



## **Street Lighting Energy Efficiencies**

### **SUMMARY**

- 1.1 The issue of reducing street lighting energy consumption has been raised by the Street Lighting PFI Managing Board, the Cabinet Member for Planning and Transportation, and the Climate Change Board. The key drivers for reducing energy consumption are linked to reducing the increasing costs of energy supply and reducing the Council's carbon footprint.
- 1.2 Street lighting officers have developed a number of options for reducing energy consumption and these were presented to a meeting of the Climate Change Board in September. Since then, street lighting officers and climate change officers have further considered the options, and are of the opinion that a Central Management System is the best long term way of achieving a significant reduction in energy consumption that would help the Council to meet its commitment to reducing its carbon footprint, whilst retaining flexibility to respond to changing circumstances and risks associated with road safety, crime and disorder, and public perception.
- 1.3 Further work is required to assess the systems available as well as the necessary up front investment and likely savings in cost and energy, but potential savings in installation costs could be made by installing necessary equipment in new lighting being provided as part of the remainder of the 5 year Core Investment Period of the PFI contract. It is recommended that Cabinet approve this approach in principle to allow further development of the detailed Business Case.
- 1.4 The PFI contract specifies various standards and levels of lighting to be achieved by the Contractor. Regardless of whether a Central Management System is adopted, it is considered that other energy efficiencies can be achieved by appropriately reducing the specified standards and levels. These changes in Specification will require a formal Contract change following negotiation with the PFI contractors, Connect Roads Derby Limited, and it is recommended that the Director of Regeneration and Community in consultation with the Cabinet Member for Planning and Transportation, be authorised to instruct the changes with immediate effect by an exchange of letters, but subject to formal contract changes being subsequently negotiated with the contractor.

## **RECOMMENDATION**

- 2.1 To approve in principle that the Council should work towards the implementation of a Central Management System of the city's street lighting and that a detailed Business Case be developed to clearly set out costs and benefits.
- 2.2 To approve in principle the proposals to reduce energy consumption as set out in paragraphs 4.7 and 4.8 and to delegate powers to the Director of Regeneration and Community, in consultation with the Cabinet member for Transportation and Planning to authorise amendments to the Street Lighting PFI Contract Specification with immediate effect, so as to reduce energy consumption, and to approve the subsequent negotiation with the contractor of a formal contract change.

## **REASONS FOR RECOMMENDATION**

- 3.1 A Central Management System is considered to be the best approach for the Council to achieve significant savings in energy costs and reductions in the Council's carbon footprint from street lighting whilst maintaining flexibility in the street lighting provision across the city.
- 3.2 Regardless of a Central Management System being introduced, other energy efficiencies can be achieved by making appropriate changes to the lighting levels specified within the PFI contract, which will require a formal Contract change. Negotiation on formal contract changes may take considerable time, but savings can be maximised by putting the changes into immediate effect.

## **SUPPORTING INFORMATION**

### **Introduction**

- 4.1 The Council awarded a 25 year street lighting PFI contract to Connect Roads Derby Ltd commencing in June 2007. The contract requires Connect Roads, through their sub-contractors Balfour Beatty, to improve the lighting to modern standards across approximately 70% of the city's streets within the first 5 years of the contract.
- 4.2 The Street Lighting PFI Managing Board, the Cabinet Member for Planning and Transportation, and the Climate Change Board have all raised the issue of the need to reduce street lighting energy consumption so as to reduce the costs of energy supply and reduce the Council's carbon footprint.

- 4.3 The Council has signed up to a carbon reduction target of reducing its carbon emissions by 25% by 2012. In addition, Government is introducing from April 2010 a mandatory cap and trade system, Carbon Reduction Commitment (CRC), which aims to deliver carbon emission reductions and cost savings in organisations such as Local Authorities. The system involves organisations purchasing emission allowances for the year. The scheme will bring added financial incentives to improve energy efficiency. There will also be reputational incentives, as an annual league table, available for public scrutiny, will be produced each year ranking the relative performance of participating organisations. Failure to comply with the CRC will bring monetary penalties.
- 4.4 The Council's street lighting staff, in consultation with Balfour Beatty staff, have considered a number of options of reducing the energy consumption of the city's street lighting. These options were presented to the Climate Change Board in September, and it was resolved that these options should be further developed. Since then, street lighting staff and climate change officers have given further consideration to the options. Some of the options are inter-dependant, and it is felt that a clear policy is required to avoid abortive costs.

