"TRIGGERS BROOM"
– AN INSIGHT INTO GUIDANCE ON ITS ASSET MANAGEMENT

Contents

Synopsis

The presentation will provide an overview of the requirements set out in various guidance documents available for the Asset Management process, specifically ITS and Traffic Signal equipment.

A brief summary of what is expected of the UK Public Sector i.e. Local Authorities and other owners of Public Assets and why Asset Management is important in general, what it can provide and how it is achieved.

The main part of the presentation will highlight to delegates the guidance available in the *UKRLG Code of Practice – Management of Electronic Traffic Equipment* and concentrate on exploring the 19 recommendations the Code highlights.

This paper and presentation will provide an opportunity to draw attention to the Code and educate delegates about the intentions of this document and the importance of implementing the recommendations in the Code.

Introduction

Within the ITS industry 'Asset Management' as a term has had a chequered past, which at best has been implemented with little guidance and at worst completely ignored. In today's ITS environment Asset Management (AM) needs to play a key role to ensure equipment is maintained in an operational state throughout its working life.

ITS equipment and the deployment of it by various organisations, including local authorities and other agencies has expanded significantly over the last 10 years, with installation at its peak just prior to the recession in 2008. The maintenance or "management" of the installed equipment was not increased at the same rate of growth, with many authorities and asset owners still playing catch up to this present day.

AM experts often talk about the stages or phases that define AM over the last 30 years as it has been in other industries. Opinions vary depending on what AM information you read, however below is an example of the stages, as detailed in 'Strategic Asset Management' publication (1999): -

- "Stage 1 - "Construction" (emphasis on construction of new assets, existing assets a low priority. Dominated by the suppliers to the construction industry.)

- Stage 2 - "Maintenance" - (Demands for maintenance and renewal dominate. This stage is dominated by technicians and suppliers to the maintenance industry, many of them former suppliers to the construction industry left without work when capital for new works becomes less available.)

- Stage 3 - "Information" (begins when, with tightening budgets and increasing demands, agencies start to demand cost justification before allocating money to maintenance. This generates the need for asset registers, valuation, information collection and data systems. This stage is dominated by IT suppliers.)

- Stage 4 - "Procedures" (begins when it becomes clear that information itself is insufficient and there needs to be sensible processes in place for agencies to make use of the information they have. This stage is dominated by the policy makers, central agencies, and consulting firms producing manuals and guidelines.)

- Stage 5 - "Outcomes" (is the most recent stage. It begins when agencies start to focus on the purpose for the asset information and management procedures. In this stage the emphasis changes to service delivery outcomes and agencies start to question why they should own assets and to rethink what is core. In this stage, asset managers play a key role in corporate decision making.)

'Strategic Asset Management', 31 December, 1999 – Penny Burns

ITS Asset owners are beginning to understand and implement AM techniques however the ITS industry is unique and often a paper exercise looking at high level processes and funding does not drill down to the day to day issues. Therefore asset owners will look for guidance on how to implement AM processes and importantly maintain them in the future.

