



Derby City Council

COUNCIL CABINET
11 September 2013

Report of the Cabinet Member for
Neighbourhoods

ITEM 11

Street Lighting Energy Reduction Project – Invest to Save

SUMMARY

- 1.1 To demonstrate the spend to save options available to significantly reduce long term energy and carbon costs, associated with the Derby City Council street lighting stock.
- 1.2 The report provides proposals for changing the energy profile of street lighting on traffic routes in the City through the use of new technology.
- 1.3 The report is written to provide the facts and figures necessary to allow the Council to evaluate a request for funding of a system that will reduce energy and carbon costs with a defined saving.
- 1.4 The report demonstrates a viable method of reducing energy and carbon costs with a defined saving and provides the facts and figures.

RECOMMENDATION

- 2.1 To note the predicted increase in energy and carbon costs
- 2.2 To approve the adoption of dimming technology where the street lighting is reduced in such a way that the energy is lowered but the perceived effect to the human eye is minimised. This is the preferred solution for an urban environment where switch-off is not considered a realistic option.
- 2.3 To approve the principles for scheme development as indicated in section 4.3.4
- 2.4 To approve the funding of £1,362,966.03 through borrowing as set out in the report. It is proposed that this will be recovered through indirect energy savings of £33,242.

REASONS FOR RECOMMENDATION

- 3.1 Derby City Council's service provider maintains and operates approximately 30,250 street lighting units throughout the city. Derby City Council remains responsible for the procurement and purchase of energy. The Council's overall street lighting energy consumption has been increasing as a result of the need to bring sub-

standard lighting installations within the City up to the required UK and European standards for residential and traffic route lighting. This process has allowed the Authority to remove a significant portion of the risk that old and life-expired apparatus would have posed if they had not been replaced.

- 3.2 There are increasing pressures on local authorities to make savings in energy consumption and service costs. The City Council has a target to reduce its carbon footprint by cutting emissions by 25% by the end of 2013-14 as proposed in our Greenhouse Gas Emission Report (September 2012)
- 3.3 Street lighting provision is one service area in which various local authorities have made significant energy and cost savings. Our current street lighting energy provision in Derby costs around £1.25 million per year and produces over 6,177 tonnes of carbon emissions (CO₂) based on 2012/13¹. This accounts for 18% of the Councils total for CO₂ emissions for both electricity and gas combined. As well as energy costs, the Council has to pay charges under the Carbon Reduction Commitment (CRC) Energy Efficiency Scheme. Over the last few years the Council has not had to pay this charge for street lighting as the street lighting team have been able to take advantage of a loophole in the regulations which allow an exemption to this charge but this will not be available after 2014. In addition to the closure of this loophole, the rules governing CRC payments have been simplified and CRC charges will apply to street lighting from next year costing the Council approximately £99,000 p.a.
- 3.4 Unmetered energy costs have increased by more than 56% between 2007 and 2013 which is an increase of more than 8% year on year.
- 3.5 Reducing energy use and associated carbon emissions is important. Taking action on climate change is in the best interests of the residents of Derby. Reduced energy consumption also means reduced energy bills which will save the Council money for the lifetime of the installed street lighting infrastructure. As part of our street lighting strategy, new technology and products are evaluated and wherever possible we actively look to reduce the environmental impact of street lighting. Over the last few years, rising energy prices have made this a higher priority and the need to be proactive in reducing energy consumption has become more urgent.
- 3.6 Advances in modern lamp technology and electronic programmable control gear, coupled with the lower and variable lighting levels permissible by the revised British Standards (BS 5489) and EN 13201, means that it is now feasible to achieve energy savings by means of reducing the wattage of the lamps through dimming in certain instances and at certain locations; the right light in the right place at the right time.
- 3.7 These methods and techniques are being successfully implemented by other similar urban Councils across the country. Coventry City Council already have a dimming system installed and has recently approved an increased dimming level from 25% light reduction to 40% light reduction after midnight in residential areas and a 50% reduction on traffic routes with times dependent of individual risk assessments of the road similar to this proposal. Leicester City Council are currently in the first year of a

¹ Budget 2012 Autumn Statement by the Chancellor of the Exchequer, the Rt Hon George Osborne MP detailed CRC would be simplified from 2013, rather than scrapped. £12 per tonne of carbon dioxide (tCO₂) in 2013-14, £16/tCO₂ in 2014-15 and from 2015-16 onwards, the price will increase in line with the Retail Prices Index (RPI)

three year roll out of dimming technology which is designed to save energy in a similar manner to this proposal.



