



City of Westminster

Cabinet Member Report

Decision Maker:	Cabinet Member for Environment and City Management
Date:	24 September 2019
Classification:	For General Release
Title:	Light-Emitting Diode (LED) lantern rollout programme and Central Management System (CMS) for Public Lighting
Wards Affected:	Borough wide
Policy Context:	The planned rollout supports the ‘City for All’ vision in delivering a lit night time environment meeting current lighting standards. The programme will support the healthier and greener city initiative, crime reduction, the clean air manifesto and the delivery of a key element of the Highways Capital Programme. The programme will reduce energy consumption and in so doing service carbon emissions.
Financial Summary:	The capital cost of LED and CMS programme is £6.442 million spread across 3 financial years (2019/20 – 2021-22). The capital cost of the programme was approved in 2017 for £6.56m and has a budget code C.WD12118. The revenue cost of CMS operation is £61,000 per annum. It is expected that once installations are complete, a minimum 30% energy saving will be achieved, and reactive maintenance activity will reduce to achieve the MTP savings of £270K over the 3 years of the rollout.
Report of:	Kevin Goad – Director, City Highways
Report authors:	Dean Wendelborn (Street Lighting Project Manager) and Dan Perks Operations Manager – City Highways.

1. Executive Summary

- 1.1. This report seeks approval for the rollout of LED lantern replacement and Central Management System (CMS) in respect of Highways Public Lighting replacing an aged and increasingly failing asset.
- 1.2. The recommendation is for the Urban Control CMS to be installed city wide replacing with existing Lucy Zodion system that covers 50% of the city. The Urban Control system was chosen after a trial of three systems (Urban Control, Signify and Luminext) where operability, cost and IT security were the key elements of evaluation, and provides a more robust service with the ability to control lighting levels and identify faults remotely and transfer data from on-column sensors.
- 1.3. The new lanterns and CMS would be installed over 2.5 years, replacing the existing 3,500 CMS in lanterns already changed to LED since 2016, and replacing or retrofitting the remaining 11,500 lanterns with LED and CMS.
- 1.4. The capital cost of the works is £6.44 million and would be delivered from the existing approved capital programme. It is expected that the roll out of the new LED and CMS would support achievement of the MTP savings of £270K as a result of reduced maintenance and energy costs.

2. Recommendations

- 2.1 That the Cabinet Member for Environment and City Management approves the continued rollout of LED lanterns and CMS for lighting at a calculated gross cost of **£6,442,000** as detailed in Section 8.1 and Appendix C, subject to the relevant IT security authorisations being gained.
- 2.2 That the Cabinet Member for Environment and City Management delegates to the Executive Director of City Management and Communities the authority to make changes to the programmes agreed, subject to the proviso that the overall budget is not exceeded and that the Cabinet Member is consulted on any significant changes.

3. Reasons for Decision

- 3.1 The existing luminaries and CMS system employed are outdated, poorly performing and coming to end of life. The number of lantern faults in the last twelve months was 4,300, far in excess of the acceptable 98% in good working order. The rollout of LED luminaires will bring all roads and footpaths up to current British lighting standards, reduce energy consumption by a minimum 30% and in so doing carbon output. It will also reduce lighting faults by approximately 60%-70% and will save on maintenance repair visits, all of which supports the City's Air Quality Manifesto objectives.
- 3.2 A CMS will provide the Council full remote visibility and control of the street lighting stock. It will allow a reduction in night scout visits and allow intelligent

profiling of lighting levels throughout the hours of darkness to appropriately light the road for the given traffic volumes as set out in the British standards.

- 3.3 The CMS can support a future Smart Cities project through IoT (Internet of Things) sensors which can support other departments across the council.

4. Background, Including Policy Context

- 4.1 The street lighting in Westminster is of local and national importance with a mixture of heritage and functional lighting, 300 of which are listed structures. As such, we have a responsibility to ensure they are kept in world class condition, provide the right quality of light at the right time in the right area when required.
- 4.2 The aim of public lighting is to encourage a safe environment for all highway users and pursuits, where people and vehicles can see and be seen. Hence meeting the council's duties under Section 17 of the Crime and Disorder Act 1998.
- 4.3 In 2011 the council commenced installation of a CMS solution operated by Harvard Technologies Limited to half of the street lighting stock, however the company went into administration in November 2018 which limited system control. The Administrators sold the Harvard system to Lucy Zodion on 1st April 2019. Prior to these issues in 2017 officers identified unacceptable levels of lighting faults with the Harvard system and commenced work with FM Conway to identify an appropriate replacement system. Due to the high level of faults in the Harvard system 2000 lanterns were removed from the CMS and placed on a standard dusk to dawn photocell.
- 4.4 The current highway street lighting is a mixture of traditional and current light sources with different colour appearances due to the advancing improvements of lantern development and efficiencies. This means that adjoining roads and even columns on the same street have different coloured lamps in some locations, which can be difficult for some road users to easily make out different shapes, obstacles or people's faces. LED luminaires can provide a higher colour rendering, making objects have a similar colour to the daytime appearance.