This paper and presentation looks at the general guidance available to asset owners and concentrates on highlighting the specific ITS asset guidance.
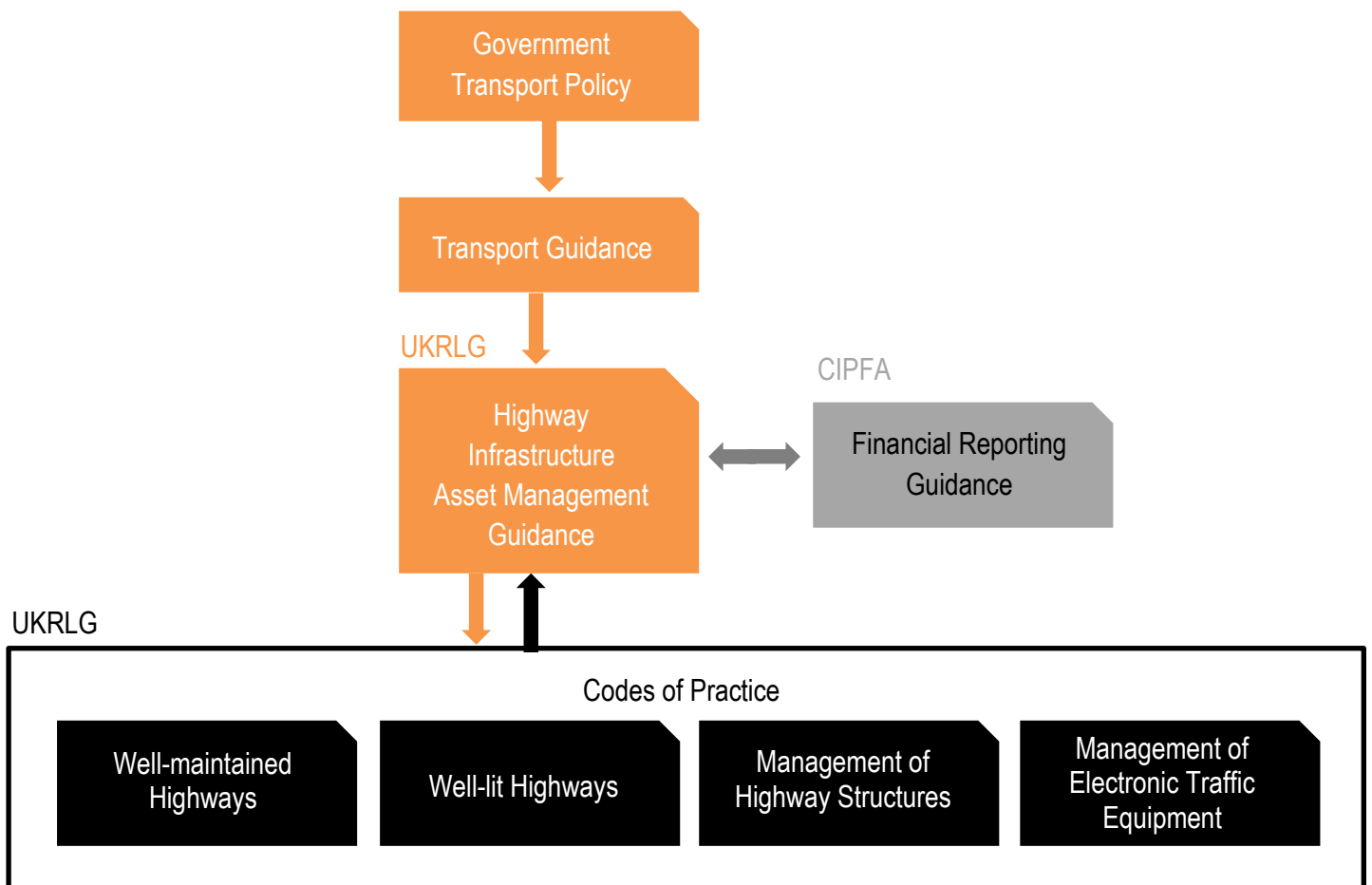

Asset Management Guidance

Available today for asset owners in all industries is a wealth of AM guidance, which is increasing month by month specifically for the Transport/Highways industry. Industry Organisations provide assistance to asset owners by providing services such as these guidelines, toolkits, frameworks and training ensuring the AM process and techniques are highlighted and implemented consistently.

Pressures on asset owners now demand that they have in place an efficient approach to AM for all of their assets, especially in areas of local and central government. The AM requirements or recommendations for asset owners are governed by the policies set within central government. ***Figure 1 - UKRLG Guidance Hierarchy*** shows the guidance hierarchy for Transport/Highways industry as detailed in the *'UKRLG Highway Infrastructure Asset Management*

This hierarchy shows how central government policies disseminate down allowing guidance to be provided to, in this case Highway Asset Owners, which captures ITS or Electronic Traffic Equipment. This paper will continue to focus on the detail of the *'UKRLG Highway Infrastructure Asset Management Guidance Document'* and the *'UKRLG Management of Electronic Traffic Equipment – A Code of Practice'* referring to other Codes of Practice available from the UKRLG website (www.ukroadsliaisongroup.org).

Other pressures or demands are being placed on asset owners, with many local highway authorities now having to meet the requirements of Whole Government Accounts (WGA). WGA information is provided to central government and is used to set forward budgets for authorities, therefore placing a greater emphasis on each authority and department to ensure that their asset information is correct and up to date. If the asset information is initially inaccurate the authority could see a greater shortfall in future budgets to maintain and upgrade their asset. The Chartered Institute of Public Finance and Accountancy (CIPFA) have produced advice on how local highway authorities can meet WGA requirements by implementing AM.