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Report of the Strategic Director for Neighbourhoods

SUPPORTING INFORMATION

4.1 Where will dimming be introduced?

- 4.1.1 This report will only consider the lighting on traffic routes and will not consider the lighting on subsidiary roads or residential streets as it has already been determined that the potential savings are much smaller and the payback periods much longer in residential areas due to lower wattage lamps.
- 4.1.2 The British and European standards for road lighting prescribe certain lighting levels on traffic routes based upon average daily traffic flows and take no account of the reduction in night time traffic volume after certain times during the night. These standards have now been reviewed and BS 5489:1 2013 now takes into account new lamp and control technologies (including dimming).

4.2 What system will be used?

- 4.2.1 Systems are now available that give the ability to make lighting level changes selectively. This will allow for higher levels of light in critical areas and reduced levels where a risk assessment shows it to be appropriate.
- 4.2.2 Derby City Council Streetpride has approved the installation of a small Telensa central management system of £53,686 from its existing street lighting budget
- 4.2.3 The energy savings that will be made from this project will cover the ongoing maintenance and support of the basic infrastructure and will provide a platform for development for both this proposal and any further housing developments in the city which will further benefit the authority through lower long term energy bills.
- 4.2.4 The Telensa system will include almost two hundred initial street lights to be adapted to use this technology on four roads within the City (see appendix 2 for details). The main aim of the system is to reduce the energy impact of new developments in the City and will also allow the residents and members to see for themselves the benefits of this technology.

4.2.5 The street lighting team has already inspected similar locations in other cities and has been able to satisfy themselves that the technology works effectively and delivers an energy reducing solution with almost no impact to the street scene and is both robust and simple to operate.

4.2.6 The proposed locations are:

- London Road (from Lincoln Avenue to just before Litchurch Lane)
- Osmaston Road (from Cotton Lane to Mitre Island)
- Duffield Road (from Broadway to Palm Court Island)
- Alfreton Road (from Mansfield Road to just after Haslam's Lane)

These locations are all currently lit to the previous British Standard and PFI contract output specification. It is proposed that the streetlights will be adapted in the current financial year as part of the street lighting routine maintenance programme.

4.2.7 This proposal includes a total of 5,967 further lantern conversions which are shown on the map in appendix 3. These conversions cover traffic routes throughout the City and only deal with larger wattage lanterns where a reasonable payback on costs can be achieved.

4.3 **What levels of dimming will be applied?**

4.3.1 Traffic flows on many of our roads between the hours of midnight and 6am are significantly lower than those during peak hours in the morning and evening rush hour. New technology now allows us to vary the level of lighting during these hours to the levels of light recommended for lower traffic flows.

4.3.2 Appendix 4 shows examples of the dimming profile that will be used to reduce energy in non-peak periods. The key points are the times marked as (A) and (B) and the key lighting levels marked as (C) and (D).

4.3.3 Each street will be individually risk assessed and traffic counts will be used to ensure that dimming does not occur until outside of peak traffic times in accordance with British and European standards. The road/footway use and traffic type will also be used to consider what level of dimming will be appropriate and a robust documented approach will be taken.

4.3.4 Based on actual inspections of real life roads lit to the same standards in other cities the values of the parameters will initially be set to (A) = 20:00, (B) = 23:00, (C) = 30% and (D) = 50%. This will mean the lighting levels will typically be dimming by 30% after 8pm and then dropped to 50% from 11pm. These levels will then be adjusted individually depending on risk factors and traffic levels. Refer to Appendix 4 for details of the key points (A), (B), (C) and (D).

4.4 **Consultation**

- 4.4.1 The Council does not have a legal duty to provide street lighting but has the power to do so under the Highways Act 1980. It also has a duty to do all that it reasonably can to prevent crime and disorder and also a duty to carry out measures designed to promote road safety. Each site at which a reduction in street lighting is being considered will be looked at individually to assess the potential impact on crime and disorder and on road safety
- 4.4.2 No formal public consultation has taken place in relation to this item to date however it is proposed that full consultation will take place with the various stakeholders, including the Police, Local residents, Councillors, Local businesses etc once funding has been approved.
- 4.4.3 Informal discussions have already taken place with the Council's Policy, Research and Engagement Team regarding data collection for road traffic incidents and crime statistics for the proposed sites.

