

FRENCHGATE TUNNEL RETROFIT

MODERNISING TUNNEL LIGHTING
THROUGH LED RETROFIT

BACKGROUND

Located beneath Trafford Way in Doncaster, the Frenchgate Tunnel forms part of the wider Frenchgate Interchange development, connecting road, rail and bus infrastructure within the town centre.

By 2023, the tunnel's existing lighting installation had become increasingly difficult and expensive to maintain. The original system used high pressure sodium (HPS) and fluorescent lighting technology housed within WRTL Metis tunnel luminaires, controlled via an ageing lighting control system.

The lighting design had originally been developed in line with the now superseded BS 5489-7 standard for tunnel lighting. Compared with modern LED tunnel lighting systems, the installation was operating with significantly higher energy consumption while offering limited flexibility in lighting control and performance management.

A survey identified that, while the luminaire housings were in serviceable condition, the lighting technology and controls no longer reflected current tunnel lighting requirements. Doncaster Council therefore sought a complete upgrade package through competitive tender. The key objectives included improved energy efficiency, compliant lighting performance and the reuse of existing infrastructure where possible.

P Ducker Systems Ltd (PDS) was appointed as principal contractor, working alongside TRT Lighting to deliver an LED retrofit solution.



SOLUTION

Instead of removing and replacing the complete luminaires, the retrofit system replaced the original HPS and fluorescent lamp gear assemblies while retaining the existing housings. This significantly reduced installation complexity, material waste and project cost while extending the usable life of the existing infrastructure.

The retrofit trays were purpose-designed for the Metis luminaires rather than adapted from alternative products. Dedicated aluminium heatsinks were developed to manage thermal performance within the enclosed tunnel environment, helping maximise LED lifetime and long-term reliability where maintenance access is difficult and tunnel closures are costly.

Separate retrofit trays were supplied for both the HPS and fluorescent lighting elements within the tunnel, with DALI drivers integrated to work alongside the new PDS Scanlight Eco+ lighting control system.

Importantly, the retrofit system was engineered as a plug-and-play solution. Existing mounting arrangements, communication connections and luminaire carcasses were retained, allowing installation without structural modifications to the luminaires themselves. The retrofit trays were also lighter than the original lamp and gear assemblies, removing the need for additional structural testing or infrastructure alterations.



The Frenchgate Tunnel project required a solution that could modernise the lighting installation while minimising disruption and making best use of the existing infrastructure. TRT's retrofit approach provided a practical and efficient way to achieve this, combining proven tunnel lighting performance with the benefits of reduced installation time, lower material usage and improved long-term maintainability.

Tim Whiteley Senior Solutions Manager at P Ducker Systems Ltd



CASE STUDY

FRENCHGATE TUNNEL RETROFIT



☐ DARK SKIES ☐ ECOLOGY ☒ APPLICATION IMPROVEMENT ☐ NEW INSTALL ☒ RETROFIT



Additional project benefits included:

Reduced energy consumption and operating costs | Improved lighting performance and uniformity
Lower long-term maintenance requirements | Reuse of existing tunnel infrastructure | Reduced installation complexity and tunnel closure time
Integration with modern lighting controls via DALI communication | Improved reliability and operational resilience

OUTCOME

The completed retrofit delivered a significant improvement in energy efficiency, lighting performance and long-term maintainability while avoiding the need for a full luminaire replacement scheme.

By reusing the existing tunnel luminaires, the project reduced material waste and retained infrastructure that still had substantial operational life remaining. This circular approach helped minimise embodied carbon and installation disruption compared with a traditional full replacement solution.

The upgraded installation also aligned the tunnel lighting scheme with modern tunnel lighting requirements while significantly reducing energy consumption compared with the previous HPS and fluorescent system.

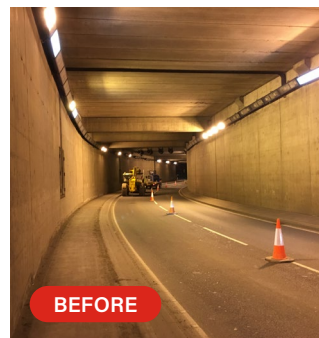
Lighting calculations for the upgraded installation estimated annual energy consumption reductions from approximately 657,769 kWh to 168,086 kWh, alongside a reduction in estimated CO₂ emissions from 153.27 tonnes to 39.16 tonnes per annum.

The scheme was also expected to deliver annual energy cost savings of more than £53,800. This figure is considered conservative, as it does not account for the increasing maintenance costs associated with the previous HPS installation.

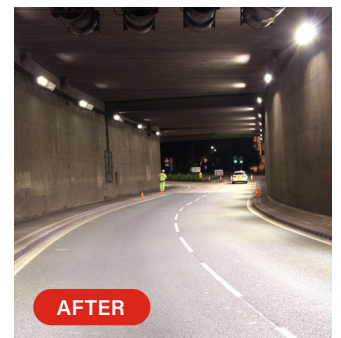


Retaining the existing tunnel luminaires while upgrading the lighting technology allowed us to improve efficiency and lighting performance without the cost and disruption of a full replacement scheme. The retrofit approach aligned well with the project objectives, and minimised difficulties of installation due to the council not owning the tunnel structure delivering a more sustainable long-term solution for the tunnel infrastructure.

Craig Morris Street Lighting Manager at Doncaster Council



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