Adaptive Street Lighting Policy 2024

Date Approved:

Date of Review:

Version	Date	Updated by	Description
V0.1	01.08.2024	Dr. A Asandei	
V0.2	02.08.2024	Jason Newman	
V0.3	30.08.2024	Dr. A Asandei	
V0.4	18.10.2024	Dr. A. Asandei	

www.slough.gov.uk
Slough Borough Council

Table of Contents

Introduction

This document sets out Slough Borough Council's policy for adaptive street lighting by implementing reduced street lighting levels during off-peak / low use periods and providing a cost effective and efficient management of its streetlighting network to achieve vital energy and carbon emission savings.

Background information

Slough has a successful track record of decarbonisation across its buildings, assets and operations which has seen the Council reduce more than 30% of its operational carbon emissions over the past 10 years. The Adaptive Street Lighting Policy presents an opportunity for the Council to save carbon, energy, and money to continue to provide essential services to its residents.

Street lighting is crucial for highway safety and community quality. We aspire for Slough residents, workers, and visitors to enjoy safe, high-quality places with minimal environmental impact.

As part of a collaborative project with Reading and Wokingham Borough Councils, by 2018, approximately 78% of streetlights were upgraded to LED technology and integrated into a central management system (CMS), known as the Mayflower Smart Cities Platform. This system allows for remote control and management of the lighting inventory, with a default adaptive lighting profile set to 70% across the Borough.

Since 2018, the Council's street lighting inventory has expanded by over 10%, due to additional adopted highway developments and the inclusion of the former SSE network on the Slough Trading Estate. Despite these advancements, no further assessment of the efficiency and cost-effectiveness of the updated lighting system has been conducted to date.

The ability to adjust lighting intensity and timings offers a significant opportunity to alleviate the financial pressures on the Council's budget caused by rising energy costs. By implementing adaptive lighting levels, we can not only manage energy expenditure more effectively but also reduce carbon emissions associated with energy consumption. Additionally, adaptive lighting can help lower light pollution levels, and improve residential amenities and may have beneficial effects on local biodiversity.

Our trials indicate that even a 50% reduction in lighting in each ward, when introduced gradually over the evening and night, would go unnoticed by most people. This gradual adjustment ensures minimal disruption while maximizing energy savings and environmental benefits.

In 2020/21, the revenue expenditure for street lighting and traffic signals energy costs was approximately £330,000. However, the sharp increases in energy prices during 2022/23 led to a dramatic rise in costs, totalling £966,000 for these services. This significant increase has placed an additional burden of over £600,000 on our revenue budgets. Despite a recent decline in wholesale energy prices over the past year, our current street lighting fixed price energy contracts are in place until 31st March 2025. It is highly unlikely that unit prices will revert to previous levels before the contract ends, resulting in ongoing future revenue pressure.

High-level projections by Power Data Associates (PDA), our meter operators who monitor and report on our lighting inventory and consumption, indicate that implementing a dawn-to-dusk lighting profile of 60% across all controlled street lighting could result in annual savings exceeding £100,000, based on current electricity unit rates. Additionally, adopting a staggered lighting profile, where lights are set at 30% after midnight until 5 a.m., could further increase savings by an additional £80,000 per annum. This approach would also yield significant carbon savings, with a reduction of more than 100 tonnes of CO2 emissions annually.

During three trials conducted in 2023 and 2024, we have gathered detailed data on the potential savings associated with various lighting profiles. These trials have provided insights into the impact of adapting street lighting to address different scenarios and concerns, such as crime rates, fear of crime, and equalities impacts. As a result, the data collected will be instrumental in guiding the Council's future decisions regarding the adjustment of street lighting levels across the borough. This will enable us to tailor lighting strategies to meet the specific needs of different areas and activities at various times throughout the night, optimizing both safety and cost-efficiency.

Aims and Objectives

1. **Provide strategic direction and a sustainable approach** to the installation and maintenance of a cost-effective and energy-efficient street lighting network.
2. **Significantly reduce street lighting energy consumption** to minimize Slough Borough Council's energy bills and carbon footprint while ensuring the benefits of effective street lighting and minimizing the council's negative impact on climate change.
3. **Best value standards for operating a street lighting** network by focusing on ensuring the system is managed in the most effective and efficient way. This includes adhering to statutory requirements, as well as managing the expectations of the public and other stakeholders.
4. **Implement appropriate levels of street lighting** in specific areas of Slough at designated times of the night, whilst maintaining safety for all highway users, especially vulnerable pedestrians, and cyclists.
5. **Establishing a robust framework** for the effective management and upkeep of street lighting.

