

North Yorkshire County Council**Executive****26 September 2017****Accelerated roll-out of LED Street Lights****Report of the Corporate Director – Business and Environmental Services and the
Corporate Director – Strategic Resources****1.0 Purpose of the Report**

- 1.1 To seek approval from the Executive to replace 7000 of North Yorkshire County Council's existing street lights with new energy efficient Light Emitting Diode (LED) lanterns during the remainder of 2017/18.
- 1.2 To seek approval for Capital investment of £2,042,303 to fund the replacement of the 7000 LED lanterns during the remainder of 2017/18.
- 1.3 To seek approval of the procurement of the initial 7000 LED lanterns through an existing PBO (Public Buying Organisation) framework and to offer the installation of these lanterns to Ringway to be undertaken within the framework of the existing Highways Maintenance Contract by the end of 2017/2018.

2.0 Background

- 2.1 The 50,400 North Yorkshire County Council street lights cost around £2.1million to power and £1.2 million to maintain each year. To help reduce these costs the County Council is running an ongoing programme to gradually replace old street light technologies with new more efficient LED equipment. The LED equipment costs less to power and is more reliable. To date around 6000 units have been converted to LED (leaving 44,071 to be converted) although at the current rate of replacement the programme will not be completed until 2057.
- 2.2 Current EU legislation has banned or is phasing out certain types of street lighting equipment that contain chemicals likely to harm the environment, such as mercury and sodium. This will affect 20% of the County Council's street lighting network.

3.0 Summary of the LED Street Lighting Business Case

- 3.1 Energy savings will be derived from more efficient lighting and maintenance costs will be reduced through more reliable lanterns, requiring less frequent cyclical maintenance and resulting in a reduced number of defects.
- 3.2 This report recommends the replacement of the remaining 44,071 lanterns with LED lanterns with a 20 year guarantee in a shorter (2.5 year) timescale to deliver savings earlier. However, due to the significant investment required, the decision sought is for an initial 7000 LED lanterns.

4.0 Financial Implications

- 4.1 The accelerated roll out of LED street lights was identified as an opportunity during the 2017/18 budget process but was not included as further work was required to develop the business case.
- 4.2 If the full replacement programme is approved, the savings of £1,004k on energy and £281k on maintenance will be saved from the street lighting revenue budget at the end of the 2.5 year programme. This is a total reduction of £1,285k but is phased over the programme as follows:-

	Phase 1	Phase 2	Total
Lanterns	7,000	37,071	44,071
Capital Cost	£2,042,303	£10,815,742	£12,858,045
Full year revenue saving	£204,121	£1,080,995	£1,285,116
Return on Investment	10.0%	10.0%	10.0%

- 4.3 At this stage approval is only being sought for the element in 2017/18 (phase 1). It should be noted that whilst capital investment is being sought the future savings will be revenue-based and will reduce ongoing revenue budgets.
- 4.4 Energy prices are rising with a 15% increase already imposed in 2017 and a further projected increase of 15% by 2020. No change to the County Council's street lighting stock could see a £600k increase in the Council's street lighting energy bill by 2020.
- 4.5 This proposal reduces the Authority's exposure to those likely future energy price increases. In order to present the most prudent view, the business case has assumed a flat rate of energy costs over 20 years, therefore expected increases will improve the financial return of the investment. To help illustrate this, the 15% increase in energy costs predicted will improve the payback period by more than 3 years.
- 4.6 Approval for funding is sought in two phases to allow the bulk of the investment to be considered as part of the standard budget approval process, whilst allowing NYCC to realise the benefits as early as possible.
- 4.7 This report is seeking approval for an initial investment of £2,042,303 to deliver the installation of 7000 LED's between September 2017 and March 2018.
- 4.8 Approval for the funding to deliver the remaining 37,071 LED's will be sought in February 2018 via the Council budget process subject to availability of corporate funding. This would therefore be a further funding request of £10,815,742 (total investment required over the life of the programme would be £12,858,045).
- 4.9 The funding is requested from reserves and the rate of return demonstrated by this investment is significantly better than that which is generated through current treasury management returns.

5.0 Equalities Implications

- 5.1 An Equalities Impact Assessment has been undertaken and the EIA Summary is set out in section 5.2 and 5.6 below.