### **Central Management System, CMS**

- 4.5 It is considered that the only way of significantly reducing street lighting energy consumption so as to assist the Council in achieving its target in carbon emission reduction is to switch off or dim large areas for long periods during the hours of darkness. This can be achieved by installing appropriate equipment within the lights, adopting either fixed or flexible systems. The fixed systems, which would be cheaper would involve the lights being either dimmed to fixed levels, or switched off, for pre-defined fixed periods. However, due to technological developments, there are now flexible systems available, known as Central Management Systems, which enable the lights to be controlled so as to dim to various levels (including total switch off) for variable periods. Such a system would be more expensive than a fixed system but would give the Council the flexibility to respond to concerns on safety, crime and public perception, which may change in the future.
- 4.6 Considerable further work is required to investigate the various CMS systems available, carry out cost/benefit analysis, funding arrangements, and to negotiate contract changes with Connect Roads. It is estimated that the cost of introducing a CMS would be in the order of £3 million. However, savings can be made, by installing necessary equipment in the new lighting being provided as part of the Core Investment Period. With over 500 new columns being installed per month, it is important that a decision on whether to work towards a CMS system is made as soon as possible.

### **Proposed Changes to Lighting levels**

- 4.7 The PFI Contract Specification includes a uniformity value. This establishes the maximum variation between the highest and lowest lighting level along a road, irrespective of the specified lighting levels. When the PFI contract was being prepared, British Standards changed and the uniformity value was increased from 20 to 25%, which resulted in an increase in the contractor's bid. The British Standards have now withdrawn the 25% value. It is recommended, therefore, that Connect

Roads are instructed to lower the uniformity value in their designs to 20% for the remainder of the CIP. This should result in a reduction in the number of new columns being provided, and thus reduce the growth in energy consumption. This will involve a formal contract change and involve re-negotiation of the payment structure, probably reducing the Council's costs. However, as this may take considerable time and savings can be maximised by immediate effect, it is recommended that the Director of Regeneration and Community is authorised to make this instruction immediately, subject to a formal contract change being subsequently negotiated with Connect Roads.

- 4.8 The Contract specifies that the new lighting should be controlled by photo-electric control units, set to switch on when the natural lighting level falls to 70lux and switch off when the natural light rises to 35 lux. However, with the installation of electronic lamp control gear in the new lighting, the time for a lamp to achieve its full output is reduced and it is felt that the switch on level can be reduced to 35 lux, and switch off level to 18lux. Reducing the specification of the photo-electric control units from 70/35 to 35/18 would delay switch on and advance switch off by a few minutes each day. Whilst the saving in energy consumption is small, this change could be achieved at no additional cost to the Council. It is therefore recommended that the Director of Regeneration and Community is authorised to instruct Connect Roads to install the lower specification photo-electric control units with immediate effect. It should be noted that a CMS system would ultimately control switch on and off times, but there is no increase in cost involved with this change at this stage, so there will not be any abortive costs.

#### **OTHER OPTIONS CONSIDERED**

- 5.1 Installing fixed dimming and switching off facilities, but discounted because of lack of flexibility. Any changes to timing of dimming levels would have to be carried out manually to each column.
- 5.2 Lowering the contract specified lighting levels on some roads for the remainder of the CIP has been considered. It has been decided not to pursue this option as it would result in different standard lighting levels across the city, and with the introduction of CMS, lighting levels could be reduced as, when and where required.
- 5.3 Minor changes to lighting equipment on illuminated signs and bollards, which are being implemented within the contract, which result in small savings in energy usage.

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**Background papers:** None  
**List of appendices:** Appendix 1 – Implications

## IMPLICATIONS

### Financial

- 1.1 The introduction of a CMS across the City is currently estimated at £3 million. Significantly more work is required to determine more accurately the costs, savings and overall benefits of such a system. A project team is being established to put together a detailed Business Case for Members to consider.
- 1.2 The project team will also work up in detail any likely savings in energy due to the proposed changing in lighting levels included in this report. It was felt important to get the changes approved quickly so there can be maximum impact on reducing energy consumption.

### Legal

- 2.1 The contract contains provisions dealing with electricity consumption and sharing of savings. Whilst these costs fall primarily with the Council, there is a mechanism for sharing savings with the contractor where actual costs are less than forecast costs. There are also further provisions with the formal payment mechanism as to the underlying assumptions on which the unitary charge is based.
- 2.2 The changes in light specification will require changes to the PFI contract and the Council and Connect Roads will need to address these issues over the coming months. The formal change procedure set out in the contract will have to be followed to give effect to any changes. As part of this process, consideration will also need to be given as to the impact on the payment mechanism and savings sharing provisions outlined above
- 2.3 With the desire to achieve early reductions in energy consumption and the likely delay in concluding the detail necessary for the formal change control procedure to be completed, it is proposed to agree with the contractor the principles to be applied so as to allow some of the changes to proceed now. It is proposed that these will be set out in an exchange of letters with the contractor.

### Personnel

- 3.1 None arising directly from this report.

### Equalities Impact

- 4.1 We need to consider in any changes to lighting levels the impact on crime and road safety. The introduction of a CMS will give us flexibility to change lighting levels to meet local needs.

## **Corporate objectives and priorities for change**

- 5.1 The proposal predominantly comes under the Council's priorities of leading Derby towards a better environment and giving excellent services and value for money.