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**MUNICIPAL ENGINEERING FOUNDATION  
(Victoria Limited)**

**2003 STUDY TOUR REPORT  
(USA, Canada and England)**

**A SYSTEMS APPROACH TO KNOWING YOUR ASSETS**



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The views expressed in this report are those of the author, not those of the Council  
(nor do they reflect current Council policy).

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## ACKNOWLEDGEMENTS

During August and September of 2003 a group of four Local Government engineers from Victoria toured the United States of America, Canada and England to visit with organisations and gain an insight into the way different organisations in different countries deal with our chosen Study Topics. This Tour would not be possible without the support and vision of the Municipal Engineering Foundation of Victoria. I also wish to acknowledge and thank both the City of Monash and my family for the support given to me in making this experience possible.

The study tour leader was Robert Ward, a Trustee of the Municipal Engineering Foundation of Victoria. Other members of the tour group were (*and topics*):

1. Danny Eaton, Manager Services, Hume City Council,  
*Workplace Culture and Productivity*;
2. Stephen Howe, Manager Asset Management, Boroondara City Council,  
*Risk Based Prioritisation of Works Programs*;
3. Peter McLean, Manager Assets and Development, Cardinia Shire Council,  
*Water Sensitive Urban Design*;

The Organisations visited during the Study Tour were

1. City of Foster, California, USA
2. City of Anaheim, California, USA
3. Orange County Sanitation Board, California, USA
4. City of Laguna Niguel, California, USA
5. Irvine Ranch Water District, California, USA
6. APWA Conference, San Diego, California, USA
7. San Diego County Council, California, USA
8. City of Indianapolis, Indiana, USA
9. National Research Council of Canada, Ottawa, Canada
10. Liverpool City Council, England
11. Borough of Telford and Wrekin, England
12. Office of the Deputy Prime Minister, England
13. Royal Borough of Kingston Upon Thames, England
14. Surrey County Council, England

The support shown to the Study Tour participants by each of the host organisations was significant, as was the exchange of information and the openness of the comments made about the organisations experiences and aspirations. Their efforts in preparing for our visit was noticed and appreciated.

As expected, not all organisations were able to assist with all Study Topics in an equal manner. However, this is in no way to be taken as a criticism of any of the organisations. It is merely an attempt to acknowledge the reality that organisations, performing basically the same functions in the public sector environment, and often with similar roles and responsibilities, all face similar issues that are dealt with in slightly different ways or are given different priorities for a range of internal and external reasons. Many of the organisations visited also shared with us some extremely valuable information, and insightful experiences, that go way beyond the limits of the Study Topic and will remain with me for a very long time.

Thomas Kuen - 7 November 2003

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## EXECUTIVE SUMMARY

A systems approach to acquiring and maintaining knowledge about infrastructure assets requires an organisation to identify its corporate and business needs for data and information and to then determine the best way each separate department can help achieve these needs. To be able to build or select and implement any "system", whether it be a management or information system, the objectives to be achieved must be defined with sufficient detail and clarity.

The pressures placed on Councils and Council Officers to have knowledge about all assets in the public domain is increasing, as is the need to understand the performance of assets for which Council has custodial responsibility to its local community. Recognising and understanding these pressures allows an organisation to adopt a holistic approach to the way in which it manages its assets. Infrastructure planners and strategists have different asset knowledge needs and perspectives to those of both internal and external service providers. A systems approach recognises these differences, and allows the two-way communication of asset related knowledge between the planners and the service providers.

This report analyses how public sector organisations in the United States of America, Canada and England are addressing these same issues that are facing municipal engineers working in Victorian local government. There is evidence that most organisations are aware of the asset management framework, as detailed in the International Infrastructure Management Manual of Australia and New Zealand.

While it was my intention to focus on how organisations in the three visited countries dealt with the transfer of knowledge from the service planner and designers to the service providers, and vice versa, it became necessary to change the emphasis of the Study Topic to accommodate a higher level "corporate" approach to the issue.

Most organisations have formally recognised the strategic importance of the role that service provider knowledge about the assets they are managing and / or maintaining plays in a modern asset management framework. Many of the organisations visited have even begun implementing strategies that will make use of new technologies and mobile computing devices to progress this strategic objective. However, most organisations are still (at best) only thinking about how to implement this change.

The challenge for each organisation is to become aware of the existing status of their own asset management and organisational culture, and identify the desired position. An agreement, or at least an understanding of current problems is required by all stakeholders if consensus is to be reached on the outcomes. Different people have different perceptions of the same problem.

The most important point to remember is that a successful "systems approach to knowing your assets" is a people issue. It is more important to focus on how organisations need and people use information, than on how computers store data. Value management and knowledge management principles offer solutions. The affordability and functionality of modern technology of computer systems is not the issue - change management is the challenge. For this reason, it is necessary for each organisation to determine its own right approach. The principles may be the same, but there is no "one" model that can or should be used by all!

## INTRODUCTION

The chosen Study Topic is “**A Systems Approach to Knowing Your Assets**”. The reason for selecting the above topic is that many Victorian Councils are now developing Asset Management Plans and there is an increasing need for Municipal Engineers to have a sound knowledge of their assets and of best practice in this field.

In an environment where communications technology and mobile computing are becoming more affordable, I was particularly interested in examining how other organisations are viewing the potential contribution that service providers can make to several components of the asset management framework. Components of particular interest to me were condition surveying, asset maintenance, levels of service and customer charters, and customers expectations. An asset management framework, illustrating that there are components that require service provider input, is shown below in Figure 1.



*Figure 1 - Asset Management Framework*

An integrated “systems approach” to the procurement and preservation of infrastructure assets by all stakeholders is expected to deliver a cost effective and efficient outcome that maximises the return to the community. I was keen to obtain information on the views and experiences of organisations from other countries.

A significant challenge is to integrate corporate asset management principles across the entire organisation. This needs to be done in a systematic way that also optimises the use of scarce resources. Infrastructure management is an activity that requires a “whole of Council” approach. The value that service providers can add to this process has been examined.

The information provided to me by the host organisations is presented in this Report. Although not always directly related to the original scope of the Study Topic, it was of more than abundant quantity and quality and made the 2003 Tour a great success. The ability of the overseas organisations that were visited to contribute to this Study Topic varied quite considerably. The differences for the variance was more a reflection of how public works is structured in the various countries, including legislative and political pressures or priorities, rather than on the capability or willingness of the staff to deliver to “best appropriate practice” in asset management.

## CONTEXT

There are three basic components to the chosen topic that need to be discussed and understood. These are:

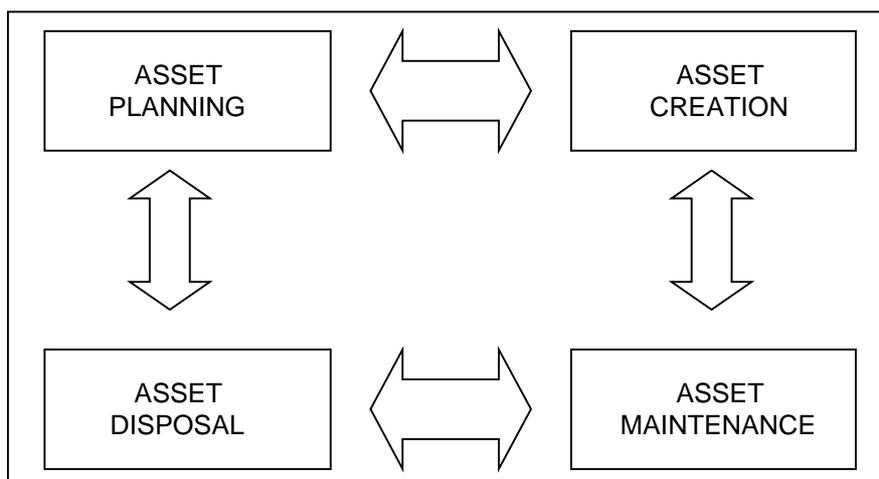
1. What is a system and what is meant by a systems approach;
2. What is knowledge; and
3. What is meant by assets.

### A Systems Approach

A systems approach to management is one that considers the whole organisation. It attempts to consider how changes made to one area of an organisation will impact other areas because a system, when working properly, is a set of related components working together to achieve some common purpose.

A systems approach does not just mean that computers are used to record data. Data, where related to a business need or statutory obligation, has value. However, just because data can be collected, and its storage and manipulation by computers is relatively cheap, doesn't necessarily mean that data has sufficient value to justify its acquisition costs. Information systems in today's business world will now generally use computers as a tool, but the definition and application of the systems approach is much broader than just the hardware components of the system. An information system also consists of software and people components. Many of the issues that limit the success of the modern "public works" organisation relate to how the organisation manages its human resources. It is in this respect that a "systems" approach" to knowing about your assets becomes important.

Adopting a systems approach just means "good management". It is about people working together and it doesn't allow for organisational silos. In many ways it is a value management exercise, where the goal of the organisation is to add value to the community in every step of the asset management process. The process is iterative and it is cyclic, and at its simplest, it can be represented as shown below:



*Figure 2 - Simplified Asset Management Process*

It is beyond the scope of this Report to define and discuss the principles of Asset Management. However, a vision of "Best Appropriate Practice in Asset Management" has been included in Appendix 1 to place the content of the Report in a context.

## Knowledge

Knowledge is the “know how” that enables information to be converted into meaningful and appropriate instructions that can be readily understood by those who are required or obliged to follow them. Information is just data that has been sorted onto useful categories. Data is simply a collection of recorded observations. Data only becomes information after it has been processed. Information is only useful to an audience if they understand it and are willing to accept or trust it.

The strategic objective of a modern organisation responsible for the provision and management of municipal infrastructure should be to become a learning organisation. According to Senge (1990) “A learning organisation is an organisation that by virtue of its people, values and systems is able to continuously change and improve its performance based upon the lessons of experience.” The reason I believe this is necessary is to overcome the “perception paradox” problem. The Perception Paradox is the four versions of how something works<sup>1</sup>:

1. The way the procedure says it works
2. The way management thinks it works
3. The way it actually works
4. The way it was meant to be

A systems approach to knowing your assets will provide the framework for overcoming the perception paradox dilemma. Modern technology and new tools make the realisation of this goal more affordable than it has ever been before. The challenge is to prioritise the business and manage the people issues associated with the rapid development and implementation of new technologies into the work place.

## Infrastructure Assets

Public sector assets have two major purposes. They exist either for the benefit of the public or for internal use by the organisation responsible for delivering other services to the community. In a public works, or local government environment, infrastructure assets are the objects that are used or manipulated by engineers (or public works professionals) to meet an identified community need and support a determined level of service.

Assets are not required to deliver a financial benefit to Council but they should be required to deliver a valued benefit to the community. Hence, in the public sector “assets” need to have a value to the community. This means the performance of the asset, or the level of service it provides to the community, is usually much more important to understand than the capital cost to Council of acquiring the asset.

Other characteristics of assets include the fact that the full cost of administering or operating the asset is often hidden to the organisation, and that the accountability for the asset shifts during its life cycle. The total cost of the asset should be understood and needs to be related to the success of the asset in supporting the delivery of the service that is valued, and funded, by the community.

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<sup>1</sup> The Audit Skills Handbook - page 9

## BACKGROUND (Monash City Council)

While the scope of the Study Topic was generic, and the structure and content of this Report is intended to be of use or interest to many Councils, it is my specific intention to apply my learnings to the benefit of my employer. Hence, the following high level description of the organisational environment at Monash.

The City of Monash's mission statement for asset management is:

*"To create, maintain and dispose of the organisations assets in the most cost effective manner to give the required level of service for present and future generations."*

To achieve this mission, a thorough understanding of the business needs and knowledge of the asset is essential. Information systems are needed to achieve this mission statement.

This Mission Statement is supported by the 2002-2005 Council and Business Plans.

**Goal 2** - *To maintain and improve the city's physical infrastructure for present and future generations.*

*Strategy - Ensure asset management plans are in place to maintain and improve Council assets.*

*Strategy - Commit to providing sufficient funding for the maintenance and upgrading of the city's physical infrastructure, roads, drains and buildings.*

To achieve the stated Vision, an organisation needs to be able to demonstrate the following to its community:

- Knowledge of existing assets - including physical condition;
- Knowledge of levels of service required by customers;
- Knowledge of asset performance and reliability;
- Knowledge of asset utilisation and capacity;
- Ability to predict future demands for service;
- Ability to predict the failure modes and estimated time of failure for assets;
- Ability to analyse alternative treatment options;
- Ability to rank works on a cost/benefit basis;
- Ability to rationalise works to suit the available budget; and
- Optimisation of operations and maintenance activities.

