



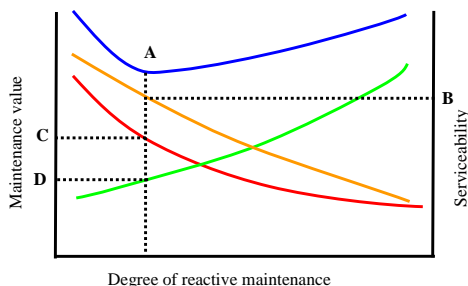
UKWIR Project WW21

Best Management Practice (BMP) for Blockage Reductions

Need for Project

The historic focus on flooding caused by hydraulic overload has now led to a higher proportion of sewer flooding events being caused by sewer blockages, with over 160,000 blockages occurring annually. There is a need to minimise sewer flooding as willingness to pay surveys consider internal flooding to be a major concern for customers. The direct cost to the UK water industry from sewer blockages is approximately £70 million per annum.

The water industry is seeking to improve its understanding of the technical feasibility and financial implications of blockage reduction strategies and to quantify their impact on customer service. Management of sewer blockages has historically been based on reactive maintenance models, but in recent years semi-proactive approaches have been implemented to positive effect on customer service. There is now a water industry need to determine the optimal balance between reactive and proactive maintenance for blockage reduction to identify whether the current rate of 160,000 blockage incidents can be cost-effectively reduced. Hence this necessitates the development of an economic level of service (ELS) model for blockages (Figure 1).



— Total maintenance
 — Reactive maintenance
 — Proactive maintenance
 — Serviceability

A	Lowest total maintenance cost
B	Economic level of serviceability
C	Economic level of reactive maintenance
D	Economic level of proactive maintenance

Figure 1: Economic level of service model

It is evident that water companies need to develop sewer blockage maintenance strategies which are flexible; appropriate; adaptable and focused on customer service. A strategy must comply with the UKWIR Common Framework for Capital Maintenance principles and deliver a positive cost benefit from its implementation.

In the future there will be a need for industry guidance which considers all the above elements.

Project Objectives

The objective of the project is to provide guidance on the effort, techniques, approaches and cost required to make a significant reduction in the number of sewer blockages. This will assist companies in reducing the number of “other causes” flooding incidents, pollution incidents and curtilage flooding.

This will be achieved through:

1. The development of an ELS model to identify the ‘economic’ balance between proactive and reactive approaches to managing blockages incidence and the impact on service expenditure.
2. Providing guidance to companies on the ‘quick wins’ for maintenance options with steps they can take to improve current management programmes and techniques to achieve successful reductions in sewer blockage rates and service improvements.
3. Providing a financial evaluation of emerging techniques and hence best management practice (BMP) to improve performance for the future.

Project Team

The project was awarded to Mouchel which has put forward a technically accomplished in-house team. This team has a wealth of pertinent experience in sewer blockage management and the derivation of the ELS with several major water companies; as well as in statistical modelling and successful delivery of previous UKWIR projects.



Work Programme

Mouchel's approach is to follow the key stages as outlined below:

- **Review of current best practice** – comprehensive interviews will be conducted with several major water companies. Information will be obtained on: current management practices; techniques and associated expenditure; and current and historical service and performance data.
- **Identification, technical evaluation and financial assessment of emerging techniques** – a literature review will be undertaken to evaluate the technical feasibility of emerging technologies and the influence of catchment attributes and external drivers. The financial implications of the most promising techniques will be assessed. An extended steering group meeting will be held to obtain stakeholder input and consensus over the most promising emerging techniques.
- **A BMP document** on current and emerging strategies and techniques summarising the 'quick and future wins' will be produced.
- **Development of a statistical model to determine the ELS** – three excel-based models will be developed; a national level and two company level models. Each model will incorporate reactive, proactive and total maintenance costs and serviceability impacts. These will be used to develop the ELS and corresponding level of service for each blockage reduction technique considered. The use of Monte Carlo analysis will be considered to allow for uncertainty and to provide a range of outputs.
- **Validation of the statistical model to determine the ELS** – Model validation will be carried out comparing predictive and actual historical data. The application of the ELS model will be demonstrated for two water companies using data collected at a catchment level. This will provide confidence each company can develop its own model. Companies will be able to

utilise the model at a company level using the model as a template; entering their own data and setting it up to capture their own maintenance strategies.

- **Establishment of a road map for the adoption of future technology** – a road map from present day to 2035 will be produced. This will logically set out future R&D needs and the progression for BMP for blockage reduction; it will permit the high level assessment of barriers to implementation, dependent factors and recommendations for future practice. This will be integrated with existing road maps, in particular the UKWIR 2007 R&D road maps.

Mouchel will present their findings to the industry in the form of a report, a spreadsheet tool and via a final project workshop.

Timetable

The project commenced in April 2009 and is due to report in November 2009. An extended steering group meeting will be held mid-way through the project to seek buy-in on the ELS model inputs. A workshop will take place at the end of the project to disseminate the project results to a wider group.

Project Benefits

- An improved understanding of the technical feasibility and the economics of reducing blockages and 'other causes' flooding.
- Structured guidance on current and emerging strategies and techniques for reducing the 160,000 sewer blockages occurring annually.
- An ELS model to allow companies to explore the economic impact of varying approaches to the management of blockages. The cost benefit of each application will be quantified to assist with the targeting of the techniques to achieve the most cost-effective solutions. (£70 million is spent on managing sewer blockages nationally).
- A Roadmap for further research, capturing items outside the scope of this project.