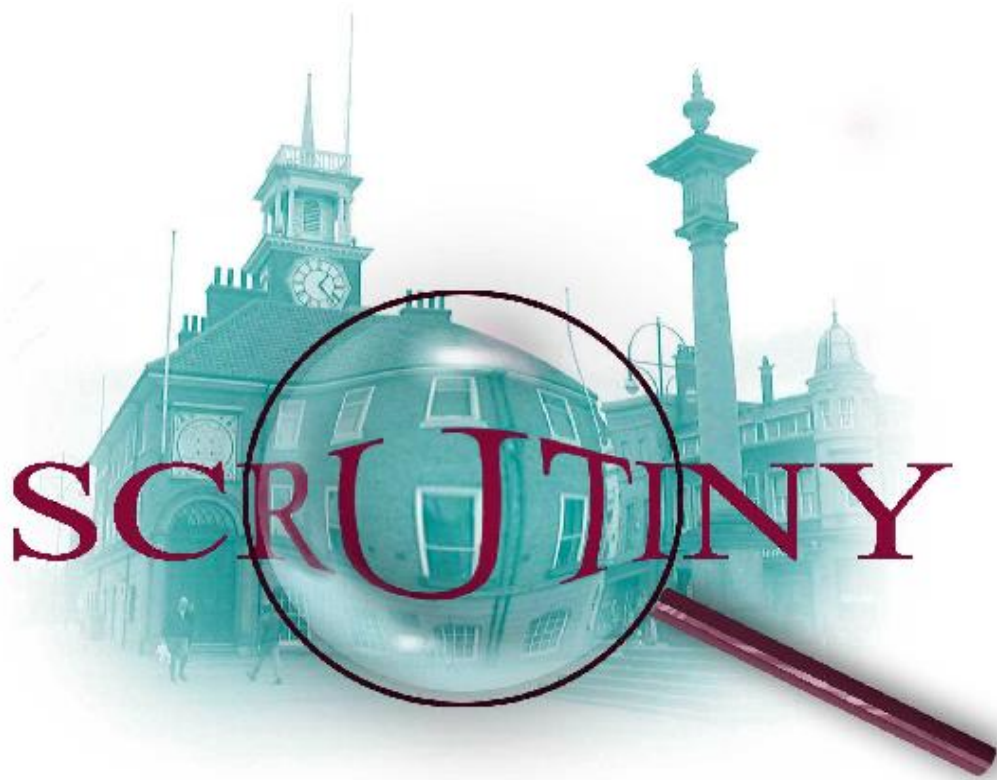


Environment and Regeneration Select Committee

Street Lighting Services



2006-2007

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Select Committee Membership

Councillor Mrs Beaumont (Chair)
Councillor Cains (Vice-Chair)

Councillor Fletcher
Councillor Larkin
Councillor Leckonby
Councillor Noble
Councillor Mrs Norton
Councillor Mrs Mrs Robinson
Councillor Rix
Councillor Salt
Councillor Smith
Councillor Walmsley
Councillor Woodhead

Acknowledgements

The Committee would like to thank the following Stockton Borough Council Officers who contributed to the review:

- **Bob Allen, Consultant**
- **Tom Andrew, Highway and Consultancy Manager (to August 2006)**
- **John Angus, Community Renewal Officer, Regeneration**
- **Ashley Briggs, Development Officer, Regeneration**
- **Andy Bryson, Financial manager**
- **Brian Buckley, Group Leader, Network Management**
- **Mike Sandbrook, Street Lighting Engineer**
- **Mike Robinson, Head of Service**

The Council would also like to thank the following external witnesses who contributed to the review:

- **Martin Follows, Derby City Council**
- **Bob Golightly, Hartlepool Borough Council**
- **Duncan Lingwood, Telford & Wrekin Council**
- **Tom Russell, Darlington Borough Council**
- **Judith Shaw, Integrated Utility Services**
- **Mike Wood, Middlesbrough Council**

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Street Lighting

Original Brief

<p>What are the main issues?</p> <p>Energy Costs; Efficiency of services; Public Safety; Sustainability; Asset Management; Energy Sources; Street Lighting Columns.</p>
<p>The Thematic Select Committee's overall AIM in doing this work is:</p> <p>To advise upon strategic and operational policy considering energy cost, service efficiency, sustainability and community safety</p>
<p>The main OBJECTIVES are:</p> <p>To complete the scrutiny review and make recommendations on future policy regarding the delivery of street lighting services</p>
<p>The possible OUTPUTS (changes in service delivery) are:</p> <p>Change to street lighting policy leading to change in operational delivery e.g. different maintenance and operating regimes and procurement</p>
<p>The desirable OUTCOMES (benefits to the community) are:</p> <p>Improved service to the community in terms of quality, price and improved customer satisfaction</p>
<p>What specific value can scrutiny add to this topic?</p> <p>Independent challenge and confidence in service delivery</p>
<p>Who will the panel be trying to influence as part of their work?</p> <p>SBC and Websters (strategic partners)</p>
<p>Who can provide us with further relevant evidence? (Cabinet Member/portfolio holder, officer, service user, general public, expert witness, etc.)</p> <p>Other Local Authorities; Specialist Bodies</p>

1.0 Executive Summary

- 1.1 The Environment and Regeneration Select Committee were tasked with examining Stockton Borough Council's street lighting services following a meeting of the Scrutiny Liaison Forum. The Committee were asked to address issues relating particularly to service costs incurred as a result of rising energy prices and an ageing stock with increasing maintenance requirements.
- 1.2 Committee also agreed to consider strategic and operational issues relating to service efficiency, sustainability, community safety and customer satisfaction as additional concerns.
- 1.3 Members were first concerned with receiving a technical overview of the service, in recognition of the highly complex nature of the subject. This was followed by receipt of oral and written evidence from SBC Street Lighting Engineers, Financial Officers and Officers from the Regeneration Department. Members also received evidence from external witnesses from Websters (DWL) and Integrated Utility Services, who are partly responsible for the Distribution Network. Committee were unable to take evidence from Northern Electrical Distribution Ltd.
- 1.4 Committee also considered desk based comparative and information gathering work relating to various schemes operated by other Councils in the same family group, and considered national 'best practice' guidance in terms of energy efficiency and general operation of the service.
- 1.5 Committee were happy that SBC is achieving best value for money in terms of energy procurement, but noted the shortfall in the 2006/07 budget, and also recognised the concerns, in both the short and long term, of rising energy costs and SBC's ageing street lighting stock. Members also note the need to create a fuller and more coherent policy for management of the service, and a requirement to undertake a comprehensive data verification exercise in order to fully calculate the required investment level.
- 1.6 It was also noted that trials are ongoing to experiment with mechanisms to reduce energy costs, and that successful trials should be rolled out across the Borough in order to achieve energy efficiencies.
- 1.7 It was stressed, though, that any experiments with dimming or reduction of street lighting should be undertaken in full consultation with safer Stockton partnership and the local communities in order that safety in the community is not compromised.
- 1.8 Members were also keen to ensure that the performance indicators outlined in the Webster's Partnership Agreement are measured and updated on a regular basis to ensure that the partnership is providing the best value for service and value for money.

Recommendations:

1. **Data verification exercise to be undertaken to determine the condition of stock.**

- 2. Ensure that performance figures encompassed in DWL Partnership Agreement are recorded for 2006 / 2007.**
- 3. Cost benefit ratio created for different scenarios relating to investment and replacement. Officers to investigate the potential of utilising the software created by Jacobs Babbie for Teford & Wreking Council for this purpose.**
- 4. An assessment of the level of finance required, based on stock condition and outcome of cost benefit ratio (see recommendations 2 & 3)**
- 5. Creation of a Business Case outlining the preferred option for investment.**
- 6. Placement of an advert in a national journal inviting expressions of interest from companies interested in entering into an agreement for the advertising rights on street columns.**
- 7. Report of the conclusions of the dimming trial to be reported back to Environment and Regeneration Select Committee**

2.0 Introduction

2.1 This report presents Cabinet with the outcomes of the review of street lighting services that was undertaken by the Environment and Regeneration Select Committee between April and November 2006.

2.2 The topic was identified as an area meriting a scrutiny review at a meeting of the Scrutiny Liaison Forum held on 8 March 2006. The issue was subsequently referred to the Environment and Regeneration Committee for approval, and passed to a meeting of the Executive Scrutiny Committee as part of the work programming procedure.

