



Transport for London's Energy Efficiency Street Lighting Programme (EESLP)

Frequently Asked Questions

1 What is the energy efficiency programme for street lighting?

The Energy Efficient Street Lighting Programme (EESLP) involves two complementary strands: an LED replacement programme to substitute lights with lower energy consuming alternatives and a Central Management System (CMS) enabling remote control and adjustment for the output of street lighting. Both these measures will be implemented over an initial three year investment period (2013/16) and result in substantial environmental benefits and cost savings.

2 Why are you targeting street lighting?

Street lighting is an important part of Transport for London's infrastructure and accounts for some 52,000 of a total of 70,000 lighting assets on the Transport for London Road Network (TLRN). The remainder includes assets such as signs and bollards and other infrastructure requiring illumination. Street lights are responsible for 60% (17,000tonnes)ⁱ of the CO₂ emitted annually by all TLRN lighting, with a demand in energy consumption equating to a current annual expenditure of £2.4m.

Energy Efficient Street Lighting Programme

Number of Lighting Points to be affected (by 2021)	35,000
CMS on approx 80% of TLRN	approx 11% energy reduction
Luminaire wattages	150W and above
Change from HID to LED	approx 35% energy reduction
Annual savings by end of initial investment period (2016/17)	approx £1.85m
Annual savings by 16/17 (CO ₂)	approx 6,500 tonnes equivalent CO ₂

3 How do you calculate your savings

Analyses conducted by TfL indicated the potential to reduce the lighting class on approximately 80% of the TLRN and deliver a 24% reduction in energy consumption. The implementation of LED technology will mean luminaires consume approximately 35% less energy than existing HID (high intensity discharge lighting – such as high pressure sodium lamps). The combined effect of the new British Standard and LEDs will enable TfL to reduce street lighting energy consumption by 36% by 2016 compared with current estimates. CMS will contribute a further 11% delivering an overall combined reduction in energy



consumption of 44% by 2016. This delivers a £1,850k per annum reduction in the street lighting energy bill by 2016.

4 What are the benefits of this investment programme?

Our investment in a central management system and energy efficient lighting is based on the following benefits:

- Reduced energy consumption and energy costs
- Reduced CO₂ emissions
- Reduced maintenance costs
- Better light control and lighting levels
- Real time performance and fault monitoring leading to improved availability by reducing fault fix time
- Improved inventory accuracy
- Ensure the extended life cycle of lamps
- Flexibility to operate lighting assets as and when required allowing remote operation of individual lamps and/or groups of lamps setting on/off times and lighting intensity
- Less disruption and congestion is caused in the replacement of lamps.
- The ability to remotely increase illumination in the event of an accident, poor weather conditions, special events and road works
- It aligns with other London Boroughs and major UK cities leading on street lighting efficiency programmes of work
- Improved accuracy of energy consumption settlement for street lighting from unmetered supplies
- Ensures TfL's consistent approach to street safety and compliance with British Standards for road lighting
- It directly contributes to a range of legislation targets and Mayoral policies.

5 How does this programme comply with the British Standard for Road Lighting?

The British Standard for road lighting (BS 5489-1:2013) was revised and published in December 2012. In recognition of rising energy prices, the new standard permits the application of less stringent lighting classes and allows their application to be determined by road use rather than full output as was previously the case.

6 Are there legislative and policy drivers behind this programme of work?

Work to reduce carbon and energy consumption responds to international, national and regional policies and legislation.

The Climate Change Act 2008 introduced legally binding targets of at least an 80% cut in greenhouse gas emissions (including CO₂) by 2050 compared with 1990 levels and an interim target of at least 34% by 2020.



The Mayor's draft Climate Change Mitigation and Energy Strategy has a target of 60% CO₂ emissions and states that TfL will actively seek to reduce CO₂ emissions from street lighting.

The Surface Transport Energy Efficiency Plan (STEEP) sets out a 30% reduction in Surface Transport's CO₂ emissions from non-transport activities by 2021/22 (compared to a 2011/12 baseline). Energy efficiency gains from street lighting are a major contributor to these targets.

7 What is entailed in the LED initiative?

We will be introducing the use of LED technology across the TLRN. We will be installing 22,000 LED lighting units over the initial three years of the project with the remainder installed as part of a business as usual replacement programme. Previously, the capital costs of LED technology were prohibitive except for use in particular locations such as tunnels and subways. As the LED market has expanded and matured, the business and technology case is now proven.