Figure 1 - UKRLG Guidance Hierarchy

The latest AM standard for asset owners is available from British Standards under the publication *'Optimal Management of Physical Assets', also widely known as* PAS 55 (Publicity Available Specification). Asset Owners and AM Organisations currently can seek accreditation against this specification and many already have, however *'UKRLG Highway Infrastructure Asset Management Guidance Document'* states that a new Asset Management standard is being produced by the International Standards Organisation (ISO). This new standard will be known as ISO 55000 and is due to be published in 2014, which will provide an international common platform for AM across all industries for all asset owners. This ISO 55000 will be a "What to do" not "How to do", whereas the UKRLG and other local Guidance and Codes of Practice support asset owners with the "How to do".

The *'UKRLG Highway Infrastructure Asset Management Guidance Document'* details 14 recommendations for highway asset owners. Examples include: -

- **Asset Data Management** – *The quality, currency, appropriateness and completeness of all data supporting asset management should be regularly reviewed. An asset register should be maintained that stores, manages and reports all relevant asset data.*

I.e. The highway authority should have an asset register, either compiled using an asset system or software or in simple terms an Excel spread sheet. However the emphasis is on the quality of this data from the start and the on-going maintenance of this data. What value is there in spending a large amount of money on an asset system which is populated with data/information which is incorrect?

- **Asset Management Framework** – *An Asset Management Framework should be developed and endorsed by senior decision makers. All activities outlined in the Framework should be documented.*

I.e. At the outset of implementing AM, the authority needs to have a framework in place which should show or include all asset management activities carried out by that authority. The framework is a high level piece of work for the authority, and it is recommended that all relevant staff levels are involved where possible, so that the framework feels embedded from the start and an attitude change towards AM is achieved.

- **Works Programming** – *A prioritised forward works programme for a rolling period of three to five years should be developed and updated regularly.*

I.e. A programme of works should be compiled based on the highway authorities' priorities, whether that be strategic networks, based on the age of asset or type of equipment. Again the emphasis is on maintaining this programme allowing the highway authority to easily identify future works and justification for works on assets. Communication is vital in relation to the update of this programme, especially across the internal highway departments as outside influences or other planned works could change priorities.

It is recommended that the local highway authority or asset owner review the *'UKRLG Highway Infrastructure Asset Management Guidance Document'* ensuring that the principles and the recommendations listed are: -

- Being implemented within the authority already and a sanity review is all that is required against the current frameworks, policies, strategies, plans and processes in place. Or: -
- Initial work has started and therefore further work and guidance is required to fully implement recommendations. Or: -
- No such structure is in place and a full review against the document is required.

Reviews of the AM structure in place are recommended to be carried out using both the Top-Down and the Bottom-Up approaches, which will allow the highway authority to capture all elements of AM within their organisation. Adopting PAS 55 allows the authority to carry out a review of where they currently are, in regards to AM and therefore provide a benchmark. This gap-analysis then allows a "How to" improve exercise to be undertaken allowing the local highway authority to understand the changes in processes and/or activities required to provide positive results and close the gaps. Carrying out further PAS 55 reviews can then detail how the authority has improved and provide justification for funding etc.

As part of the Bottom-Up review the local highway authority should refer to *Figure 2 - 'UKRLG Management of Electronic Traffic Equipment – A Code of Practice'*, as this provides lower level guidance on a wide range of subjects including Reactive Maintenance, Proactive Maintenance and Procurement.

The guidance document provides the reader with a more technical understanding of the management of ITS or Electronic Traffic equipment, providing an important part to the AM process.

The experience and knowledge of ITS asset owners and local highway authorities across the UK vary, with some authorities reliant on one person for ITS and others drawing on expertise of large consultancy organisations.
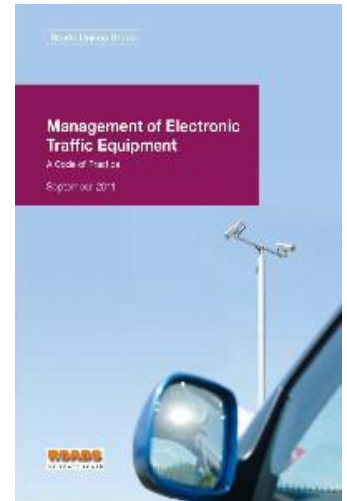
Figure 2 – CoP Front Cover

This guidance document was compiled to ensure that each local authority, large or small, experienced or inexperienced, could refer to a 'Good Practice' guide as no such document had ever existed prior.