Allowing flexibility to evaluate and adopt new technologies and policies through a risk-based approach as necessary.

Strategy Overview

1. Statutory requirements

Slough Borough Council, as the Highway Authority, is responsible for providing and maintaining electrical assets on the road network throughout Slough, excluding motorways and trunk roads. Under the Highway Act 1980, the Council has the authority, **but not the obligation**, to provide street lighting. However, the Council has a duty of care to road users and must ensure that obstructions on the highway are properly illuminated. Additionally, under the Highways Act, the Council is required to ensure the safety of the highway, including any lighting equipment placed on it. The Electricity at Work Regulations further mandate that owners and operators of electrical equipment ensure its safety.

The Highways Act 1980, Section 97 states:

(1)...”every local highway authority may provide lighting for the purposes of any highway or proposed highway for which they are or will be the highway authority, and may for that purpose –

> **(a) Contract with any persons for the supply of gas, electricity or other means of lighting; and**
>
> **(b) Construct and maintain such lamps, posts and other works as they consider necessary”**

Consideration has been given to the following key elements during the development of this Policy document:

2. Technology requirements

Slough Borough Council’s Street Lighting Network comprises over 13,000 lighting units, managed through two types of controllers: nodes and sub-masters.

- **Nodes:** These are small, cylindrical units mounted on top of most street light lamps. They handle individual light control and communication within the network.
- **Sub-Masters:** These larger cylindrical units can control up to 500 nodes and directly interface with the Mayflower Central Management System (CMS), allowing for more comprehensive management and monitoring of the lighting network.

Since the initiation of this project in November 2022, significant progress has been made in identifying, managing, and resolving various faults and issues affecting the condition of the lighting network and its management.

- **Initial Challenges:** At the start of the project, the Council lacked an in-house lighting engineer and did not have trained officers familiar using the Mayflower CMS. This led to reliance on external experts from Enerveo, the CMS operators, for programming and updates.
- **Recent Developments:** Over the past year and a half, we have successfully built-up internal expertise and gained greater control over the network. We

now have trained officers capable of managing the Mayflower CMS, reducing our dependency on external consultants; thus, reducing our costs.

- **Ongoing Improvements:** Despite these advancements, further work is needed to optimize the street lighting network to meet both current and future needs. Continuous efforts are required to fully harness the potential of the lighting system. A full-time dedicated officer is still needed within the Council, in order to maintain, update and operate the streetlighting network. A new maintenance contract is required with our service partners Enerveo, Volker & Power Data Associates (PDA).

3. Implementation Strategy:

3.1. Adaptive lighting trials

Trials are an essential part of the decision-making process before adjusting any illumination setting of an active Street Lighting Network. Several trials were also undertaken in the lead up to this Policy being written, and future ones may also be needed. These will be approved under a significant officer decision process. Trials might be required to evaluate how adaptive lighting systems perform under various conditions, measure their impact on energy efficiency and safety, and identify any potential issues or improvements needed for the broader implementation of adaptive lighting throughout the borough.
Setting up a trial should take into consideration several vital elements.

The areas the selected for these trials should chosen based on guidelines from British Standards BS 5489 and BS 13201, which provide comprehensive criteria for road lighting. Additionally, the trials need adhered to national best practices outlined in the Institute of Lighting Professionals' Professional Lighting Guide PLG08, which offers guidance on the application of adaptive lighting within public spaces.

The trial zones should be selected mainly within residential areas with minimal external lighting sources. They should be chosen for their similar lighting profiles and heights, and to ensure any changes in lighting levels would be noticeable to residents and road users. Further trials might need to include some main roads, junctions, and high streets, to assess both visual impact and potential cost savings. The later should be done so after consultation with the relevant stakeholders and ensuring that there are no safety risks to any of the vulnerable groups.

Testing various scenarios during any trial, should include multiple lighting levels at different times of the day and over several months, to evaluate network performance, visual effects, and to get a good representation of the potential savings to be achieved.

In person surveys of different scenarios to be tested is a must, firstly to confirm that the networks perform as expected, but also to assess other factors that could affect the road users and give rise to safety concern.