The characteristics of the relationship between service planners, service purchasers and service providers will be critical in achieving the outcomes of the vision. Communication and knowledge management systems are also vital components.

It is for the above stated reasons that an understanding of a systems approach to knowing your assets will be of benefit to Monash. Capturing the tacit and explicit knowledge of all service providers will help improve Council's asset management performance in a cost effective manner. Some additional information on Monash City Council's infrastructure and service provider staffing is included in Appendix 2.

## **MAIN REPORT - STUDY TOUR VISITS**

Not all organisations visited are specifically discussed in this Report. However, the discussions with Officers at these Councils are still reflective of the general conclusions and recommendations contained herein.

### **United States of America**

Local government in the United States of America is very important to the people. There is also significant variability in the assets a Council may look after and the manner in which it provides the services to the community.

Often there is a four tiered level of government in the United States of America - National, State, County and City. Public Works Departments (PWDs) at the County and City level are often responsible for the following categories of infrastructure assets - roads, footpaths and drains. "Full service" Councils may also be responsible for water supply and sewerage disposal and treatment services. Generally, buildings are looked after by the "environment" departments which also look after parks and reserves. Pathways in reserves are not usually looked after by the PWDs either.

### **Government Accounting Standards**

Statement 34 of the Government Accounting Standards Board (GASB-34) requires that infrastructure assets be valued. Even though GASB-34 is only a Standard, and not a legislative requirement, many Cities are starting to treat its implementation in a serious manner. The Government Accounting Standards Board (GASB) has warned that Cities and Counties face severe consequences if the requirements of GASB-34 are not met. Future funding to Authorities is likely to be linked to compliance with GASB-34.

GASB-34 requires that organisations have an inventory of infrastructure assets that have been valued. It is also required that the assets are either depreciated or managed better using a "modified approach". The "modified approach" is endorsed by the American Public Works Association (APWA) as the rationale is that the value of assets is related to condition more than it is to depreciation. The required elements of the "modified approach" are that it requires:

1. An inspection / condition assessment process that ensures that assets are being adequately maintained to the intended standard; and
2. A process where the planned performance and cost of the asset can be compared and evaluated against the actual performance and costs.

Annual work plans can be used to relate work requirements for each activity with the resources and costs of doing the work, and activity based work reporting captures actual performance and cost data. This was found to be consistent with the approach adopted by some of the American organisations that were visited.

As mentioned by the US Department of Transportation, GASB-34 " more closely aligns government financial reporting practices with those that are presently used by proprietary funds and for corporate style accounting because governments are now required to accrue costs in the same way businesses do".

## **City of Foster, California**

As the City of Foster is a “full service” Council, the Public Works Department has responsibility for the following - roads and footpaths; drainage assets; and water supply and sewerage. The City of Foster is an organisation that performs nearly all of its maintenance work with internal staff. Only major repair works and capital works tend to be outsourced.

### **Knowing Your Assets**

Foster is in a unique position in that it is a totally planned community. It is a fully and comprehensively planned City, built on landfill placed in the San Francisco Bay, of the early 1960's. As a consequence, asset records and knowledge is good, age of assets is relatively young and condition is good.

The entire city is surrounded by water and there are no main through roads. The focus of its attentions on assets has been on those for water supply and sewerage, and drainage.

Foster is proactive in its compliance with Statement 34 of the Government Accounting Standards Board (GASB-34). The City values and reports on the condition of its assets. It has GASB34 compliant asset registers, and many assets are able to be displayed in the internally developed Asset Management and Geographic Information Systems. All maintenance works are recorded in a Works Management System.

### **A Systems Approach**

The City has excellent records as all maintenance tasks are recorded on Works Orders. An identified strategic action is to link the works records to asset data contained in the corporate registers.

This approach allows Foster to adopt the “modified approach” for complying with GASB-34. Rather than reporting a depreciated expense, Foster is able to demonstrate that it can meet the requirements of a systematic approach to managing its assets. This is achieved by<sup>2</sup>:

- Having a current inventory of eligible assets;
- Documenting the condition of those assets via a reproducible assessment procedure;
- Demonstrating that assets are being preserved at a level predetermined by the government; and
- Estimating the actual cost to maintain and preserve the asset.

Foster appears to be in an unenviable position, relative to most other US Councils. It has good knowledge of its assets, but more importantly management has been able to allocate sufficient resources to allow it to adopt a proactive approach to GASB-34 compliance. Availability of funds, and good asset knowledge, is not a luxury that many US Councils appear to have.

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<sup>2</sup> Based on “Primer: GASB34” - US Department of Transportation

## **City of Anaheim (Traffic Signals Department), California**

The City of Anaheim consists of 350,000 residents, and manages its Traffic Signal sequencing to cater for the 20 million people who visit attractions within the City limits each year. Anaheim is one of the largest of the 34 Cities within Orange County.

### Knowing Your Assets

The Traffic Signals Department is responsible for the operations, maintenance and management of 300 signalised intersections. This is expected to increase to 350 intersection over the next few years.

For each of the last eleven years the City has reduced its traffic signals maintenance budgets (from \$1,000,000 to \$400,000 USD), even though the number of signalised intersections has significantly increased over the corresponding period. This has resulted in some components of the system no longer being operational, such as detectors, and the level of service is compromised accordingly.

### A Systems approach

Internal staff do all the preventative maintenance works and inspection on traffic signal assets. All the reactive works on traffic signals and control boxes are outsourced. The formal contracts contain nearly 300 schedule of rate items for the works, and all works are issued and recorded on Work Orders. These Work Orders allow for job costing to be performed on each asset. Both paper records and electronic data is received from the contractors. The detailed data that is received also allows for costs to be forwarded on to third parties when deemed necessary or appropriate.

At the City of Anaheim, Team Leaders from the Traffic Signal maintenance and planning areas are in continual communication with each other on the condition of the infrastructure and the performance of the system. They also jointly review and amend the Seven Year Capital Improvement Program on an annual basis. All capital decisions and recommendations take into account life cycle costing of the asset and aim to minimise future operational and maintenance liabilities.

## **Orange County Sanitation District, California**

The Orange County Sanitation District (OCSD) is responsible for sewerage treatment and disposal within the Orange County area. It is also involved in the management and treatment of urban stormwater runoff. It services a population of 2.3 million.

OCSD was mainly developed in the 1950's and the age of infrastructure assets is starting to become an issue. The business focus is shifting shift from one where new assets are created to that of renewing existing ones. A significant portion of the Operations and Maintenance activities are performed by OCSD staff.

OCSD introduced a District Assessment and Reinvention Team (DART) in 1996. This was the result of a competitive assessment of the Operations and Maintenance Department where the objective was to document the gap between existing OCSD performance and identified best practice of the private sector. Improvements to the organisation have been implemented ever since. The production of an Asset Management Strategic Plan was an extension to the original DART program.

### Knowing Your Assets

The OCSD has responsibility for the following assets:

- Sanitary sewers (625 miles) and pumping stations (19 No.);
- Process plant systems and equipment;
- Office buildings, shops, storage buildings and grounds;
- Fleet, motor pool, and portable equipment; and
- Computer and communication systems.

The organisation's first Computerised Maintenance Management System (CMMS) was implemented some ten years ago. Field staff were involved in the selection, evaluation and implementation processes. Even today, all existing staff on the CMMS team are from a Trades background. Recording of all works related tasks is still paper based but OCSD intends to introduce mobile devices in the near future.

It is the intention of the OSCD to acquire a new CMMS that, while still supporting the business needs of the operational areas, is to be structured in such a way that the data can be stored in a new data warehouse. It will also contain data from the finance system so that meaningful asset management reports, that contain timely and complete information, can be made accessible to all areas of the organisation.

### A Systems Approach

The genesis of OCSD's systems approach to knowing about their assets was the DART Reinvention Plan of the mid 1990's. It was realised then that Engineering staff planned and built new assets, that Operations and Maintenance staff looked after the assets, and that the existing business and information systems didn't support the sharing of information or cross-training between these departments. As there were no open databases there was a lack sharing of information, and with the increasing age of infrastructure assets the need to focus more on the renewal of assets became more important. The role collaboration and communication between these groups was recognised as being a vital component of the planning process.

OCSD has adopted a systems approach to the management of its assets and has started to implement its Asset Management Strategic Plan. Interestingly, the OCSD has already identified some of the key challenges to be overcome to implement the Plan. These include that there:

1. Are few strong outside drivers to improve asset management performance;
2. Is a culture of technical silos;
3. Are many staff feel that they have a “full plate” now;
4. Must be strong support and leadership shown from the top; and
5. Is no formal teaching of “asset management” principles in the US.

By identifying these challenges, the OCSD is able to manage them. Strategies that have been developed and implemented, to overcome the above mentioned challenges include educating staff at all levels about asset management, engaging staff in the process of gap analysis and developing an asset management vision for the organisation, creating an Asset Management Steering Committee structure, obtaining the commitment of senior management, and finding an “Asset Management champion that will never rest!”. The Asset Management Improvement Plan is a ten year, \$12 million USD project that will involve both staff and consultants.

OCSD see Asset Management as a “management paradigm” and not as a project. The principles of the paradigm are to organise the strategic, operational and tactical levels of planning in a coordinated and value-adding framework. The framework is based on the approach described in the Australia / New Zealand “International Infrastructure Management Manual” of 2000.

The OCSD Asset Management Strategic Plan identifies components that contribute to an “asset management value chain” approach that enables optimum stewardship of assets. These are asset processes and practices, asset information systems, data and knowledge, people issues, organisational issues and commercial tactics. Section 2.3 of the Plan describes the benefits of asset management and how to create an asset-centred organisation (refer to Appendix 3 for details). The organisation recognises the need of current and reliable asset performance data.

The 2003-04 OCSD Budget Document contains some Unifying Strategies that will facilitate the implementation of the Asset Management Strategic Plan:

- Integrate our mission, unifying strategies, goals and expected outcomes into a single guidance document;
- Continue to deploy asset management principles throughout the agency;
- Develop and deploy reliability-based maintenance and operational-readiness assessment protocols;
- Complete and deploy improved in-house communication standards and resources;
- Develop succession planning and career development program; and
- Convert O&M manuals from paper-based system to IT-based system.

OCSD is an organisation that can demonstrate a documented “systems approach to knowing your assets”. Many of these documents are publicly available on the web.

## **Irvine Ranch Water District, California**

The Irvine Ranch Water District (IRWD) is a “special district” established by the local community. As a special district IRWD is independent of City and County government, and is enterprise based. This means that the IRWD is a not-for-profit public agency that has its own Board of Directors, and that its fees are billed or assessed based on the amount of use of service by each customer. IRWD provides domestic water service, sewage collection, and water reclamation for the City of Irvine and portions of surrounding communities. It serves a population of 316,000 people in an area of 133 square miles.<sup>3</sup>

The organisation is recognised within the industry as being progressive. It has been operating within the framework of a Total Quality Management (TQM) System since 1995. Details of this approach can be found on their website at [www.irwd.com](http://www.irwd.com). It is recognised that to achieve the stated objectives, of continuous improvement and a commitment to "doing it right the first time", some of the requirements include the need for a process for estimating and focusing on quality and operational measures. The creation of a significant number of cross-departmental process teams to address critical District-wide issues is an example of a strategic action identified in the TQM Implementation Plan.

This attitude was demonstrated to us by the discussions we had with IRWD staff and the way they explained internal relationships and how they exchange data and information between all areas of the organisation.

The Board is also supportive of a Value Engineering approach to service delivery which requires that each area of the organisation tries to add value to its service for the next consumer of its service, which includes other departments within the organisation.

As an example, the IRWD has the following computer systems in place:

- Geographic Information System - good for inventory management;
- Computerised Maintenance Management System - for work order; and
- Asset Management System - finance focussed for valuation and forecasting.

It is recognised that these system are not linked and do not “talk” to each other. While each of these systems, on their own, is performing well, IRWB is moving towards implementing a centralised assets database that will reduce the duplication of effort required to maintain and share asset based data, support the various department’s business and customer service needs, and make consolidated data and information available to all areas who need it.

The organisation’s current knowledge of its assets is current, complete and all programs and known future liabilities are fully funded. Assets are fully funded when they are created, usually from developer contributions, and a replacement fund exists that is of sufficient size to replace all assets at the end of their useful life.

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<sup>3</sup> [www.irwd.com](http://www.irwd.com) - accessed 11 October 2003

## **APWA Congress, San Diego, California**

The annual Congress of the American Public Works Association (APWA) was held at the San Diego Congress Centre from 24 to 27 August, 2003.