2.3 A scope and project plan for the review was created by the Chair, Vice-Chair, Cabinet Member, Link Officer and Scrutiny Officer at meetings held in March, and agreed by all Members of the Committee at a meeting held on 26th April 2006.

2.4 The objectives/aims developed by the Committee for the review were as follows: -

- To advise upon strategic and operational policy relating to energy cost, service efficiency, sustainability, community safety and satisfaction
- To complete the scrutiny review and make recommendations on future policy regarding delivery of street lighting services
- Findings and recommendations from the review to be reported to Cabinet/Council

2.5 The review addresses the following strategic corporate objectives:

- Resource management – Improve operational efficiency
- Community Safety – Respond to residents' concerns and fears of crime and anti-social behaviour, as part of the safer Stockton partnership

3.0 Background

3.1 National Context

3.11 Local Authorities do not have a duty to provide street lighting, but once provided, they do have a duty to maintain it in a safe condition.

3.12 Modern street lighting provides a number of benefits to the community, many of which (outlined below) are identified in the recent 'invest to save' document produced by the UK lighting board:

- Prevents night time personal injury accidents
- Reduces street crime
- Reduces the fear of street crime
- Promotes sustainable transport, promotes public transport, cycling and walking
- Facilitates social inclusion by providing the freedom to walk along and use our streets after dark
- Promotes economic development by supporting a 24 hour leisure economy and distribution
- Facilitates lifelong learning by providing after dark access to educational facilities
- Assists with emergency services to identify locations and carry out their duties. Without modern street lighting the time taken to attend and incident could be increased

3.13 The Government outlined the desire to create more attractive and sustainable urban environment in the 2002 Urban White Paper. Government have also promoted the use of Private Finance Initiatives to increase investment into local authorities street lighting stock

3.14 In November 2004, "Well Light Highways", the code of practice for highway lighting, was published by the UK Lighting Board. The document provides local authorities with guidance on lighting management in an ever-changing environment, creating a strong foundation for a positive and lasting road lighting maintenance policy. Adoption of the recommendations in this code promotes the delivery of Best Value services.

3.2 Local Context

3.2.1 Stockton Borough Council is responsible for approximately 25,600 street lighting units. The units comprise:

- Lighting on local authority roads
- Street lights mounted on buildings and other structures that illuminate the street
- Lights in highway tunnels/underpasses and pedestrian subways
- Lights on housing estate footpaths.

3.2.2 An inventory detailing the number and type of lamps and their associated mounting arrangements is outlined at **Appendix 1**.

3.2.3 In addition to the street lighting units outlined at table 1, the Authority also operates around 2,200 other units comprising illuminated bollards, road signs,

pedestrian crossing signs, school crossing beacons, and special event units. This equipment is excluded from the BVPI.

- 3.2.4 Street lighting units are maintained on behalf of the Authority by David Webster Ltd (DWL) via a Partnership Agreement, which is monitored by officers in the Highways Dept. This Agreement, (which came into effect in October 2004) covers a 4 year period with the option to extend for a further 2 years.
- 3.2.5 Performance of the service is monitored via 2 BVPI's (215a and 215b). BVPI 215a measures the average number of days taken to repair a street lighting which is under the control of the local authority. BVPI 215b measures the average time taken to repair a street lighting fault where the response time is under the control of the Distribution Network Operator (DNO). Performance for 2005/06 for Stockton-on-Tees Borough Council is outlined at figures 1 and 2 (Page 23 – 24).
- 3.2.6 Performance issues are also addressed as part of the Partnership Agreement with DWL, which encompass a number of KPI's, the aim of which is the delivery of five key outcomes :
1. Increased levels of customer satisfaction (**reduce number of complaints, increase commendations, reduce response times**)
 2. A safe environment for the community (**reduce crime and fear of crime, achieve column replacement targets**)
 3. Reduce the environmental impact of street lighting (**recycle or reuse higher percentages of materials, use only energy from green sources**)
 4. Increase levels of people satisfaction (**improve the satisfaction rating of staff working in the partnership, reduce staff turnover and sickness, reduce accidents**)
 5. Improved service delivery (**increase %ge "on" average, reduce %ge of repeat visits, increase %ge of scouting reports to customer reports**)

4.0 Methodology

4.1 Members of the Select Committee undertook an initial scoping exercise in June 2006. This exercise addressed issues relating to:

- The objectives of the review
- Key questions/evidence
- Identification of participants
- The extent of public involvement
- Information required to inform the review process
- Setting a time-scale for the review
- Officer Support

4.2 Following on from the scoping exercise, the Select Committee agreed a detailed Project Plan, which set out the key tasks to be undertaken by the Committee, time-scales for task completion and key milestones. The Project Plan established the key areas of the Committee's work. They were:

- To obtain written evidence, including background information and evidence from Officers of the Council
- To obtain oral evidence from Officers of the Council
- To undertake comparative work with other Authorities
- To obtain written and oral evidence from external witnesses

4.3 Committee received a technical overview of the service at the beginning of the review in recognition of the highly complex and technical nature of the subject, which was followed by an introduction to the current status of the service. Following this initial overview, Members agreed to pursue the following key themes:

- Partnership arrangements and current policy, particularly relating to the Code of Practice.
- Energy procurement
- Energy consumption

5.0 Summary of main background documents:

5.1 The following documents were also made available to Committee Members in order to inform the review:

- Briefing Note (technical Overview) – Highways department, SBC
- Briefing Notes – Regeneration & Highways Departments, SBC
- Briefing Note – Middlesbrough Council
- BVPI Figures
- 'Well-lit Highways', Code of Conduct – UK Lighting Board
- 'Street Lighting - Invest to Save' – Institute of Street Lighting Engineers
- Briefing Note – Derby City Council

Evidence/Findings

6.0 Technical Overview

- 6.1 Committee were provided with a technical overview of issues relating to street lighting. The overview was provided by Officers in recognition of the highly complex and technical nature of the information to be considered as part of the review.

Power Consumption

- 6.2 Typically, in domestic accommodation, lighting is provided by incandescent lamps (GLS). With incandescent lamps the majority of the power consumed, (some 90%), is converted to heat, leaving only 10% converting to light, so they are rather inefficient in terms of energy usage. Due to the nature of and demands on street lighting lamps, the lighting industry has therefore been driven to produce lamps that deliver improved energy efficiencies.
- 6.3 Street lighting lamps of different types (SOX, SON, MBF, CDM etc) produce illumination in generally the same way, via the release of photons when an electric current is passed through a metallic vapour. The process is very efficient in terms of light output versus energy consumed.
- 6.4 Lamps are designed to convert electrical power (watts) into light (lumens). This conversion is termed as the lamps efficacy
- 6.5 Table 1 (below) gives typical figures for different types of lamp.

Table 1	Lumens Per Watt
Incandescent (GLS)	10
Mercury Vapour (MBF)	40 to 60
Fluorescent	64 to 90
Metal Halide	70 to 100
High Pressure Sodium (SON)	90 to 125
Low Pressure Sodium (SOX)	120 to 200

- 6.1 In terms of overall power consumption street lamps do not only consume the rated lamp wattage. For example, for a lamp rated at 150 watts, losses incurred by the control gear could add another 25 watts making the total loading nearer 175 watts. Further, when lamps are initially switched on, and are in their start up mode, they can demand in the region of 50% more energy than their normal running load. This start up period varies between lamps but can be typically 5 minutes.
- 6.2 In addition to the losses outlined above, electricity supply companies are concerned that equipment connected to their network operates efficiently in the way it converts their supply of voltage and current into Watts of usable energy.