3.2. Field observations

- Different locations within each trial zone should be visited to measure light intensity and ensure scheduled switches occurred throughout the night.

- In person assessment of the perceived visibility is vital to gauging the safety of the road users and can help prepare mange any expectation or concerns that stakeholders may have.
- Surveys should also be used to identify faulty lights and repairs needed throughout the network.
- The trials improved understanding of the network, provided valuable data, and demonstrated that adaptive lighting could achieve the desired savings without compromising safety.

3.3. Developing adaptive lighting options

Based on the key findings from the trials, further work and research may be conducted to ensure the street lighting network is always well-prepared to support the implementation of adaptive street lighting across the borough.

Hardware upgrades and replacements are likely to be needed regularly, followed by extensive adjustments to the CMS, to ensure optimal conditions for the borough-wide implementation of the Adaptive Street Lighting Policy and any subsequent changes deemed necessary. The Network currently is functional and deemed suitable to undertake the necessary lighting regimes proposed by this Policy.

Following any trial, the data collected, and the calculations undertaken for each new proposed lighting scenario should be the main factors to influences any changes made to the Street Lighting Network. Thus, the flexibility of the Adaptive Street Lighting Policy to deal with current and future needs of the Council and its residents is necessary.

3.4. Implementation

Following Cabinet approval of the Adaptive Street Lighting Policy, the rollout, testing, and commissioning are expected to take at least 6 months, covering all residential areas and roads in Slough, excluding any exempt areas. The rollout is anticipated to be completed by the end of March 2025. For 2024/2025, approximately 8% reduction in energy consumption across the lighting network is forecasted.

4. Energy, CO_2, and Cost Savings:

The Council's core objective will be to continue or maintain the savings in comparison to the previous years, by carrying out further trials and replacing the old assets in the network, removing unused or redundant infrastructure, and trying to secure suitably priced energy contracts each year.

Some cost will be dictated by the fluctuations in cost of energy, which the policy cannot influence. However, the focus will be on energy consumption and efficiencies to control costs; to continue and make the network more efficient by replacing older sodium and LED technology, and through carrying out more trials, etc. Some consideration shall be given to whether all lighting is required, and any decision to add or remove assets will have to be reported via a significant officer decision process.

Since the complete transition to LED lighting in 2016, energy consumption across the street lighting network has decreased by approximately 32%.

Year	Units	Total	Change % year/year
2016-17	kWh	4,141,016	LED replacement
2017-18	kWh	2,915,843	-29.6%
2018-19	kWh	2,655,354	-8.9%
2019-20	kWh	2,579,745	-2.88%
2020-21	kWh	2,573,357	-0.25%
2021-22	kWh	2,691,641	+4.60%
2022-23	kWh	2,834,550	+5.31%
2023-24	kWh	2,817,534	-0.60% (trials)

Since the start of 2023 when the first trial was setup, additional savings were achieved compared to 2022/2023, and further trials undertaken to date continue to have a positive impact on the energy consumption with a forecast 3% reduction.

24/25			
Do Nothing Option	**Dimming Trial 1 + 2 + 3**		
Actual £	**Savings/Costs**	**Actual kWh**	**Difference**
£66,457.90	-£3,907.60	198,000	-8,480
£58,244.90	-£2,836.10	173,275	-6,118
£51,070.10	-£1,827.00	152,312	-5,224
£55,614.80	-£990.40	166,069	-2,998
£63,162.20	-£2,839.60	188,236	-8,590
£74,959.01	-£760.89	219,178	-5,620
£90,448.15	-£1,808.15	264,468	-6,781
£97,783.71	-£2,647.19	285,917	-7,331
£105,694.27	-£3,855.13	309,048	-7,924
£101,458.37	-£3,059.23	296,662	-7,607
£85,855.11	-£3,782.59	251,038	-6,437
£80,101.47	-£1,494.93	234,215	-6,006
£930,849.98	**-£29,808.82**	**2,738,418**	**-79,116**
without VAT			
£0.340/kWh	-£29,808.82	79,116	

The full implementation of the Adaptive Street Lighting Policy profile 1 in Slough is estimated to achieve significant energy saving more than 400,000kWh, 100 tonnes CO_2, and £113k cost savings which will help with the Council's budget targets. Additionally, the renewal of the energy contracts will achieve more than £200k per annum cost savings.

