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HIGHWAYS AND TRANSPORT SERVICES

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STREET LIGHTING SAVINGS

Purpose of Report

1. To consider carrying out public consultation in connection with proposals to reduce the energy consumption and carbon footprint of the Council's street lighting.

Background

2. The Council has 40,524 street lights and illuminated signs. Energy costs have risen by 30% recently, and although they may fall in the short term, they are likely to continue to rise in the longer term. The energy budget for street lighting is currently over £1.2 million, and with current budget restrictions these costs are becoming unaffordable.
3. Street lighting accounts for 12% of the Council's carbon footprint producing 7,084 tCO₂ per year. Allowances under the Carbon Reduction Commitment (CRC) Scheme are payable for street lighting as the Council is responsible for procuring and paying for electricity consumption. These allowances will be payable on the Council's street lighting from 2014/15 onwards at an estimated annual cost of £128,000, a cost that will increase year on year. The Council has a target to reduce its carbon footprint by 20% by 2013/14 and an aspiration to achieve a 50% reduction by 2020.
4. Street lighting is a highly technical service, which in Wiltshire is managed by a specialist consultant on behalf of the Council, with a specialist contractor carrying out the lighting maintenance. The electricity for the lighting is procured corporately as part of corporate energy purchasing. Energy costs are particularly volatile, but are expected to continue to rise in the future. With limited budgets and rising costs the future provision of street lighting needs to be considered.
5. The Council has already made a start in reducing its energy consumption in connection with street lighting. Over 1,300 units have already been converted to part night lighting following the community based project last year, and a previous Salix funded investment to save scheme converted the Council's illuminated bollards to low energy units.
6. At the Council meeting on 28 February 2012 Members asked for a report for Cabinet regarding ways to improve the efficiency of street lighting and reduce energy costs.

Main Considerations for the Council

Options to reduce street lighting energy consumption

7. The technology used in street lighting has improved considerably in recent years, and where possible energy efficient equipment is being installed as part of the routine maintenance of the lighting units and is used when new lighting is installed.

8. The number of street lights is increasing. New developments have lighting which is adopted by the Council and, although the new houses bring in extra revenue for the Council, they increase the energy costs. The developments recently completed, or in the process of being constructed, will increase energy costs further.
9. Previously, the capital cost of making changes and installing energy efficient units to existing lighting has been an issue because of potential long payback periods. However, the rising energy costs and future CRC 'Carbon Tax' are making this equipment more attractive and more cost-effective. A substantial initial investment is still required, but the payback period is reducing.
10. A number of options for reducing energy consumption have been considered. The cost and benefits are currently being assessed in detail, but the initial work indicates that some are likely to be more cost-effective than others. The options are described below:

Permanently turn off street lights

11. Permanently turning off street lights would reduce the energy costs, but the columns would still remain, and for safety reasons the columns would eventually have to be disconnected and removed. The timescale for their removal would depend on their rate of deterioration, which is likely to accelerate when the lights are not operational, and there would be concerns about the safety of the electrical equipment. Removal within about five years may be necessary.
12. It should be noted that the permanent removal of large numbers of street lights would result in dark areas on many streets at nights and on winter mornings. The impact on individuals and the community, which have had the benefit of street lighting for many years, would need to be carefully considered where this option is applied.
13. There is a risk of considerable adverse publicity and comment in connection with turning street lights out permanently. The fear of crime and concerns about road safety should not be underestimated. Other authorities have had to turn lights back because of local opposition.
14. It is anticipated that permanently removing street lighting would be most suitable at a small number of sites where under current design standards street lighting would not be installed. A number of these are high energy consuming lights on main roads, which are currently operating for part of the night, and could be turned off to further reduce energy consumption.