- 5.2 The financial and sustainability benefits of LED lighting are very significant and well understood. The proposal is also likely to deliver a range of difficult to measure benefits to a large group of people through improved personal safety on better lit roads and pavements, and improved perceptions of safety.
- 5.3 However research evidence suggests that LED lighting may also negatively impact a small number of people with specific health or visual impairment issues. While the evidence is not fully understood, advice is to avoid using bluish-white light. As a relatively 'late adopter', NYCC can avoid the use of technology that throws out bluish white light. The installation of 4000K lighting (with potential to move to 3000K lighting as the programme progresses) seems likely to greatly reduce the potential for negative impacts.
- 5.4 NYCC will mitigate the potential negative impact through offering to install front, side or rear shields around a lantern if it causes specific problems e.g. directly outside somebody's bedroom window. These mitigation measures will be offered in response to complaints as they impact on the lighting performance.
- 5.5 Once available, NYCC will also offer to use 3000K lighting (the 'warmer' light that is closer to old-style sodium lanterns) in response to health related complaints received.
- 5.6 Therefore the overall conclusion of the EIA is to continue the proposal, while being ready to offer potential solutions on a case by case basis to mitigate specific problems.
- 5.7 A copy of the full EIA is attached as Appendix A.

6.0 Legal Implications

- 6.1 The proposed conversion of County Council assets to energy efficient LED is consistent with the national guidance on street lighting maintenance (Design Manual for Roads and Bridges and Well Lit Highways Code of Practice) and will enable the County Council to reduce energy costs and carbon consumption in keeping with the Government's aim of reducing UK Carbon Emissions

7.0 Procurement

- 7.1 A Gateway 1 report has been completed and it considers the options available for the County Council to procure the necessary equipment and to undertake the conversion of all North Yorkshire County Council street lighting to energy efficient LED technology.
- 7.2 The recommended option is to use a Public Buying Organisation (PBO) framework such as the Yorkshire Purchasing Organisation (YPO) to procure the lanterns for 2017/18 and to have the Council's current Highways Maintenance Contractor, Ringway carry out the installations.
- 7.3 The quality and volume of the LED installations completed in 2017/18 will be closely monitored and will inform decisions on whether to offer the installation of the remaining 37,071 LED lanterns to Ringway.

8.0 Risks

- 8.1 The associated risks of the project have been considered and a mitigation plan has been put in place to help ensure successful delivery. A summary of the key risks is as follows:

Risk	Mitigation / Action
Impact of removal of maintenance work from Highways Maintenance Contract	The recommended option will minimise the impact on the existing Highways Maintenance Contract with Ringway and reduce the associated risks of compensation events or impacting on remaining street lighting work.
LED performance / quality / colour	Lanterns with a 20 year warranty and the lowest level of blue light available to be used Lighting design to be completed to ensure most appropriate lanterns used
Unexpected volume of column / bracket replacements	Budget has been included in the project for expected volume of column/bracket replacement. Volume of actual replacements will be monitored during rollout.
Impact on members of public, astronomers and wildlife	Screens can be fitted to resolve individual issues. Lighting design to be completed to ensure highest quality lighting and minimise light pollution Lanterns with lowest level of blue light available to be used Conservation areas to be rolled out as late in programme as possible to allow latest LED's to be installed.

9.0 Recommendations

- 9.1 That the Executive approve the recommend option to replace 7000 of North Yorkshire County Council's existing street lights with new energy efficient LED lanterns during the remainder of 2017/18.
- 9.2 That the Executive approve the Capital investment of £2,042,303 to fund the replacement of the initial 7000 LED lanterns during the remainder of 2017/18. Approval for the capital investment for the financial years 2018/19 and 2019/20 will be sought via the annual budget report to the Executive in February 2018 subject to availability of corporate funding.
- 9.3 That the Executive approve procurement of the 7000 lanterns through an existing PBO (Public Buying Organisation) framework such as YPO then offer the installation of these lanterns to Ringway to be undertaken within the framework of the existing Highways Maintenance Contract.