Year	Consumption (kWh)	Forecast Energy Costs	Energy Cost - Contract Renewal saving	Energy Consumption Cost Savings	Total Forecast Savings	Options
Current Energy Contract Price 34.1p/kWh						
2024-25	2,738,418	£930,850	**N/A**			Do nothing
Energy Contract Renewal 26p/kWh						
2025-26	2,738,418	£711,989	£218,861	£0	**£218,861**	Do nothing
2025-26	2,304,027	£599,047	£218,861	£112,941	**£331,803**	Lighting Profile 1 Boroughwide

2025-26	2,061,765	£536,059	£218,861	£175,930	**£394,791**	Lighting Profile 2 Boroughwide

It is recommended that an annual report on consumption be provided, with periodic re-evaluation of tasks where necessary, to ensure we remain on track with our savings goals.

5. Safety Enhancements:

The adaptive street lighting policy improves safety for all road users by tailoring lighting levels to specific needs and conditions, which can enhance visibility and reduce hazards. Here's how it works:

- **Targeted Illumination**: By adjusting lighting levels based on factors such as traffic volume, time of day, and weather conditions, the policy ensures that areas with higher pedestrian or vehicle activity are better lit. This focused illumination helps increase visibility and safety at critical times, such as during peak traffic hours or in high-crime areas.
- **Enhanced Visibility**: For pedestrians, cyclists, and drivers, appropriate lighting reduces the risk of accidents and collisions by improving visibility of road signs, obstacles, and other road users. This is especially crucial in areas with high foot traffic or where cyclists and drivers interact frequently.
- **Dynamic Adjustment**: The system can adjust lighting levels as needed. For example, lights can be brighter during rush hours or in areas with frequent pedestrian crossings, while being reduced in low-traffic periods. This dynamic adjustment helps balance safety with energy efficiency.
- **Improved Reaction Times**: Optimised lit roads and pathways allow all road users to see and react to potential hazards more quickly, reducing the likelihood of accidents. For drivers, this means clearer views of the road and surroundings; for pedestrians and cyclists, it means increased awareness of their environment.
- **Reduced Light Pollution**: By decreasing the lighting levels when full illumination is unnecessary, the policy aims to minimises light pollution. This not only benefits the environment, but also reduces glare for drivers and prevents distractions for pedestrians and cyclists.
- **Traffic safety:** The current proposed lighting scenarios were tested and the calculations made confirm the Council's needs for savings will be met. However, any further changes to the network to achieve additional savings, will require a lighting design assessment to be carried out. Implementing the adaptive street lighting on all main roads and other high traffic areas will need to be considered, and a suitably certified lighting designer will have to be employed to assess the traffic safety and compliance with British Standards are maintained.

Overall, an adaptive street lighting policy enhances safety by ensuring that lighting levels are appropriate for the current conditions, making roads safer for everyone while also conserving energy, while not leading to any actual anti-social behaviour and crime.

6. Environmental Impact:

Based on the research and trial data, implementing the policy borough-wide is expected to deliver significant benefits, including energy and cost savings, reduced CO_2 emissions, decreased light pollution, and overall environmental conservation.

These savings will be monitored and recorded regularly to measure progress against the Council's strategic savings objectives, contained within the Councils Carbon Management Plan.

7. Maintenance and Monitoring:

Maintenance of the street lighting network and monitoring of adaptive lighting systems will be conducted regularly to ensure effective operation and prompt resolution of any issues. The appointed officers will actively manage any software or hardware malfunctions and prioritise any work that needs to be undertaken.

A formalised contract with exact KPIs needs to be in place, including a prioritised plan for dealing with any emergencies with the network.

8. Stakeholder Engagement:

During the Policy development and as part of the data collection during the trials we engaged with stakeholders such as residents, councillors, Thames Valley Police (TVP), CCTV team and all relevant Council Teams. Their input was used to decide on any areas that might be exempt from the implementation of the Adaptive Street Lighting Policy.

9. Review and Adaptation:

During and after the implementation period, the Council will conduct annual reviews of the policy and make necessary adjustments based on feedback from stakeholders.

A review of the policy will also be prompted by advancements in technology, new partnerships, or available funding opportunities that could benefit the Council.