5. Research, Trials and Outcome

- 5.1 In early 2018, £200K of Community Infrastructure Levy (CIL) funding was gained to support a trial of LED/CMS options. Trials of LED luminaires and retrofits into heritage lights have been undertaken by the Lighting Service provider, FM Conway, finding solutions that work for the various road environments within the City, and that also keep the heritage lanterns aesthetic appearance intact. FM Conway's LED luminaire trial findings are provided in Appendix A

- 5.2 The trial findings recommended that for functional lanterns, the Urbis Axia LED lantern is used. The service provider found it to provide excellent performance, cost effective and is a tried and testing luminaire throughout the UK. It is recommended that for heritage lantern retrofit LED geartrays, that retain the existing heritage lantern, the service provider advised that the Indo Lighting retrofit geartrays is used, providing cost effective sealed bowls, and allow an efficient installation process for the various types of lanterns in WCC.
- 5.3 Signify, Luminext and Urban Control CMS have been compared on grounds of cost, operability in the inner city (high rise) urban environment, compatibility with existing systems and capabilities for use as part of a smart city solution (support data transfer from a variety of sensors). Without a CMS system, WCC will be reliant on night scouts to identify faults and will not have the ability to remotely control lights, which gives added benefit to residents, the Police, and various events that happen within the City throughout the year.
- 5.4 FM Conway CMS trial findings are provided in Appendix A. The trials considered cost, performance in the city and IT security. The outcome was the service provider recommended the Luminext CMS system. However, as Luminext do not have a presence or approval to operate in the UK market, and to ensure a tried and tested system it is the recommendation that Urban Control CMS is installed. (Appendix B – Urban Control proposal)
- 5.5 Urban Control is the recommended CMS solution because it performed well for operation in an inner-city urban environment, is used by neighbouring London boroughs and has the relevant Elexon (UK Power Network) approvals. The Urban Control system is widely used in the UK and the world. The system backed by Itron (£2 billion US tech firm) provides the level of confidence the Council needs to know the system will be maintained and kept in a high standard. There will be ongoing system management and hosting costs by Urban Control to maintain the server and cloud-based web management front end applications, which will be integrated with the Council's asset and defect inventory software (Confirm).
- 5.6 Urban Control is currently used in the City of London and London Borough of Brent. As part of the trials and due diligence, officers made a reference visit to the City of London in May 2019 to gain an insight into system operation in a dense urban environment and were satisfied all the necessary requirements were met. During the visit the City of London made us aware that the Signify system trial they had undertaken hadn't worked so this system was not included in the costed options shown below.
- 5.7 Officers also engaged with colleagues at the London Borough of Brent in July 19 about the installation and operation of Urban Control and gained very positive feedback.
- 5.8 The Urban Control system can support a future smart city solution and already deploys air quality monitors, traffic analytic cameras and road temperature sensors.

5.9 For the purposes of comparability, the costs of design, build and operating for 12 years were gained and are shown in the table 1 below.

Table 1 - Options costings

Option	CMS (£k)	Lanterns/Gear Trays (£k)	NAAS/SAAS/Confirm integration (over 12 years) (£k)	Total (£k)
Luminext	1,700	4,110	740	6,550
Urban Control	2,130	4,110	670	6,910

6. Procurement

6.1 The works will be procured through our existing contract with FM Conway for Highways Maintenance and Management and Public Realm Projects (2014-2022 + 4 years extension)

7. Programme Delivery

7.1 Upon approval it will take 2.5 years to install the LED lanterns and CMS nodes. We will need to keep the existing CMS (now taken over by Lucy Zodion) in operation throughout that period.