### **Congress Presentation: City of North Miami Beach Public Works Department**

*“Knowledge Management for Public Utilities: a strategic approach for the retention of intellectual capital”* - Baker, Perez and An

The City of North Miami Beach has recognised that issues such as outsourcing and downsizing of the workforce, and the ensuing loss of corporate knowledge is a real issue for public utilities of today. An ageing of workforce, and the amount of knowledge that leaves the organisation when long term employees retire is also identified as an issue. The position put to the Congress is that organisations “ ... must therefore enact a systems approach to ensure that knowledge is maintained and not transferred from the organisation as a result of these trends ...”.

A knowledge management approach is seen as the solution to ensuring that an organisation does not become one that “fails to know what it already knows”. It is proposed that historically, in the public sector, staff have been the major repository for information critical to the operation of the business. It is suggested that reasons for this situation included the belief that having knowledge provided for better job security, as well as the fact that information systems capable of storing this knowledge were of little value or non existent.

To be effective in its implementation, a knowledge management system need to be supported by a change in culture. This can be achieved by education and by management continually reinforcing the fact that capturing the knowledge of the staff in a corporate system will improve the efficiency and effectiveness of the organisation.

By identifying that loss of institutional knowledge is an issue, the City has recognised the strategic role that the knowledge of its staff and external service providers play in managing its assets and service delivery. Knowledge management is seen as a solution for the following reasons:

- It provides a solution for the retention of organisational knowledge;
- It is a system for capturing and storing knowledge;
- It is a system for the sharing of knowledge;
- It provides for organisational continuity; and
- Knowledge is essentially collaborative - it falters with a data-hoarding mentality.

Knowledge is considered to be actionable information. It is suggested by the presenters that many organisations are rich in information about their assets, but are lacking in knowledge.

### Congress Exhibitor: CitiTech Systems Inc

CitiTech's approach to the management of infrastructure was similar to most of the software vendors I spoke to at the Congress Exposition. They describe four steps to maintenance management, with linkages between all steps. The four steps are planning, organising, directing and controlling. This is consistent with a systems approach to knowing your assets. Their product development is responding to market needs. Their software brochure describes maintenance management as:

*"An effective maintenance management system is much more than work management, asset management, fund management or any other component. It is the integration of these various functions into one, simple-to-use, integrated application. In the past, agencies developed several "data islands", each maintaining elements of the solution, but none providing the solution. This approach fails to integrate data together into meaningful management reports. Maintaining "data islands" is very labour-intensive, requires manual evaluation of information, and is prone to error.*

*The secret to effective maintenance management is a system that integrates all the elements of an organization together to perform the following tasks:*

1. *Work Planning and Budgeting.*
2. *Asset, Resource and Fund Management.*
3. *Work Management and Tracking.*
4. *Manage Work Requests.*
5. *Simplified data collection / entry.*
6. *Comprehensive reporting.*
7. *Facilitates data integrity.*
8. *Flexible Design.*
9. *GIS Integration.*
10. *Customer Service."*

The commentary in the brochure about the "controlling" process of effective maintenance management is another example of a "systems approach":

*"As work is performed, labour, equipment and material information is captured by the program and activity, and related to one or more infrastructure assets. This results in Asset Management, as well as Work Management. Work performance and costs can be analysed by program and/or activity, assets can be managed (individually and/or as part of a system) with asset condition based on inspection results and a detailed history of costs and performance."*

The use of new and mobile technology to capture the knowledge of service providers is relevant to the above position. It is affordable if the organisational culture and change management issues can be addressed.

## **San Diego County Council, California**

The County of San Diego (SDC) is located in south-west USA. While there are about 2.9 million people living within the 5,000 square miles of the County, the County only services the unincorporated areas not covered by the City of San Diego and the 18 other Cities within the County.

Services provided by the County include, but are not limited to:

- Water supply;
- Sewerage;
- Waste management;
- Transportation and roads;
- Stormwater management and drains; and
- Airports (3 large and 4 others).

About 450,000 people receive services from the County.

### Knowing Your Assets

SDC has 1900 centre line miles of roads on its road register. Most of SDC's roads are local roads, but nearly half of all local roads in the County are private roads. This often creates customer service issues as many residents need to be informed of this when they contact SDC (say) to report a pothole and request that it be repaired.

The California State Road Authority (Caltrans) are responsible for State Highways and some main roads. Signs are often used at Freeway interchanges to indicate the boundary between various organisation's responsibility.

SDC have details of 40,000 street signs and 13,000 drainage culverts (under roads). All data can be displayed in the GIS.

### A Systems Approach

The culture, and organisational structure, of the organisation demonstrates its commitment to looking after its assets in a systematic way.

1. The Land Development Division is shown to operate across all other Divisional boundaries. This is not to place them in a position of power, control, or superior influence but is intended to show the requirement for them to operate in consultation and partnership with the other Divisions.
2. The operational Divisions are responsible for asset inventories, asset data collection and condition assessments. In the Transportation Division field staff have been equipped with GPS units and used to collect asset location and condition data. Processes have been developed and implemented to standardise this task.
3. Operational and field staff are involved in the prioritisation of capital works projects when available budgets are known. Pre-construction meetings involve Contractors and Field staff.
4. Good "engineering" is seen to require a "collegial" approach - communication

and teamwork are necessary components.

5. Office based staff see their role as supporting field based staff who are delivering services to the community
6. Field staff are given an indication of the approximate budget amount that is available for capital works on roads and asked which ones should be done this year and which ones could be done in the next, or subsequent, years.
7. Design staff convene pre-construction meetings that include the contractor and maintenance field staff.
8. Office based staff see their role as being to support the field based staff.

### The Future

GIS will form the foundation for future asset management initiatives. It will be used to display asset related inventory data to field staff who will eventually be using mobile computing devices to record data in the field. The data to be captured will relate to age of the assets and the condition. Where possible, this data is to be captured as a "Value adding" component to normal routing or operational activities, rather than a special business project.

### Additional Items

Of a more general nature, the following comments were also made by SDC staff"

- Their approach is to capture costs on stormwater quality assets on a geographic area basis. This is to allow actual performance data to be compared to expected performance data.
- Staff are to be assigned geographic regions (which are determined by basing them on expected work loads). This will be possible because the asset base will be identified and the work load quantified. It is expected that this asset knowledge will allow service providers to perform their required tasks in a more efficient manner.
- Field staff involved in determining developer contributions for future assets which will be maintained by the County. This is believed to be appropriate because service providers are felt to have a good understanding of the future financial liabilities that new infrastructure assets will add to the organisation.

## **City of Indianapolis, Indiana**

The City of Indianapolis is the twelfth largest City in the United States. Indianapolis covers an area of some 350 square miles and services a population of some 800,000 people. The Department of Public Works (DPW) has over 600 staff, which includes approximately 50 engineering and administrative employees. The DPW manages:

- Water supply and sewerage;
- Drainage;
- Transportation and roads; and
- Bridges and Structures.

Other assets, such as parks and buildings, are managed and maintained by the Forestry Division of the City of Indianapolis. The City is also the County.

### **Knowing Your Assets**

Details of all the water supply and sewerage assets and road assets are stored in the City's Infrastructure Management System (Hansen Version 7.7). It is administered from the Operations Centre and is able to display all asset related data in the Geographic Information System (ESRI's ArcView suite of products). All asset related data is contained in the Infrastructure Management System (IMS). All geo-referencing data is stored in the GIS with a common asset identifier used to link the two datasets. The Parks module of Hansen was purchased one year ago and tree data is currently being collected by field staff as it is to needed - just in advance of issuing programmed work to contractors. Sewer related data was captured in the early 1990's and the road network was completed in 1996. The collection of this data was outsourced as it was considered to be a significant project in its own right, that required additional funding and extra resourcing.

### **Infrastructure Management System**

When the City receives a request for service, the general process is as follows:

- Service request received by DPW
- Request assessed by one of nine Township Coordinators
- If request is deemed to be reasonable, either Service Request is forwarded to more appropriate area of City Operations or a Work Order is created.

Customer requests are logged as "service requests" and assessed by Area Coordinators - for all asset categories.

Each job is issued on a Work Order and if the asset does not exist in the asset register at the time of the service request, it is created before the issue of the Work Order. Labour, equipment, material, and plant costs are recorded for each job. The costs of all assets are known for both reactive and programmed works. Quantities of work are also recorded. This process is also used when Field Staff "find-it fix-it".

This is an example of a systems approach as the service provision function is being used to populate the asset register as well as service and performance related data.

## A Systems Approach

The City of Indianapolis demonstrates a systems approach by

- It's organisational structure
- Work groups and engineering staff liaising on Capital Works Programs

The creation of strategic planning positions are intended to develop closer working relationships between the Capital Works programs and maintenance programs

Field staff, including those in the Forestry Division, are to own and maintain the asset inventory. Field staff identify new or missed assets and collecting all data. Information derived from maintenance effort and cost data, combined with the knowledge of the field staff and service providers, is a key input in determining the priority of projects on the Capital Works program.

The City has awarded a \$16 million USD per annum contract for the management and maintenance of water supply and sewerage treatment sewer services. The City has a team of staff dedicated to the management of this contract. The Contractor uses the IMS for all jobs, and records the cost of each job in the IMS against the specific asset on which the work was performed. The City controls all security settings and access privileges to the IMS. The Contractor does all the data entry.

## The Future

Future directions and initiatives were discussed with City staff. These include:

- Mobile Computing - for staff to perform asset related data capture and work performance and asset performance data. It is to be the field staff who will update and maintain the accuracy of the inventory and the link to the GIS.
- Internet Access to Contractors - the City will control the use of the Infrastructure Management System and the control of all its data. Data is valued and is managed as another category of asset.
- Engineers will be doing most inspections - from "operational" asset data lists.

## **National Research Council of Canada**

The National Research Council of Canada (NRC) are the Project Managers for the development of the National Guide to Sustainable Municipal Infrastructure (The Guide). This is a three year project with 75 per cent (\$12.5 million CAD) of funds being contributed by the Federal Government through its Municipal Infrastructure Investment Program - NRC is contributing the remaining 25 per cent. There is also significant in-kind contribution from many professionals working in the sector. There are fifteen full time staff on the project, with an equal amount of input coming from the NRC and the Federation of Canadian Municipalities.

### Knowing Your Assets

Canadian Municipalities spend \$12 to \$15 billion (CAD) per annum on infrastructure such as roads, water and sewer systems. It is estimated that 80 per cent of this is spent on maintenance, renewal and operations. Infrastructure is valued as being important to quality of life and environmental sustainability. NRC estimates that \$1.1 trillion CAD of infrastructure is under the direct control of Municipalities. The NRC has also estimated that the deferred maintenance is some \$100 billion CAD.

In Canada, as was also stated to be the case in both the USA and in England, the infrastructure renewal gap is increasing, as are environmental pressures. The current level of investment is not sustainable, and the long term solution is not seen as "just spending more money". Levels of service, and the way in which infrastructure related services are delivered, both need to be reviewed and improved.

### A Systems Approach

The Guide focuses on knowledge dissemination throughout the municipal sector in Canada. The challenges the project must overcome relate to the quality of information, ensuring relevance to prospective users, managing expectations and relationships, funding beyond 2005, and raising national awareness of the infrastructure funding issue.

A high level systems approach to infrastructure management is evident by considering some of the objectives of the project. They include the promotion of integrated decision making and the promotion of sustainable infrastructure philosophies.

NRC is conducting research on multi-objective optimisation, and some Research Papers on this approach being applied to rooves are available on the NRC website. Engineers have often evaluated and chosen projects utilising multi-objective optimisation. An Analytical Hierarchal Process (AHP) can be used by decision makers to prioritise maintenance works on the basis of:

1. Minimising the cost of the network;
2. Maximise the performance of the network; and
3. Minimising risks to the network.

The "Best Practices for Utility Based Data" Report covers water, wastewater and stormwater utilities and provides some relevant and practical advice on the above

principles. A systems approach to operations, maintenance, rehabilitation and replacement, through access to sound and accurate information, is seen as a fundamental requirement to the facilitation of better asset management. Section 3.6.5 of the Report discusses operations and maintenance data and states:

*“For effective management, O&M requires transactional data regarding resource usage (eg. labour, equipment, materials, contracts, etc.) for defined activities against individual assets.”*

The Report goes on to say:

*“With good information management practices and support systems, utilities can associate O&M activities with specific assets to determine the effectiveness (Is the asset doing the job it was designed and installed to do?) and the efficiency (Is the asset costing more than it should?) of the asset. By making comparisons of alternative ways of performing activities, best practices can be identified, implemented, and monitored to ensure the anticipated improvements are realised.”*

Even though the Report does not specifically address the relationship of the parent organisation with its service providers, the asset data and data management principles apply equally to internal staff and external contractors.