10. Compliance and Standards:

Slough will ensure that the adaptive street lighting policy complies with all relevant regulations and standards (including new codes and standards) for street lighting. Additional design reviews will be conducted to confirm that the aging network meets current standards, and ongoing maintenance and monitoring will address any issues that arise.

Essential Considerations

1. Slough Borough Council is committed to reducing the energy consumption of street lighting. The first steps to achieve this were taken in 2016 by updating the majority of the streetlighting network to LED (Light Emitting Diode) technology. This initiative already helped reduce the energy use and carbon emissions from street lighting by setting the network lighting levels at a default 70%.
2. The term "street lighting" includes all mains-powered illuminated assets on the adopted highway, such as streetlights, illuminated signs, bollards, and other street furniture requiring electrical supply. When accessing mains electricity is challenging and/or costly, alternative sustainable power sources should be considered based on whole life costings.
3. The policy statements in this document endorse an approach where street lighting infrastructure is installed only when necessary and at appropriate illumination levels. The focus is on using the right type of lighting in the right way at the right times.
4. An evidence-based, risk-oriented approach will be adopted to balance personal safety, environmental impact, active travel needs, energy consumption, and the preservation of dark skies (reducing light pollution).
5. Slough Borough Council follows a risk-based approach to determine where street lighting is required. Electrical assets are maintained only in specific locations based on a clear need, as identified through various criteria. Examples of such locations and needs include:
    - **Major Road Junctions and Roundabouts**: Lighting is provided at major road junctions and roundabouts as part of a suite of potential safety measures aimed at reducing the risk of night-time accidents. These areas are prioritized due to their high traffic volumes and complex navigation, where improved visibility can significantly enhance safety for all road users.
    - **Partnership Schemes**: In collaboration with parish councils, as well as the Police, lighting is installed in areas where there is a heightened fear of crime. Such installations are considered where there is a clear need and sufficient funding is available for both the installation and ongoing maintenance. These partnerships help address community concerns and enhance safety in high-risk areas.
    - **Residential Areas**: Street lighting is installed in residential areas where roads and footpaths are adopted by the council only when a key safety need has been identified. This is done to address specific safety concerns that cannot be mitigated through other means. The decision is based on a thorough assessment of the potential benefits of lighting in improving safety for residents.
    - **Unlit Highway Areas**: New lighting is considered for unlit highway areas only if it is deemed necessary for safety purposes. Such decisions are made following appropriate consultation or a road safety audit evaluation.

This ensures that the installation of new lighting is justified by a clear safety need and is supported by evidence-based analysis.

By adhering to these criteria, Slough Borough Council ensures that street lighting is deployed effectively, addressing specific safety needs while optimizing resources and maintaining a focus on risk management.

6. Restrictions on Provision and Maintenance of Electrical Assets

Slough Borough Council has established clear guidelines regarding the provision and maintenance of street lighting to ensure resources are used effectively and in alignment with public safety priorities. The Council does not provide or maintain electrical assets under the following conditions:

- **Private Areas**: The Council does not install or maintain lighting in private areas, including residents' garages, private car parks, or roads that have not been adopted as highways maintainable at public expense. These areas are considered the responsibility of the property owner or managing body, not the Council.
- **Non-Highway Paths**: The Council does not provide or maintain lighting associated with new installations on definitive footpaths, footpaths with permitted rights, bridleways, and towpaths. These paths are typically managed by other authorities or organizations, and lighting on such routes is not covered under the Council's street lighting policy.

7. Slough Borough Council will continually review LED equipment, including dynamic lighting systems, to ensure that it remains the most suitable for the diverse range of environments within the borough. This ongoing review process will involve:

- **Regular Evaluation**: Periodically assessing the performance of current LED and dynamic lighting systems to ensure they meet the latest standards for energy efficiency, durability, and effectiveness in various environmental conditions.
- **Adaptation to Environmental Conditions**: Tailoring lighting solutions to suit different environment types, such as urban areas, residential neighbourhoods, and rural settings. This ensures that lighting is optimized for visibility, safety, and aesthetic appeal in each specific context.
- **Technological Advancements**: Staying informed about and integrating the latest advancements in lighting technology. This includes updates in LED efficiency, dynamic lighting capabilities, and smart control systems to enhance performance and energy savings.
- **Feedback and Data Analysis**: Collecting and analysing feedback from residents and stakeholders, along with performance data, to identify areas for improvement and ensure that lighting systems effectively address community needs and environmental challenges.
- **Best Practices and Standards**: Adhering to industry best practices and standards for street lighting, including compliance with regulations and guidelines, to maintain high quality and reliability in lighting installations.

