved.

An element of multi tasking in carrying out many maintenance tasks in any one precinct.



Provision of all tools to allow all of the tasks to be performed by a work crew while on the job.

A simple communication and recording system to organise work and record outcomes that facilitated iterative improvements.

The separation of the inspection role from the doing role.

A data base of knowledge to defend against litigation.



This systems approach to routine Local Government maintenance has the capacity to reduce costs, reduce rework, quantify a level of service in reproducible terms and reduce the possibility of litigation and therefore lower insurance premiums.

Adoption of this system has assisted the two case study Councils as well as many others both large and small to achieve cost reduction improvements, Occupational Health and Safety, improved risk profile and raise Community and Staff satisfaction.

## **2. Pro Active Road Reserve Maintenance**

The AUS-SPEC series of Road Reserve Maintenance Specifications is a complete package to deliver an asset maintenance program that underpins the Council Asset management Strategy. The package includes 40 generic activity specifications covering most, if not all maintenance activities on residential and rural roads. It also includes many templates for quality assurance checklists and inspections. The package also includes an MDR template, MMS details, a contracts section should the road maintenance go out to contract and plenty of

plain English guidelines to allow any Council to get started.

This system allows a Council to avoid a reactive maintenance system and provides clear evidence that the road assets are being managed in a responsible manner.

## **3. Application to a Council maintenance system – The steps involved:**

To go from an ad-hoc or reactive road reserve maintenance system to a pro active system involves a number of fairly basic and logical steps.

These can be summarised as follows:

Define the classes of defects to be addressed in the road reserve.

Split each road in the network into one of 4 different classes of road and apply a score being a “Road Traffic Score”. This defines the level of risk should an intervention not be carried out.

Define the “Intervention level”, the “Response or need recording level” and the “Compulsory intervention level”. for each road traffic score. Also defined as the “Levels of Service”.

Inspect the network and record defects meeting the pre determined intervention levels in the Maintenance defect Register.

Set up the maintenance gangs to work in the defined precincts.

Record the completed works.

Monitor progress and modify the system as it gets more and more accurate.



#### 4. The process at Penrith City Council and some of the benefits

Penrith City Council implemented the AUS-SPEC # 4 systems approach to road reserve maintenance in 2001-02.



Programmed Approach to Maintenance

##### 4.1 Council's Objectives

Decreasing number of community complaints

Carry out work in a cost effective and efficient manner

Be able to benchmark with peers

Satisfy our customers within a clear framework

Adequate reporting for insurance purposes

Repeatable and quantifiable criteria for work

Professional approach to asset management

Organise maintenance in a systematic way

More pro-active approach

Minimised risk profile

Inspection by Asset Co-ordinators

Appropriate quality management controls

#### 4.2 The issue of "Service Levels" Versus "Available Funding" Levels

Starting with the existing Council maintenance funding levels, we can improve on these as time goes by.

Pro rata the existing Maintenance funds into the categories identified in the AUS-SPEC Activity Specifications.

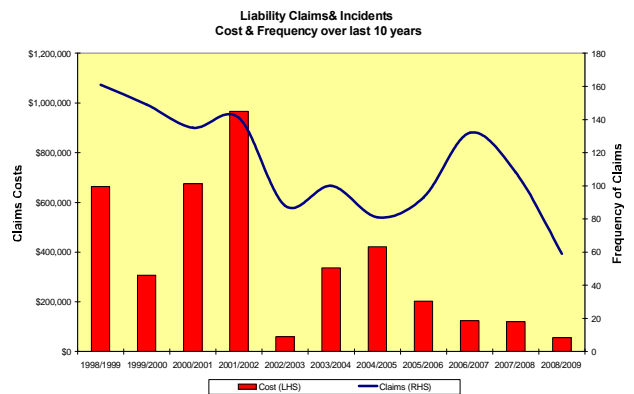
Plot the month by month costs associated with the intervention levels previously set and monitor progress.

Amend the intervention levels to better accord with the allocated budget.

This process is then monitored every month and will become more and more accurate. *(Allowance must be made for seasonal variation).*

#### 4.3 The ultimate result.

Presented below are a series of graphs, which plot reductions in the numbers of and costs of claims against Penrith City Council for defects in footpaths and road pavements.