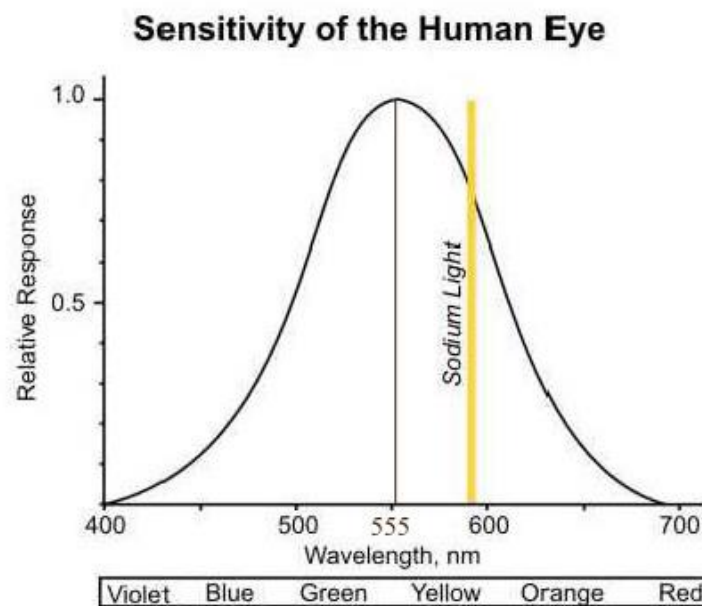
Ideally, watts would be the simple product of voltage and current. However since all the distribution networks are transmitted as alternating current, losses occur which reduce this conversion. This conversion loss is known as the equipment's Power Factor. Items of equipment aim to operate at a power factor as close as possible to unity i.e. no loss. In reality different items of lighting equipment actually operate between power factors of 0.9 and 0.98. Power supply companies can impose additional tariffs on large consumers of energy that operate at low power factors. Power supply companies are becoming more sensitive to power factor issues and this could also have a bearing upon the types of street lighting units utilised in the future.

Street Lighting Lamps and Colour Rendering

- 6.6 Taken in isolation, Table 1 indicates that SOX lamps are more appropriate in terms of energy efficiency, yet SOX lamps only comprise about one third of Stockton Borough Council's lamps (about 8,200).
- 6.7 The ability of a lamp to reproduce "daylight" is called the colour rendering index. This "Ra" index has a scale from 0 – 100 with daylight rated as 100.
- 6.8 Traditionally the favoured lighting source utilised in road and street lighting has been the low-pressure sodium (SOX) discharge lamp. This type of unit is very efficient at converting electrical energy into visible light (see table 1), but has a Ra index of 0. The light output from these units is therefore virtually monochromatic, being concentrated in a very narrow band (yellow/orange) of the visible spectrum, and produces the typical yellow colour cast lighting encountered on our streets and highways for many years. This output provides an unnatural appearance to the human eye and is very poor for colour recognition (a particular problem with CCTV systems and other crime related issues).
- 6.9 In more recent times high pressure sodium (SON) lamps were developed. These sodium lamps provide much improved colour rendering performance in the range of Ra 25 – 55. These units still exhibit the typical sodium yellow appearance but do provide a broader spectrum and are a marked improvement on SOX lamps.
- 6.10 The Mercury Discharge Lamp (the first mass produced lamp used in lighting schemes) is not as energy efficient as its sodium based counterparts but it does provide better colour rendering properties in the range of Ra 40 – 50. It produces a greyish blue colour output and is regarded as a cold colour when compared to the warmer (yellow) of sodium lamps. It still has a market as both the lamp and its control gear are relatively cheap to produce.
- 6.11 Further recent developments in the production of metal halide lamps, particularly ceramic arc tubes (CDM), have provided lamps that have significant improvements in delivering "white" light over SON lamps. CDM lamps can now provide colour rendering in the range of Ra 80 – 90.
- 6.12 Although the lamps referred to in 6.9/6.10 are actually less energy efficient (lumens per watt – see table 1) than the SON and particularly the SOX units, there is an argument that the improved colour performance across the full

spectrum allows designers to utilise lower wattage lamps to deliver the same “perceived” level of illumination.

- 6.13 This is backed by recent studies which have revealed that the human eye behaves differently in high and low light conditions. In bright conditions the eye operates in its normal photopic region and at this level the frequency of light generated by the SOX lamp is almost at the peak sensitivity of the human eye (see graph below). However in very low lighting conditions often encountered in street lighting conditions the sensitivity of the eye shifts towards the Blue end of the spectrum and sodium lighting performs poorly making detail difficult to see. This explains why lower levels of “white” light (containing a mix of frequencies) can be more acceptable to residents even though, in reality, the measured lighting levels are less. Lighting designers can therefore utilise smaller wattage “white” light lamps and regain energy efficiencies.



- 6.14 Low pressure sodium (SOX) lighting is still extensively utilised on long lengths of motorways where the requirement is to provide very energy efficient, low contrast lighting where colour rendering is not a priority.
- 6.15 Development is continuing with LED’s (Light-Emitting Diodes) as a potential replacement for the conventional lamps currently available. LED’s have been available for some time and are in general use, but essentially as small, relatively low power units. The aim is to produce ever-larger units capable of delivering sufficient output to be viable as street lighting units. LED’s operate “cold” and hence provide high efficacy with most of the energy radiating in the visible spectrum. With the pressures of increasing energy costs it is hoped that LED development could provide good quality lighting at a viable cost.

Street Lighting Luminaires

- 6.16 As discussed above, the type of lamp utilised has a bearing upon the nature of the light produced. However this light source must be controlled to deliver the light accurately to the target surface. This is dependant on the luminaire, which consists of the light source or lamp, the reflector for directing the light, an aperture (with or without a lens), the outer shell or housing for lamp alignment and protection, an electrical ballast, if required, and connection to a power source.
- 6.17 Luminaires are constructed from a range of materials and are purpose designed for a variety of installation and operational requirements. For example, on motorways the lighting must be evenly distributed avoiding high intensity areas followed by dark spots. It would also be unacceptable to provide motorway lighting that produced excessive glare for drivers of vehicles.
- 6.18 Lighting designers are also now charged with cutting down light pollution e.g. light directed upwards into the night sky, which in addition to being wasteful also hinders the viewing of stars. The direction of the light being emitted by the luminaire is controlled via its shape, material, construction and most importantly by the light source reflector
- 6.19 The size, shape, and weight of the luminaire is dependent upon the lamp, the lamp control gear, the lighting distribution required and of course the desired aesthetic appearance.
- 6.20 In addition to housing the lamp and distributing the emission of light correctly the luminaire also contains the control gear required to operate the lamp. Discharge lamps require a high voltage pulse of energy to ignite the lamp and this is delivered via the control gear. Traditionally this control gear comprises an electromagnetic ballast and capacitor unit. Manufacturers are moving towards electronic control systems, which are lighter, and more energy efficient.

Physical Requirements of Columns

- 6.21 The choice of column size, shape, and material is dependent upon a number of factors. The height of the column is determined by the required light distribution (spacing factors, type of luminaire, location requirements etc). The higher the column, and heavier the luminaire the stronger it needs to be at the base. The column must be capable of taking a particular load and this loading is affected by the weight of the luminaires, their wind area, and the wind speed at the location. Columns in exposed locations (motorways, dual carriageways, airports) and in excess of 8m are given an "exposure class" rating of 1, with class 2 for columns in excess of 8m but not in exposed locations, and class 3 for columns of 8m and below not in exposed locations. The shape, wall thickness, and material of the column are therefore constrained by a number of factors.
- 6.22 Columns can be manufactured from a range of materials including mild steel, stainless steel, cast iron, aluminium, and concrete.
- 6.23 Lighting columns are relatively low cost, low technology items of infrastructure. Columns should provide in the region of 30 years service if correctly

manufactured and maintained. The choice of base material, the type of protection applied, and the local environmental conditions all impact upon the lifespan of columns. The most common material (mild steel) can be affected by a range of environmental conditions. Corrosion can be accelerated by a column's exposure to environmental pollution (acid rain – in industrial areas), salt deposits (road salt used to prevent the highway from freezing, and dog urine), local ground conditions (clay soils retaining moisture, or soils with a high content of aggressive agents), and exposure to other chemicals (weed killers etc).

- 6.24 Corrosion can therefore be a much localised activity and may go undetected for long periods of time. It cannot be assumed therefore that because a particular column is a certain age it is still fit for purpose.
- 6.25 With financial pressures imposed on many Local Authorities across the country, street lighting schemes have been under funded over the years. This has led to a general reduction in planned maintenance (painting, inspections etc) of the columns as the need to spend more on reactive maintenance has increased. Inevitably this has led to a progressive decay in street lighting stock nationally.

Aesthetic Features of Columns

- 6.26 Provided the physical requirements can be met the designer may have a wide choice of materials, finishes, and styles. Columns can be coated with a range of products providing an extensive choice of colours and finishes. The styling of the column can also be varied from the typical tubular format seen extensively on our motorways through to period style units used in “heritage” areas.