7.2 Given fault levels with the existing system our priority is to replace the existing Lucy Zodion CMS system first to getting those lights operating consistently as soon as possible, following cabinet approval this is programmed for a start in September/October. The programme for the remaining CMS will be rolled out in conjunction with the LED lantern deployment. The service provider's preferred programme rollout will prioritise replacing the non-functioning CMS system in lanterns already changed to LED, first functional LED lanterns then heritage LED lanterns. Following this, functional lanterns will be replaced by LED along with CMS at the same time, and lastly, heritage geartrays retrofits with CMS.

8. Financial Implications

8.1 The capital and revenue implications are shown below in table 2. The capital for the works was agreed two years ago and can be fully funded from Capital Budget C.WD12118

8.2 MTP savings of £150K for the 2020/21 year will be gained from the roll out of the LED lanterns as a consequence of reduced maintenance and energy. There

will be additional MTP savings of £60K in years 2021/22 and 2022/23 as part of the ongoing capital investment as noted in Table 5. (These MTP savings exclude the £130k relating to the replacement of gas lights).

Capital Budget

The table 2 below shows the costs of the project;

Table 2 – detailing profile of Capital spend

Activity	Annual Cost 2019/20 (£k)	Annual Cost 2020/21 (£k)	Annual Cost 2021/22 (£k)	Total Cost (£k)	Comments
LED Upgrade	814	1,872	1,555	4,241	This is the cost of upgrading all lanterns in the City to LED, For functional lanterns this is complete replacement and for heritage lanterns this is a retrofit of geartrays including existing lantern removal and electrical testing
Urban Control CMS	655	792	754	2,201	This is the cost of the Urban Control system including installation of hardware, software and middleware to ensure compatibility with existing WCC systems
Capital Budget	1,469	2,664	2,309	6,442	

Table 3 – detailing anticipated roll out of equipment

Volume	2019/20	2020/21	2021/22	Total	Comments
LED Upgrade	2,300	5,300	4,300	11,900	Volume of LED lanterns replaced, year 1 ¼ of function lanterns, year 2 ¾ of functional lanterns and ¼ heritage retrofits, year 3 ¾ heritage retrofits
Urban Control CMS	4,800	5,300	4,300	14,400	Volume of CMS nodes installed, year 1 all existing Harvard nodes and ¼ of functional LED lanterns, years 2 and 3 as with LED lanterns

The functional lanterns cost less to replace with LED than the heritage lanterns.

Revenue Budget

The LED replacement programme is expected to give a benefit to future revenue maintenance costs by reducing the amount of streetlight outages, and the CMS reducing the amount of required night scouts. This will also help negate the impact of recent energy increases.

The revenue cost of the CMS system is £61,000 per annum which is cheaper than our existing CMS costs of £67,000. There will be a crossover period where we will have both systems in use, but the programme will start with switching out the old CMS nodes to reduce these costs. The budget code is W26560/4861.

Table 4 – Revenue Budgets

Activity	Annual Cost 2019/20 (£k)	Annual Cost 2020/21 (£k)	Annual Cost 2021/22 (£k)	Ongoing annual costs (£k)	Comments
Existing CMS	67	34	0	0	This will reduce by 50% in the first year as we convert to new CMS
Urban Control CMS	10	30	61	61	This is the cost of the Urban Control system including installation of hardware, software and middleware to ensure compatibility with existing WCC systems
Revenue Budget	77	64	61	61	

Table 5 – Savings from reduced energy and maintenance

Activity	2020/21 (£k)	2021/22 (£k)	2022/23 (£k)	Total Savings (£k)
MTP Savings	150	60	60	270

These MTP savings exclude the £130k relating to the replacement of gas lights.

9. Legal Implications

- 9.1 The City Council, as local highway authority, has a duty under the Highways Act 1980 to ensure the effective maintenance and management of the Council's highway and highway assets (including lighting), and that they remain safe and effective. The programmes set out in this report help discharge the City Council's duty in this respect.
- 9.2 The existing Contract A with FM Conway for Highways Maintenance and Management and Public Realm Projects provides for FM Conway to deliver such public lighting systems for the City Council and accordingly, this proposal is compliant with the Public Contracts Regulations. The contract has a term till 2022 and can be extended for a further 4 years.
- 9.3 To cover the eventuality of continuing to avail of the services and benefits of the LED and CMS from Urban Control, it is being ensured that FM Conway's contract with Urban Control contains a suitable novation clause enabling the contract to be novated to the City Council or its new Service Provider as part of exit management plan of FM Conway's aforesaid contract with the City Council.