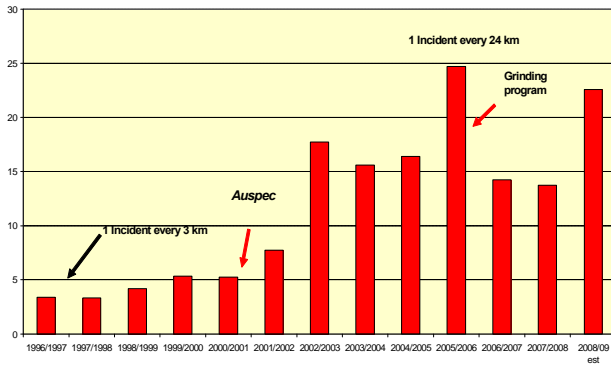
*The line in this graph shows the number of all reported liability incidents over the last 10years. The bars show the value of claims made over the same period. The reduced cost of claims could be attributed to the introduction of the Civil Liabilities Act in*



2002/03. The reduced number of incidents cannot be attributed to changes in legislation. People have incidents and report them.

management and our ability to demonstrated that we have systems in place.

Footpath Incidents per KM of Footpath



This shows the number of incidents per km of footpaths. In 1996/97 an incident occurred every 3 km of paving. The introduction of AUS-SPEC has resulted in better priority setting and maintenance management. As seen in the previous graph length of our paving has increase at least twofold. You should note there is now only 1 incident in every 24 km or the frequency of incidents has improved almost eightfold in 2008.

#### 4.4 Benefits of AUS-SPEC #4 to date

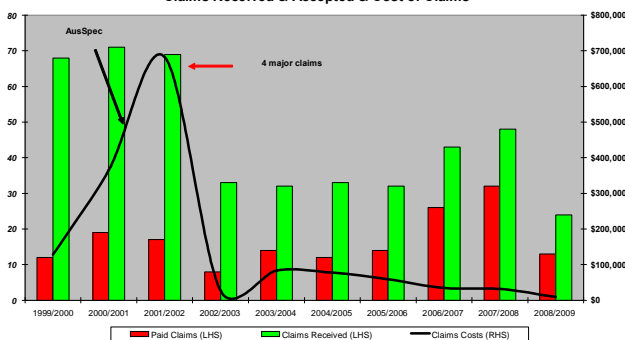
Many cycles of AUS-SPEC inspections have now been undertaken by Council's two asset co-ordinators (each co-ordinator covers approximately 500km of road network, 200 laneways and walks 130km of formed footpaths). In excess of 92% of potholes identified (approx 2,100 locations) have been repaired. Those outstanding are those identified in the most recent round of inspections, which did not reach 'compulsory' intervention levels or "Levels of Service", and are currently being repaired within the target timeframes.

Underlying the success of the program is the AUS-SPEC suite of documents from the Institute of Public Works Engineering Australia (IPWEA). The documents provided Council with a systematic approach to maintaining road reserve networks using a maintenance plan and a series of specifications for each of the many activities.

The information now held regarding road reserve defects is becoming a valuable tool in insurance claim defence as it details the location/ severity of the defect, reported date, due date for completion and actual date of completion. Already many claims have been deflected through reference to the system of inspection and maintenance, and the total number of claims has declined.

At the same time that the costs of road and path repairs have reduced, customer requests to fix potholes or trip hazards have decreased. Additionally, productivity within the teams has an increased by an estimated 10% as crews are able to work within smaller regions with fewer site moves. The "Flocons" have realized real benefits as there is no longer a two person crew 'searching' for potholes but rather a crew utilising an AUS-SPEC list of road pavement defects to repair

Road & Footpath Claims  
Claims Received & Accepted & Cost of Claims



This graphically summarises our liability performance. While we acknowledge that the cost of claims has been affected by the introduction of the Civil Liabilities Act in 2002/03 the number of incidents and claims is not affected by the legislation. The reduction of the frequency of incidents and claims is attributed to improved asset



potholes and edge breaks at known locations.

Data is also now available to facilitate the reporting of asset maintenance statistics to comply with Legislative requirements.

This systems approach has helped Penrith City Council enormously.

## 5. The process at Parramatta City Council and some of the areas for development

### 5.1 The asset centric process at Parramatta City Council

Since 2003, Parramatta City Council has installed a systems approach to Road Reserve Management.

Council implemented the AUS-SPEC #4 – Roads Maintenance Specifications with the assistance of Mr. Bill Woodcock.