7.0 Current Lighting Stock – Stockton Borough Council

Lamps

- 7.1 Examination of Stockton Borough Council's (SBC) inventory (Appendix 1, table C) reveals that approx 50% of the lighting stock is comprised of high pressure sodium (SON) lamps. The SON lamp provides improved colour rendering performance over the SOX lamp and maintains relatively high levels of energy efficiency. Although less efficient in converting watts to lumens the SON lamp provides improved lamp life (28,000 hours) over the SOX (20,000 hours) and hence benefits from lower maintenance costs. Colour rendering of SON lamps can be further improved but this is at the cost of reducing energy efficiency so specialist lamps are usually restricted to areas with specific requirements. The SON lamp is seen as a good compromise between energy usage, lamp life and colour rendering, and is the most popular source of illumination on the streets and roads.
- 7.2 SBC have in the region of 1400, 125 Watt Mercury Discharge (MBF) lamps on the current inventory. These units are relatively inefficient in terms of energy conversion (see table 1, p.) but do give acceptable lamp life (22,000 hours). Due to the escalating cost of energy MBF lamps have been targeted for immediate replacement as funds become available.

- 7.3 Overall, as outlined in table C, SBC currently utilises 10 different types of lamp with power ratings ranging between 18 watts and 500 watts.
- 7.4 A full inventory of the column materials, age, heights of columns and energy profiles is outlined at **Appendix 1**.
- 7.5 £30,000 from the street lighting budget has recently been earmarked for a data verification exercise to be undertaken by David Websters Limited for the Governments Condition Index, and to ascertain the overall condition of the stock. It is a requirement that all Local Authorities provide an indicative condition report. Levels of funding assigned will be determined by the condition.

Columns

- 7.6 As with the lamps, the lighting stock comprises a variety of columns. These columns are of different materials, heights and condition. A summary table (Appendix 1, table B) indicates that there are approx. 25,600 columns supporting the various lighting units. The majority are of mild steel construction. However, it may be noted that there are 4234 concrete columns over 30 years old. Typically, these columns are beyond their useful life and should be prioritised for replacement based upon condition assessment. Again, the data verification exercise will update the accuracy of the existing database and enable officers to identify those columns that should be prioritised for replacement

Telford & Wrekin

- 7.7 Telford & Wrekin are understood to have used a software programme as part of the process to determine the viability of applying to central government for PFI credit approval. Officers are to investigate the potential for utilising this , or a similar programme, when undertaking the feasibility for funding future obsolete column replacement

Recommendations:

Data verification exercise to be undertaken to determine the condition of stock

Cost benefit ratio created for different scenarios relating to investment and replacement. Officers to investigate the potential of utilising the software created by Jacobs Babtie for Teford & Wreking Council for this purpose.

8.0 Partnership Arrangements

- 8.1 David Webster Ltd (DWL) maintains the street lighting units on behalf of the Authority via a Partnership Agreement, which is monitored by officers in the Highways Department. This Agreement (which came into effect in October 2004) covers a 4 year period with the option to extend for a further 2 years. The terms of this Agreement encompass a number of Key Performance Indicators (KPI's) with the aim of delivering five key outcomes:

- Increased levels of customer satisfaction (**reduce number of complaints, increase commendations, reduce response times**)
- A safe environment for the community (**reduce crime and fear of crime, achieve column replacement targets**)
- Reduce the environmental impact of street lighting (**recycle or reuse higher percentages of materials, use only energy from green sources**)
- Increase levels of people satisfaction (**improve the satisfaction rating of staff working in the partnership, reduce staff turnover and sickness, reduce accidents**)
- Improved service delivery (**increase %ge “on” average, reduce %ge of repeat visits, increase %ge of scouting reports to customer reports**)

8.2 The terms of the agreement require that DWL undertake night time inspections along planned routes on an agreed programme, such that all units are inspected twice monthly in the period between October to March and once monthly between April and September. In addition to the planned inspections, faults are also reported via members of the public, Council Officers, etc.

8.3 All faults that are ‘called in’ or detected during the planned inspections are entered onto the data base and individual units are allocated a faults history log. Once entered onto the system the fault is time stamped and tracked from time of reporting to resolution. DWL have been set a target of 4 calendar days to resolve the fault once it has been logged on to the system. The UK Lighting Board Code of Practice for Highway Lighting Management - “Well-lit Highways” proposes 5 working days as the maximum response time for reactive maintenance issues. The SBC target of 4 calendar days is therefore a more onerous target to meet and requires a higher level of performance from DWL.

8.4 A full years operating data now exists for the period April 2005 – March 2006 and analysis is underway to determine how the Agreement has performed in comparison with the KPI ‘s outlined at 8.1.

Recommendation: Ensure that performance figures encompassed in DWL Partnership Agreement are recorded for 2006 / 2007.

8.0 Performance

8.1 The rectification of street lighting faults is the subject of two Best Value Performance Indicator’s (BVPI’s). BVPI 215a measures the average number of days taken to repair a street light which is under the control of the local authority.

8.2 Examination of BVPI 215a for the period 2005/6 reveals that the target repair figure of 4 days was exceeded over the year. A figure of 4.6 days was actually achieved. Committee were asked to note, however, that during the start up period of the maintenance agreement both DWL and SBC experienced difficulties in operating the monitoring database. It is believed that the initial issues led to somewhat misleading results in reporting fault repairs. The early months of monitoring were distorted and target repair figures were reported longer than were actually being achieved.

- 8.3 These administration practices have been addressed over the months and reporting figures, which are now more accurate, show that response times in the last quarter of the year averaged around 3 days, highlighting that significant improvements have been made (See fig. 1).
- 8.4 In recognition of the fact that certain faults cannot be solely resolved by Local Authorities (or under the terms of the partnership agreement with DWL, where SBC is concerned) a separate BVPI (215b) was created by the Government to measure the average time taken to repair a street lighting fault where the response time is under the control of the Distribution Network Operator (DNO).
- 8.5 Experience has revealed that repairs to street lighting units do not rank highly with the DNO and that repair times can be excessive. Examination of BVPI 215b (DNO) for the period 2005/6 reveals that our target repair figure of 30 days was exceeded with a figure of 51.48 days actually achieved. Although far from satisfactory overall, significant improvements have been made over the second half of the period. A month on month improvement has been achieved to the point that in March 2006 the DNO achieved resolution of faults in 20 days (see fig.2). This performance level continues to be monitored by Council Officers.
- 8.6 The statistics for the year April 2005 / March 2006 reveal that, on average, some 630 "faults" were recorded per month - although this is a significant number of faults (7,550 in the period) in the context of the whole stock, 97.4% of units were operating correctly on average throughout the period.