8. Sustainable Removal and Maintenance of Lighting Assets

When street lighting is no longer effective in improving road safety or reducing crime, Slough Borough Council will follow a structured process to evaluate and remove unnecessary lighting. This process will comply with regulations, involve thorough assessments, and ensure transparent communication with stakeholders. Although no official process currently exists, the Council plans to develop one with input from the Highways Service, and once completed, it will be made available on the Council's website. This approach ensures well-informed and transparent decisions that prioritise community needs and safety.

In cases where signs cannot be removed or de-illuminated, the Council will explore alternative solutions, such as solar power or other off-grid technologies, to maintain sign functionality while addressing energy use and sustainability concerns. This reflects the Council's commitment to enhancing the sustainability of its signage while keeping it effective.

Sustainable tasks to be undertaken:

- Replacing obsolete equipment;
- Alternative power sources
- Improved lighting technologies
- Other adaptations (EV charging; Wi-Fi, CCTV)

9. Considerations for Landscape and Trees in Street Lighting Design

During the pre-application stage of a planning application, careful consideration should be given to the integration of street lighting with landscape and tree placement. The goal is to avoid potential issues that could arise from tree canopies blocking light output, which could lead to increased maintenance costs and impact the effectiveness of the lighting.

By addressing these factors at the pre-application stage, Slough Borough Council ensures that street lighting is effectively integrated with landscaping, reducing future maintenance challenges and supporting sustainable and efficient management of public spaces.

The Policies

ASL Policy 1

Slough Borough Council will reduce the council's impact on climate change and the environment, as per our ***Climate Change Strategy and Action Plan***, by adopting a thorough evidence-based approach to the provision of street lighting and electrical assets in the network. This approach will involve collecting and analysing data related to traffic patterns, accident reports, and community feedback to make informed decisions regarding the street lighting assets.

Climate change – Slough Borough Council

ASL Policy 2

Slough Borough Council will provide or ensure provision of adequate and appropriate levels of lighting to ensure safe passage to all users of the highway network. This will include suitably adjusting the lighting levels during low traffic periods and enables the reduction in running hours due to the instant switch on of LED equipment. We will review and, where appropriate, de-illuminate or provide off-grid solutions for signage where possible and practical.

ASL Policy 3

The policy considers the impact of light pollution on nature and dark skies in assessing where lighting should be added or reduced across the transport network. When new lighting is deemed to be necessary on grounds of public safety, reduction in burning hours and of lighting levels should be used to preserve the night sky and mitigate environmental impacts.

Framework Biodiversity Management and Monitoring Plan.pdf (citizenspace.com)

Towards a Dark Sky Standard | Institution of Lighting Professionals (theilp.org.uk)

British Standards Institution - Street lighting (bsigroup.com)

ASL Policy 4

Slough Borough Council will actively engage with local stakeholders when evaluating any proposed changes to the deployment of street lighting, ensuring that the potential impact on these groups is carefully understood and mitigated. The consultation process will involve key stakeholders such as residents, businesses, community groups, and other affected parties to gather their input and concerns. This feedback will be integral to shaping the design and specification of new or updated street lighting systems, ensuring that their needs are fully considered.

ASL Policy 5

Slough Borough Council will seek to develop an integrated dynamic lighting solution to encourage and enable active travel across the Borough.

Local Cycling and Walking Infrastructure Plan – Slough Borough Council

Action Plan

Slough Borough Council is committed to making Slough a safer, more efficient, and attractive place to live, work, and visit. Our adaptive street lighting policy supports this goal by reducing carbon emissions and enhancing the quality of our environment. We will continue carrying out LED street lighting upgrades where necessary and collaborate with other projects and future opportunities, such as installing on-street residential electric vehicle charging points on lamp columns. Additionally, we aim to leverage the Central Management System (CMS) for emerging 'Smart City' technologies, exploring possibilities for sensory applications and other innovative solutions.

The Action Plan for implementing the borough-wide Adaptive Street Lighting Policy will be a dynamic document recording and managing any risks affecting its successful delivery.

