CASE STUDY

Doncaster Council:

annual energy savings of £1.3 million

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Smart street lighting

the first smart city application at scale

Doncaster is the largest metropolitan borough in England covering 220 square miles and housing over 45,000 smart streetlights.

Along with most English councils, Doncaster faced reductions in core funding, creating a difficult balancing act of yearly budgets. The council needed to reduce their streetlight energy usage to mitigate energy price increases, meet tough carbon emissions targets and better allocate spend in the borough.

Funding

The council took the initiative and created a business case to seek external funding, as finding the resources from public spending was going to make the process much slower. The business case clearly showed the short-term return on investment (ROI) of a smart street lighting solution extended over the product's 20-year lifespan, and this exercise secured £14.4 million of internal and government backed Salix funding.

Doncaster Council is already well on their way to recouping their investment as the solution is achieving overall energy savings of approximately £1.3 million annually with potential to increase this in the future.

> "Using Telensa's wireless solution to connect our streetlights has achieved smarter, more efficient and more reliable lighting for our residents – it's the backbone of our connected town"

Craig Morris

Street Lighting Engineer

Smart street lighting

providing the perfect infrastructure for further cost savings

In addition to the energy savings achieved by the council's connected LED streetlight upgrade, they have taken advantage of further streetlight initiatives to increase savings for the borough.

Traffic Adaptive Lighting

In late 2018 Doncaster Council used its smart streetlight infrastructure to trial traffic adaptive lighting. This is where the output of a group of lights is dynamically adjusted by the central management system (CMS) based on real-time traffic data from a radar-based sensor. The trial controlled 178 lights from Junction 3 of the M18 into Doncaster and the data obtained showed peak volumes of 29,000 movements per day and highlighted a 'black period' after 8pm equivalent to only 7,000 vehicle movements per day. This analysis justified the move from Class M4 lighting to Class M5 between 8pm and 5am when it was previously between 10pm and 5am.

The energy savings from doing this were substantial, down from 67,087KWh to 51,474KWh and translated into savings of 23% in KWh and 19% in energy spend.

The council is building on the success of this trial by placing further sensors in strategic locations.

Recycling project

Doncaster Council spearheaded an innovative partnership with the National Offender Management Service and local prison HMP Lindholme, employing inmates to break down old luminaires to their component parts. This project saw 97% of the luminaire materials being recycled. This delivered a surplus of around £2 per fitting, totalling approximately £90,000, which Doncaster will be reinvesting into its street lighting.

This project produced more than just financial benefits; environmental impacts were minimised as the luminaires were recycled by a local recycling company. Furthmore, inmates benefited from earning, were encouraged to seek further education and the prison service managed to recoup some of the costs to house inmates.

Doncaster Council

how their energy savings and maintenance cost savings added up

Doncaster Council achieved energy savings of £1.3 million annually by:

- Precisely dimming light levels in response to their chosen external factors
- Precisely trimming the time streetlights are burning at dusk and dawn to lower burn hours and inefficiency
- Adapting power use to deliver constant light output, adapting to the combined effects of gradual LED lumen depreciation and dirt build-up between cleaning intervals

Doncaster Council achieved significant maintenance cost savings by using the CMS generated, detailed insights and 24/7 fault reporting to:

- Remove night patrols
- Better first-time fix rates
- Enhance resource planning
- Remotely respond to residents' light-level requests

> "Our smart streetlight project has been an enormous success for the borough, reducing the council's total electricity spend by over 25% and providing improved lighting for residents."

Craig Morris

Street Lighting Engineer

Telensa

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Telensa PLANet is the world's most deployed smart streetlight solution, with a footprint of 1.7 million lights. Building on the compelling business case for its smart street lighting, the company provides cities and utilities with an open, low-cost platform to add multiple sensors.

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