DAVID BOWE
Corporate Director
Business and Environmental

GARY FIELDING
Corporate Director
Strategic Resources

Author of report: Claire Cooper

Background documents: Gateway 1 Procurement Report

Equality impact assessment (EIA) form: evidencing paying due regard to protected characteristics

(Form updated May 2015)

Accelerated roll-out of LED Streetlights

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যদি আপনি এই ডকুমেন্ট অন্য ভাষায় বা ফরমেটে চান, তাহলে দয়া করে আমাদেরকে বলুন।

如欲索取以另一語文印製或另一格式製作的資料，請與我們聯絡。

اگر آپ کو معلومات کسی دیگر زبان یا دیگر شکل میں درکار ہوں تو برائے مہربانی ہم سے پوچھئے۔

Equality Impact Assessments (EIAs) are public documents. EIAs accompanying reports going to County Councillors for decisions are published with the committee papers on our website and are available in hard copy at the relevant meeting. To help people to find completed EIAs we also publish them in the Equality and Diversity section of our website. This will help people to see for themselves how we have paid due regard in order to meet statutory requirements.

Name of Directorate and Service Area	Business and Environmental Services, Highways & Transportation
Lead Officer and contact details	Paul Gilmore, Electrical Engineering Manager, BES
Names and roles of other people involved in carrying out the EIA	Mike Douglas, Performance and Improvement Officer, BES

How will you pay due regard? e.g. working group, individual officer	Individual Officers, taking account of published research and feedback from practical testing undertaken elsewhere.
When did the due regard process start?	January 2017

Section 1. Please describe briefly what this EIA is about. (e.g. are you starting a new service, changing how you do something, stopping doing something?)

The proposal is to accelerate the replacement of a range of present street-lighting owned by NYCC, with new LED alternatives.

To date around NYCC have replaced about 6000 older-style street lighting lanterns with LED equipment. These lights have been replaced when the opportunity has arisen for example when existing lanterns have failed. Due to the approach taken thus far, the 6000 LED lights are widely spread around the county.

The proposal will be to replace this piecemeal approach with a programme to move all streetlights onto the new LED basis over a 2.5-year period.

The scope is limited to highway lighting owned by NYCC. District, Parish or Town Council street lights are not part of this proposal.

Section 2. Why is this being proposed? What are the aims? What does the authority hope to achieve by it? (e.g. to save money, meet increased demand, do things in a better way.)

LED streetlights give a number of technical and financial benefits over the range of older technology non-LED lights.

- a) Use less energy.
- b) Longer lasting – requiring less routine maintenance.
- c) More resilient – require less reactive maintenance.
- d) Throw a more focused light beam downwards onto pavements and highways (ie the areas that we want to light), with less light thrown upwards and sideways (reduced light pollution).

The proposal will see an investment of £12.85m over a 2.5 year timeframe. We expect it to deliver a revenue budget saving of £1.285m per year.

The proposal will also reduce the environmental footprint of North Yorkshire streetlighting by saving an estimated 3360 tonnes CO2 per year.

The proposal is expected to make North Yorkshire's highways and pavements safer through being better lit.

Section 3. What will change? What will be different for customers and/or staff?

The proposal is to accelerate the replacement of street lights with LED alternatives. To this point about 6000 LED streetlights have been installed.

Over a 2.5 year period, North Yorkshire residents will see their streetlights migrate to LED so that by 2020, all North Yorkshire County Council owned street lights will have LED's. The proposals do not include any change to the location of street lights or to the length of time that street lights will burn.

The proposals will not impact on street lights owned by Town, Parish or District Councils.

Lighting will be designed to the minimum levels permitted by the British Standard. In some cases this will mean a reduction in the lighting levels however it may also involve an increase in the level of illumination in certain areas.

Therefore the impact on residents will be due to the different look and feel of LED streetlights.

Research suggests that some residents including those with some visual impairments have reported finding LED light harsh. The fittings that we installed up to the start of 2016 were all 5000K lanterns which tend to give out a focused whiter light. LED lighting technology is developing rapidly and newer LED's now provide a warmer light while retaining the technical and financial benefits. As a relatively late adopter, NYCC is able to propose using 4000K lanterns for this programme, which means that NY residents will see less difference between their existing lights and new LED streetlights. We will continue to monitor improvements in the technology and will consider 3000K lighting in Conservation areas. If the financial benefits of the technology improves sufficiently we will switch to using it as standard during the three year programme, however at the moment it is not as energy efficient as the 4000K lanterns which we currently use and propose to use for the programme.

There should be no difference for staff.

Section 4. Involvement and consultation (What involvement and consultation has been done regarding the proposal and what are the results? What consultation will be needed and how will it be done?)

None so far and no direct consultation planned.