Published in September 2011 the guidance provides local highway authorities with 19 recommendations. All 19 recommendations should be reviewed and ideally the local authority should document the processes/actions currently in place for each recommendation AND/OR document the processes/actions that need to be put in place for each recommendation.

The 19 Recommendations are: -

1. All parties involved in delivering the service should seek ways to improve the service to meet the customers' needs. New equipment, processes and strategies should have identifiable tangible benefits, but cost should not be the only consideration.
2. Authorities should seek to future proof systems and processes as far as is practicable.
3. Where possible, authorities should aim to increase the use of recycling and re-use of equipment within their maintenance regime.
4. Authorities should consider the use of low energy (e.g. ELV) equipment as the norm, especially for new or renovated sites.
5. If authorities own assets containing other technologies that are not covered by this Code, they should ensure that a guidance document is in place to be used by their staff.
6. Where authorities elect to adopt policies, procedures or standards different from those suggested by the Code, it is essential for these to be identified, together with the reasoning for such differences, and approved as appropriate by the authority.

7. Once an authority has established procedures for dealing with its maintenance requirements, the procedures should be reviewed on a regular basis to ensure that they are still fit for purpose and in accordance with any updated regulations or guidance.

8. Authorities should undertake a full review of current practices, followed by an assessment of the differences between current practice and the recommendations set out by the Code. Once the gaps are identified, clear plans should be established on how they are to be addressed.

9. The authority should develop an Implementation Plan, in accordance with the recommendations of this Code, for the management of their maintenance. The development of this plan should be treated as a formal project, with agreed milestones, resources and budgets in order to ensure that the optimum outcome is achieved.

10. Authorities should ensure that suitably trained staff are in place to undertake the management of maintenance of electronic traffic equipment.

11. Detailed asset management systems should be put in place.

12. Performance Indicators should be used to measure authority and contractor effectiveness in delivering the service and to provide a baseline from which improvements can be measured.

13. Authorities should provide financial plans for maintenance that detail their priorities as well as clear direction on how the maintenance operations will be managed in the short, medium and long term.

14. Authorities should ensure that adequate systems are in place to process and manage faults.

15. Authorities should establish effective systems for the transfer of faults from UTC and RMS to an appropriate FMS, with instructions to the maintenance contractor providing enough detail to allow the effective repair of the fault.

16. Designers should take account of the whole life cycle of the asset, including installation, maintenance and decommissioning, during the design stage.

17. Annually authorities should report actual performance in complying with their service policy statement, including National and Local Performance Indicators as appropriate.

18. Authorities should satisfy themselves that maintenance contractors have satisfactory procedures in place to provide an effective maintenance service as required by the contract.

19. Preventative maintenance should be treated as the key tool to successful implementation of the asset management plan, forestalling poor performance and failure of the installation.

Local highway authorities should have the majority of these recommendations in place already, however with such variation on each authorities position in the ITS AM process, it is advised that a review against these recommendations is carried out by every local authority in the UK.

Four of the 19 recommendations have been highlighted in further detail below: -

Recommendation 1 - All parties involved in delivering the service should seek ways to improve the service to meet the customers' needs. New equipment, processes and strategies should have identifiable tangible benefits, but cost should not be the only consideration.

It can be very easy to forget on a day to day basis why we are carrying out ITS operations and who we are managing the equipment and road network for, which is primarily the end user – the travelling members of the public. These first line customers should always be the end outcome when carrying out reviews and any decision that reduces the quality of the service to them, should be further investigated in order to justify that decision.

For example if you currently carry out Bulk Lamp Changing (BLC) on a 6 monthly basis across your entire traffic signal asset, what would be the effect to the end user if you decided to change this to an Annual or a Bi-Annual BLC. Primarily the effect to end users would not be that obvious, unless a large number of lamps started to fail, which from experience is unlikely. Fault rates may increase marginally, however the benefits could include an annual reduction in cost, environmental savings (including travelling to site by contractor and reduction in recycling of old bulbs – whether they are working or not), less disruption to the travelling public by reducing Traffic Management required.

Each review decision would need to identify the tangible and non-tangible benefits and disbenefits, the costs and the timescale over which the decision will implemented, the costs saved and the benefits achieved.

Q – Do you on a day to day basis take into consideration the end user i.e. the travelling public? Honestly?

Recommendation 2 - Authorities should seek to future proof systems and processes as far as is practicable.