Figure 1 – BVPI 215a

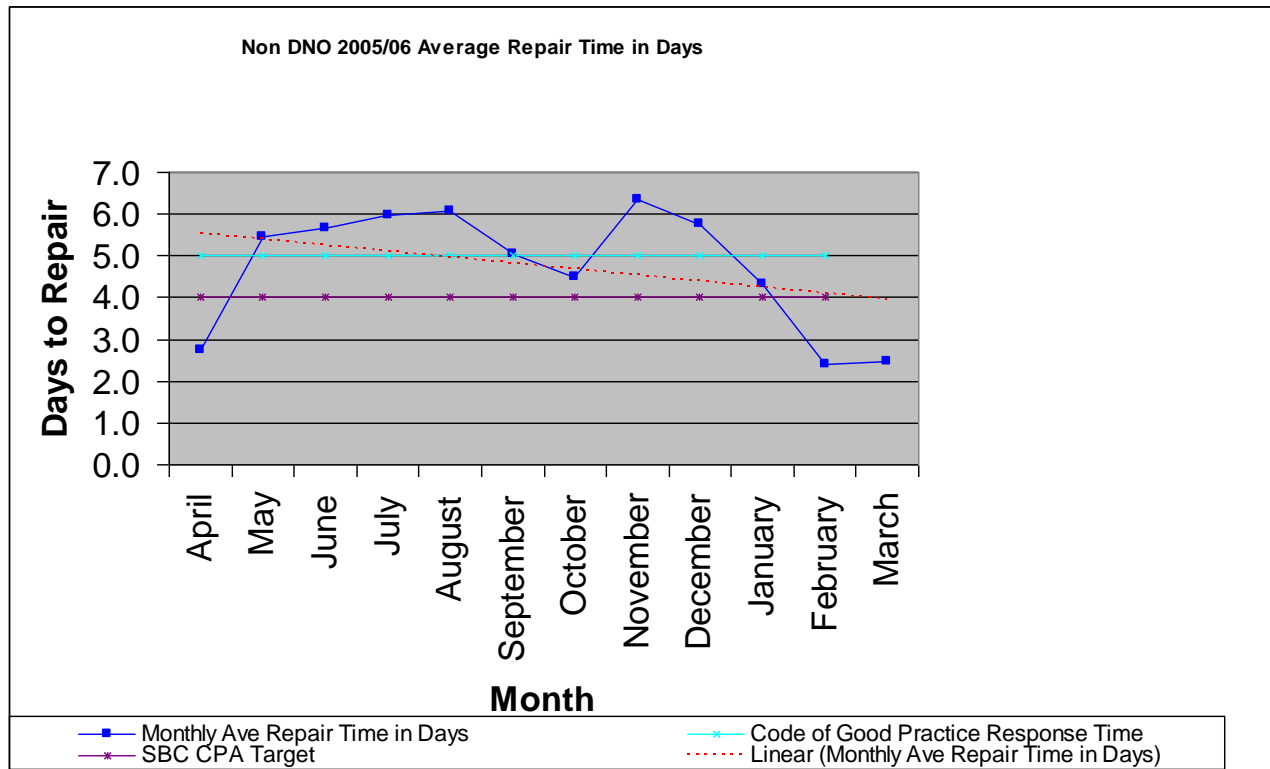
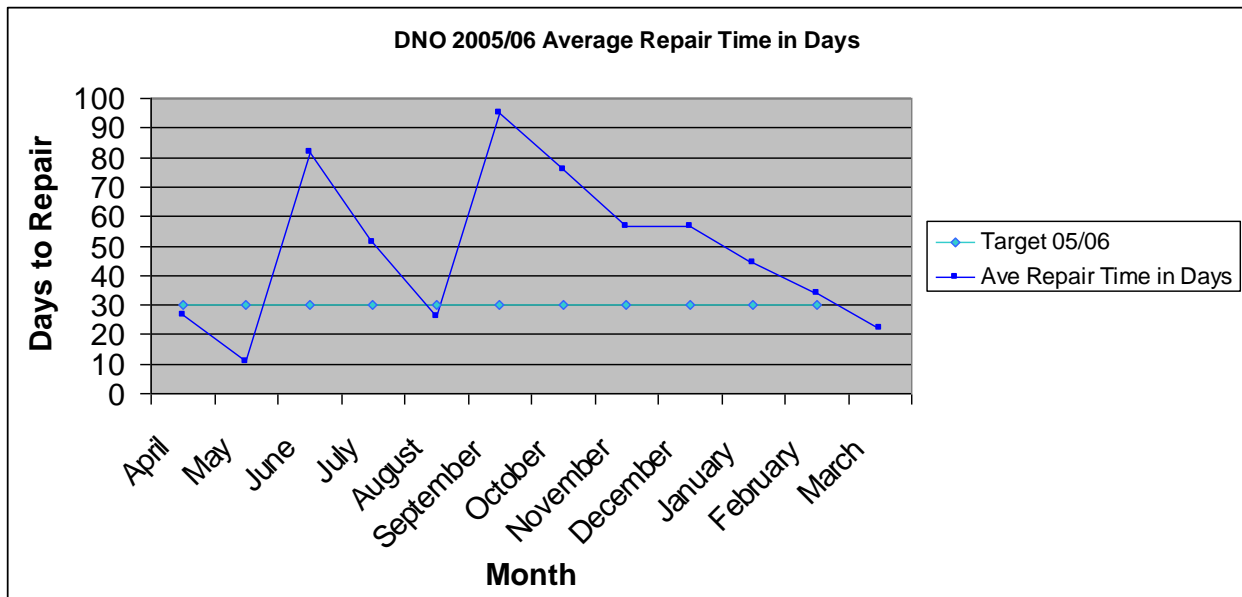


Figure 2 – BVPI 215b



9.0 Code of Practice

9.1 “Well-Lit Highways”, the code of practice for highway lighting management was published by the UK Lighting Board in November 2004. This code provides guidance to local authorities on a range of issues (service provision, cyclical maintenance, reactive maintenance, service agreements with the DNO, procurement) relating to the provision of street lighting schemes. Adoption of the recommendations in this code will help the delivery of Best Value services.

9.2 Stockton Borough Council intends to conform to the Code of Practice, and Officers have undertaken an analysis of the recommendations in this code against the current regime and produced an Action Plan to bring SBC operations as far as possible in compliance with this code (**Appendix 2**). The action plan highlights a number of areas where improvements can be made. The action plan highlights the need to negotiate a formal service level agreement with the DNO to improve their performance.

Recommendation: Production of a policy document based on the recommendations outlined in the UK Lighting Board’s Code of Practice for Highway Lighting Management

10.0 Financial Issues

10.1 Energy Procurement

10.1.1 Energy is purchased by the North East Purchasing Organisation (NEPO) on behalf of Stockton Borough Council. NEPO is a purchasing and contracting consortium consisting of 12 full member local authorities and 13 associate members. The North Eastern Purchasing Organisation was established in 1976

as a means of aggregating contracts and pooling purchasing knowledge and expertise between the original 5 Tyne and Wear metropolitan authorities. It has since expanded its membership and services and now negotiates 92 different contracts. NEPO covers an area from the Scottish border through to Tyneside, Wearside, County Durham and Teesside.

10.1.2 NEPO purchases energy via three different contracts, which are framework arrangements:

- Gas
- Non half-hourly electricity – A fixed price is charged for a certain length of time
- Half-hourly electricity – Consumption monitored and charged for on a half-hourly basis.

10.1.3 Of the half-hourly, unmetered electricity, approximately 200 m kw hours are purchased a year through the NEPO contract for all northern-eastern authorities, except District Authorities, who are not responsible for managing street lighting services and Newcastle and North Tyneside, who have entered into PFI's.

10.1.4 Energy is purchased from NPower, and the contract was entered into in April 2004 following a tendering process. A number of issues, including price and quality were examined as part of the process, and NPower's tender was considerably cheaper at the time. The contract was agreed for three years initially with an option to extend the contract for a further two years. The contract expires in April 2007, and it has been agreed by NEPO Committee to extend the contract to 2009.

10.1.5 As part of the terms of the contract, the individual purchasing decisions remain with NEPO, whilst NPower are responsible for distribution and administration. NPower, though, are not energy producers, but have a team of buyers who purchase electricity from the open market. The challenge for NPower is to buy at the right time (NEPO monitors the market to ensure that they are receiving value for money).

10.1.6 Electricity was originally bought in advance in 4 tranches for the following year on the Future's Market, which has traditionally led to the achievement of good prices. Because of rising energy prices, NEPO now buys smaller tranches of energy using daily market intelligence. The change to this flexible purchasing regime was instigated in order to reduce the risk of buying at a point when prices are high. NEPO is the only organisation in the country that has moved to such flexible arrangements, and is seeing savings as a result of their implementation.

10.1.7 The flexible purchasing schemes that allow buyers to spread the risk, on top of the tendering processes undertaken by NEPO, ensure that best value is being achieved at the moment.

10.1.8 The amount each authority consumes is worked out via the Estimated Annual Consumption Proforma, which is the basis upon which SBC and all other authorities are charged. This means that any reduction in, for example, the wattage of lamps used, will be reflected in the Estimated Annual

Consumption, and should impact on prices. SBC currently pay around 7p/kw hour

Finding: Committee find that SBC are achieving best value for money in terms of energy procurement

10.2 Expenditure

10.2.1 Budget

10.2.2 The revenue budget for 2006/07 is £1,972,305

This budget is targeted at the following areas:

Electricity costs	£1,168,065
Scouting	£24,500
Emergency call out	£7,280
Repairs	£375,160
Electrical testing	£46,000
Data Verification & testing	£30,000
Painting	£27,990
Bollard and sign clean	£13,750
Traffic light – Bulk change/ maint	£18,288
Management fee	£293,949
TOTAL	<u>£2,004,982</u>

There is a shortfall of £32,677 on the works targeted above. The Department will not overspend on the 2006/7 budget but will cut back on the street lighting programme of works so that expenditure will be within the agreed budgets.