4.5 **Saving Summary**

- 4.5.1 The costs for the conversion of all remaining 250w SON, 150w SON and 140w Cosmopolis. The total cost for all of the conversions is £1,362,966

Using the average dimming profile of 30% after 8pm and 50% after 11pm and assuming an energy inflation figure of 8%, realises a saving of £160,242 in 2014/15. The table below shows the breakdown.

- 4.5.2 The borrowing costs for the project are £127,000 per annum for the remainder of the Street Lighting PFI agreement of 19 years. The table below shows the breakdown.
- 4.5.3 Each of the three lamp schemes can be considered separately and should always be chosen on the basis of the largest wattage first to give the maximum saving against expenditure. The number of lantern upgrades can be chosen with a phased approach based on funding available but the long term savings will be significantly increased if the full project is approved.

4.5.4 Saving Summary

Lamp Type	Num Lanterns	Cost of Fitting (£)	Annual Saving (£)	Annual Borrowing Costs (£)	Annual Saving less Borrowing Costs (£)	Annual Saving on Cost of Fitting
250w SON	725	185,114	30,798	17,249	13,549	16.6%
150w SON	1,926	432,946	48,723	40,341	8,382	11.3%
140w CPO	3,316	744,906	80,721	69,410	11,311	10.8%
TOTAL	5,967	1,362,966	160,242	127,000	33,242	11.8%

4.5.5 If the project is accepted then a reduction of £10,000 expenditure will be contributed towards the pressure within the CRC payment due to a reduction in CO2 emissions.

OTHER OPTIONS CONSIDERED

- 5.1 Take no action - energy usage would remain the same for the foreseeable future and the council will need to pay the various taxes on carbon and energy usage as outlined in 3.3 and pay increased energy costs. In the current financial climate with increasing energy costs this option was not seriously considered as it is clear that action needs to be taken to address the future increasing energy bills and associated carbon costs²
- 5.2 Switch off lights - some rural based councils have switched off lights for a portion of the night (part night switching) which has provided reasonable levels of energy saving but has proved very unpopular and has attracted negative press coverage. It has not been considered in an urban environment. This option was also not seriously considered as the council has stated publicly³ that switching off street lights in Derby City would not occur and in addition, from investigations into other council's policies around the country, no urban environments have considered switch off as a viable choice due to crime and safety issues. The third option is already being considered and implemented in most local authorities around the country. This option provides the only realistic solution to Derby as it will reduce energy consumption in such a way that the street lighting service can be maintained.

This report has been approved by the following officers:

Legal officer Financial officer Human Resources officer Estates/Property officer Service Director(s) Other(s)	Olu Idowu – Head of Legal Services, Legal & Democratic Services Amanda Fletcher – Head of Finance, Neighbourhoods Jayne Stutt – Strategic HR Business Partner, Chief Executives N/A Tim Clegg – Service Director, Streetpride
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² The energy costs for Derby City Council's street lighting stock have increased significantly over the last few years, from £0.04351 KWh in June 2007 to £0.10186 KWh in June 2013, (57.28% in 6 years) this is a direct result of above inflation increase in energy costs. This upward trend is projected to continue, particularly given the current financial climate. This poses a real challenge for the Authority.

³ Former Council Leader Philip Hickson stated "We're not going to be switching any street lights off and on the whole I think it's really good news for the public" in a BBC interview on 6th October 2011 - see <http://www.bbc.co.uk/news/uk-england-derbyshire-15205529> for further details

For more information contact: Background papers: List of appendices:	Michala Medcalf 01332 641856 michala.medcalf@derby.gov.uk None Appendix 1 – Implications Appendix 2 – Map of initial pilot installations for Telensa system Appendix 3 – Map of large wattage lamps for project Appendix 4 – Proposed dimming profile
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IMPLICATIONS

Financial and Value for Money

- 1.1 The saving calculations for this project are based on known and well established figures for the consumption of street lighting.
- 1.2 Unmetered energy costs have increased by more than 56% between 2007 and 2013 which is an increase of more than 8% year on year.
- 1.3 Appendix 5 shows the costs for adopting of the lanterns required for the project.
- 1.4 The saving from the Street Lighting PFI budget after borrowing costs for the project is £33,242. Once the borrowing period has ended then the £127,000 budget can be used to support the council's budget position.
- 1.5 The reduction of CRC payment of £10,000 from the Carbon Reduction Commitment budget will contribute to reducing the pressure due to the increase in CRC charge to £16 per tonne of carbon dioxide.