To achieve optimal effectiveness and efficiency, a systems approach requires that the methods by which service provider data and information is turned into corporate knowledge be looked at in a true partnership framework. Communication needs to occur through all levels of the value chain. It is not appropriate for the client to dictate to the provider how things should be done - this merely transfers unnecessary additional costs from one party to the next. Improvements in technology are delivering new tools to be considered for use in achieving these objectives. Mobile computing devices, in varying forms, are expected to be part of the new toolkit. The impact of these changes on the culture of the workforce is not to be underestimated.

#### Additional Information

The Guide is comprised of a series of Best Practice Reports that are available from [www.infraguide.gc.ca](http://www.infraguide.gc.ca). As at September 2003, nineteen Reports have been published. Some general information on the Project is included in Appendix 3.

## **England**

It is now a legislative requirement in England, that every Transport Authority, which includes Councils, produce a five year Local Transport Plan. Progress against this Plan is reviewed annually, and includes collecting and reporting on the condition of the road network. Interestingly, Councils tend to rely on grants from National Government for capital works on local roads rather than relying on general revenue.

Also, about five years ago, it became a requirement that Councils have Asset Management Plans to manage and maintain school facility assets. This requirement is often linked to the availability of national government funds.

Increasingly, the provision of funds by the National Government are being linked to the existence of these types of Plans and the performance of the Council against key indicators.

All the Councils visited in England have outsourced all service provision. Most still perform their own assessments of customer service requests, when related to infrastructure matters. Some perform condition and monitoring type inspection with their own staff, while others require that this be done by external service providers. Modern contractual arrangements tend to be based on a "partnership" philosophy.

## **Liverpool City Council**

The Liverpool City Council (LCC) combined with the Merseyside Metropolitan Authority in 1986 and now, as one of only a few Metropolitan Cities, is responsible for services including transport, waste, drainage, parks, cemeteries, housing and education. United Utilities, a private company is responsible for the combined sewer-drainage system. All road drains in Liverpool discharge into these combined drains.

A Best Value Review of Road Based Services was completed in 2000. Road based services include highways and public lighting. The main findings of the review were that there was little in the way of planned maintenance, there were limitations in the highways inspection regime, and there is poor co-ordination, asset management and inventory procedures.

### **Knowing the Assets**

LCC is responsible for the maintenance of 1300km of highways, including more than 90 structures (bridges, culverts, retaining walls), and over 50,000 street lights.

An audit has been performed on the street lighting assets as a result of the Best Value Review of Street Based Services. LCC have identified that 40% of lighting assets are past the end of their useful life. In addition, it has been identified that 60% of lighting assets are currently out of date or dangerous, with another 20% expected to become out of date or dangerous in another five years. A knowledge of the asset stock will enable LCC to seek funds through a Private Funding Initiative - Enterprise Liverpool (EL)<sup>4</sup> can then make a bid to LCC for these funds and to use them to

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<sup>4</sup> Enterprise Liverpool (EL) is an external service provider to Liverpool CC - LCC own 20% of EL.

improve the asset stock. The detailed inventory of the lighting stock can also be used to audit the energy efficiency of the system, and be used to evaluate alternatives improvement options.

### Systems Approach

Liverpool has moved away from employees delivering services to an environment where developing partnership arrangements with external service providers is the strategic direction. An outcome of the year 2000 Best Value Review of Street Based Services was that EL perform the day to day management of the highway function. Some of the aims of LCC's partnership approach with EL is to improve the coordination of street works, improve the highway inspection regime, and move from a reactive to proactive maintenance program.

Liverpool Council's systems approach to asset management is demonstrated by some of the processes that are now in place with Enterprise Liverpool. These are:

- EL policy is linked with LCC's 2000 Best Value Review of Street Base Services.
- Works management Work Orders trigger changes to the asset register
- Maintenance input is a significant component of the capital works process
- EL perform all condition surveys on the road network. EL are also responsible for the five year structural program for roads. They have both the revenue and Capital Expenditure budget, which was agreed with LCC at the beginning of the contract term.
- LCC's role in the partnership is to get policy adopted by Council. EL's role is to implement the adopted policy.
- An infrastructure management system is used to capture the value of all work performed on every asset. LCC are not interested in what it actually costs EL to deliver the service, they are just after an improvement in the performance of the service / asset over the ten year life of the partnership agreement.
- EL use mobile devices and custom software to update the public lighting data in the asset register while out on site performing maintenance services.
- Where a defect relates to a utility organisation's asset or activities, EL inspect the site after 7 days to ensure that the defect has been rectified. It does not matter to LCC or EL that the utility organisation might feel it has 20 days to rectify the defect.

### Best Value

The Conclusions and Recommendations of LCC's Best Value reviews have been included with this Report – refer to Appendix 5 for Highways and Appendix 6 for Street Lights. They have been included because they contain and document LCC's "systems approach to knowing about your assets". These Appendices demonstrate how Best Value reviews can be used to produce significant value to the organisation.

Many of the recommendations in these Best Value Review Reports are now "actions" that are being used by LCC to improve its asset management framework and

performance. Next steps include implementation of an asset management group, improved coordination, and inter agency coordination.

### Summary

LCC's philosophy to asset management can be summarised as now adopting a holistic approach that includes a true partnership solution with the service provider (EL). Project goals included a consolidated asset register, implementation of an enhanced customer interface, true multi-functional inspections, and improved coordination between all parties. This included a change to the organisation's management structure. Achievements to date include the use of handheld devices for all site based inspections. LCC has 13 inspectors to cover the 12 city "ward" areas and respond to approximately 110,000 customer enquiries. Every enquiry is inspected, but only 25 per cent of inspections require in repair team action.

### Additional Information - Schools

A copy of LCC's Final Report on its 2001 Best Value Review of Asset Management (Schools) is available on Liverpool's website (at [www.liverpool.gov.uk](http://www.liverpool.gov.uk)). The Background section of Liverpool's Report describes the situation that was also discussed with staff at Telford and Wrekin Council. The "Summary of Service Improvements" section of this report is an example of a systems approach to knowing your assets.

Some of the improvements are listed in the Final Report are:

- Maintenance of accurate audit of school premises and repairs required;
- Effective I.T. system to support work planning;
- More effective long term planning of repairs and maintenance; and
- More effective monitoring and reporting of performance in the delivery of the AMP and in time the development of benchmarks.

Operational tasks or actions identified in the Asset Management (Education) Improvement Plan are to produce a program of inspection, repairs, and maintenance (taking into account the long term view) and to develop a system that enables schools to know exactly where they are in a repairs schedule. Both of these initiatives require input from service providers and users of the facility to make some crucial connections to the corporate asset management approach.

## **Borough of Telford and Wrekin**

The Borough of Telford and Wrekin is a Unitary Authority<sup>5</sup>, created in 1998. With a population of nearly 160,000, and growing rapidly, the Borough has a substantial portfolio of assets to maintain.

Discussions focussed on the processes followed by the Asset and Property Management Department in looking after its portfolio of 278 operational properties. Operational properties include facilities such as libraries and buildings. The Asset and Property Management Department is in the Resources Directorate. The Borough's "systems" approach to asset management is for the Resources Directorate to provide support to all other Client Directorates, those including Social Care, Education and Culture, and Environment and Economy.

### **Knowing Your Assets**

Asset knowledge is a critical issue at Telford and Wrekin Council because of the World Heritage listing of the Iron Bridge site. Geotechnical issues associated with landfill instability require significant engineering input and skill at Iron Bridge. Old mine shafts are also a concern as are old tip sites. Conversely, the "new town" of Telford is only forty years old. My asset management discussions with key staff at Telford generally related to building assets.

### **A Systems Approach**

The Asset and Property Management Department see their role as an "agent for the client". The client identifies and defines their business needs and the Client Agent Manager has responsibility for:

- Delivery of Council's property capital program;
- Management of repairs and maintenance of operational buildings; and
- Asset Management input on operational properties.

The Councils Asset Management Team consists of Architects, Surveyors, and Valuers and has cross-organisational links.

A systems approach is demonstrated by ensuring that the people who are responsible for the design are also those who manage the maintenance of the facility. It is in their, and the organisation's interest, to produce optimal designs based on life cycle costing principles. Their approach can be summarised as:

1. Know what assets you have;
2. Know what condition your assets are in;
3. Adopt whole life costing in the design and evaluation stage;
4. Consider energy performance; and
5. Adopt value engineering principles.

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<sup>5</sup> **Unitary authority** is a term used in the United Kingdom for a local government body which forms a single tier of administration. Traditionally there would be a two-tier arrangement where each county had a council and contained multiple districts with councils of their own. The area administered by a unitary authority is called a "unitary authority area" or sometimes a "unitary district".

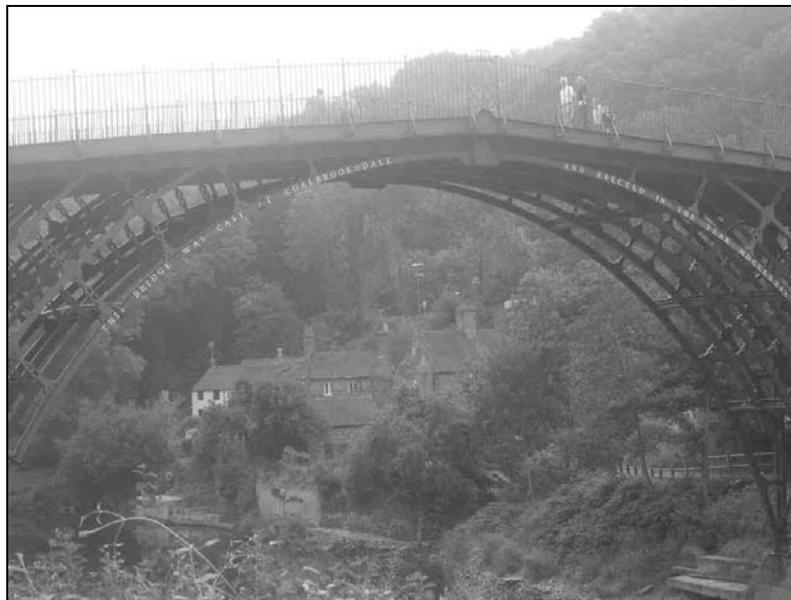
[www.wikipedia.org](http://www.wikipedia.org) (October 2003)

The City developed Suitability templates that are used to assist in determining a Statement of Priorities - a useful mechanism for determining which project should get funding. Suitability templates for schools consider issues such as whether the shape of a classroom is satisfactory and whether a library counter is large enough for its intended use. The City looks after 84 schools - a significant asset portfolio. Telford's proactive approach to managing these assets has resulted in the City being successful in getting grants for the Education Department for school projects.

The linkages between design and service provider staff are evident and strong. Examples of how Telford is adopting a systems approach is by:

- Day to day contact between Asset & Property Management officers and building managers and users;
- Operational building users and managers' active participation in the Condition survey process and in the developing Suitability survey process; and
- Regular meetings with operational property managers, who pass on user feedback (both staff and customers).

Telford has established an effective Consultation Group. Surveys of facilities consider condition, suitability and access issues. A Statement of Priorities has also been produced. A Buildings database has been developed internally which is used to prioritise works and contains data on costs for individual buildings. It has the ability to identify hot spots, liabilities, asbestos issues, insurance and condition surveys.



*Figure 3 - the historic "Iron Bridge" near Telford (1779). The area is World Heritage listed.*

## **Royal Borough of Kingston Upon Thames**

The Royal Borough of Kingston Upon Thames (RBK) is the smallest of London's thirty-two Boroughs. Even so, it serves a population of 147,000 residents that are represented by 48 Councillors.

### **Knowing Your Assets**

RBK can demonstrate a good knowledge of its assets. There are numerous internal and public documents that relate to assets and asset management. These include the Capital Investment Strategy and Asset Management Plan, Street Scene Improvement Plan (Highways Maintenance), Best Value Improvement Plan and District Audit Action Plan 2003, and departmental business plans.

Most of RBK's assets have been valued and the maintenance backlog has been quantified. Housing and Education area service assets have been valued at £341 million (GBP) with a maintenance backlog of £39 million (GBP). The highway network is valued at £330 million (GBP) and consists of some 330 kilometres of principal roads (B Class), non-principal classified roads (C Class) and unclassified (residential) roads. Assessments of the network have revealed that some 54 kilometres of local roads require attention for structural defects. With respect to street lighting, 43 per cent of current stock is beyond its design life and 47 per cent of stock are performing at below current lighting standards.

Detailed visual inspections (DVI), or condition surveys, are performed on all B and C Class roads on an annual basis. Unclassified roads are inspected as the budget allows, and this is typically 35 to 40 per cent of the network per annum. DVIs include footways, and the footways are "walked" when they are assessed.