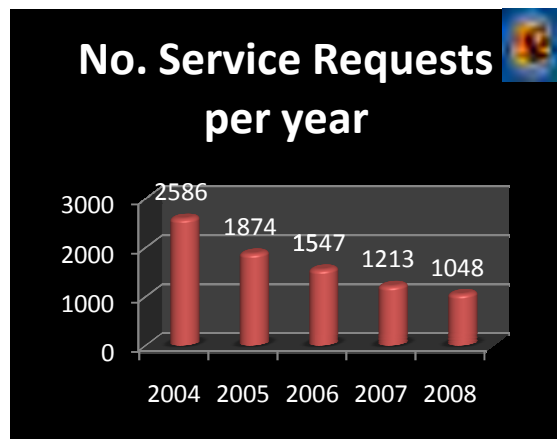
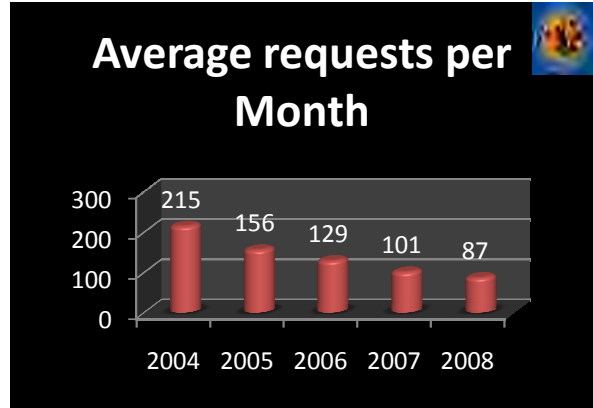
This included the preparation of a Road Reserve Maintenance Management Plan and the establishment of the Maintenance Defects Register.

The inspection regime was carried out by a full time AUS-SPEC inspector assisted by a University student who worked part time for Council.

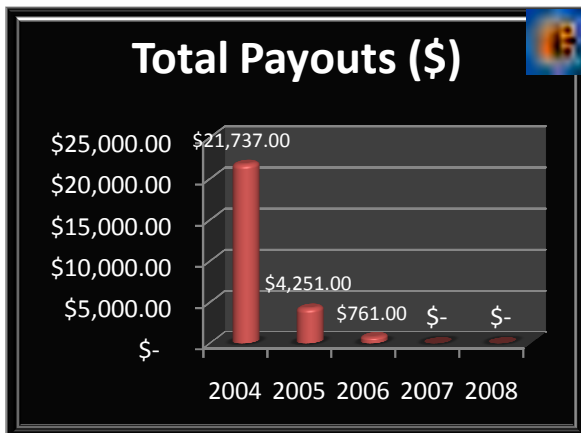
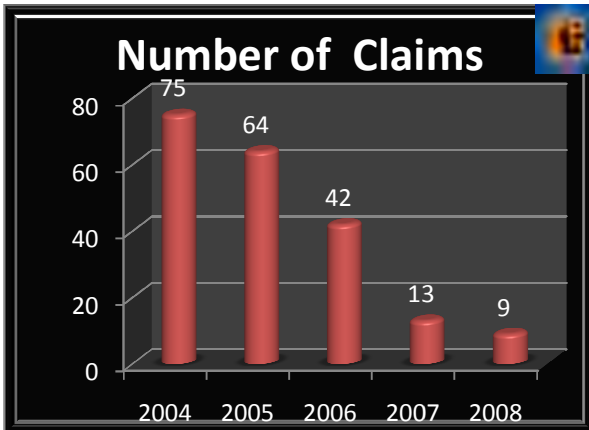
A Maintenance Defect Register (MDR) was prepared on a spreadsheet to record the inspections, allocate the job and also record the completion of the work.

This has resulted in a systematic approach of identifying and prioritising maintenance works based on scheduled inspections and over the years has resulted in a decreasing number of reactive maintenance requests and the number of insurance claims against the Council.

I have summarised the numbers of reactive maintenance service requests from 2004 to 2008 in a spreadsheet to show the declining trend below (see below).



It is also most pleasing that the process has also resulted in substantial cost savings to Council in reduced insurance claims and payouts as evident from the attached table. These claims relate to incidents arising out of defective road pavement, line markings, kerb and gutter and associated street signage and furniture (see below).



In conclusion, I am convinced that a systematic (asset centric) approach to road maintenance is the only way to manage roads in a safe and cost effective manner. The sooner the process is implemented, the better the outcome over the long term will be for Councils and other road asset owners alike.