10. Staffing Implications

- 10.1 There are no staffing implications arising from this report. The works will be undertaken by FM Conway as part of the existing Highways Maintenance Management and Public Realm Projects (2014-2022)

11. Business Plan Implications

- 11.1 The works programmes presented in this report have been developed using recognised good practice and Value Management techniques and Asset Management principles.
- 11.2 The recommended programme supports the Clean Air Manifesto, Economic Development, Crime Reduction and Well Managed Highways elements of the Business Plan.

12. IT Implications

- 12.1 Urban Control have met with our Enterprise Architecture team to discuss future opportunities across the Council's services in terms of a Smart City approach and IT security.
- 12.2 There have been a number of meetings between Urban Control and The City Council's IT team and these meetings will continue to ensure that the system confirms to relevant security standards. The City Council's IT team are also going to engage with the City of London IT team and are due to meet with the

independent security advisor that worked for the City of London during their rollout.

- 12.3 The Urban Control system allows for data from column mounted sensors to be transferred in other council systems. The City Council's IT team will be working with Urban Control to explore this added value.

13. Consultation

- 13.1 The City Council agreed the installation of LEDs in 2016 and this is an acceleration of that programme. No additional consultation is planned.

14. Crime and Disorder Act 1998

- 14.1 It is recognised that good street lighting has a deterrent effect on street crime and burglaries etc. All street lighting improvement schemes within the capital programme, take into account the need for better lighting. The Lighting against Crime programme is specifically targeted at crime hot-spots identified using information relating to crime and developed in liaison with the police. The change to the use of white light sources is having beneficial effects on the quality of the night-time CCTV and for individuals to be able to recognise friend or foe more easily.

15. Health and Safety Issues

- 15.1 The proposed programme will improve the lighting experience for residents and visitors and help support crime reduction.
- 15.2 All works undertaken will be closely monitored and carried out to the requirements of the Health & Safety at Work Act 1974 and the Construction (Design and Management) Regulations 2015.

16. Impact on Health and Wellbeing

- 16.1 The proposals identified in this report are considered to have a minimal impact on the health and wellbeing of the community. Whilst some low level negative impacts may be experienced during the works (associated with vehicles and some glare of new lights when first installed), overall the works are expected to produce benefits for the community with better controllable lighting. Shields on the rear of lanterns will be available upon request, but the nature of LED lighting is very directional than traditional light sources and we expect this demand to be low compared to older light sources.

17. Outstanding issues

- 17.1 The smart cities element of the project is breaking new ground for the Council and the Council's IT Security team will continue to work with Urban Control and the City of London's IT security consultant to ensure that the system complies with the relevant IT security standards.

If you have any queries about this report or wish to inspect any of the Background papers please contact: Dean Wendelborn on 020 7641 1885 or dwendelborn@westminster.gov.uk, or Daniel Perks on 020 7641 7971 or email dperks@westminster.gov.uk

BACKGROUND PAPERS

Westminster LED & Functional Luminaire Review 2014

For completion by the **Cabinet Member for Environment & City Management**
I have <no interest to declare / to declare an interest> in respect of this report

Signed:

Date:

NAME:

Councillor Tim Mitchell, Cabinet Member for Environment & City Management

State nature of interest if any

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(N.B: If you have an interest you should seek advice as to whether it is appropriate to make a decision in relation to this matter)

For the reasons set out above, I agree the recommendation(s) in the report entitled

Light-Emitting Diode (LED) lantern rollout programme and Central Management System (CMS) for Public Lighting and reject any alternative options which are referred to but not recommended.

Signed

Councillor Tim Mitchell, Cabinet Member for Environment & City Management

Date

If you have any additional comment which you would want actioned in connection with your decision you should discuss this with the report author and then set out your comment below before the report and this pro-forma is returned to the Secretariat for processing.

Additional comment:

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If you do not wish to approve the recommendations, or wish to make an alternative decision, it is important that you consult the report author, the Director of Law, Strategic Director Finance and Performance and, if there are resources implications, the Strategic Director of Resources (or their representatives) so that (1) you can be made aware of any further relevant considerations that you should take into account before making the decision and (2) your reasons for the decision can be properly identified and recorded, as required by law.

Note to Cabinet Member: Your decision will now be published and copied to the Members of the relevant Policy & Scrutiny Committee. If the decision falls within the criteria for call-in, it will not be implemented until five working days have elapsed from publication to allow the Policy and Scrutiny Committee to decide whether it wishes to call the matter in.

Appendices

Appendix A – Trial LED & CMS findings

Appendix B – CMS details

Appendix C – LED & CMS cost breakdown

Appendix D – Historical Reactive Maintenance Costs