Many local authorities across the country have adopted LED technology, with some undertaking physical trials of different lighting solutions. The results should be transferable to residents in North Yorkshire. We tried unsuccessfully to access the results of lighting trials conducted elsewhere.

Therefore we have relied on the results of published research evidence to understand the implications of LED lighting.

Section 5. What impact will this proposal have on council budgets? Will it be cost neutral, have increased cost or reduce costs? Please explain briefly why this will be the result.

The proposal is to invest £12.85m over a 2.5 year period to replace approximately 47,000 lights. We expect it to deliver £1.285m revenue savings per year.				
Section 6. How will this proposal affect people with protected characteristics?	No impact	Make things better	Make things worse	Why will it have this effect? Provide evidence from engagement, consultation and/or service user data or demographic information etc.
All residents including groups of people with protected characteristics	X			<p>The replacement of approximately 6000 streetlights with LED over the last few years has resulted in very few comments complaints.</p> <p>This suggests that on balance residents are unlikely to be negatively impacted by the new lighting.</p>
All residents including groups of people with protected characteristics		X		<p>There are likely to be positive impacts on safety for residents including people in all of the protected groups through better and more focused lighting of highways and footways. This is likely to reduce accidents through people being better able to see.</p> <p>The proposal is to design to the location rather than generically and therefore we should be able to avoid a light 'puddling' effect where people will walk in and out of areas of lighting. The approach is to provide a consistent quality of light.</p> <p>National research suggests that street-lighting has little or no impact on levels of crime and anti-social behaviour. However they also suggest that improved lighting may have a positive benefit on feelings of personal safety after dark. The research evidence is mixed. While any benefit would apply to all residents it could be expected to apply particularly to those with lower perception of safety.</p>
All residents including groups of people with			X	Potential for LED lighting to impact negatively on sleeping patterns where the lighting effectively replicates daylight. Typically this is

protected characteristics				<p>where streetlights are bluish-white and at the colour temperature of daylight (about 5700K).</p> <p>However the proposal is for NYCC to roll out 4000K lanterns which fall between the 'cool colours' associated with daylight and 'warmer colours' of previous sodium streetlights. In fact the proposed streetlights provide a light similar to that of moonlight. Therefore there is little reason to expect the new lighting to impact on sleep patterns.</p> <p>The suggestion is to offer a directional shield around the street light for customers for whom the roll-out causes a specific problem. For example where a streetlight is directly outside a bedroom window we would offer to design in a different way.</p>
Age	X	X		As above for neutral and positive benefits.
Disability	X	X		As above for neutral and positive benefits.
Age and Disability			X	<p>Research evidence points to bluish-white light having some negative health effects or causing some difficulty for a proportion of people with some types of health problems. For example there is a suggestion that exposure to bluish light may contribute to the development of age-related macular degeneration. However evidence is not conclusive.</p> <p>For some people with impaired sight, whiter light can improve the contrast between print and background, but for others it may be problematic through generating too much glare. Again evidence is mixed.</p> <p>There are suggestions that higher colour temperature lighting may cause a negative impact for some people with autism or epilepsy. Again this is not fully understood.</p>

				<p>Overall research evidence appears to be patchy and it is not possible to reach strong conclusions. However the American Medical Association recommends avoiding bluish-white lighting.</p> <p>The proposal is for NYCC to roll out 4000K lanterns which fall between the 'cool colours' associated with daylight and 'warm colours' of previous sodium streetlights. In fact the proposed streetlights provide a light similar to that of moonlight. Therefore the new lights would be seem likely to avoid the negative issues associated with bluish-white lighting.</p>
Sex (Gender)	X	X		As above for neutral and positive benefits. There is no reason to believe that the proposal will have any negative impact due to gender.
Race	X	X		As above for neutral and positive benefits. There is no reason to believe that the proposal will have any negative impact due to race.
Gender reassignment	X	X		As above for neutral and positive benefits. There is no evidence to suggest that lighting will have any negative impact for transgendered people.
Sexual orientation	X	X		As above for neutral and positive benefits. There is no reason to believe that the proposal will have any negative impact due to a person's sexual orientation.
Religion or belief	X	X		As above for neutral and positive benefits. There is no reason to believe that the proposal will have any negative impact due to a person's religion or belief.
Pregnancy or maternity	X	X		As above for neutral and positive benefits. There is no reason to believe that the proposal will have any negative impact due to pregnancy or maternity.
Marriage or civil partnership	X	X		As above for neutral and positive benefits. There is no reason to believe that the proposal will have

				any negative impact due to marital status.
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Section 7. How will this proposal affect people who...	No impact	Make things better	Make things worse	Why will it have this effect? Provide evidence from engagement, consultation and/or service user data or demographic information etc.
..live in a rural area?	X	X		As above for neutral and positive benefits. There is no reason to believe that the proposal will have any negative impact on people living in rural areas.
...have a low income?	X	X		As above for neutral and positive benefits. There is no reason to believe that the proposal will have any negative impact on people with lower incomes.

