



Tube Lines takes stock of its assets with IBM Maximo asset management.

Overview

■ The Challenge

Reversing the effects of decades of under-investment in the London Underground. Responsible for over 200 miles of track, 255 trains, 100 stations, 2,395 bridges and structures, 71 lifts and 227 escalators, Tube Lines requires up-to-date asset information in order to understand the trends in asset performance that will drive proactive maintenance strategies to maximise performance and minimise passenger interruptions.

■ The Solution

IBM Maximo asset management.

■ Key benefits

Consistent approach to maintenance management across 15 classes; real time access to up-to-date asset information for engineers and contractors enabling efficient job scheduling; reduced duplication and improved information accuracy resulting in more effective proactive maintenance strategies.



Integrating asset maintenance activity and equipment history in IBM Maximo with financial and planning systems is helping Tube Lines meet its financial targets, plan for long-range capital investments and improve the rail infrastructure.

Transport Investment

On 31 December 2002, Tube Lines assumed responsibility for the maintenance and upgrade of the entire infrastructure on the Jubilee, Northern and Piccadilly lines as part of the largest improvement programme the Tube has ever seen. Tube Lines has a 30 year Public Private Partnership (PPP) contract with London Underground. The contract is output based, meaning Tube Lines is rewarded for good performance and penalised for poor performance.

Reversing the effects of decades of under-investment in the Tube is a huge task requiring an injection of resources on the scale of which the Underground has never seen before. Tube Lines is involved in a massive improvement programme, tripling investment and committing over £4.4 billion to improve the Jubilee, Northern and

Piccadilly lines in the first 7½ years – the equivalent of spending almost £1.6 million per day.

Tube Lines is responsible for over 200 miles of track, 255 trains, 100 stations, 2,395 bridges and structures, 71 lifts and 227 escalators and is constantly striving to implement new, more efficient and effective ways of improving the Underground.

Martyn Capes, Asset Systems Technical Manager, Tube Lines, says, “Passenger safety is the primary objective on the railway. However, after years of under investment Tube Lines needs to ensure that the planned capital investment is used as effectively as possible. Excellent asset management is essential both to minimise passenger disruption and to drive out inefficient, costly processes that have become endemic across the underground network.”

IBM Maximo enables Tube Lines to better monitor the condition of each asset to make more informed decisions for maintenance and renewals

Goals

- Deploy a single asset management solution across the enterprise
 - Provide engineers with mobile access to asset information
 - Streamline processes and improve resource effectiveness
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Asset Management

Underpinning the new strategy has been a complete overhaul of the IT infrastructure. When Tube Lines took over in 2003, information on assets was distributed across almost 500 disparate systems and 1500 Excel spreadsheets. As Capes explains, “Without excellent, up to date asset information, Tube Lines could not attain any understanding of trends in asset performance to drive the proactive maintenance strategies required to maximise performance and minimise passenger interruptions.”

The company set up its £30 million X.Calibre project, which encompassed new connectivity and desktop hardware as well as Enterprise Resource Planning (ERP) and Enterprise Asset Management (EAM) applications. Having undertaken a comprehensive market evaluation, the company opted for the IBM Maximo asset management solution to manage its assets.

“IBM Maximo is a best of breed application that was selected for its depth of functionality, its unique web architecture and its ease of integration. Critically it has open application programming interfaces (APIs) and interfaces with Oracle applications for its ERP solution, Documentum for document management and Primavera for project planning, enabling Tube Lines to create a comprehensive, asset based information resource,” Capes confirms.

Using IBM Maximo, the company now records detailed information on its asset, including a complete history, Asset Condition Inspection (ACI) and Asset Condition Assessment (ACA). The company also records when an asset was last maintained, what work was carried out, and by which engineers or maintainers.

The company has 15 different asset groups, including fleet, tracks, signals and premises, some of which are maintained by Tube Lines, others by contractors including Otis, Marconi and Alstom. Asset information can be searched in multiple ways – by class, route, station, or simply using its unique section code. “Creating a single source of all asset information has provided unprecedented visibility of asset performance across the three lines managed by Tube Lines,” he says.

Tube Lines has also leveraged a close collaboration between the IBM Maximo team and Syclo, who jointly developed the off-the-shelf IBM Maximo Mobile Suite. Specifically, Tube Lines utilised the IBM Maximo Mobile Work Manager solution to provide mobile access to asset information for 1,000 staff and is currently developing a Geographical Information System with GPS to achieve pinpoint accuracy of asset location.

Efficiency Transformation

Tube Lines is now better able to monitor the condition of each asset to make more informed decisions for maintenance and renewals. Integrating asset maintenance activity and equipment history in IBM Maximo with financial and planning systems is helping the company meet its financial targets, plan for long-range capital investments and improve the rail infrastructure.

For example, asset refurbishment is now carried out on the basis of performance rather than age. Capes explains, "Tube Lines now has a league table of best and worst performing assets every month. Using this to prioritise refurbishment based on performance has reduced both the cost of repairs and the costs associated with penalties for missing the service levels agreed with London Underground."

Linking this information into procurement also enables Tube Lines to monitor the performance of goods supplied, highlighting issues with specific asset types. For example, the company has recently undertaken a wholesale replacement of door seals after IBM Maximo identified persistent problems. "Prior to implementing a single asset management system the company simply would not have had visibility of this issue. By replacing the seals Tube Lines has significantly reduced the maintenance problem," he confirms.

Proactive Strategy

Detailed analysis of the worst performing assets also considers the need for a change to the maintenance schedule – for example if the asset persistently fails on the same day. With some 60% of assets actually above the ground, and affected by the weather, the company has a constantly evolving set of asset management challenges.

As Capes says, "It is essential to minimise the impact of maintenance on passengers. Using the IBM Maximo Train Movements module, for example, the timetable is embedded in the system to ensure train maintenance is scheduled effectively and efficiently.

The use of IBM Maximo mobile technology is also supporting a far more efficient, effective maintenance strategy. Utilising a range for devices from PDAs to tough books, Tube Lines has significantly streamlined maintenance processes.

Results

- Maximo has enabled Tube Lines to provide a consistent approach to maintenance management across 15 asset classes.
- Both engineers and contractors have real time access to up to date asset information. This has enabled efficient job scheduling to minimise passenger impact.
- Reduced duplication and improved information accuracy combines with trend analysis to enable far more effective proactive maintenance strategies.

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Each engineer receives a work order online and can then sign off the job online once complete. Information is recorded once, transforming accuracy, and consistent data definitions reduce incidents of duplication or confusion. Furthermore, adding GPS to the mobile system will enable engineers to locate assets to within one metre, which has significantly reduced the duplicated reports of asset faults.

Tube Lines is currently implementing IBM Maximo asset management in its fault reporting centre, emergency response, transport and Health & Safety business. This is enabling a shift from telephone based to email based fault reporting direct into the system, further reducing the administrative overhead. Using workflow and escalation processes the company can ensure that faults are resolved within the set Service Level Agreement.

Financial Return

The implementation of IBM Maximo has transformed Tube Lines' effectiveness. Emergency maintenance has been reduced with a concomitant increase in proactive maintenance. As a result, asset failure rates are down enabling Tube Lines to achieve compliance to its service level agreements with London Underground.

Streamlined processes have enabled Tube Lines to reduce its previous reliance on contract staff to carry out administrative roles. "In the past, it would take several people days to locate asset information," he says. "Now that information is available within seconds. The resultant reduction in contract staff has delivered annual cost savings."

Recently, Tube Lines has insisted all its contractors use IBM Maximo Mobile suite and now has real time visibility of its complete asset portfolio for the first time. “This has significantly improved scheduling of maintenance,” he says. “For example, using job plans within IBM Maximo to combine planned maintenance by different teams on the same piece of track reduces the need for two separate protection units. In addition to improving efficiency, this will deliver a cost saving in administration.”

Indeed, the company has achieved financial savings as a result of the implementation of IBM Maximo. A reduction in duplication of faults recorded has cut down on work orders being raised and improved maintenance prioritisation and effectiveness. Teams now go out with full confidence in the jobs to be undertaken – and have the right equipment and parts required to complete the asset repair.

Customer Approval

The improved asset performance has been well received by Tube Lines customer London Underground which receives daily, weekly and monthly reporting from the IBM Maximo asset management solution. Indeed Tube Lines is consistently achieving the quality of service demanded by London Underground to deliver excellent and safe passenger services.

“By implementing IBM Maximo, Tube Lines has demonstrated that it is possible to deliver value in the transport industry. Whilst the priority is always passenger safety, the improved understanding of asset performance has enabled a proactive maintenance strategy that has delivered quantifiable financial benefits and a return on investment,” Capes concludes.

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*– Martyn Capes, Asset Systems
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