In additional to the above revenue budgets there is also a capital allocation of £242,000 in 2006/07, which has been directed at renewing the oldest and most inefficient lighting columns. The funding is from the Local Transport Plan.

10.3 Energy

10.3.1 In recent years the energy market has been volatile, resulting in a significant rise in the cost of electricity. The street lighting network consumes a large amount of electricity annually and the running costs have almost doubled since 2004. Typically, a street light operated from dusk to dawn is on for approx 4,100 hours per annum. The energy consumption of the units varies depending upon their designed function but is typically between 35 and 250 Watts.

10.3.2 The vast majority of the street lighting units are fed via unmetered supplies. Charges are therefore calculated and levied utilising a nationally agreed formula based upon the wattage of the unit and predicted usage.

10.3.3 Energy costs for 2004/05 were £512,000 and for 2005/6 the energy costs rose to £781,000. Electricity charges have budgeted to increase £438,000 (60%) to £1,168,065 in the 2006/07 financial year. A headroom bid of

£400,000 was approved as part of the 2006/07 budget setting process to offset the majority of the increase.

- 10.3.4 It is also anticipated that electricity charges will further increase by 20% per year compounded for 2007/8 and 2008/9. The current Engineers Medium Term Financial Plan (MTFP) has electricity budgets of £1,401,678 (2007/8) and £1,682,014 (2008/9). Resources have not yet been identified in the MTFP to cover the additional increase.
- 10.3.5 Energy costs are an area of concern both in the short and long term. The Council has no direct control over the price of energy, but strategies have been employed by NEPO to mitigate the impact of these escalating costs (see section 10.1). Council officers are investigating a range of options to reduce energy usage and also seeking ways to generate revenue from the network, which could be used to offset running costs.

Finding: The Committee note the detrimental impact of rising energy costs, and would support the investigation of solutions to encourage energy reduction.

10.4 Street Lighting Stock

- 10.4.1 The operation of a lighting network comprising 25,600 Street lighting units and 2,200 ancillary units requires financial planning and control. In addition to the reactive maintenance issues (fault resolution) described in sections 8 & 9, the system also requires expenditure on planned maintenance activities to both prolong the lifespan of the existing stock, and to ensure its safe operation.
- 10.4.2 SBC is faced with an ageing infrastructure and the need to replace columns as they near the end of their lifespan. The Council has targeted the replacement of the 3,476 concrete columns as a priority. Approximately 40% of these concrete columns were replaced by 2005 / 06 and a Capital allocation of £242,000 is included in this year's budget to further replace and renew obsolete columns.
- 10.4.3 In a report published by the Institution of Lighting Engineers, "*Lighting Columns and Sign Posts: Planned Inspection Regime*", particular concerns are highlighted in regard to mild steel columns designed and manufactured since about 1970. The report states that these columns, "which are of very slender thickness, and the product of low cost production" are the main cause of concern. The street lighting network has circa 5,000 mild steel columns, which fall into this category.
- 10.4.4 In recognition of these safety concerns the Council undertook a risk assessment of the stock and all these columns were structurally tested in 2003. Around 100 defective columns were replaced as a result.
- 10.4.5 The infrastructure needs to be maintained via painting, cleaning, and ongoing structural and electrical testing. At times complete replacement of obsolete units is required. In addition capital schemes are required to service new developments. The network therefore continues to expand, and both reactive and planned maintenance costs are coming under budgetary pressure.

10.4.6 It is estimated that the network as a whole comprises approximately 10,000 columns over 25 years old - with a replacement cost between £7million and £8 million.

Finding: The Committee note the detrimental impact on the budget of an ageing street lighting stock, and would support the investigation of schemes to finance stock renewal, where necessary.

Recommendation:

An assessment of the level of finance required, based on stock condition and outcome of cost benefit ratio (see recommendations 2 & 3)

10.5 Green Energy

10.5.1 Green energy is available on the future markets, but at a premium. There are also different definitions of the term 'green energy' and the types of energy that should be classed as green. Demand for green energy also significantly outstrips supply. NEPO have traditionally purchased a proportion of green energy, but a move to increasing the amount purchased might result in a price rise of up to 14%. Any savings made from reducing the amount of green energy we already purchase may be offset, though, by a climate change levy.

11.0 Future Funding Sources

11.1 Committee were advised that a sustainable solution is required on the future policy regarding the delivery of street lighting services. This could be solved by using different options including:

- 1) Operating Lease
- 2) Private Finance Initiative (PFI)
- 3) Prudential Borrowing
- 4) Capital / Funding Bids (e.g. NRF)
- 5) Advertising

Committee undertook research and comparative work with Councils in the family group on the above schemes. Examples from family group of how & why the various sources have been utilised by authorities to upgrade street lighting stock.

Operating Lease

11.2 An operating lease is a lease whose term is short compared to the useful life of the asset being leased. An operating lease is commonly used to acquire equipment on a relatively short-term basis.

11.3 One of the options available to the Council is to enter into an operating lease with a company, whereby the company would replace all of the stock, and lease it back to the Council for a period (e.g. 25 years), during which time the Council remains responsible for all repairs and maintenance and energy costs. The stock would return back to SBC ownership at the end of the agreed lease period.

- 11.4 The benefits of this option are the likely reduction of maintenance and energy costs, although this option may not be suitable where the condition of stock is not sufficiently poor to warrant wholesale replacement.

Private Finance Initiatives (PFI)

- 11.5 A Private Finance Initiative is a method developed to provide financial support for "Public-Private Partnerships" (PPPs) between the public and private sectors. These projects aim to deliver all kinds of works for the public sector, together with the provision of associated operational services. In return, the private sector receives payment, above the price that the Public Sector could have achieved the work, linked to its performance in meeting agreed standards of provision.
- 11.6 Where projects are procured by local authorities, the capital element of the funding enabling the local authority to pay the private sector for these projects is given by central government in the form of what are known as PFI "credits". PFI is not just a different way of borrowing money; the loans are paid back over the period of the PFI scheme by the service provider who is at risk if the service is not delivered to standard throughout. The local authority then procures a partner to carry out the scheme and transfers detailed control and in theory the risk, in the project to the partner.
- 11.7 Committee received evidence from two authorities in the family group that have pursued pfi schemes:

Redcar & Cleveland Borough Council

- 11.7.1 At the Street Lighting PFI Sub-Committee held on 18th March 2004, Members approved the Outline Business Case for submission to the Department for Transport in support of Street Lighting PFI credits.
In the OBC the Council was seeking Government approval for £21.1m PFI credits to enable 85% of the existing street lighting stock to be replaced and the installation of 3,500 new columns to bring the street lighting infrastructure up to the latest European standards.
- 11.7.2 The Government's inter-departmental Project Review Group assessed the project on 10th August, 2004, when it was agreed that the project should receive Central Government support.
- 11.7.3 Following Government approval, the Council commenced the procurement of the project in October 2004. Subject to the completion of the procurement process it is planned to commence the project in June, 2006.
- 11.7.4 During the preparation of the OBC, the Council received support for the project from Arriva North East Ltd., Langbaugh Primary Care Trust, Cleveland Police Authority, Cleveland Casualty Reduction Group and Age Concern.
- 11.7.5 Further consultation will be required during the programming phase of the project and this will cover Area Environmental Committees and other representative groups.

Derby City Council

11.7.6 Derby Council maintains over 29,000 street lights and illuminated signs. There has been no large scale capital investment in street lighting for some years, and over 75% of the stock is now considered to be in poor structural condition and/or at the end of its design life.

11.7.7 Business Case – See Appendix 3

Prudential Borrowing

11.8 The prudential borrowing power, which came into effect as part of the Local Government Act 2003, allows councils to borrow without the consent of central government, as long as they remain within their own affordable borrowing limits. Future revenue streams are used as security for loans.

11.9 Committee received the following evidence from Darlington Borough Council:

“We started looking at a white light programme during 2001/02 and trialled several lanterns. The preference was for the Urbis Opalo, 42w PL-T as a direct replacement for the old 125w MBF lanterns that we wanted to replace. We checked existing lighting levels in a number of streets before and after conversion and determined a percentage increase in lighting levels. The whole exercise was costed out taking into account cost of new lantern, labour cost for conversion, reduced cost of future maintenance and set this against the savings to be made in energy cost. At the time the saving was in the region of £18 per unit per year, we had over 1800 MBF units, so the prospective saving was over £32k per annum. The proposal as a whole had to go as a report to Scrutiny Committee for approval and the Highways Manager and Street Lighting Engineer addressed any queries the panel had. The conversion programme was staggered over 4 financial years and prudential borrowing to the amount of £60,000 was used to fund it.”