Introduction of part night lighting and dimming of street lights

15. The introduction of controls to turn off the lights after midnight and back on in the early morning would reduce energy costs whilst still having the lights operating when most needed. The Council has already converted 1,300 street lights to part night lighting, mainly through the successful community area based project to reduce unnecessary lighting.
16. Some of the newer units which need to be kept on for safety reasons could be dimmed in off peak periods in order to slightly reduce lighting levels and energy consumption. For example, on the A350, near the new ASDA development at Melksham, the new lighting units are dimmed when traffic volumes are low, resulting in a 30% reduction in energy usage. Unfortunately, at present about 50% of the county's current lighting stock is not suitable for dimming because they are older units.

17. The technology is now available to control street lighting from a central computer management system. This would allow units to be used for part of the night, or where existing lights are suitable for the lighting levels to be dimmed or adjusted to meet circumstances. An initial scheme is being implemented in Wiltshire using developer's contributions arising from a recent development. This will allow the technology to be introduced immediately in a small area before it is rolled out to the rest of the county. Other authorities have already successfully introduced this or similar technology, including Warwickshire, Birmingham, Essex, Suffolk and Cornwall.
18. The central management system would enable individual lights to be operated separately. For example, lights in some streets could be timed to come on or go off at particular times according to circumstances. Lighting in town centres could be dimmed or turned off during the evenings, but turned up late at night when people leave clubs and public houses. The lighting times can be changed remotely with no need for engineers to visit site, and the system can accommodate changes to British Summer Time. Lights that are faulty, or remain on all day, can be detected remotely and efficient repair schedules can be set up.
19. In the event of anti-social or criminal behaviour occurring, the lighting could be switched on, or its timing altered, as necessary. The computer controlled system offers the opportunity to react to circumstances, and offers scope to achieve further savings through dimming or reducing the hours of operation as circumstances and energy costs change. There should be less complaints about faulty lighting units and reduced electricity usage.
20. It is considered that it would be feasible to convert over half of the Council's lighting stock to part night lighting, and introduce dimming on a further 5% of the remaining lights. Most of the street lights to be converted to part night lighting would be on residential minor roads, with the main road units being dimmed for part of the night, or turned off where appropriate. The lights would be on at peak times in the mornings and evenings with this option.

LED (Light Emitting Diode) Lighting

21. The latest street lighting equipment available on the market is considerably more energy efficient than the older equipment which comprises most of Wiltshire's lighting stock. LED lighting uses considerably less energy and the units are longer lasting than the older lighting units.
22. The cost of converting street lights to LED lighting can be considerable, with the costs of the higher powered LED units for main road lighting currently significantly higher at over £600, compared to similar traditional units which usually cost just over £300. However, LED units are reducing in price, and it is likely that there will be further reductions in the future as the technology improves and the use of these units increases. The economics of LED lighting will then become much more attractive.
23. The LED lighting is particularly suitable for dimming, either through a central management system, or with individual control of units. They allow much more control of lighting levels at different times of day to take into account traffic or pedestrian movements than the lighting systems currently used.
24. On recently constructed developments all new street lighting is being installed so that it can be dimmed, usually between midnight and 5.30 a.m. to reduce energy usage by up to 70%. It is proposed that new lighting systems should have LED or other energy reducing units installed.