Asset management staff at RBK view their responsibility as being one of enabling service provision, rather than being the service provider. Working in partnership with contractors becomes important. Refer to the Contactor Charter in the 2003-04 Performance Plan (see Appendix 7) for more details.

### **Systems Approach**

RBK demonstrates a systems approach to the general management of the organisation by operating in a matrix management framework. A corporate Asset Management Group has been established. Assets are now managed on a whole of life basis, and maintenance costs are a component of the capital project determination and evaluation process. Maintenance management staff are involved in decisions at the ground level.

RBK is in the process of developing a new Highway Maintenance Strategy where the focus on purpose of a local street has shifted from traffic to "environmental and residential" objectives.

Highway inspectors respond to all requests for service, and the results of their inspections and assessments are passed on to Road Services maintenance teams. All road maintenance activities in RBK are contracted out, but there is no formal

process or mechanism for the contractors to report to RBK on any additional defects that have been found or have been rectified.

The 2003 District Audit Action Plan identifies some areas for improvement. One area relates to the issue of “repair” and “maintain”. It suggests that in the long term, repair is more expensive than maintain, and that a reactive approach to repairs, rather than a proactive approach to maintenance does not deliver best value. Making the shift from a repair focussed organisation to a preventative maintenance approach requires a systems approach to knowing your assets. Knowledge of the service provider, combined with appropriate information management tools and systems, are required to make the transformation.

Some of the recommended “next actions” from the District Audit Action Plan are:

- Develop a comprehensive Highway Maintenance Plan;
- Ensure that annual service plans include clear organisational targets;
- Complete survey work on the highways asset base as soon as possible;
- Ensure that good practice service standards are established;
- Prepare estimates for works backlog and life cycle cost;
- Make appropriate bids for resources to address the highways maintenance backlog; and
- Ensure that performance-monitoring reports are produced and presented.

Problem areas that were identified include a shortage of asset knowledge, and that more appropriate and flexible information systems and tools are required to better analyse and report on asset related data. The service provider is recognised in current strategic action documents as being a vital partner in the solution.

A new Street Lighting Inventory / Management Information System has been installed (April 2003). Further developments in functionality have been requested, and this will form the model for other systems in the future. Sufficient knowledge of the current asset will make available the option of Private Finance Initiative (PFI) Project for street lighting - details of PFI projects and requirements is included in Appendix 8. Performance measures must be established and monitored before this approach becomes a funding option to upgrade / replace the existing street lighting inventory.

## **Surrey County Council**

Surrey County Council (SCC) serves a population of 1.7 million people. There are eleven District Councils operating within the boundaries of Surrey County. They have responsibility for surface and roof water drainage, sewer, parks and entertainment. The County has responsibility for roads, new developments, passenger transport and buildings (for education, library, and social services).

The Central Government's Highways Authority has put Councils on notice. From 2006, all requests for capital funds are to be asset management based and supported by Asset Management Plans. Central government is seen as the source of all capital funding on local roads. Previously it was just the A Class roads. From 2000 onwards, local road funding was linked to the Local Transport Plans. These five year Plans include a requirement to review progress each year. An example would be to monitor and report on the condition of the road network.

### **Knowing Your Assets**

The City is responsible for 4,800 kilometres of local roads, the majority of which is unclassified local (D Class) roads. There are also 3,500 kilometres of unsealed ROWs. Ninety per cent of the road network in Surrey have never been "designed" and there are only limited funds available to look after them. It has been determined that 30 % of the local road network has a residual life of less than five years.

### **A Systems Approach**

Following a Best Value Review the organisation was restructured for the purpose of relating Directorate responsibilities to customer expectations and the removal of a "functional silo" mentality.

The County entered into a new contract with its highways service provider in April 2003. Again, it is based on a partnership approach. It is a lump sum / cost plus contract which is expected to operate in an "open book" atmosphere.

Surrey's Highway Network Maintenance Management Plan describes how Council will "... work with ... contractual partners towards establishing and maintaining an inventory of key highway features ...". This is to facilitate compliance with The Highways Act 1980 which requires that an accurate register of all road maintenance which is performed at the public expense. The organisation is moving towards a partnering philosophy with its service providers - where knowledge and problems are shared. This is in contrast to the old contract management framework which is considered to be too adversarial. The new contract framework involves:

- A partnership - where both parties share common goals (improve the assets);
- A "cradle to grave" philosophy to asset management that requires the maintainers and designers of assets to communicate openly and honestly; and
- The contractor is aware of SCC's budgets and reports all completed reactive maintenance to SCC.

Staff at Surrey are involved in a National Asset Management Steering Group, and intend to produce Asset Management Plans for Highway Assets by April 2004.

## SUMMARY

This Study Tour has demonstrated to me that the three countries visited are facing similar infrastructure related issues to those facing public sector organisations in Australia. We are all using similar principles to develop a systems approach to knowing our assets. There is also international awareness of the progress Australia and New Zealand are making in the field of asset management.

It is not appropriate to suggest a single solution for every organisation. A general recommendation is that each organisation must identify its business needs and determine its priorities, examine its culture, and determine a framework to move forward that includes the input of all stakeholders in the development process.

There is general recognition and agreement that asset management requires organisations to adopt a philosophical approach. Existing service providers and resources can make an immediate and significant contribution. While management systems and technological based tools are becoming a practical necessity, organisational and cultural factors are usually the greatest impediment to successfully implementing any change.

An atmosphere that encourages and rewards a partnership attitude and open communication between service planners, service purchasers and service providers, will deliver maximum benefits to the organisation in most effective and efficient manner. New technology and mobile computing, also when in the management of service providers, will deliver value to an organisation that adopts and implements a value management and knowledge management approach to its business.

Even though the organisations visited were at varying stages of the journey along the path to Best Appropriate Practice in asset management, it was still possible to learn a significant amount from each of them when discussing their past experiences and future strategic directions. It has given me a greater confidence and perception of the choices available to me in my work at my own workplace.

## CONCLUSIONS

**United States of America:** There appears to be reasonable recognition, amongst all public works authorities, of the principles of asset management. Many of the organisations visited are keen observers of developments and initiatives of Australian and New Zealand public authorities. Most were aware of the Australia / New Zealand International Infrastructure Management Manual.

The ability of American organisations to put their asset management vision into practice is very much constrained by funds. Wealthy Councils (with new infrastructure in good condition) and Water or Sewerage Boards (who can determine their own revenue levels) appear to be the only organisations willing or able to take a proactive approach to managing and maintaining their infrastructure assets. The City of Foster, Orange County Sanitation Board and Irvine Ranch Water Board are all examples of this.

It was also observed that despite GASB-34 only being a Standard, as opposed to being a legislative requirement or Regulation, the threat of future funding being tied to compliance with its requirements has resulted in many organisations valuing and either depreciating assets or managing them better using the “modified approach”. The modified approach is typical of “a systems approach to knowing your assets”.

**England:** I observed that Council’s in England are becoming quite sophisticated in the way they are using the outcomes of Best Value Reviews to determine and implement improvements to service delivery. There are strong links between Best Value Reports, Audit Commission requirements, and newly developed Strategic Plans.

Best Value reviews tend to reinforce the need to adopt a corporate and holistic approach to asset management. A partnership attitude with service providers is seen by most Councils visited as being important, as is capturing the knowledge that service providers have about the organisation’s assets. The philosophy of modern partnership-based contracts is to emphasise and work on the mutual benefits that can be achieved by adopting a systems approach to sharing knowledge on assets.

Best Value Reports, and the “Code of Practice for Maintenance Management: delivering best value in highway maintenance”, continually make reference to the importance of organisational culture and shared values when considering procurement options and the delivery of services to the community. When assessing the culture of an organisation, the following should be considered:

- Do people feel safe to communicate openly?
- Are there structures that promote team interaction?
- Are employees’ suggestions handled expeditiously and with respect?
- Are there for a for the flow of ideas across departmental lines?
- Are there systems to measure benefits and value of corporate knowledge?
- Does learning result in changes to actual work practices?
- Is available technology being fully used to collect, analyse and implement knowledge?
- Do you know with whom and where your corporate knowledge resides?
- Are adequate resources committed to promotion and support of learning?

## General

The following general observations relate to conversations that occurred with staff at most of the organisations that I visited. They are not Country specific but do represent the general principles and philosophies of the three countries. Many of these comments are consistent with the content of the Australia / New Zealand International Infrastructure Management Manual and the framework of the Victorian Step program for progressing local government asset management performance.

1. Knowing about your assets is no longer a technical issue - it is a people issue. The effective management of information must begin by considering about how people use information - not with how people use computers.
2. Knowledge management is a critical component of asset management. It is the ingredient that allows risk to be managed and uncertainty to be reduced.
3. The adoption of value management principles is a necessary component of a successful asset management framework.
4. Knowing your assets isn't just about having access to the data that tells you indisputable facts such as quantity, quality and age. It is also about having an awareness and understanding of the contents of design documents, standards, operating procedures, and knowledge of those servicing and using the assets.
5. Advances in information technology is making it more affordable than ever before to introduce changes to the workforce that allow for the capture and storage of electronic data
6. Improvements in communication processes and attitudes between service planners / purchasers and service providers will assist in the translation of policy goals into technical targets. Clearly defined and understood technical targets allow the service provider to effectively monitor the performance of the asset and report when performance is less than optimal or not as expected.
7. Asset management needs to be linked to overall business goals. Strategies and policies need to be communicated to service providers and service providers need to ensure actual performance related information is passed back. Service provision managers play a crucial role in the plan-do-check-act cycle of corporate asset management.
8. New technology and mobile / remote access computing devices are becoming affordable tools that can deliver the knowledge of the organisation to service providers while simultaneously capturing the experiences of the service providers - a knowledge management framework and system is required.
9. The organisational and change management issues associated with implementing a systems approach to knowing your assets, that includes the service providers to the organisation, must not be underestimated.
10. The support of all sections of an organisation is necessary to develop and implement a sensible systems approach to knowing your assets.
11. Training and communication programs are required to support the development and implementation of a systems approach to knowing your assets.

## RECOMMENDATIONS

These recommendations are based on my discussions with staff at the host organisations. They are intended to be a checklist of items to be considered when determining how to best apply a “systems approach to knowing your assets” in a Victorian local government organisation.

1. A systems approach to knowing your assets needs to be led from the top levels of an organisation’s management structure.
2. A systems approach to knowing your assets needs to be supported by training. All staff and service providers need to understand the requirements of the business and the value to all of working together in a constructive partnership.
3. A systems approach to knowing your assets needs to become part of the culture of the organisation.
4. Develop and implement a culture that promotes communication and relationships as important components to “knowing your assets”.
5. Implementation strategies to be structured so that early goals can be observed and celebrated.
6. Introduce knowledge management principles to the organisation include these principles in your asset management framework.
7. Develop and implement a training program that presents your Asset Management System to be a Knowledge Management System.
8. To achieve effective use of data, an organisation should consult with all users of the data to understand their business needs, and then develop training and support programs that increase the ability of users to get value from the data.
9. That organisations consider the development and implementation of a corporate Information Policy that states that each manager must ensure that data is used for the good of the whole organisation, and is made accessible in an appropriate manner to all who have a legitimate right to use it, rather than just using data for the benefit of a single operational business unit.
10. Organisations develop strategies with both internal and external service providers to capture, store, transfer and manipulate data in an effective and efficient manner. This is expected to include the use of mobile computing devices (both with and without live access to corporate databases) and the use of the Internet or Electronic Data Interchange (e-business) with customers and service providers .
11. It should be an objective of an organisation to capture the tacit knowledge of service providers so that they can become explicit knowledge within the realms of the organisation’s knowledge management system. Knowledge is the ability to translate information into meaningful instructions.
12. That organisations understand their business needs, the culture of their service providers, and their information requirement priorities before implementing information technology solutions in the field.