## 6. Impact and influence of the Civil Liabilities Act 2002.

### 6.1 In the Preamble to the Civil Liabilities Act the general principles state:

**(1) A person is not negligent in failing to take precautions against a risk of harm unless:**

- (a) the risk was foreseeable (that is, it is a risk of which the person knew or ought to have known), and
- (b) the risk was not insignificant, and
- (c) in the circumstances, a reasonable person in the person's position would have taken those precautions.

**(2) In determining whether a reasonable person would have taken precautions against a risk of harm, the court is to consider the following (amongst other relevant things):**

- (a) the probability that the harm would occur if care were not taken,
- (b) the likely seriousness of the harm,
- (c) the burden of taking precautions to avoid the risk of harm,
- (d) the social utility of the activity that creates the risk of harm.

### 6.2. Other principles

In proceedings relating to liability for negligence:

- (a) the burden of taking precautions to avoid a risk of harm includes the burden of taking precautions to avoid similar risks of harm for which the person may be responsible, and
- (b) the fact that a risk of harm could have been avoided by doing something in a different way does not of itself give rise to or affect liability for the way in which the thing was done, and
- (c) the subsequent taking of action that would (had the action been taken earlier) have avoided a risk of harm does not of itself give rise to or affect liability in respect of the risk and does not of itself constitute an admission of liability in connection with the risk.

Councils still need to inspect their asset network and have a system in place to demonstrate they are responsibly managing the Community's assets and prove legally that this is the case.

"Levels of Service" need to be defined and communicated to show the community what their rates are achieving.

## 7. Risk management and the integration with current Asset Management philosophies and Asset Reporting.



Current changes to the way Councils must manage and maintain their Council assets have meant that the older ways of maintaining the Community's assets has become more involved and requires a higher level of scrutiny.

Risk reduction and risk minimisation require Council to look at ways of eliminating risk or mitigating its effects.

AS 4360 – Risk Management clearly sets out the process to put in place a risk system to reduce any organisation's risk profile.

The AUS-SPEC maintenance series of maintenance specifications sets out a risk minimisation process to facilitate the compliance with the Australian Standard. These cover Roads Maintenance as detailed above as well as the same systems approach to Parks and Recreation maintenance and Buildings and Facilities maintenance.

### **8. Is it worth the bother?**

Both Councils have done the hard yards to achieve the results attained. Penrith has pursued the project. Due to different staffing during the intervening period, Parramatta has only implemented a part of the overall process however the Council has still has reaped the benefits of a systemised process and will now be developing the full system.

Both have found the results well worth the effort.

### **9. Conclusion**

In summary, a pro active approach to routine maintenance is now a necessity if a Council is to realise the benefits shown above.

This system allows a Council to define its "Levels of Service", link them to a budget amount and then communicate this information to the Community.

Litigation is still a factor and a judge is still looking for the evidence of a responsible approach to looking after the Community's assets. Records of inspections, the establishment of the community's accepted intervention levels based on what they can afford and records of the work done are all necessary to make a justifiable case and reduce litigation payouts. The data produced and developed through the iterative process followed provided invaluable information required for Asset Reporting. Inclusion in the development of Asset Management Plans is therefore easily facilitated.

The systems approach defined in the AUS-SPEC package achieves the above as well as reducing operational costs and making it easier to attract the right level of funding from Council for maintenance.

The same can be said for the Parks and Recreation and the Building and Facilities package also under the AUS-SPEC banner.

### **10. References**

- THE AUS-SPEC SERIES OF MAINTENANCE SPECIFICATIONS PUBLISHED BY THE IPWEA AND NATSPEC JOINT VENTURE.
- IIMM IPWEA **2006**

## Authors



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Hans Meijer has 20 years of local government experience in both planning and delivery of works, with the most recent 14 years experience gained at Penrith City Council; His current position is City Works manager. Hans holds a degree in Civil Engineering.

Hans has as a strong interest and extensive experience in Asset Management with a focus on road assets. As Asset Systems Engineer at Penrith City Council Hans has implemented software packages and systems to improve Asset Management as well as developing his team of staff.

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Andrew Ling has over 15 years project and asset management experience at Parramatta City Council. In his current position as Service Manager Civil Infrastructure, Andrew is responsible for the development of asset management plans/policies and allocating resources and setting priorities for a broad range of civil assets such as roads, footpaths, drainage systems, bridges, flood control structures and street furniture.

Andrew has a great passion to implement systematic approach to asset management to ensure the civil assets he manages is maintained at an optimum level to achieve maximum benefit for the community and to mitigate risk to the Council.

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