Proposed Scheme

25. The economic assessment of the proposal is currently being undertaken, and the results of this work will be reported to Cabinet, together with the outcome of the consultations, later this year for decision.
26. From the assessments carried out to date the preferred method of obtaining energy savings is:
 - (a) Part night lighting on at least 50% of the Council's street lighting where feasible.
 - (b) Dimming of lighting at less busy times where appropriate and technically feasible.
 - (c) LED lighting or similar for all new street lighting.
 - (d) Turning off street lighting where there are no significant pedestrian movements and it is not required for safety reasons.
 - (e) Introduction of a Central Management System to control the operation of the majority of the county's street lights in order to provide more responsive control of the lighting.
27. Turning off street lights for part of the night appears to be acceptable to most members of the public, based on the Part Night Lighting trials carried out in conjunction with the Area Boards last year. In a small number of locations the full night lighting was reinstated following specific requests from residents, but generally part night lighting would have significantly less overall adverse effect on the public and road users than turning the lights off permanently as the lighting would be operating when the roads are busiest.
28. A Central Management System would require more investment, but would have significant long-term benefits, and would be the most flexible method of introducing changes to existing street lighting.
29. The introduction of LED lighting would help reduce energy costs, but the initial assessments indicate that the large scale conversion of existing lighting would not be cost-effective with the current cost of these units. A full financial assessment of this aspect will be carried out to inform the Cabinet report.
30. Street lighting is generally considered to improve road safety not only at night, but also in fog, rain and times of poor visibility. The key lights at junctions and similar locations would remain on. Despite Wiltshire being a safe county there is a fear of crime, and there are concerns that reducing street lighting could increase anti-social behaviour and vandalism at night, and consequently the identification of units for treatment will need careful consideration.
31. Many environmental community groups in the Wiltshire World Changers Network are keen to work with their local communities to identify areas that are suitable for part-night lighting and dimming. A recent presentation to the network by Climate Friendly Urchfont on their community streetlight project sparked much interest and debate. These groups would be willing to work with the Council to reduce their area's carbon footprint, provided support was available in the form of toolkits. By working in this way, the Council has the opportunity to generate positive publicity by saving money and carbon as well as increasing community resilience.

Consultation

32. In the Public Consultation on the Council's budget in February 2012 savings from reduced street lighting scored the highest of the seven savings options showing a high level of public support.
33. Before implementing changes to the street lighting consultations will be undertaken, including the information set out in **Appendix A** of this report. The document includes frequently asked questions and a description of the proposals.
34. The views of the police, other public bodies and those affected by the proposals will be sought. The Area Boards will be asked to consider the matter, and the local Town and Parish Councils will be invited to comment. The results of the consultations will be reported to Cabinet before a decision is made regarding the implementation of the changes.

Environmental and Climate Change Considerations

35. Carbon emissions associated with street lighting account for 12% of the Council's overall footprint. Although there is currently no requirement to purchase allowances under CRC, as the supply is passively metered, there is a significant and increasing annual cost incurred relating to electricity consumption. The 2011/12 budget for electricity to power streetlights is £1.183 million.
36. Street lighting has a key part to play in reducing the Council's energy consumption, and a number of part night lighting schemes have already been installed by this Council successfully. The implementation of a scheme to further reduce energy would help the Council meet its carbon reduction targets.
37. The implementation of a scheme to reduce unnecessary lighting would significantly reduce street lighting energy consumption and the Council's carbon footprint. This scheme also offers the opportunity for local environmental groups to reduce the carbon footprint of their area and engage their community in the debate on environmental impacts and energy savings. The Council co-ordinates the Wiltshire World Changers Network, which brings together people and communities from across Wiltshire who are taking action to look after the environment, tackle climate change and protect wildlife, and can use this forum to engage groups on this topic.

Equalities Impact of the Proposal

38. A reduction in street lighting, especially in urban areas, could have equality and diversity implications. With street lighting permanently turned off in some areas some sections of the community may feel disadvantaged or at risk.
39. Fear of crime is a serious consideration even in a safe county like Wiltshire, and walking along streets with unlit areas may inhibit some members of the community from walking at night or early in the morning, or result in parents refusing to let children walk to school. Therefore, the introduction of part night lighting in residential areas is likely to have less adverse effects than turning off lighting permanently.
40. In areas where there are higher than average crime rates, or where anti-social behaviour is a problem, reducing street lighting may be perceived by many to be increasing the danger to the public, and care would need to be taken in selecting the units to be converted. In some areas, such as town centres with CCTV systems, the lighting would remain on all night.

Legal Implications

41. There is no legal requirement for the Council to provide street lighting, but where lighting is provided there is a responsibility to keep it in safe condition.
42. Street lighting is often provided at major junctions and locations where there may be hazards. It can play a part in improving road safety, and the current proposals will leave lights on at the identified high risk areas. There may still be a risk of accidents on unlit sections of road, but it is unlikely that legal action could be taken against the Council for not providing street lighting.
43. Some existing 30 mph speed limits in urban areas require a street lighting system to be in place to be enforceable. If street lights are turned off permanently, and redundant columns are removed, it may be necessary to amend some speed limit orders to ensure that the speed limits on the road are not changed.