The ITS industry has a wide range of suppliers and manufacturers, ranging from the very large down to the smaller companies trying to establish a proportion of the market or supplying niche products. Difficult decisions are often faced by local highway authorities when capital revenue based contracts are tendered, leading to a number of suppliers or manufacturers submitting an interest. Quality and Price are the main two items considered during contract tenders and depending on the weighting given, local highway authorities can often award the cheapest option, which inevitably may not always the best.

The recommendation is trying to ensure local highway authorities take into account the long term considerations/impact when investing in systems or equipment. I.e. an Asset Management approach to systems and processes.

For example if an authority are looking to invest in a Car Park Guidance system or another type of ITS system, the authority needs to understand the following: -

- What is the expected manufacturer's life expectancy of the equipment?
- Has the manufacturer the longevity and stability to be able to provide parts/spare equipment through the life of the system?
- Can the system be upgraded at the end of its life expectancy or will it even be required?

There is no point in investing large amounts of money in a system where the equipment could be obsolete in two years' time, because the manufacturer or a supplier has gone out of business. Therefore the importance of the decision at the contract tender stage is even greater.

Authorities should review their current processes to determine if they are still relevant or require amendment. Some processes will have the flexibility to still be a valid process after years of implementation, whereas others may need to be amended in line with system, organisational structure and staff changes. Therefore this is where *Recommendation 7* is implemented by the authority.

Q – What equipment or systems within the authority do you have concerns over, with regards to future proofing?

Recommendation 8 - *Authorities should undertake a full review of current practices, followed by an assessment of the differences between current practice and the recommendations set out by the Code. Once the gaps are identified, clear plans should be established on how they are to be addressed.*

This paper has already looked at this recommendation in many formats; however this is a lower level recommendation which follows the format of the PAS 55 gap analysis process. Information gathered from this review can be utilised as part of the higher level PAS 55 gap analysis process, providing time and money savings at a later date to authorities.

For example authorities could review their processes of Fault Management against *Recommendation 14* and *Recommendation 15.* The authority may feel that they have adequate systems and processes in place for the number of assets managed versus the number of staff in the department. However if carrying out a gap analysis review identifies the processes do not align to "Good Practice", then the authority if satisfied with the current practices should document that the review has taken place and detail the reasons why "Good Practice" has not been implemented.

Checking a Remote Monitoring System (RMS) once a day may be considered adequate for an authority with 20 traffic signalised assets, but not for an authority with over 400 signalised assets. Whatever the size of the asset stock an authority should review its processes, as from experience we can all improve on what we are currently doing. For example for the authority carrying out one daily RMS check, what is the process if a set of signals goes "Off" or "All Out", is this picked up the next day during the daily check and is this providing a quality service to the customer. Some would say Yes, some would say No depending on contracts and experience. The Code does not define "Good Practice" for the number of RMS Instation checks, however it is recommended to check more than once a day and if possible configure some sort of alarm to identify *Urgent* type reported faults.

If the Fault Management process is carried out by the maintenance contractor internally on behalf of the authority it is still recommended that a review is completed. Any gaps should be identified and actioned to ensure the contractor is working in line with the authorities policies and "Good Practice", ensuring the customer is receiving a quality service.

Q – Do you feel that your current Fault Management processes are robust?

Recommendation 11 - *Detailed asset management systems should be put in place.*

The *'UKRLG Highway Infrastructure Asset Management Guidance Document'* recommends having in place an Asset Data Management as detailed in the Asset Management Guidance section of this paper Page 4.

An Asset Management System could be a combination of a number of systems including Fault Management, Remote Monitoring, UTC/SCOOT, UTMC, Excel Spread sheets or Access Databases etc. Any sub system that contains information relevant to the asset should be incorporated into the overall AM system. For example RMS should contain the telephone number or IP address, asset address and fault history. This type of information from the sub systems is considered as an input into the AM system.

As part of this AM system it should be documented where the various types of information are stored and how i.e. electronic/paper or both and any missing information required.

Various outputs from this system should be available for on-going performance reporting, valuation reports, management reports etc.

Authorities can decide how simple or complicated their AM systems should be depending on the number of assets owned, the sub systems operated, the amount of input information and what type of outputs they require.

As previously mentioned output information from AM systems is now being requested by central government under WGA, and within authorities there is a greater expectation to understand what assets are owned, how much the authority is spending on assets, the future costs allowing budget prediction and justification to the end users on what services/assets their taxes are being spent on and why. These outputs and the pressures on them are likely to determine the complexity of the AM system.