The current key actions are:

Key Actions	Timescale
Create the Technical Officer Group	April 25
Implement Policy in stages	TBC
Finalise new maintenance contracts with services partners and establish annual KPIs	TBC
Complete a Succession Plan	TBC
Formalise the considerations for landscape and trees in street lighting design	TBC
Prepare an obsolete equipment management plan to replace existing sodium lights and old columns with new LED technology	TBC
Produce procedure document for new lighting assets design and removal of redundant ones	TBC
Continue to support the council's commitment to carbon reduction	Ongoing

1. Succession Planning

Ensuring the consistency and the continuity of the adaptive street lighting policy implementation is crucial for achieving the Council's savings target. A continuity plan will ensure that street lighting remains operational during emergencies or disruptions while prioritizing public safety and sustainability. Internally, it will keep a clear record of the tasks and responsibilities required to achieve our objectives and help maintain reliable and sustainable network regardless of who is in post.

The main tasks to creating a Succession Plan are:

- Identify a list of potential risks to the network and the implementation of the policy:

- Define Critical Operations and Functions: prioritise essential functions of the street lighting system that must be maintained during a disruption.
- Coordinate emergency responses
- Create a log of maintenance
- Create log of log in and record of where things are.
- Monitoring and Reporting System Performance

2. Monitoring and maintenance

Currently monitoring and maintenance of the street lighting network is carried out reactively. There is no formalised contract with exact KPIs for most of our services, thus the costs and response times are uncontrollable and a potential risk to the success of the policy implementation. As part of the new maintenance contract there should be a prioritised plan for dealing with emergencies, etc. and setting appropriate metrics that we can report on annually.

3. Streetlighting standards for developers

To be completed.

4. Review of existing infrastructure – redundancy

To be completed.

5. Sustainable infrastructure – replacement of assets

To be completed.

6. Annual review of ASLP

An annual review shall include an appraisal of:

a. Metrics recorded to show street lighting health and performance.
b. Previous years' costs, usage and savings achieved.
c. Estimate savings to be achieved the following year.
d. Council's savings targets and proposed amendments of the ASLP to achieve them.
e. Whether further trials are needed.

7. Exemption areas

Ringfenced areas where the adaptive street lighting policy cannot be implemented. based on stakeholders engagement.

In order to include an area on the exemption list the following process shall be followed:

i. Stakeholder nominates area of concern including boundary map, reasons for inclusion, expected level of illumination, duration of exception, etc.
ii. Proposal is reviewed by the Technical Officer Group
iii. A decision is made and the reasons are presented to the stakeholder.

iv. The necessary adjustments are made to the street lighting network in the proposed area.

By following this action plan, the council can ensure a systematic and effective implementation of a borough-wide adaptive street lighting strategy, achieving significant energy savings, cost reductions, and improved public safety and satisfaction.

We expect to have the Action Plan implemented in full by the end of 2025.

Measuring Success (Annual Reporting)

To evaluate the success of implementing a borough-wide adaptive street lighting policy, the following indicators and the corresponding information should be gathered:

1. **Energy Consumption**:
   - **Baseline Energy Usage**: Pre-implementation energy consumption data.
   - **Post-Implementation Energy Usage**: Monthly and annual energy usage data after implementation.
   - **Percentage Reduction**: Comparison of energy usage before and after implementation.
2. **Cost Savings**:
   - **Initial Investment Costs:** Total expenditure on installing adaptive street lighting.
   - **Operational Costs:** Monthly and annual maintenance and operation costs.
   - **Energy Cost Savings:** Reduction in energy bills due to lower consumption.
   - **Total Cost Savings:** Overall financial savings considering both reduced energy costs and operational efficiencies.
3. **Lighting Performance and Quality**:
   - **Light Levels**: Measurements of illuminance and uniformity across different areas.
   - **Adaptive Lighting Performance**: Data on how lighting levels adjust based on time of day, traffic, and pedestrian presence.
   - **User Feedback**: Surveys and reports from residents and road users regarding perceived lighting quality and safety.
4. **Maintenance Efficiency**:
   - **Maintenance Requests**: Number and type of maintenance requests before and after implementation.
   - **Response Times**: Average time taken to address maintenance issues.
   - **Downtime**: Frequency and duration of street light outages.
5. **Environmental Impact**:
   - **Carbon Emissions**: Reduction in CO_2 emissions resulting from decreased energy consumption.
   - **Light Pollution**: Measurements of light pollution levels before and after implementation.
   - **Sustainability Metrics**: Data on the use of eco-friendly materials and disposal of old lighting equipment.
6. **Public Safety**:
   - **Crime Rates**: Analysis of crime statistics in well-lit versus poorly-lit areas.
   - **Accident Rates**: Traffic accident data in relation to street lighting conditions.
   - **Emergency Services Response**: Feedback from emergency services on visibility and accessibility improvements.
7. **Technology Performance**:
   - **System Reliability**: Uptime and reliability data for the adaptive lighting control systems.

- **Data Accuracy**: Accuracy of sensors and control systems in adjusting lighting levels.
- **Software Performance**: Performance metrics of the control management system (CMS), including user interface and functionality.

8. **Community Satisfaction**:
   - **Resident Surveys**: Regular surveys to gauge resident satisfaction with the new lighting.
   - **Public Feedback**: Input from public meetings and community feedback sessions.
   - **Complaint Data**: Number and nature of complaints related to street lighting.
9. **Implementation Timeline and Milestones**:
   - **Project Timeline**: Adherence to the planned timeline for implementation.
   - **Milestone Completion**: Achievement of key milestones within the project.
10. **Compliance and Standards**:
    - **Regulatory Compliance**: Adherence to national and local regulations and standards for street lighting.
    - **Industry Standards**: Compliance with industry best practices and standards for adaptive lighting technology.

Gathering and analysing this information will provide a comprehensive evaluation of the success of the borough-wide adaptive street lighting policy, highlighting areas of improvement and ensuring the policy meets its intended objectives.

Implementation strategy and review

1. **Technical Officer Group**: A team formed of technical officers, each an expert on a subject relating to each of the five policies that need to be implemented. The Director of Regeneration, Housing & Environment to assign a lead on this team, related to active travel, sustainability, community safety, community engagement (TVP member) etc. This dedicated project management team will be responsible for the day-to-day implementation of the street lighting policy. This team tracks progress, manages resources, and ensures that timelines are met.
2. **Regular Reporting**: Implement a system for regular reporting to the technical officer group, in order to address issues in a timely manner and avoid additional costs and complaints. Reports should include progress updates, financial status, key performance indicators (KPIs), and any issues or risks encountered.
3. **Performance Metrics and KPIs**: Performance metrics and KPIs will be set to measure the success of the adaptive street lighting policy implementation. These will include energy savings, reduction in CO_2 and expenses, overall network maintenance costs, improvements in lighting quality, and feedback from the community.
4. **Audit and Review**: We shall conduct regular audits and reviews of the policy's implementation. This will be carried out annually by the Technical Officers Team to ensure transparency and accountability.

5. **Community Engagement**: Engagement with the community to gather feedback and address concerns once the policy has been implemented is an important step. This might include public consultations, surveys, and a dedicated helpline or online portal for reporting issues related to street lighting.
6. **Action Plan**: This will act as a risk management plan created to identify potential risks to the policy's delivery and outlining mitigation measures. This will be regularly reviewed and updated to address new risks as they arise.
7. **Budget Oversight**: A robust financial oversight with regular budget reviews and adjustments will be necessary regularly and annually. This helps to keep the policy within financial constraints and ensures that resources are being used efficiently.

By implementing these arrangements, the council can effectively monitor the delivery of the adaptive street lighting policy, ensuring that it meets its objectives and delivers value to the community.

Reference & Supporting Documents

- **BS 5489-1:2020 -** Code of practice for the design of road lighting. Lighting of roads and public amenity areas.
- **BS EN 13201:2015 -** Road lighting. Calculation of performance.
- **BS 7671:2018 -** Requirements for Electrical Installations. IET Wiring Regulations.
- **CEN/TR 13201-1:2014 -** Road lighting. Guidelines on selection of lighting classes.
- **LG15 Transport Buildings -** Design of public areas of railway stations, bus and coach stations, airports, and ferry terminals
- PCPI_LIGHTING_GUIDE_web.pdf (securedbydesign.com)
- Resources | Institution of Lighting Professionals (theilp.org.uk)
- Lighting Against Crime | Institution of Lighting Professionals (theilp.org.uk)

Appendices

Appendix 1 – Mapping of the network lighting levels in the borough after implementation