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## APPENDICES

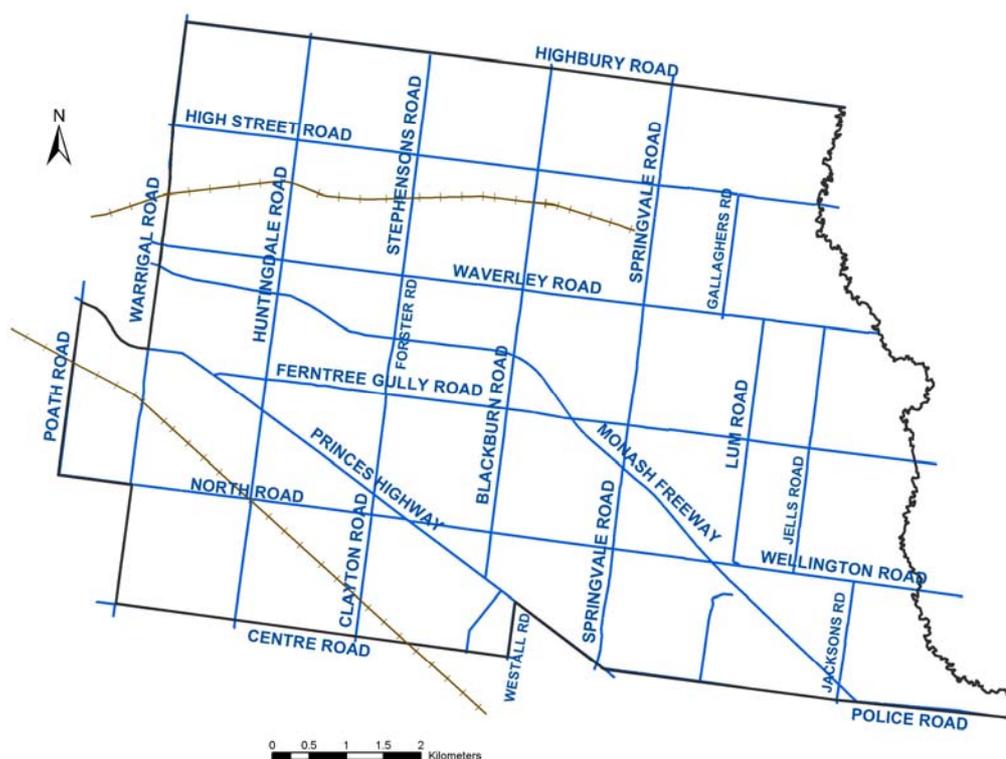
### Appendix 1 Vision for Asset Management

An organisation that is delivering Best Appropriate Practice (BAP) in asset management should be able to make the following claims:

1. We know what we own or have responsibility or legal liability for.
2. We have recorded these assets in a register down to a identifiable level.
3. We monitor the condition, performance, utilisation and costs of assets down to the managed component level and aggregate this data to give outputs of cost and performance at the asset, facility, subsystem or full system / program levels.
4. We thoroughly understand and have recorded the current levels of service 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 years) 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 and Operations.
9. We only make decisions on individual projects when all service programs have completed these outputs and the funding needs of the whole organisation is known together with the knowledge of its impact on rates and charges.
10. We always approve the necessary renewal programs to sustain the existing levels of service before other works, providing they are justified through out process.
11. We only approve capital for new works and services with the commitment of the necessary recurrent expenditure.
12. 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.
13. We link our corporate goals to our investments and ultimate action plans.
14. To do this efficiently and effectively we need to:
  - Apply best appropriate life cycle Processes and Practices to our valuable community assets;

- Acquire and maintain the necessary Data and Knowledge needed by these processes;
  - Store this data and knowledge in the most appropriate Asset Management Information System;
  - Prepare an Asset Management Plan so that the strategy is known to all; and
  - Adopt Commercial Tactics which means that we carry out the work using a 'best value' process that ensures we are getting the best combination of value from the service provided and price.
15. To ensure the sustainability of these asset management (AM) activities we support the AM program through our corporate structure, roles and responsibilities, and policies and resulting strategies.

## Appendix 2 Monash City Council



Monash City Council is located approximately 20 kms east of the Central Business District, near the geographic centre of Melbourne. With a population of 166,000 people it is one of Victoria's most populous metropolitan municipalities. It covers an area of 82 square kilometres. It was created in December 1994 by the amalgamation of the former City of Waverley and the northern two thirds of the former City of Oakleigh (the southern portion of Oakleigh became a part of the new City of Kingston).

Some general information relating to Monash infrastructure assets include:

600 hectares of parks, gardens, reserves

54 sports fields

2 public golf courses

3 swimming pools

120 playgrounds

100,000 street trees

280,000+ trees in reserves

700+ km local roads

76 km main roads

1800 km pathways

1150 km drains

33,000 pits

200+ buildings

200 bus shelters

Infrastructure maintenance is provided by a combination of direct labour and external contractors. Even though there are over 100 outdoor employees, over half the maintenance expenditure is to the external contractors. At amalgamation, all Waverley and Oakleigh staff became employees of the City of Monash.

### Appendix 3 OCSD AM Strategic Plan

The following is an extract from Orange County Sanitation District's Asset Management Strategic Plan of November 2002.

#### 2.3.1 CREATING AN ASSET-CENTRED ORGANISATION

At the heart of effective asset management is knowledge - knowledge that is built on valid, reliable data, and timely, accessible information.

##### **Knowledge of...**

- Our Level of Service that assets need to deliver
- Attributes and characteristics of existing assets
- The physical condition and remaining useful life of assets
- How the assets are performing compared to level of service required
- Current utilization of assets
- Ultimate capacity to meet demands

##### **...gives us the ability to...**

- Predict demand for service from customers so the right assets are built at the right time
- Predict how and when assets will fail
- Forecast likelihood of failure, and
- Assess probable consequences of failure

##### **...which allows us to...**

- Analyze alternative operations, maintenance and treatment options
- Rank operations, maintenance, acquisition and renewal on benefit-cost basis
- Effectively develop and appropriate our capital and operations budget
- Optimize operations and maintenance activities
- Develop and revise strategic objectives for each asset, and
- Review and revise plans at suitable intervals

##### **...which, in turn, enables us to...**

- **Effectively** manage the process of asset creation, handover and commissioning, utilization, renewal, disposal, and
- **Confidently** provide sustained performance at lowest life-cycle cost

www.ocsd.com (October 2003)

## **Appendix 4 NRC's National Guide to Sustainable Infrastructure**

The following is copied from NRC's brochure on Canada's National Guide to Sustainable Municipal Infrastructure (May 2003).

### **Why a National Guide?**

It's no secret that municipal infrastructure is underfunded and decaying at an alarming rate. Our ageing systems reflect decades of infrequent inspection and maintenance, inconsistent management and (in some cases) substandard design or installation. The solution is not simply more money. Municipalities now spend \$12-to-\$15 billion (CAD) annually on infrastructure but face an increasing demand for more and better roads, and water and sewer systems, as populations grow and higher standards for health and environmental protection are set. The solution is to change the way we plan, design, and manage infrastructure. Only by doing so can municipalities meet new demands within a fiscally responsible and environmentally sustainable framework, while preserving quality of life.

This is what the *National Guide to Sustainable Municipal Infrastructure: Innovations and Best Practices* seeks to accomplish. By bringing together the practical knowledge of Canadian municipalities and technical resources from all facets of the industry, the Guide will help communities across Canada get the maximum return on every dollar invested in infrastructure – while being mindful of the social and environmental implications of their decisions.

The federal government, through its Infrastructure Canada Program and the National Research Council (NRC), has joined forces with the Federation of Canadian Municipalities (FCM) to build this project. Based on Canadian experience and research, the Guide sets out the best and most sustainable practices for planning, designing, and delivering systems for drinking water, stormwater, wastewater, roads, and now, transit.

This ground-breaking project – a first in Canada – is made possible through \$12.5 million CAD from Infrastructure Canada, in-kind contributions, technical resources, the collaborative effort of municipal practitioners, researchers and other experts, and a host of volunteers throughout the country.

### **Who Needs Best Practices?**

If you have any interest in excellence in infrastructure, you need the Guide. Municipal managers and operators (or practitioners), elected municipal officials, senior municipal administrators, and federal, provincial, and territorial governments are the front-line users of the Guide. It is also of interest to the private sector, professional associations, researchers, educators, and others whose work intersects with municipalities' efforts to improve infrastructure.

But, ultimately, it is municipal taxpayers who benefit. They will have greater confidence in how their tax dollars are spent, and they will know that national best practices are being developed to support delivery of their community's infrastructure. This means more public confidence in drinking water, road safety, and in the operation of stormwater and wastewater systems.

## How Are Best Practices Developed

In 2001, five technical committees of volunteer infrastructure experts from the public and private sectors – with input from other stakeholders – determined priorities for best practices. The committees and their working groups then got to work.

With the help of consultants they gather information through surveys of municipal practices and published literature. They formulate best practices and test their conclusions through peer review and consultation.

Drafts are distributed through a large network of practitioners, elected officials, administrators, academics, industry representatives, and others. Comments are incorporated in a three-level process to ensure a high level of objectivity and rationale in the published best practices.

All the easy-to-use reports published to date are available on-line at [wwaiinfraguide.gc.ca](http://wwaiinfraguide.gc.ca) or by contacting us ... by email at [infraguide@nrc-cnrc.gc.ca](mailto:infraguide@nrc-cnrc.gc.ca).

## Guide to the Guide

The Guide synthesises Canadian experience and knowledge about infrastructure into best practices for use by decision-makers and technical personnel in the public and private sectors. It is supported by a network of practitioners, researchers, and municipal governments across Canada. The best practices address both decision-making and technical issues, and are available on-line and in print.

Decision-making tools – These documents help municipalities identify needs evaluate solutions, and plan long-term strategies for improved infrastructure performance at the best available cost.

Technical best practices – These technical modules set out best available technologies and methods related to sustainable municipal infrastructure.

Best results:

- Improved consistency of infrastructure repairs and new construction;
- Better integration of needs and expertise, which allow municipalities to adapt new methods to local conditions;
- Greater transfer of technology and knowledge among municipalities and with the private sector;
- Steady improvement to technologies and processes that preserve and enhance infrastructure;
- Better value for money spent on infrastructure; and
- Enhanced education and research, therefore better strategic planning

[www.infraguide.gc.ca](http://www.infraguide.gc.ca)

## Appendix 5 Liverpool City Council - Highways

Liverpool's 2001 Best Value Review of Street Based Services:

### ***Conclusions and Recommendations.***

44. In seeking a suitable partner for the future provision of highways maintenance services an attempt has been made to set down the aims and objectives of the service as part of the information provided to bidders. However the Best Value Review understands that the City Council has not, in recent years, been asked to consider and determine its specific policies on highways maintenance. There are several references to overriding strategic aims in the Best Value Performance Plans and Liverpool First documentation. However need to be developed in the specific context of highways maintenance to ensure that the service aims and performance are fully in tune with the overall strategy of the Council. It is therefore recommended that urgent attention be given to this issue which will undoubtedly assist in shaping the partnership role.

45. The clear identification of service aims will also assist in the programming of work and dramatically changing the current ratio of planned and reactive maintenance. Very little planned maintenance has been undertaken in the city during the last two years whereas good practice dictates that up to 80% of the work should be pre-planned. This is an issue that will require close attention when scrutinising submissions from prospective partners. The Best Value review recommends that a continuous improving target ratio be agreed with the partner over the period of the contract.

46. The Local Transport Plan, prepared jointly by the Merseyside Metropolitan Authorities, recognises that highway deterioration is a key factor throughout the area. The prioritisation of available funds for structural maintenance is therefore very important. The Plan indicates that Merseyside Districts base their maintenance policies around the Highway Code of Good Practice, a co-ordinated assessment system based on visual condition surveys, highway conditions determined mechanically by Deflectograph and SCRIM and the strategic importance of the route in the transport network. Significant emphasis is therefore placed on the use of the data produced by visual and mechanical surveys to plan structural maintenance, to support and justify financial bids and for Best Value Performance Indicators. As a result of a shortage of trained staff no visual surveys were undertaken in 2000/01 and although the deflectograph survey was done during the autumn of 2000 the information has not yet been processed for use. Given the importance of the use of the data the Review is strongly of the view that the Council should give a much higher priority in future to undertaking the necessary surveys. It is further recommended that a much more sophisticated and structured approach is required to assess maintenance needs and prioritise expenditure. The Authority should examine the possible use of additional assessment systems such as UKPMS<sup>6</sup> and CHART which produce detailed information on the condition of footways as well as carriageways. They also are more suited to measuring ride quality, a characteristic not picked up well by deflectograph surveys.

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<sup>6</sup> United Kingdom Pavement Management System - <http://www.ukpms.com>

47. The Best Value Review recommends that the Highways Code of Best Practice be formally adopted by the Council and thus not only provide a framework within which highways maintenance can be planned and organised in the future but also provide a consistency of approach with neighbouring authorities.

48. Between the years 1996/97 and 1999/00 the percentage of budgeted expenditure above SSA for highway maintenance steadily increased from 34% to 63%. The Council, as part of the 2000/01 budget setting process, used inter authority SSA comparisons to highlight opportunities for reducing expenditure and as a result the Authority reduced the overall Highways Maintenance budget to such that it was 30% above SSA level. Expenditure for 2001/02 is budgeted at 25% higher than the Authority's SSA level. It is also noted that the principal road maintenance cost per km in Liverpool is significantly higher than other metropolitan districts. It is also recognised that there are a higher proportion of roads in the city that are in a poor structural condition. Nevertheless the Best Value Review believes that a progressive and targeted reduction in the cost per km should be pursued. The Partnership offers opportunities for a much more efficient use of resources and it is considered that the Council should aim to achieve an increase in the amount of highway maintenance undertaken at a lower overall cost than at present. The Council is therefore recommended to adopt challenging targets during the next five years to bring the cost below the Metropolitan districts average.