Q – Could you detail and describe the current AM system within your authority right now?

Recommendation 16 - Designers should take account of the whole life cycle of the asset, including installation, maintenance and decommissioning, during the design stage.

The Asset Management process and the adoption of the AM culture within an authority are behind this recommendation. Experience has often shown that during the design of a set of traffic signals or the placing of a Variable Message Sign (VMS) at the side the road, that designs and designers have not always considered the AM approach and therefore ignored exploring the whole lifecycle of an asset.

This recommendation is to ensure that designs enable assets not just for installation, but for maintenance and for the end of the assets operational life, in decommissioning. Designers should be aware and if not, made aware of the latest ITS/Civil products available on the market and the "Good Practice" processes in place, to ensure the ITS asset encompasses the "whole lifecycle" approach within in its design.

For example low energy equipment (e.g. ELV or LED), as in *Recommendation 4*, if utilised at a set of traffic signals, could reduce the amount of ducts required, due to less cable, which could have an effect on the installation time on site and the resulting disruption to the end user. LED traffic signal heads also require less maintenance, than the normal type, resulting in less Traffic Management required, less visits to the asset overall and less disruption to the end user – the customer. ELV equipment is also safer to work on and safer to the end user, due to the reduction in working voltage/current values. This lower working voltage/current therefore has a positive effect on both the maintenance operation and at the end of its life, during the decommissioning of the asset.

The above example shows that a simple decision to implement low energy equipment at the design stage, even though slightly more expensive could have a greater longer term positive effect. These decisions should be discussed carefully at the design stage, with open communication vital between various departments within the authority.

Q - How many authorities can immediately name an ITS asset where there was fundamental design flaws which has resulted in issues during the asset's operational life?

The *'Figure 2 -UKRLG Management of Electronic Traffic Equipment – A Code of Practice'* provides asset owners with a wealth of other information on "Good Practice" for ITS or Electronic Traffic Equipment. The guidance document if read by a complete novice to the ITS industry, could be used as an "Idiots Guide" which incorporates a wealth of details from ITS acronyms right up to the Legal Requirements. With the guidance approaching its second anniversary it is time for this document to become a cornerstone within the industry and the aim is for all local highway authorities to at least know about the document and understand its purpose, if not implementing the recommendations in it.

Conclusions/In Summary

Whatever peoples thoughts on Asset Management, good or bad Asset Management is here to stay within our industry and rightly so. The days of installing assets such as traffic signals or CCTV systems as part of large capital schemes and not considering their operation or life expectancy should be history, as engineers and local authorities have a duty to consider the whole lifecycle of an asset.

Asset Management can be a complicated procedure, however breaking the process down in to smaller and less onerous tasks has to be the way forward. With some local authorities not even knowing what assets they have installed on street, Asset Management may seem a long way off, however simple steps can be taken to begin climbing the rungs of the AM ladder.

Local Authorities need to ask themselves some probing questions, for example – Are we confident that we know what ITS assets we are responsible for on street? What is the condition of our ITS assets on street? Do we have in place a replacement programme for the next 3 to 5 years?

You are not alone! Knowledge sharing of good practice between Local Authorities and asset owners has to be key to the success of AM within the ITS industry. The size of our industry, online forums such as TSG and the annual events held, such as the JCT symposium, the User Groups and others, provides plenty of opportunities for networking and discussions about good practice.

Day to day reference is provided by the guidance highlighted in this paper and the expertise gathered and the knowledge gained from the production of these documents should not be ignored by engineers within our industry. These documents do not have all the answers however they will provide questions for a discussion, which will eventually allow the asset owner to understand how best to implement AM within their location.

Finally - "Triggers Broom" – why reference to this in the title. The paradox of "Triggers Broom" or "The Ship of Theseus" raises the question of whether an object is still the same object if you replace all of its components. In the story the local authority awarded *Trigger* a medal for having the same broom for 20 years, however it turned out that over this period it had 17 new heads and 14 new handles. Therefore this raises the question is it the same broom?

Unfortunately this therefore also highlights that the authority was poor at Asset Management, with no condition records of its asset and the components that make this asset up. However on the positive side it was promoting Asset Management by rewarding staff for maintaining their assets………

Acknowledgments

References

UKRLG Code of Practice – Management of Electronic Traffic Equipment 2011

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'Strategic Asset Management', 31 December, 1999 – Penny Burns

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