Risk Assessment

44. An assessment is being undertaken of potential cost savings. Energy costs can vary in the short term, but longer term price increases are likely. Taking measures to reduce energy consumption for street lighting now will reduce the risk of future energy costs having an adverse impact on budgets in future, with consequent implications for Council services.
45. The street lighting currently uses energy throughout the night when demand is low. The introduction of energy saving measures which reduce off-peak energy consumption may not deliver the full value of expected savings if energy suppliers increase their pricing mechanisms to allow for the reduced consumption from street lighting during off-peak hours.
46. There is a risk of considerable adverse publicity and comment in connection with changes to street lighting, but in particular with turning street lights out permanently. The fear of crime and concerns about road safety should not be underestimated in considering the options. In order to manage this risk, a comprehensive communication and engagement programme will need to be developed, working in partnership with Area Boards and local environmental groups where they exist to maximise positive news stories.

Financial Implications

47. The financial implications of the proposed changes to the Council's street lighting are being assessed, and will be reported to Cabinet, together with the outcome of this consultation. The assessment will include initial capital outlay as well as ongoing revenue financing and operational costs, and will estimate cashable savings through a 25 year business case model using a standard Net Present Value appraisal method.
48. Initial indications are that the capital cost of implementation of the currently identified proposal would be £1.8 million. The annual energy cost savings could be in the region of £300,000 annually (assuming current day energy prices) and taking into account financing and operating costs, the net revenue savings are forecast at around £0.130 million annually. The Net Present Value of the savings when assessed over 25 years is in the region of £4 million based on present day energy costs. The savings would be considerably more if energy costs increase as expected. The introduction of Carbon Tax will increase the costs of energy usage in the longer term as well, making the introduction of energy saving measures increasingly necessary.

49. The full financial assessment of the proposal and other options will be reported to Cabinet before a decision is made regarding any changes.

Options Considered

50. Various options have been considered to reduce street lighting energy consumption, including permanently turning off some street lighting, converting lights to operate for only part of the night, dimming others at off peak periods, and introducing LED lighting to replace existing lighting units.
51. From the initial investigations, converting a majority of the street lights to operate for only part of the night, and dimming others at off peak periods, would appear to offer the best savings in the longer term, with potentially little adverse impact on the public and communities. The proposals include the removal of lights at a number of locations where they would not be provided under current design standards, and the introduction of LED and similar units on new lighting schemes.
52. The lighting at key locations, such as important junctions and traffic signals, would operate all night as necessary to ensure that road safety is not compromised. Lighting in town centres would be controlled so that lighting levels are appropriate for the time and potential usage by the public.

Reasons for Proposal

53. There is a need to reduce street lighting costs because of budget constraints and rising energy costs.
54. There is a range of options available to reduce energy consumption, from turning out lights permanently to dimming them at off peak periods. The initial assessments indicate that the best balance is a package of measures, including the conversion of about half the existing lights to operate for part of the night.
55. Before this matter is considered by Cabinet it would be appropriate to undertake consultations on the proposals. If the scheme is agreed by Cabinet later this year detailed proposals will be prepared for further consultations with the local communities.

Proposal

56. That consultations should be undertaken on the proposed changes to the Council's street lighting, which are to introduce:
- (i) Part night lighting on at least 50% of the Council's street lighting where feasible.
 - (ii) Dimming of lighting at less busy times where appropriate and technically feasible.
 - (iii) LED lighting or similar for all new street lighting.
 - (iv) Turning off street lighting where there are not significant pedestrian movements, and it is not required for safety reasons.
 - (v) Installation of a Central Management System to control the operation of the majority of the county's street lights in order to provide more responsive control of the lighting.

57. No final decision has been made regarding the proposals. The results of the consultation and of the financial assessment will be reported to Cabinet for a decision later this year.

The following unpublished documents have been relied on in the preparation of this Report:

None

Appendices:

Appendix A – Consultation on Street Lighting – Saving Money, Energy and Carbon