Section 8. Will the proposal affect anyone more because of a combination of protected characteristics? (e.g. older women or young gay men) State what you think the effect may be and why, providing evidence from engagement, consultation and/or service user data or demographic information etc.

The demographic profile suggests that a larger proportion of older people will also tend to have problems with visual impairment – as a natural part of ageing. As set out above the impact will be both positive and negative.

Section 9. Next steps to address the anticipated impact. Select one of the following options and explain why this has been chosen. (Remember: we have an anticipatory duty to make reasonable adjustments so that disabled people can access services and work for us)

Tick option chosen

1. No adverse impact - no major change needed to the proposal. There is no potential for discrimination or adverse impact identified.

2. Adverse impact - adjust the proposal - The EIA identifies potential problems or missed opportunities. We will change our proposal to reduce or remove these adverse impacts, or we will achieve our aim in another way which will not make things worse for people.

3. Adverse impact - continue the proposal - The EIA identifies potential problems or missed opportunities. We cannot change our proposal to reduce or remove these adverse impacts, nor can we achieve our aim in another way which will not make things worse for people. (There must be compelling reasons for continuing with proposals which will have the most adverse impacts. Get advice from Legal Services)

4. Actual or potential unlawful discrimination - stop and remove the proposal – The EIA identifies actual or potential unlawful discrimination. It must be stopped.

X

Explanation of why option has been chosen. (Include any advice given by Legal Services.)

The financial and sustainability benefits are very significant and well understood. The proposal is also likely to deliver a range of difficult to measure benefits to a large group of people through improved personal safety on better lit roads and pavements, and improved perceptions of safety.

However research evidence suggests that LED lighting may also negatively impact a small number of people with specific health or visual impairment issues. While the evidence is not fully understood, advice is to avoid using bluish-white light. As a relatively 'late adopter', NYCC can avoid the use of technology that throws out bluish white light. The installation of 4000K lighting

(with potential to move to 3000K lighting as the programme progresses) seems likely to greatly reduce the level of negative impact.

We will mitigate the potential negative impact through offering to install front, side or rear shields around a lantern if it causes specific problems eg directly outside somebody's bedroom window. These will be offered in response to complaints as they impact on the lighting performance.

We could also offer to use 3000K lighting (the 'warmer' light that is closer to old-style sodium lanterns) in response to health related complaints received.

Therefore the overall conclusion is to continue the proposal, while being ready to offer potential solutions on a case by case basis to mitigate specific problems.

Section 10. If the proposal is to be implemented how will you find out how it is really affecting people? (How will you monitor and review the changes?)

We would monitor impact through the number and type of complaints raised in response to new street lighting.

Section 11. Action plan. List any actions you need to take which have been identified in this EIA, including post implementation review to find out how the outcomes have been achieved in practice and what impacts there have actually been on people with protected characteristics.

Action	Lead	By when	Progress	Monitoring arrangements
Monitor complaints - number and type	Paul Gilmore	Ongoing, but every quarter throughout the programme.		As part of regular performance management.
Offer mitigation through using shields or different lanterns in response to specific complaints.	Paul Gilmore	Ongoing		As part of regular performance management.

Section 12. Summary Summarise the findings of your EIA, including impacts, recommendation in relation to addressing impacts, including any legal advice, and next steps. This summary should be used as part of the report to the decision maker.

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Therefore the overall conclusion is to continue the proposal, while being ready to offer potential solutions on a case by case basis to mitigate specific problems.

Section 13. Sign off section

This full EIA was completed by:

Name: Paul Gilmore

Job title: Electrical Engineering Manager

Directorate: Business and Environmental Services.

Signature:

Completion date: 14th September 2017

Authorised by relevant Assistant Director (signature):

Date: