

DERBYSHIRE COUNTY COUNCIL

CABINET MEETING

15 July 2014

Report of the Strategic Director – Economy, Transport and Environment

INVEST TO SAVE FUNDING PROPOSAL FOR STREET LIGHTING (JOBS, ECONOMY AND TRANSPORT)

(1) **Purpose of the Report** To inform Cabinet of the benefits and affordability of an invest to save proposal for street lighting to assist mitigate and sustain required revenue budget savings, and deliver further revenue savings through significantly reduced energy usage.

(2) **Information and Analysis** Increases in energy costs and carbon reduction targets have required detailed investigations into how the Council can better manage both these and also any potential volatility in the energy supply market. There is also a need to improve the whole life costing of the Council's highway lighting stock so as to sustain required revenue budget reductions from the service.

Current Challenges for Street Lighting

Street lighting energy costs in 2003 were £1.239 million per annum and by the end of 2013 this had increased to £3.142 million per annum, a 154% increase in energy costs over ten years. This is despite recent energy saving initiatives being introduced by the service through use of more energy efficient equipment and, over the last two years, part night lighting schemes. The current level of investment in energy efficient equipment and the need to deliver properly risk assessed part night lighting schemes, rather than switch all lights off on a street at midnight, is insufficient to mitigate asset growth and the ever increasing unit cost of energy.

A report to Manchester City Council on 12 February 2014 identified that estimates from Laser (the largest local authority energy buying group) buying for 110 local authorities are that energy costs are likely to rise by a further 80% by 2020, equating to a 10% per annum increase. Without more significant investment, the annual energy bill for the Council's street light assets could be in the order of £5.5 million by 2020.

There is a justified business need to ensure the future management strategy for street lighting assets delivers reduced energy usage with an equal need for this strategy to consider the wider major community benefits of street lighting:

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- Contributing to the reduction of night time personal injury accidents.
- Reducing street crime.
- Reducing fear of street crime.
- Promoting sustainable transport by promoting the use of public transport, cycling and walking.
- Facilitating social inclusion by providing the freedom to walk along and use streets after dark.
- Promoting economic development by supporting the 24-hour leisure economy and distribution.
- Facilitating lifelong learning by providing after dark access to educational facilities.
- Assisting the emergency services to identify locations and carry out their duties (without modern street lighting the time taken to attend an incident could be increased).

A capital allocation for 2014/15 through the Local Transport Plan (LTP) will enable completion of the removal and replacement of all remaining Type 1805 concrete columns which have been nationally identified as being structurally unsound. Since being identified in 2007, approximately 6,200 columns, mainly located within residential areas where the risk of injury or damage to property is greatest from any collapse, will have been replaced by March 2015. There are also approximately 22,000 steel columns in the height range of 5 to 6 metres, within residential areas, that are still of structural concern. They were manufactured during the 1970's and early 1980's with no root protection and are now beyond their design life. They can be subject to extensive corrosion below ground level which is difficult to identify and presents a risk to highway users, property owners and maintenance operatives.

On 28 January 2014, a report to Cabinet approved revenue budget reductions for 2014/15 for the Economy, Transport and Environment Department, subject to consultation where necessary. A £775,000 cut was applied to street lighting through the introduction of a Burn to Failure Policy for lamp replacement and re-prioritisation of repairs. To deliver this approximate 60% cut to the street lighting revenue budget requires a change of policy from planned to reactive maintenance and wide consultation, approved by Cabinet on 2 June 2014, which is currently taking place on proposals. The outcome of this consultation would be the subject of a future report to Cabinet later in the year.

If a policy change is approved it is anticipated that, by the end of 2014/15, there would be a maintenance backlog of approximately 6,000 faulty street lights. This equates to 6.7% of the Council's 89,000 street lights not operating as planned; the outturn for 2013/14 was less than 1%. The experience of other highway authorities which operate a similar, solely reactive maintenance policy, is of a large increase in random lamp failures, which results in a reduced level of service when funding is not available for repairs. Typically, it is reported that 20-30% of these authorities' lighting stock may be reported as

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out at any one time under an extended burn to failure regime. Significant future funding would be required to reinstate a steady state maintenance regime.

The Council has challenging carbon reduction targets and street lighting, during 2014/15, will be seeking to reduce carbon associated with energy use by:

- Implementing a third year programme of part night lighting schemes.
- Reducing energy usage through LTP schemes on the strategic network to introduce energy efficient lamps and dimming solutions.
- Removal of street lighting in non-residential areas no longer delivering an economic benefit to communities.

The Economy, Transport and Environment Departmental Service Plan identifies in performance target ESLP 554 a reduction of 3,000 tonnes of carbon by 31 March 2017 from the 31 March 2014 recorded total. This would be good performance in relation to the funding available to progress energy efficiency options but insufficient to make a significant reduction from a service which is responsible for approximately 20% of the Council's total carbon generation.

Over the last two years, part night lighting schemes have been introduced in mainly rural locations of the County, and the application of agreed risk mitigation criteria has resulted in very few concerns being raised. The consultation carried out to inform the Cabinet decision to introduce a Part Night Lighting Policy identified strong support in rural areas with more concerns being raised in urban communities. Some of the comments received as part of this consultation were that opportunities to use energy efficient equipment should be considered as an alternative to switching off. On 31 January 2012, when the Policy was approved (Minute No. 32/12 refers), part night lighting represented the most cost effective option for delivering energy reduction in the shortest payback period. There has since been significant technology advancement and cost reduction which mean other cost effective options are now available as an alternative to part night lighting. An increasing number of authorities are now implementing invest to save options that do not require the switching off of street lights and this could be highlighted in the response to consultation on proposed 2014/15 schemes within urban areas.

Invest to Save Proposal

Advances in light emitting diode (LED) technology and the reduction in price of these lamps for street lighting application presents an opportunity to significantly reduce the whole life costing of the Council's lighting stock within residential areas.

LEDs provide a white light source which is brighter than the orange lighting currently utilised on the majority of the Council's street lights. Utilisation of dimming in association with LEDs would assist to maximise energy saving and

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overcome the problem highlighted on some initial schemes, around the country, of the brightness of the lights impacting on a few residents ability to sleep. LEDs have a light source which is better directed to illuminating the highway and reduces upward light emissions, and rearward intrusion into properties contributing significantly to the reduction of light pollution. The need to balance the backlighting from any LED installation in residential areas would have to be considered as part of project implementation to provide a suitable level of transition from light to dark at property boundaries.

Research suggests that LED technology has reached a maturity that will not greatly improve over the next five years and costs are at a level that they will not significantly reduce over a similar period. This view is also reflected in the significant number of other local authorities within the United Kingdom which are already implementing or proposing to implement similar invest to save projects.

More locally, Manchester City Council is proposing to retrofit 56,150 LED lamps over a 36 month period, Salford City Council is carrying out a similar project and will retrofit 26,000 LED lamps across the city. Sheffield City Council is installing 68,000 LED lamps and Rotherham and Barnsley have commenced a joint procurement for LED lamp installation.

The proposal would deliver substantial financial and carbon savings along with the wider benefits of having a better quality, more focused light source which would reduce light pollution, from a major part of the Council's lighting stock. The proposal would provide real long term benefits in sustaining reduced revenue expenditure and mitigating the expected continuing rise in energy costs.

The following is proposed for street lights within the 5 to 6 metre height range:

- Replacement of existing lamps on 46,680 lighting columns with LED's.
- Replacement of 18,382 out of design life 5 metre high columns including a LED lamp.
- Replacement of 4,018 out of design life 6 metre high columns including an LED lamp.
- Utilisation of dimming technology in association with the installation of LEDs so as to reduce light levels and energy consumption during the period of low highway usage.

In total, 69,080 street lighting units could be converted to LED, approximately 78% of the Council's street lighting stock located mainly within residential areas of the County. The replacement of 22,400 out of design life street lighting columns is necessary due to a life expectancy of LED lamps of up to 20 years. Fitting LEDs to lighting columns, which could be structurally unsound, would not enable the full whole life costing benefits to be delivered. The replacement of these columns in residential areas would also eliminate

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the significant risk, to the Council, from the potential to cause harm or damage resulting from any collapse.

There are lighting columns within the height range of specific historical interest and located within conservation areas which will require special consideration. It is possible to convert these to an LED light source but this will need to be achieved with sensitivity so as to protect and maintain the original column design and character.

The investment period for the proposal would be over three years, the obvious benefits of a short installation period being the earliest access to energy and carbon savings. It would also enable the programming of works to target the earliest reduction in any maintenance/repair backlog if any future decision is made to change street lighting policy to deliver required revenue budget cuts. Early consideration of market capacity is indicative of the timescale being achievable.

The proposal incorporates the use of high performance/high quality LED lamps, proven long life LED chips, lenses and circuit characteristics to ensure maximum equipment life from the investment. Equipment will also be required to meet performance levels and longevity standards recommended by the Institution of Lighting Professionals (ILP) deemed suitable for street lighting purposes.

Proposal Benefits

Other local authorities implementing or proposing to implement LED invest to save projects are all suggesting that energy savings of between 50-60% are achievable. The proposal includes dimming in conjunction with the installation of LEDs so 60% energy savings would be expected. On current energy prices this would be a £1.57 million annual saving after full installation. It would also reduce the Council's exposure to rising energy prices and any potential carbon taxation through a substantial reduction in energy usage.

The energy reduction assumptions are based on energy usage identified by Elexon for LED's compared to the existing lamps utilised. Elexon is the independent body that assesses the energy usage of each type of lamp used across the country. All energy suppliers use these figures to determine the cost of energy consumed per lamp.

The proposal would mitigate the base revenue budget cut of £775,000 to street lighting applied from April 2014 and provide the ability to sustain this reduced level of revenue funding without any significant adverse impacts on service provision.

The replacement of 22,400 out of design life street lighting columns would eliminate the risk associated with a collapse in the mainly residential locations in which they are located. It would also provide an opportunity for communities

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to identify any of these columns that are regularly used for attachments, such as festive decorations, floral baskets, etc, so that appropriate columns and any necessary electrical connections are incorporated into the replacement specification.

The proposal would deliver a carbon reduction of approximately 6,000 tonnes per annum, around 33% of the carbon generated through electricity use for street lighting. This will assist to demonstrate the Council's sustainability leadership through a significant reduction in its carbon footprint and its commitment to achieving carbon reduction targets.

Energy and carbon savings from the proposal would be greater than that being obtained from part night lighting, although installing a LED lamp on street lights that have been converted to part night lighting would provide the best energy saving option and better minimise the impact of the whiter light source on the rural night time environment.

Consultation

To progress an invest to save proposal for street lighting, there would be a need to consult on the utilisation of dimming in conjunction with LED lamps. Dimming of lamps within residential areas is not current Street Lighting Policy and has the potential to impact on all communities within the County. The views of community and protected characteristic representational groups, as well as the general public, will be sought.

Wide public consultation on a change to Street Lighting Maintenance Policy is currently taking place and this has included a question to determine the support for the use of dimming and LED lamps to deliver financial and carbon savings, if funding were available.

The consultation exercise is for eight weeks, using the Council's website, local newspapers and local council establishments. A paper-based or electronic questionnaire has been sent to all representational organisations for groups with protected characteristics, and town and parish councils to obtain feedback.

The responses will be used to prepare an Equality Impact Analysis (EIA) on the utilisation of dimming in conjunction with LED lamps and will be presented to a future meeting of Cabinet.

(3) Financial Considerations A preliminary cost modelling exercise has been undertaken to identify potential future costs and savings associated with the implementation of LED technology. The current cost model assumes that a total of 69,080 lamps will be replaced (including 22,400 defective columns), over a 3 year period at a capital cost of around £24m. Future savings are highly dependent on estimates of future energy prices. The Council has experienced an average energy price increase of 11% each year

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over the last 4 years; however, to be prudent, the current analysis assumes just an increase of 5% per annum for future energy prices.

Initial modelling suggests that savings of the order of £2.9m per annum could be achieved once the lamps become fully operational. Debt charges of approximately £1.75m per annum over 25 years will need to be set against this saving, resulting in a net saving after financing costs of £1.15m in the first year of full operation.

This analysis will be subject to further investigation and refinement as more information becomes available. Future cost modelling will examine different scenarios and include sensitivity analyses so that the impact of different variables, such as energy price increases, initial capital cost, and financing costs on the potential savings, can be thoroughly understood.

(4) **Legal Considerations** As the highway authority, the Council has a power, rather than a duty, under the Highways Act 1980 to provide and maintain road/street lighting. Where it is provided, it must be to the standard set in the Council's Street Lighting Policy. In exercising its powers in respect of the extent operation and maintenance of lighting, a highway authority should act reasonably.