49. There is a lack of an accurate and up to date inventory and condition assessment of highways and associated equipment. Most major highway authorities in the UK have the use of a GIS system to record essential data relating to highways, street lighting, street furniture, utilities equipment etc. thus providing information that enables better planning and design, monitoring and cost control. Furthermore additional refinements are possible that give improved data and control over such issues as excavations by utilities and better co-ordination of winter maintenance. There are clear advantages in having a citywide system for all service applications but inevitably the development of such a system is likely to take a long time before it is available. The Best Value Review recommends that arrangements should be made quickly and if necessary, in advance of the city wide system, to develop a GIS system for the highways services. Because of the wide application to all aspects of highway management and the need to ensure that the system is eventually compatible with any general Council system, it is recommended that the highways GIS comes under the direct control and management of the authority. In order to start the process it is recommended that a survey of all equipment and fixtures together with an assessment of condition is undertaken by the partnership during its first year of operation.

50. The impact that major highway works can have on normal road traffic conditions can be enormous and the consultation comments from members of the public and business community endorse the need for a sensitive approach when planning activities. It is recommended that a Code of Practice be formulated and adopted as soon as possible which incorporates a number of fundamental principles, some of which are set out below:

- Allowing sufficient time for advance consultation with businesses and residents prior to commencement of highway schemes.

- Co-ordination of major highway works to avoid simultaneous work on routes that may act as an alternative to the original disrupted route.
- Use of the web site to advertise proposed roads works programmes.
- Management of works in a manner that is sensitive to the minimisation of disturbance.
- Maintenance of pedestrian access
- The adoption of flexible working arrangements to minimise total time spent on any one job. The adoption of a time occupied regime to ensure that there is a focus on urgency.
- Improvement of house keeping of jobs both during and after works.

51. Response time in dealing with highway maintenance issues is very important hence the specification in the partnership bidding documentation of the times required to the notification of problems. These vary according to the nature and urgency of the individual problem. The Best Value review is very concerned however about findings of the recent internal audit report which concludes that the average time spent dealing with the most urgent of notifications and thus requiring a 1 hour response, was in fact considerably in excess of this requirement. In the circumstances the Council is recommended to undertake an immediate investigation of responses in all categories, and to carry out an assessment of current backlog of work. Urgent attention may be required prior to the appointment of a partner to improve the response rate as a priority. Furthermore it is important to devise a suitable monitoring regime to ensure that the proposed response arrangements with the partner are properly achieved. It is also recommended that the need for a 1 hour response be reviewed bearing in mind that the Best Value Performance Indicator 105 has adopted an emergency response time of 24 hours.

52. The condition of the city's footways is generally unsatisfactory and is the source of community concern. Whilst the poor conditions are in part due to the lack of effectiveness in the past performance of the Direct Service Organisation (DSO) a significant contribution is made by the damage to the flagged surfaces brought about by regular parking of vehicles on the pavement edge. Liverpool appears to have a high proportion of flagged footpath surfaces and maintenance, which involves the replacement of cracked and broken flags, generally results in high costs. Furthermore the level of claims in Liverpool due to tripping, caused no doubt in substantial part by raised flags, is very high. The Best Value review therefore recommends the use of flexible surfacing as a replacement to flagging in areas, other than in the city centre and conservation areas.

53. The Review also urges the Council, in conjunction with the Police, to address the question of pavement parking. It is recommended that the Council examines the issue quickly and determines an appropriate policy involving encouragement, education, the provision of parking areas and enforcement to deal with the problem.

54. It is understood that the Council continues to deal with a high incidence of tripping claims, many of which date back as far as 1996. As a result the highways maintenance budget has had to devote a significant proportion of its funds, up to £4m per year, to deal with the problem. This figure does not include the cost of processing

the claims, necessitating the employment of 21 staff in the Claims Unit. In 1999 the Council determined that in order to minimise its liability it was necessary to demonstrate that there was a regular inspection of footways in place resulting in the repair of damaged footways within a specified period. Accordingly area inspection teams were established under s.58 of the Highways Act and an inspection regime was adopted. There was a subsequent reduction in the number of successful claims. However during the last 18 months, as a consequence of the City Council's staff reduction programme, the inspection staff has been reduced and the frequency of inspection has suffered leading again to an increased number of successful claims. Whilst the Best Value Review has been advised that the staffing complement has again been brought up to strength very recently and that this responsibility is likely to be undertaken by the Partnership in due course, the City Council is nevertheless recommended to give urgent attention to maintaining the inspection regime at full strength until such time as the partnership comes into being. Thereafter attention should be given to the manner in which partnership intends to undertake the inspection task to ensure that claims are maintained at an optimum level. The formulation of a suitable performance measure is clearly required perhaps involving the indemnification of the City Council for all claims or claims above a specified level. It is understood that the Claims Unit has recently been brought under the control of the Resources Directorate. It is felt however that the efficiency, size and functioning of the Unit requires detailed assessment as quickly as possible.

55. There is a great deal of concern from the general public, business and Council Members alike in regard to the number frequency and reinstatement arrangements of excavations of carriageways and footways. With the growth in the number of utility and cabling companies the concern has increased in recent times. New legislation was enacted earlier this year which introduced a revised specification for the Reinstatement of Openings in Highways together with a system of rules which sets out maximum time periods for reinstatement of excavations and puts into effect a standard daily charge on a utility when these times are exceeded. It is incumbent on the local authority to establish inspection regimes and systems to monitor the utility companies and initiate the new charging structure. The Best Value review had been advised that Liverpool would not be in a position to introduce the new rules until the Partnership is in place but it is pleased to note that a team has now been appointed to take on the new duties as from October 1st 2001. It is felt that the new arrangements offer an important opportunity for the Council to significantly improve on the present situation. It is vital therefore that when the new system is up and running it is maintained especially during the transitional phase of transfer of the function to the partnership.

56. It is also suggested that the Council should pursue a more constructive and robust approach to the coordination of excavation works. Utility companies are already under a duty to notify the Council in advance of any excavations and with the introduction of revised guidelines earlier this year there is an opportunity for the Authority to open fresh discussions with utility and cabling companies with a view to facilitating more advanced planning and better pre-notification. Successful coordination schemes have been developed elsewhere in the country, notably Hampshire, and the Council is recommended to investigate best practice and set a programme for introducing new arrangements in Liverpool.

57. It is recognised that highways maintenance is an integral part of the transport management strategy and that the programme of structural and reactive maintenance will be influenced by the Council's approach to traffic management and road safety. It is therefore felt to be appropriate for the Best Value Review of Planning and Transportation, which includes traffic calming and road safety, is to be undertaken during 2002/03 at which time the partnership for street lighting and highways maintenance will be underway. It is recommended therefore that in undertaking the Review in 2002/03 full account is taken of the significant influence that transportation and planning policies will have on the maintenance services.

58. It is recommended that the level of dialogue between Liverpool highway specialists and their counterparts in neighbouring authorities and core cities be increased. In common with other street based services there has not been a great deal of cross fertilisation of experience and views with other authorities and in consequence the Council runs the risk of not keeping abreast with developments and best practice. In particular there needs to be a great deal more emphasis placed on benchmarking discussions when methods and costs can be compared with authorities of similar size and structure. Best Value network clubs organised by organisations such as APSE<sup>7</sup> and professional bodies have been active for some time and the Council is recommended to take advantage of these opportunities to share information and compare costs and approach.

59. Gully cleansing is currently undertaken by the Street Cleansing DSO and will in future be included within the Partnership. Consequently the poor productivity and high cost issues currently associated with the service will be tackled by the selected partner. In assessing the Partnership cost structure for gully cleansing the Council is nevertheless recommended to consult in advance with those authorities where best practice and performance is presently achieved.

60. It is also recommended that the responsibility for maintaining the connections from gullies to the main drainage network be included within the total responsibilities undertaken by the Partner. This will overcome the present fragmentation of responsibility whereby the task of dealing with blocked connections is part of the Highway Consultancy's workload independent of the gully cleansing activity.

61. It is also recommended that the Council should clearly specify the records to be kept by the Partnership of gully emptying frequency. At a time of increased flooding and more rapid recourse to litigation it is imperative that the Council is fully prepared to deal with an increase in claims. Consideration should also be given to the possibility of seeking an indemnification from the partnership for any claims resulting from the failure to empty gullies at the required frequency.

62. The Best Value review supports the hardcore recycling initiative set up by the Council with Tarmac Roadstone at the Newton Road depot and would urge the Council to ensure as part of the negotiations to select a Partner that the use of the facility is maximised and that subject to satisfactory specification the Partner be required to make maximum use of the recycled product.

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<sup>7</sup> The Association for Public Service Excellence - <http://www.apse.org.uk/>

63. In parallel with this Best Value Review a disciplinary investigation relating to winter maintenance has been undertaken and the opportunity was taken by investigation officers to assess the efficiency and effectiveness of the systems in operation. The Review has been made aware of the resultant report and would endorse the recommendations relating to the following:

- The installation of temperature sensors in vulnerable areas of the city should be investigated.
- The provision of a direct link between the Met Office and the Duty Manager.
- The provision of electronic contact between the Met Office and the Duty Manager.

64. In addition the Group considers that the importance of reviewing procedures and routes annually prior to the winter period should be emphasised. The priority in salting route specification can change in the light of previous year's performance, changed transport priorities and traffic volumes underlining the need for regular review. The responsibility for providing the service will be taken on by the partnership but bearing in mind the importance of the service and the impact it can have on business and community life in Liverpool it is imperative that the Council establishes a strict monitoring regime to ensure that performance is satisfactory, responsive to local needs and is progressively improved during the contract period

## **Appendix 6 Liverpool City Council - Street Lights**

Liverpool's 2001 Best Value Review of Street Based Services:

### **Recommendations to improve the service**

60. In common with many other services there is an absence of a clear strategy and priorities for street lighting. As a consequence it is extremely difficult to assess whether the service aims and objectives correctly reflect the City Council's priorities. Nevertheless the Best Value Group acknowledged that the service is well operated due mainly to the commitment and enthusiasm of both client and contractor. It is recommended however that urgent attention is given by the City Council to the development of a street lighting strategy and specification of policy objectives.

61. The data held by the City Council on its stock of street lighting is incomplete and out of date. Evidence from elsewhere also demonstrates that an up to date inventory is an essential prerequisite to the forecast of accurate energy demands thus permitting experimentation and robust negotiation with energy suppliers. The City Council is recommended to update its street lighting inventory as a matter of urgency, using as appropriate, GIS or comparable IT systems.

62. The City Council's stock of street lighting is very old in comparison with many other authorities. Little investment has been made in recent years to replace old stock and as a consequence maintenance costs are higher in Liverpool than in other comparable authorities. There is therefore a priority need for a capital investment programme to progressively modernize the street lighting stock. Whilst the City Council is currently seeking means of assembling the necessary capital through either a PFI bid or through the proposed Highways partnership it is nevertheless felt that in the meantime a proportion of the block allocation under the Local Transport Plan should be devoted to street lighting improvement, matched by a similar amount from LCC general resources or other funding sources. This would allow a start to be made to the task of replacing the old stock.

63. The type of street lighting varies considerably in Liverpool thus adding to the maintenance cost. Whilst the City Council offers advice to developers on the type of new lighting that would be acceptable a number of major developments, involving in the main public/private partnerships, have not adhered to the advice and as a result lighting has been selected that on the grounds of aesthetics without regard to the long term cost and practicability of maintenance. It is therefore recommended that a Code of Practice be developed, and regularly reviewed, which would provide developers with guidance on a range of but limited number of options for street lighting. The opportunity can thus be taken to incorporate energy efficient lamps together with low maintenance and vandal proof characteristics in the design. At the same time the specification can and should anticipate the European standard due for introduction in the near future. Where there is a clear case for a development to go ahead outside the specification the developers should be required to deposit a commuted financial sum for future maintenance.

64. The Best Value Group considers that more attention should be given to the development of a structured approach to energy reduction. Street lighting currently costs the City Council £4.8m pa and this includes an energy bill of £1.5m. Whilst the lighting unit presently pursue many individual initiatives a more coordinated and

integrated programme is recommended with regular monitoring and reporting to the Executive Member. It is also recommended that a more robust approach is adopted to the question of energy supply although progress may be limited without good data on annual and seasonal needs. The limited opportunity available to officers for dialogue with other authorities can result in the City Council failing to keep abreast of or not fully investigating current developments in street lighting energy management. The City Council is therefore recommended to establish a programme of identification and investigation into street lighting energy initiatives being undertaken in the UK and thus feeding into the production of its own long term energy conservation plan.