A maximum of 95% luminaires are suitable for substitution with LED lights and all those replaced will be recycled.

8 What will a CMS for street lighting entail?

The introduction of a CMS involves the procurement and installation of remote communication devices on street lighting units. Those first addressed will be the higher output types ie those with a power rating of 150W and above – with some 35,000 lights in scope.

9 What is the purpose of a CMS?

The CMS will enable lighting levels to be adjusted to align with traffic flows and usage at different times of night according to the prevailing conditions. Controlling lighting levels in this way complies with British Standards and will significantly reduce TfL's energy consumption and carbon emissions without compromising road user safety.

In addition the CMS will provide a more accurate record of energy consumption. It will also monitor the condition of the street light and report back any failing or failed units.

10 Will the CMS be restricted to street lighting only?

Although CMS technology could in principle be used to adjust the lighting levels of other illuminated assets (signs, bollards, etc), this infrastructure represents a relatively small proportion of TfL's energy consumption and are therefore excluded from the initial investment phase.



11 How will the CMS be rolled out?

The CMS will be implemented over an initial 3 year investment period and targeted towards street lights with the highest energy consumption ie those with a power rating of 150W above. These streets lights account for 70% of the lighting stock and 80% of consumption. By 2021/22, CMS will be installed on 100% of the luminaires with a power rating of 150W and above.

12 Will there be disruption to lighting levels during the transition to CMS?

Following the transition to CMS, lighting levels may take 24 hours to 'bed in' before settling into their correct operating regime.

13 Will this amount to turning off the lights and compromise safety?

We will not be turning off the lights. Lighting will now be controlled and adjusted to align with traffic flows and road usage at different times of the night.

14 What evidence or studies into the technology have been undertaken?

Following the success of CMS with other UK and London local authorities, we conducted pilots in three different areas in 2012. These pilots determined the optimum lighting levels for the TLRN, provided insight and reassurance on public perceptions and demonstrated the business case for further roll out of a pan-London CMS. The three sites selected were:

- Site 1: Upper Thames Street, Stamford Street and Blackfriars Road
- Site 2: A232 Wickham Road
- Site 3: A127 Southend Arterial Road.

We reduced lighting in these areas during times of low traffic volumes – very late night and very early morning. This aim was to evaluate the impact of changes in lighting classes and CO₂ saving and whether route users or local residents found any noticeable difference in lighting levels.

Key findings:

- Awareness of the lighting adjustments was very low – few noticed the changes until prompted by the moderator.
- There was no sense that lighting levels at the beginning of each session (ie 50%) seemed lower than usual and none felt less safe than they normally would.
- There was no difference in perceptions of safety between pilot groups and the control group (where lighting remained at normal levels throughout).

15 Will this mean that quieter areas outside London will be darker?

The basis of the CMS is to control lighting levels according to the context which may be time of night, day of week, season and event. The focus of reduction will be from midnight to 5am, and imperceptible based on the evidence of pilot studies.



The benefit provided by the CMS is that it enables greater flexibility of lighting levels to provide more as well as less output depending on the situation. This means that lighting levels can rapidly be increased at specific locations at times of special events as well as accidents and emergencies.

16 Will the CMS link up with boroughs and their systems?

Boroughs have been informed of our work through the London Lighting Engineer Group (LoLEG) and other technical liaison groups. We are keen to build on the experiences of other boroughs and align with their lighting classes on borough roads and policies. Other metropolitan authorities and boroughs have provided encouraging feedback and found no adverse impacts to date.

17 How will you monitor the performance of the CMS against its anticipated benefits?

We will monitor the success of CMS across a range of qualitative and quantitative indicators. These indicators include: savings in energy efficiency and operations, customer feedback, and incidences of crime and accidents.

18 What will happen to heritage lighting columns?

The works will bring benefits to road users by replacing old columns with new column and modern lanterns as well as reduce the need for large scale maintenance of the lighting system in the near future.

There will be no impact on heritage lighting columns as they do not fall within the scope of the roll out. Some heritage lighting optics may change to LED lights but the visual appearance will not change.

Some ornamental or 'mock heritage' columns may be subject to evaluation and review in accordance with Streetscape Guidance.

¹ This figure is based on the Carbon Trust's 0.45kg CO₂/kWh conversion factor