The highway authority also has a duty under Section 17 of the Crime and Disorder Act 1998 to exercise its functions with due regard to their effect on crime and disorder in its area.

When considering the proposal in this report, Members should have due regard to protecting and providing for the welfare and interests of persons who share a relevant protected characteristic (age, disability, gender reassignment, marriage and civil partnership; pregnancy and maternity, race, religion or belief, sex and sexual orientation). An Equality Impact Analysis will be included in a future report to Cabinet.

(5) **Equality and Diversity Considerations** As contained in the report, an Equality Impact Analysis will be undertaken by the Council to make an assessment of the impact of the utilisation of dimming in conjunction with LED lamps to deliver energy and carbon reductions.

(6) **Environmental and Health Considerations** There is the potential for LED light to cause sleep disturbance through the suppression of the hormone melatonin. Melatonin is naturally produced by the body in the evening and contributes to the circadian rhythm in humans and other animals. An independent Health Impact Assessment, relating to use of LEDs for street lighting, commissioned by Trafford Council and carried out by the Institute of Occupational Medicine in June 2013, acknowledged these concerns and concluded *"the proposed LED street lighting programme has overall no (neutral) or a minor positive health and wellbeing impacts for residents,*

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workers and visitors to Trafford compared to the existing type of street lights being used". A separate report carried out by the Alliance for Solid State Illumination Systems and Technologies (ASSIST) in December 2012 studied the potential of outdoor lighting to stimulate the human circadian system compared different outdoor lighting systems and concluded a one hour continuous exposure to 5200k (kelvin) LED lighting "*would not meaningfully stimulate the human circadian system*". A 6,500k level is considered to be the colour temperature of daylight and the industry is adopting a 4,000k to 5,000k range for street lighting LEDs. The methodology of the Trafford Health Impact Assessment is thorough and systematic, and its findings are applicable to Derbyshire.

A related concern is that of the glare from LED street lighting identified through concerns raised by residents in relation to projects implemented by other local authorities. The use of high quality/high performance LEDs in conjunction with dimming technology will enable lighting levels and light spread patterns to be introduced to minimise such impact.

The Trafford Health Impact Assessment found that LED street lighting may reduce crime due to improved night time visibility. This may have a positive impact on health as people may feel safer in better lit streets which may lead to increased levels of physical and social activity in the evenings.

The financial savings which could be achieved from the introduction of an invest to save proposal will contribute to the cuts the Council has to make over the next four years. This will help to protect other Council budgets which provide services that will, directly or indirectly, contribute to the health of Derbyshire residents.

In summary and taking account of available evidence, there does not appear to be a significant risk to health from introducing LED street lighting in Derbyshire.

The use of systematic monitoring and evaluation of any issues raised by residents should be a consideration if the proposal is progressed. These could include concerns:

- About light trespass into properties.
- About glare or other installation queries from highway users.

Details of monitoring arrangements would be included as part of a future report to Cabinet.

(7) Human Resources Considerations The delivery of an approved invest to save project would require the Department's street lighting organisation to be supported through external contract arrangements to

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ensure lamp and lighting column replacements were implemented within a three year period.

(8) **Property Considerations** Street Lighting utilises existing Council facilities in Chesterfield, Duffield and Chapel-en-le-Frith to deliver services. The property in Chesterfield, on Turnoaks Business Park, is leased and is the main stores for street lighting equipment. Any investment in LED technology would mean that limited lighting stock would be required to be held in future providing an opportunity to review the need for the cost of leasing a property the size of that at Chesterfield. The Council has an option on the property lease until March 2022 with the next break identified in the lease agreement for March 2017.

In preparing this report the relevance of the following factors has been considered: prevention of crime and disorder and transport considerations.

(9) **Key Decision** Yes.

(10) **Call-in** Is it required that call-in be waived in respect of the decisions proposed in this report? No

(11) **Background Papers** Exempt. Officer contact details – Peter Booth, extension 35450.

(12) **OFFICER'S RECOMMENDATIONS** That Cabinet:

- 12.1 Notes the benefits and affordability of an invest to save proposal for street lighting to assist mitigate and sustain required revenue budget savings, and deliver further revenue savings through significantly reduced energy usage.
- 12.2 Receives a further report after completion of the public consultation on the policy change for street lighting to include more detailed financial modelling identifying how an invest to save proposal could be developed and progressed to deliver a value for money medium to long term street lighting strategy.

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