



Case Study

Central Line Train Maintenance Optimisation

The Central Line is one of the busiest lines on London Underground (LU) and serves over 1 million passengers per day. LU was struggling to carry out all of the required maintenance on its train fleet. The fleet is maintained across two large and complex depots, using facilities that are not ideal for the work that needs to be carried out. When the project started, reliability was the lowest across all LU fleets and the timetable was frequently not achieved due to poor availability of serviceable trains.

In order to solve the problem, the first challenge was to understand the root causes of why asset availability targets were not met. Analysis of failure data proved that many programmes were already in place to address reliability issues. However, by using Frazer-Nash's exclusive Depot Modelling Software Tool to model the train downtime in the depots, a number of areas where availability was being limited were identified. These included a maintenance regime which was very awkward to plan and deliver, an uneven balance of work between the two depots, a large discrepancy between the headcount and actual staff on shift, and a highly segmented workforce that limited flexibility.

Following identification of the causes, Frazer-Nash developed an improved balanced maintenance regime to solve the problems and to align with LU Asset Management objectives. This new regime was similarly modelled, to demonstrate that the proposed solution not only addressed the problems that currently exist but also was deliverable in its own right.

The new balanced maintenance regime did not change the scope or frequency of the existing tasks, but repackaged them in a way that made the regime much easier to plan and deliver, by minimising the number of planned maintenance activities to be completed (12 fewer activities than previously). The regime provides more time to work on each train during a planned maintenance activity. By reducing the number of times each train requires maintenance, there are further benefits in terms of increased availability of the fleet, through reducing the number of trains that are required for maintenance on any particular day.

Following development of the new balanced maintenance regime, extensive stakeholder engagement activities were undertaken, to ensure that all levels of the maintenance organisation were involved in the development of the new regime and that all potential issues had been addressed.

On behalf of LU, Frazer-Nash produced a complete set of updated maintenance documentation for the new balanced regime. This included all maintenance instructions, maintenance record forms, overarching documentation and an update of the Asset Management Plan.

The benefits generated by the new regime are estimated by LU to be in the region of £1.5 million per year taking into account reductions in performance penalties, increased customer revenue due to improved asset availability, and reduced maintenance overtime hours resulting from these changes. As the fleet is due to remain in service for at least 20 years, this is a very significant saving.

There are also further benefits expected after implementation that will include:

- ▶ Improved asset reliability
- ▶ Reductions in overall planned maintenance duration
- ▶ Reduced number of outstanding corrective maintenance tasks
- ▶ Improved material availability and reduced wastage
- ▶ Increased staff involvement and capability
- ▶ Improved maintenance planning from a much simplified regime.

The result of these improvements are likely to be:

- ▶ Increased public reputation by delivering demonstrable improvements to service performance
- ▶ Increased customer revenue, as the line will become known as a reliable way to travel.

Client

London Underground

Business need

Understand the root cause of low fleet availability and implement changes to address this.

Why Frazer-Nash

Frazer-Nash were able to independently and comprehensively understand the root cause of low fleet availability and identify where areas for improvement could be made. We went on to facilitate the introduction of a new maintenance regime.

Date project completed

Summer 2018



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Offices throughout the UK and Australia

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