Legal

- 2.1 None

Personnel

- 3.1 None

Equalities Impact

- 4.1 Effect is primarily on road users and the lighting levels are above those required for pedestrians

Health and Safety

- 5.1 Works to be carried out in accordance with the Street Lighting PFI Service Provider Health and Safety arrangements.

Environmental Sustainability

- 6.1 By completing the works identified in the recommendations there will be a reduction in energy that will increase the council's ability to meet its sustainability targets for CO₂ reduction.

Property and Asset Management

- 7.1 None

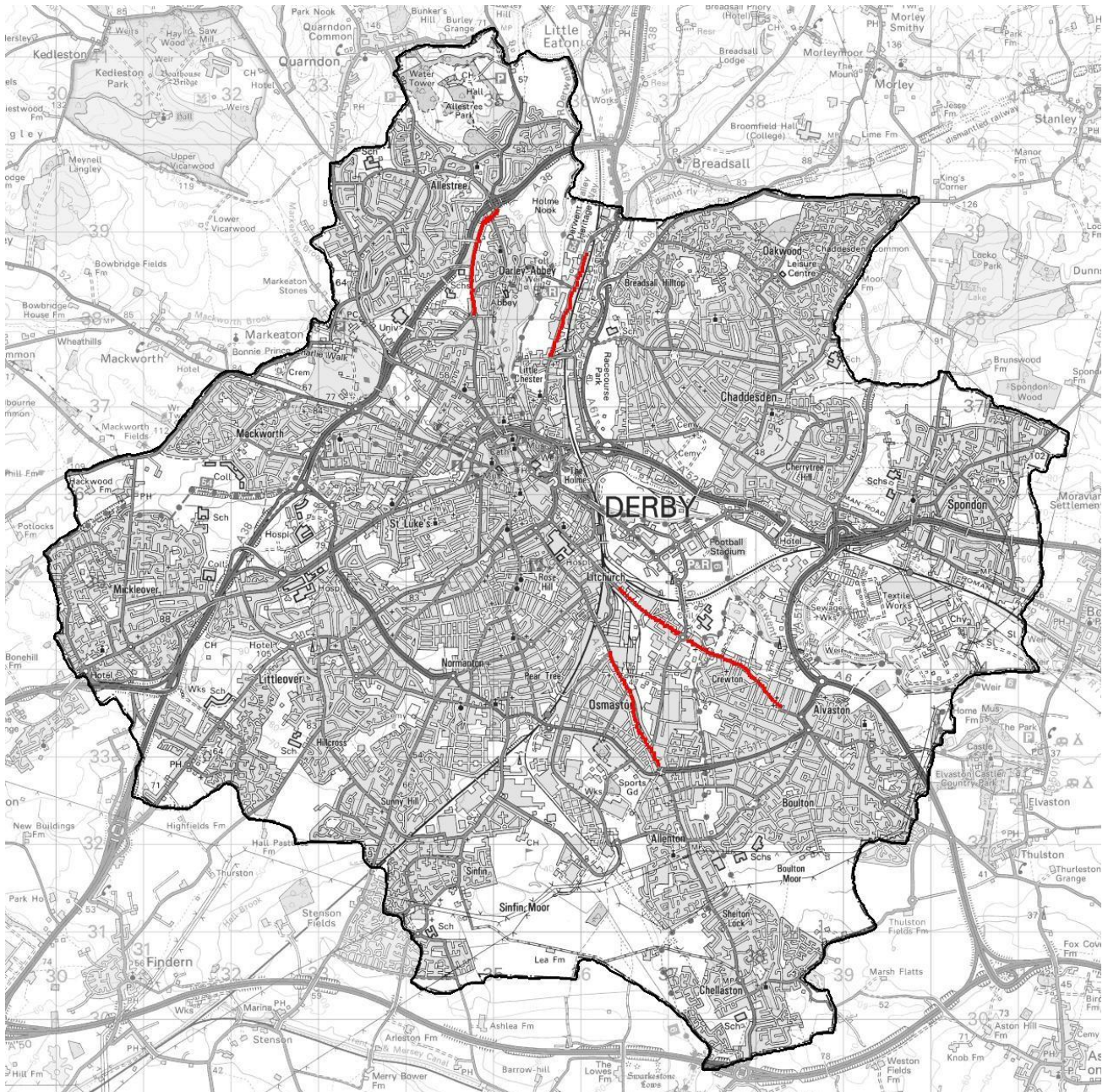
Risk Management

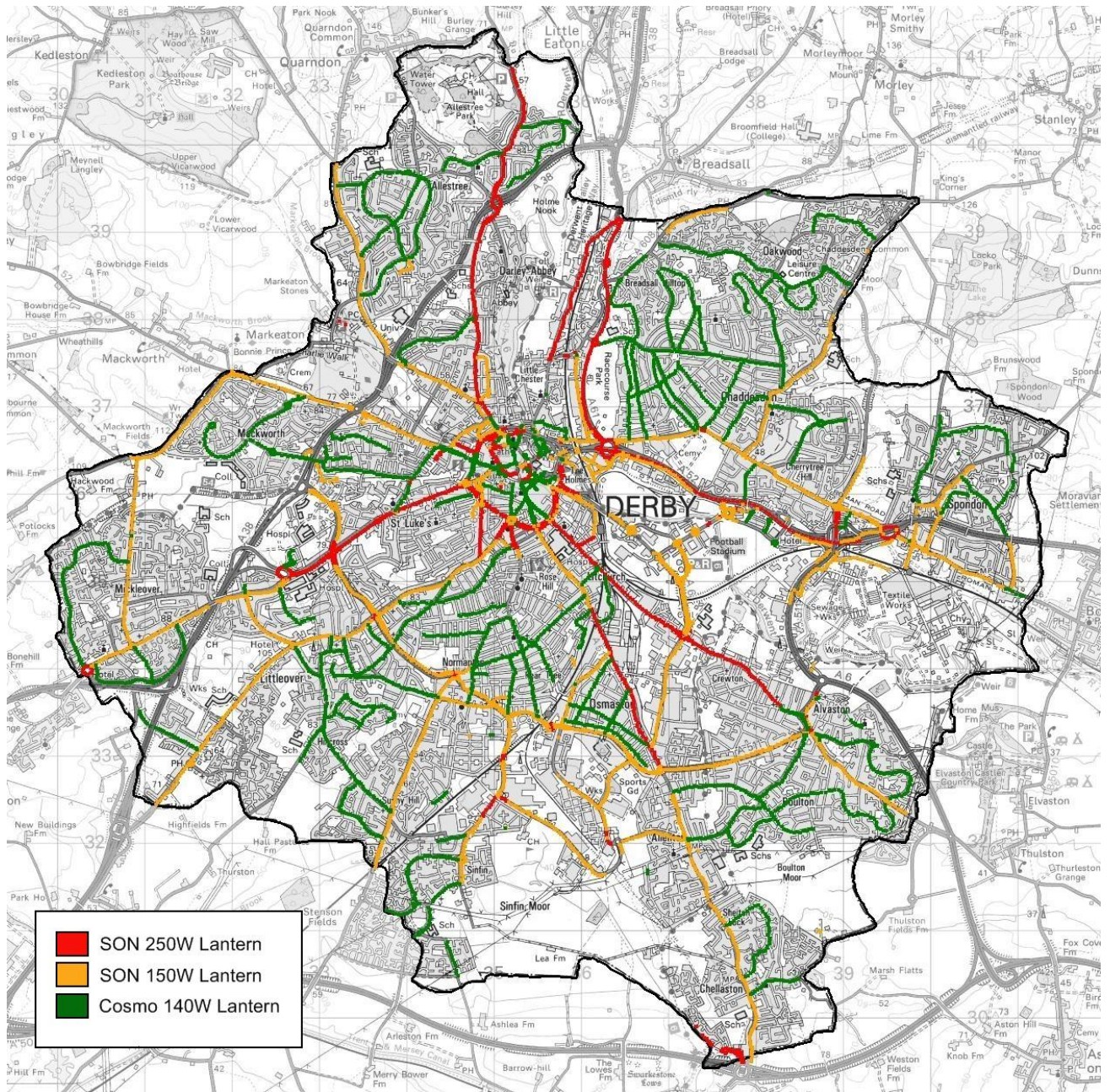
- 8.1 There is a risk of public dissatisfaction which may arise from the use of variable lighting levels. The benefit of the proposed solution is that the lighting is controlled centrally and it is easy to adjust for specific conditions and changes if issues occur with the public.
- 8.2 Dimming to 50% is generally not perceptible to the human eye so we consider that this can be introduced without significant opposition.

Corporate objectives and priorities for change

- 9.1 This recommendation will continue to meet the following corporate objectives:
- Being safe and feeling safe
 - Providing good quality services that meet local needs

Derby City (Initial Pilot Installations)



Derby City (Proposal Target Lighting - Large Wattage)

Derby City (Proposed Energy Savings through Dimming Profile)