65. The City Council is also recommended to re-examine its approach to lamp replacement. Dialogue with other authorities has revealed differing views on the 'burn to extinction' v. 'block replacement' issue. Whilst acknowledging that Liverpool looked at this argument a few years ago and concluded that the retention of the existing 'burn to extinction' policy was justified at the time the Best Value Group believe that the time is right to re-examine the issue.

66. In common with most of the other services being examined the street lighting service suffers from poor budget monitoring. Those responsible for the delivery of the service should specify the management and financial information required to properly manage the activities and it should be incumbent on the financial support unit to provide the necessary information. Basic interrogation information does not appear to be available or accessible such as the annual financial allocation for sign illumination or cost of inspections undertaken at night compared with cost of daytime inspections. The future management of the function must have access to such data in order to achieve proper management of the allocated resources.

67. The Best Value Group was impressed with the approach adopted by Birmingham City Council in the use of criteria for its replacement programme. Liverpool City Council in planning its own stock replacement programme, whether by PFI or partnership, is recommended to examine the model used by Birmingham which is based on crime, accidents and a number of other social factors.

68. There is little evidence to demonstrate that the City Council is properly recovering the costs incurred when a third party vehicle is responsible for damage to street lighting columns and other street furniture. It appears that there is insufficient priority given to this issue and as a result the Authority bears the full cost for repair or replacement. It is therefore recommended that the City Council addresses this missed opportunity forthwith.

69. It has been noted that a number of authorities have used their street lighting stock to generate income. Initiatives such as advertising on lighting columns, sponsorship of columns, and the use of columns for telephone antennae are a few of the schemes that have come to the attention of the Group. The City Council is recommended to determine its policy in this regard and if minded to pursue the matter a full investigation into options and potential benefit to service and community should be undertaken making full use of experience from elsewhere.

70. The City Council does have a structured programme of cleaning and repair of road signs and whilst this responsibility may lie with other than the street lighting

team attention should be given to the organisation and frequency of the function. It was noted on the other hand that the City Council has its own in-house sign manufacturing team which it is understood is well respected for the quality of work undertaken. Subject to the City Council being satisfied that the team produces work that provides value for money consideration should be given to extending the scope of the team's market both within the City Council and beyond. For instance the possibility of providing other Merseyside authorities with a similar service might be explored.

71. Whilst acknowledging that the future delivery of the street lighting service is somewhat uncertain at this time it is felt nevertheless that the City Council should encourage greater dialogue between its officers and the representatives of other authorities. In common with the other services being examined it has been noted that the officers responsible have very little contact with their opposite numbers regionally or nationally. As a consequence opportunities may be missed to keep in touch with service development and certainly the benefits of benchmarking with other similar authorities are not being accessed.

72. As far as the proposed partnership is concerned, many of the above issues will be of paramount interest in determining the route forward. At present the service is organised along traditional client/contractor (DSO) lines. The opportunity presents itself in the new arrangements for the partner to take on both roles subject to suitable checks and safeguards. Attention would thus be focused on specifying outcomes rather than methods of input albeit within a structured and pre-determined cost.

73. Other issues that require consideration in forming a partnership:

- Inspections: Are they to be continued and if so by whom?
- Determination of frequency of inspections, variations between areas and seasons
- Repair response time: to be specified in outcomes
- Traffic Sign Illumination: What is to expected of partner?
- New Stock: Absorption within negotiated price or increase of cost to City Council?
- How does the partner intend to achieve continuous improvement?
- Adoption of local PIs to allow City Council to measure performance.
- Continuous benchmarking with other local authorities – how is to be achieved?
- Energy Supply: Responsibility of partner or City Council?
- Provision of information to City Council: Range and frequency?

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## **Appendix 7 Royal Borough of Kingston (RBK)**

### ***Contractor Charter - 2003/04 Performance Plan (June 2003)***

#### Contractor Charter

The Council aims to make a significant change in how it develops its future relationships with Contractors and Suppliers. The Council has therefore developed a Charter setting out the principles of our new approach and how we will work with our contractors. The Council's approach is to foster a genuine partnering relationship with its Contractors.

Fundamental to the Charter is a willingness to be open, honest and co-operative. We want both parties to work towards outcomes which achieve maximum mutual advantage through long-term relationships.

#### Charter Principles:

- To work together in a spirit of partnership, sharing commitment and common objectives
- To foster open and honest communication and trust
- To deliver high quality services that demonstrate best value for local communities
- To behave ethically in our business delivery
- To work together to seek investment opportunities to enhance services
- To be innovative and imaginative in developing service improvements
- To identify and solve problems to achieve solutions, not impose penalties
- To focus on outcomes, adopting a flexible approach to service improvements
- To share the risks and the benefits
- To be aware of and accept our respective responsibilities
- To ensure that the Council's policies, aims and objectives are adhered to in providing services

This year we have been asked to include in our Performance Plan some information regarding how RBK approaches contracts that involve the transfer of staff. This chapter briefly examines the Royal Borough's approach to dealing with the legislative framework for the handling of workforce matters and the Code of Practice on Workforce Matters in Local Authority Service Contracts.

RBK's current practice is confirmed in a Transfer of Undertakings (Protection of Employment) Regulations ("TUPE<sup>8</sup>") Consultation Procedure Agreement approved by the former Policy and Resources Committee in 1994 and is in accordance with the guidance set out in the Local Government Act 1999 (part 1).

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<sup>8</sup> <http://www.tssa.org.uk/index.htm>

RBK values its workforce, both as an employer where work is carried out in-house or as a client where work is provided externally. In circumstances where outsourcing is a possibility, the Council will:

- consult staff;
- provide information to bidders for services;
- apply the Transfer of Undertakings (Protection of Employment) Regulations (TUPE) on a transfer; and
- ensure staff who are transferred have the option to maintain their membership of the Local Government Pension Scheme.

### Statement on Contracts

RBK seeks to achieve fairness for new joiners taken on to work on service contracts beside transferred workforces. We therefore comply with the mandatory guidance on the arrangements which are to be applied following a transfer to private sector public service providers. The requirements of the guidance are set out in a Code of Practice that will apply to all contracts advertised after the issue of the statutory guidance in March 2003 and include:

Service providers will be required to offer employment on terms which are no less favourable than those of transferred employees.

Service providers will be required to consult representatives of a trade union on the terms and conditions to be offered to such new recruits.

Service providers will need to offer new joiners one of the following pension provision arrangements:

- Membership of the local government pension scheme where the employer has admitted body status.
- Membership of a good-quality employer pensions scheme - either a final salary scheme or a contribution scheme where the employer must match staff contributions up to 6%.
- A stakeholder pension scheme under which the employer will match staff contributions up to 6%.

### Monitoring

The Council will monitor compliance with the provisions of the Code including the terms and conditions for transferred staff and new joiners. For staff employed on externally provided Council services, the employer is the service provider. Accordingly the responsibility for ensuring that the consultation requirements and the terms of conditions of staff are no less favourable than for transferred employees, rests with the service provider. Arrangements will be included in contracts to request confirmation that the requirements of the Code are being met.

### Compliance

The Council, as required, will enforce the obligation of the service provider created by the Code. In the event of any difficulties all parties must exhaust normal local procedures, and failing that, an independent arbitor will be appointed by ACAS and strict time limits imposed. As set out in the Code, if the Council is satisfied that a service provider has not complied with the Code it will not be bound to consider that provider for future work.

### Action Points

The Royal Borough of Kingston will continue to take proper account of staff matters in all future contracting arrangements.

RBK, in line with current practice, will continue to consult with staff and their representatives where potential outsourcing of services to an alternative provider is being considered. TUPE regulations will continue to apply and pension arrangements will be protected in line with the Pensions Regulations on a transfer.

### Statement on Contracts

Contract arrangements and documentation in relation to any transferred services from March 2003, will include the provisions for contractors engaging new staff to work on services to be provided as part of the contract with RBK, to be employed on conditions no less favourable than those of transferred employees.

Light touch monitoring and annual monitoring and report as part of Performance Plan will be carried out in accordance with the Regulations.

Discussions and negotiations with contractors for new services will need to take place to identify the group of staff which will be affected by the new joiners provisions set out in the Code of Practice.

## Appendix 8 Private Finance Initiatives (PFIs)

The following is an extract from a commercial website in the UK. PFIs were seen, by some of the Councils I visited, as a means of dealing with the infrastructure renewal gap. Under strict national government guidelines, to be eligible for a PFI project, asset data must exist and monitorable performance measures must be established. These requirements are consistent with a systems approach to knowing your assets.

### "An Introduction to PFI / PPP"

Public private partnerships (PPPs) are a generic term for the relationships formed between the private sector and public bodies often with the aim of introducing private sector resources and / or expertise in order to help provide and deliver public sector assets and services. The term PPP is used to describe a wide variety of working arrangements from loose, informal and strategic partnerships to design build finance and operate (DBFO) type service contracts and formal joint venture companies.

The Private Finance Initiative (PFI) is a form of PPP but is also, principally, a form of contracting or procurement, the hallmarks of which are:

- a long term service contract between a public sector body and a private sector 'operator'
- the provision of capital assets and associated services by the operator
- a single 'unitary' payment from the local authority which covers investment and services
- the integration of design, building, financing and operation in the operator's proposals
- the allocation of risk to the party best able to manage and price it
- service delivery against performance standards set out in an 'output specification'
- a performance related 'payment mechanism'
- an 'off balance sheet treatment' for the local authority so that any investment delivered through the project does not count against borrowing consents
- support from central government delivered through what are known as 'PFI credits'

The present government remains committed to developing and extending public private partnerships and particularly the PFI:

*"In an age of tight public spending, value for money public/private partnerships will be at the heart of a much needed renewal of our public services." Geoffrey Robinson June 1997.*

The Government's commitment to PPPs recognises that neither central nor local government in isolation will be able to finance all the investment needed in the country's public sector infrastructure. But it also makes clear that whoever provides an asset or delivers a service, this is not, of itself, important. As the Prime Minister has stated "What's best is what works best".

Both Best Value and PPPs move away from the doctrinal approaches of the past that saw successive governments believing that either the public or the private sector was automatically best. Now, for both central and local government, who does what will

be judged, in future, solely on how services are delivered and whether such services are high quality and good value for money for the local community.

To make a success of a PPP requires new attitudes and skills in order to identify when a partnership route might be best for the public and then to make it happen in practice.

Some councils have decided to develop PPPs because they recognise that they will not have sufficient resources for all the investment their communities need. Increasingly councils are forecasting their investment requirements and comparing it with the level of resources they are likely to receive in the future. Councils often find that the need for investment greatly exceeds the likely level of traditional resources likely to be available.

A PPP should not however be seen as the financier of last resort: there is unlikely to be a benefit to the public, if PPPs deliver more expensive services. The challenge for councils has been to develop PPPs that give good value in their own right. PPPs must therefore be able deliver significant performance improvements and efficiency savings and the process of scheme appraisal is intended to enshrine these principles in local authority procurement practices.

PPPs cannot be justified by crude claims that the private sector is better at managing and providing assets and services than the public sector; this is clearly not always the case. A PPP must be tested in practice through a realistic project appraisal and the preparation of a robust business case. There are circumstances though, where value is more likely to be added through a partnership scheme. The 4ps can help councils to identify such schemes and, for example, experience has shown that:

- Significant economies can arise by taking an integrated approach to the procurement of services; by bringing the design, build, operation and maintenance of an asset, together in one organisation; avoiding costly disputes with different contractors over who is responsible for what particular aspect of the transaction and placing responsibility firmly with the operator;
- If the operator is concerned about the lifecycle costs of assets supplied to deliver the service they are more likely to design and build the assets with those objectives in mind.
- A PPP approach may provide better value because it brings economies of scale. An organisation whose core function is to manage and maintain properties nationwide might be able to bring greater expertise to the task than would a single local authority acting in isolation;
- A PPP may lead to a more vigorous use of assets to deliver benefits to both parties to the agreement;
- A PPP forged through negotiation may deliver value for money because the competition process provides a spur to the private sector to perform and step forward with their optimum solution;
- A PPP may bring in additional expertise or finance that the private sector has developed on a global scale;

But benefits are not automatic from PPPs: they only result from well-planned and rigorously appraised schemes.”

[http://www.4ps.co.uk/general\\_introduction.htm](http://www.4ps.co.uk/general_introduction.htm) (November 2003)