Capital/Funding Bids

11.10 The main issue with sourcing and using external funding for the street lighting service, once provided by the Council, is that this service is a statutory requirement. An application to an external funding body would have to clearly demonstrate that any funding secured would be used for additional items above that of the statutory requirement.

11.11 In 2003/04 a project was carried out in Partnership with the Parkfield/Mill Lane Neighbourhood Management Pathfinder to improve the street lighting across the Parkfield/Mill Lane neighbourhood. This project was continued in 2004/05 and 2005/06.

11.12 The aims of this project was to bring forward the cyclic maintenance programme, which is being implemented through Stockton Council's street lighting section, in those areas (within Parkfield/Mill Lane) that had a high rate of reported crime and anti-social behaviour. It is well documented that improved lighting in an area has a positive impact on the levels of certain types of crime. In addition, the project also installed several adaptors to allow for a mobile CCTV camera to be positioned on the street lighting column.

- 11.13 The funding to carry out this project was secured from several sources including the Neighbourhood Management Pathfinder, NRF (Neighbourhood Renewal Fund), Single Regeneration Budget (SRB) and the New Opportunities Fund (now The Big Lottery). This funding was matched with the existing available annual budget for the cyclic maintenance of the street lighting.
- 11.14 The funding amounts that were secured through these external funding bodies was not a vast amount and only allowed for street lighting in 15 streets to be improved.
- 11.15 Possible avenues to explore for future funding include:
- The Big Lottery - has several funding programmes, one of which is aimed at carrying out Environmental Improvements. However at this time the full details of the '*Changing Spaces*' has yet to be released.
 - Department for Communities and Local Government (DLCG) - It is unclear what funding will be made available from Central Government. The Single Regeneration Budget has ended and the current round of Neighbourhood Renewal Funded has been allocated. *There is a White Paper expected in October, which is to highlight the future thematic priorities for the future years. The general feeling is that this will indicate that the priorities are Community Engagement, Health and Worklessness. However, again there is no guarantee that funding will be available.*
 - As well as looking at reducing crime as additionality, other avenues to explore could be incorporating art and innovative methods of increase energy efficiency in the street lighting. Although this again is no guarantee of additional funding.
 - Funding could be made available to improve the street lighting in an area through wider regeneration schemes e.g. housing regeneration schemes, as well as the lighting around the new development funding gains could be made to carry out improvements to surrounding areas.
- 11.16 Committee noted that, if external funding is to be considered for street lighting improvements any application would clearly have to demonstrate additionality, or incorporate innovative methods to improve energy efficiency. There is no guarantee that funding programmes would be available for these projects or that an application would be successful.

Middlesbrough Borough Council

- 11.17 Middlesbrough Borough Council have actively sought additional funding through SRB and NRF to target fear of crime issues and improved neighbourhoods. The Council have worked with many partners such as NDC (West Middlesbrough Neighbourhood Trust) and Groundwork Trust to deliver community improvement projects which in turn has resulted in an additional £2.5 million being invested in street lighting improvement schemes. The need for this had been highlighted by consultation with community groups.

Advertising

- 11.18 Street lighting advertising in the form of banner signs has increased in popularity on recent years. There is a growing market for banner style advertising on street lighting columns.
- 11.19 The prime factor in agreeing to this form of advertising is a financial one. Potentially, each column erected in the Borough could generate between £750 and £1000/annum income for the authority. With significant budget pressures on the street lighting service because of inordinate increases in energy charges, there is a case for considering this as a revenue stream to ease the financial burden on the street lighting budgets. Members are aware that the street lighting energy charges have risen from approximately £500k per annum to over £1m per annum in two years.
- 11.20 An initial survey by an interested advertising company has identified 100 suitable sites in the Stockton town centre area alone. Based upon figures indicated above, there is potential for up to £100k per annum for the Stockton town centre alone. This could be developed and extended to other areas of the Borough over time.
- Preliminary consultation has been carried out in the following areas:
- Planning – it has been confirmed that planning permission would be required in each case. Planning Officers have confirmed that they have no objections in principle to the proposals. However, careful consideration would need to be given to the suitability of each site. They would have serious reservations, for example, should proposals be received for advertising columns in conservation areas.
 - Highways – as the highway authority, due consideration needs to be given to the safety implications of such installations. As such, each sign would need to be assessed in terms of a risk assessment. Conditions would be included in any consent to ensure that, for example, inappropriate text and/or phone numbers are excluded from the signage. The content of an advert would need to comply with the requirements of the [Advertisement Standards Association](#).
- 11.21 *Officers have indicated that they wish to seek approval for the placement of an advert in a national journal inviting expressions of interest from companies interested in entering into an agreement for the advertising rights on street columns.*

Finding: Following data verification and assessment of level of finance required a full appraisal / business cases will need to be carried out on each of the options to identify which will best achieve the objectives of this review.

Recommendations:

Creation of a Business Case outlining the preferred option for investment.

Placement of an advert in a national journal inviting expressions of interest from companies interested in entering into an agreement for the advertising rights on street columns.

12.0 Options for Energy Reduction

12.1 Invest to save

12.2 Following Essex County Council's decision to switch off a section of its street lighting in a bid to reduce energy use, the Institute of Lighting Engineers (ILE) produced a set of guidelines for cost and energy savings in public lighting.

12.3 The document – "Street Light – Invest to Save, reduction or removal of street lighting, interim advice note LB1" outlines a number of considered proposals for reducing energy. They are as follows:

12.3.1 **Re-adjustment of the lighting levels at which photo-cells switch street lighting:** This proposal, suitable for high pressure sodium lamps on modern electronic control-gear, could save 200 hours burning time a year (or 5%). SBC may consider the use of different types of photo-electronic cells when replacing columns. To replace all columns and lantern across the Borough would cost circa £4.2m. The replacement of lanterns and photo-electronic cells only on all columns across the Borough would cost roughly £1.2m.

12.3.2 **Selective reductions in residential lighting:** In rural or purely residential locations, with low crime, it may be possible to consider switching off, or preferably, dimming street lighting during after-midnight hours. See section 13 for further details.

12.3.3 **Reduced traffic route lighting:** Many traffic routes only have peak flows of traffic for relatively short periods of the day – and low levels of traffic during the night. On these roads, the use of electronic dimming technology to reduce light levels, in accordance with British and European standards, could lead to energy reductions of up to 50%. The ILE has just published a guide to variable lighting levels for highways.

12.3.4 **Re-consideration of road lighting class:** The British and European Standards for road lighting published in November 2003 give far greater scope for the choice of lighting class to be applied to traffic routes and residential roads than previous editions. Careful consideration of the type, use and location of the road may allow a lower lighting class to be provided than was formerly used.

12.3.5 **The adoption of 'white light' sources:** The British Standard now allows residential road installations using 'white light' sources (lamps with a colour rendering index greater than 60) to be classified one class lower than previously – again this would offer potential savings in energy consumption, in addition to an improved visual ambience for residents. SBC use white light wherever possible.

12.3.6 **Conversion of older lighting equipment:** Modern road lanterns, with improved lamps, reflectors and electronic control gear, offer much greater energy efficiency. Local authorities should consider the replacement of older types of road lighting (low pressure sodium and mercury vapour) wherever possible, to minimise energy use and create safer, brighter lighting.

12.3.7 **Photo-cell control of illuminated traffic signs and bollards:** Signs and bollards are often lit 24 hours per day. The introduction of small, electronic photo-cells could provide a simple, economic means of ensuring these units are only switched on when required – after dark. The use of high reflective signs should be considered as an alternative to illuminated signs where legally permitted.

12.3.8 Switching off or removing street lighting is an option outlined in the ‘invest to save’ report, but SBC Engineers advised Committee that they would not recommend pursuing this option at the current time.

13.0 Dimming trial

13.1 An opportunity has arisen for the council to trial a new remote control lighting system on the stretch of Darlington Lane between Gentian Way and Elm Tree Avenue.

13.2 10 new columns will replace existing units, 5 on each side of the highway in a staggered configuration. The luminaires will incorporate a white light source (150w CDO-TT), electronic control gear and miniature radio transmitter/receivers (nodes) in place of the usual photo electric control cells.

13.3 Each “node” communicates with a local main control unit attached to one of the columns which in turn is linked via a master antenna, mounted on the roof of Kingsway House, to a standard desk top computer in the Highways Department. The operating radius of the radio system is 6 miles but can easily be extended by the use of repeaters if required. The system has the capacity to control and receive information from up to 50,000 luminaires.

13.4 The initial intention of this trial is to determine the benefits, in terms of reduced energy consumption and prolonged lamp life, of dimming street lights by up to 50% during the hours of darkness when there is little or no motorised or pedestrian traffic (for example 12:00 a.m. to 6:00 a.m.), without compromising public safety.

13.5 This will be facilitated by having the 5 columns on one side of the road on a separate circuit to the 5 on the opposite side. Each circuit will be connected via a check meter to the distribution board in the feeder pillar. The luminaires on one circuit will be dimmed whilst the others are left to burn as normal. The actual difference in consumption can then be determined by taking usage readings from the two meters at regular intervals, although a discernable difference comparison may not be reached for up to 12 months.

13.6 In addition to the above there are other benefits to be gained from this system. Lights out (no need for scouts), high current at outgoing side of ballast (lamp approaching failure), high current at incoming side of ballast (low incoming voltage) and individual control gear component faults are all reported directly to the Street Lighting section, via the radio link, by the local main control unit, reducing repair times and repeat visits. Should the control system develop a fault all lights will fail safe to ‘on’ until the problem is rectified and normal conditions resume.

- 13.7 During this trial period signs will be erected at the approaches warning road users and pedestrians of the “*experimental street lighting trial ahead*”. The trial should be fully operational by late November early December 2006.

Recommendation:

Report of the conclusions of the trial to be reported back to Environment and Regeneration Select Committee

14.0 Conclusions and Recommendations

- 14.1 The Committee aimed at the beginning of this review to have been able to help find a resolution to the impact of spiralling energy costs and an ageing street lighting stock on the budget. Members feel that officers in the department are already working hard to find solutions, and hope that the recommendations outlined in the report will offer further guidance.
- 14.2 The Committee is pleased to have had an opportunity to speak to not only officers of the council, but also external partners on what are very complex issues. Members hope that the Council will give support to the findings and recommendations outlined in the report in order to overcome some of the issues outlined in the review.

Recommendations:

1. **Data verification exercise to be undertaken to determine the condition of stock.**
2. **Ensure that performance figures encompassed in DWL Partnership Agreement are recorded for 2006 / 2007.**
3. **Cost benefit ratio created for different scenarios relating to investment and replacement. Officers to investigate the potential of utilising the software created by Jacobs Babbie for Teford & Wreking Council for this purpose.**
4. **An assessment of the level of finance required, based on stock condition and outcome of cost benefit ratio (see recommendations 2 & 3)**
5. **Creation of a Business Case outlining the preferred option for investment.**
6. **Placement of an advert in a national journal inviting expressions of interest from companies interested in entering into an agreement for the advertising rights on street columns.**
7. **Report of the conclusions of the dimming trial to be reported back to Environment and Regeneration Select Committee**

Appendix 1

SBC Street Lighting Stock Inventory

Table A - Primary factors

Totals in Tables A and B should be equal

Column material	Age in years	Number of columns by column mounting height							Average height over 12m	Total columns
		4m (or less)	5m	6m	8m	10m	12m	Over 12m		
Mild steel (tubular and sheet)	0 - 20	0	125	7078	1372	3181	160	1	14	11917
	21 - 30	0	4966	2613	780	459	8	0	0	8826
	31 - 40	0	0	0	0	0	0	0	0	0
	Over 40	0	0	0	0	0	0	0	0	0
	Total	0	5091	9691	2152	3640	168	1	14	20743
Stainless steel	0 - 20	0	0	15	0	58	15	0	0	88
	21 - 30	0	0	0	0	0	0	0	0	0
	31 - 40	0	0	0	0	0	0	0	0	0
	Over 40	0	0	0	0	0	0	0	0	0
	Total	0	0	15	0	58	15	0	0	88
Concrete	0 - 20	0	0	0	0	0	0	0	0	0
	21 - 30	0	0	0	0	0	0	0	0	0
	31 - 40	0	2551	1286	372	25	0	0	0	4234
	Over 40	0	0	0	0	0	0	0	0	0
	Total	0	2551	1286	372	25	0	0	0	4234
Aluminium (tubular and fabricated)	0 - 20	0	0	0	0	18	0	0	0	18
	21 - 30	0	58	4	0	0	0	0	0	62
	31 - 40	0	0	0	0	0	0	0	0	0
	Over 40	0	0	0	0	0	0	0	0	0
	Total	0	58	4	0	18	0	0	0	80
Cast iron	0 - 20	0	0	0	0	0	0	0	0	0
	21 - 30	0	0	0	0	0	0	0	0	0
	31 - 40	0	27	5	4	0	0	0	0	36
	Over 40	0	0	0	0	0	0	0	0	0
	Total	0	27	5	4	0	0	0	0	36

Wood Include poles mounted on electricity/telecom poles	0 - 20	0	0	0	0	0	0	0	0	0
	21 - 30	0	0	0	0	0	0	0	0	0
	31 - 40	0	79	209	1	0	0	0	0	289
	Over 40	0	0	30	0	0	0	0	0	30
	Total	0	79	239	1	0	0	0	0	0
Composite Include fibre glass and GRP	0 - 20	0	1	0	0	0	0	0	0	1
	21 - 30	0	0	0	0	0	0	0	0	0
	31 - 40	0	0	0	0	0	0	0	0	0
	Over 40	0	0	0	0	0	0	0	0	0
	Total	0	1	0	0	0	0	0	0	0
Other Include structure mounted, eg. wall brackets, subways, under passes, tunnels, under bridges.	0 - 20	0	91	0	0	0	0	0	0	91
	21 - 30	0	0	0	0	0	0	0	0	0
	31 - 40	0	0	0	0	0	0	0	0	0
	Over 40	0	0	0	0	0	0	0	0	0
	Total	0	91	0	0	0	0	0	0	0
All	Total	0	7898	11240	2529	3741	183	1	14.0	25592

Table B - Column type profile

Totals in Tables A and B should be equal

Column material (see notes to Tabel A)	Number of columns
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Mild steel ¹ - EPC ² only	5053
Mild steel ¹ - HDG ³ only	84
Mild steel ¹ - EPC ² & HDG ³	15606
Mild steel ¹ - total	20743
Stainless steel	88
Concrete	4234
Aluminium	80
Cast iron	36
Wood	319
Composite	1
Other	91

All	25592
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Table C - Energy profile

Wattages are actual stated lamp wattage, not circuit wattage. Totals in Tables C and D should be equal

Lamp type	Lamp wattage	Number of lamps	Lamp type	Lamp wattage	Number of lamps	Lamp type	Lamp wattage	Number of lamps
SOX Includes LPS, SOX+, SOXPLUS etc	35	626	QL Include induction lamps	55	0	PL-L Includes PLS	24	0
	55	5096		85	0		36	168
	90	1328		Other	0		40	0
	135	1168	Metal Halide	70	0		55	0
	180	40		100	0	Other	0	
Other	0	150		0	PL-T	18	12	
SOX-E	26	0		250		28	26	0
	36	0		400		0	32	0
	66	0	1000	0		42	0	
	91	0	2000	0	Other	0		
	131	0	Other	0	TH	50	0	
Other	0	CDM/T Includes CDM / TT etc.	35	322		100	0	
SON SON plug in lamps. Includes HPS and all high pressure sodium derivatives.	50		0	70		34	300	0
	70		11478	150		0	500	10
	100		1250	250		0	1000	0
	150		2717	Other	0	1500	0	
	250	176	MCF	20	0	Other	0	
400	65	30		0	GLS Includes tungsten	60	22	
600	0	36		0		100	0	
1000	0	40		0		150	0	
Other	0	58		0	Other	0		
MBF	50	0		65	0	MBT/L	160	0
	80	0		70	0		Other	0
	125	1435		75	0	Other Only for lamp type categories not listed above. Insert to nearest wattage.	25	0
	250	0		85	0		50	0
	400	0		125	6		100	0
Other	0	Other	0	150	0			
				200	0			
				400	0			
				600	0			
				1000	0			
				2000	0			
				Other	0			
						All	Total	25981

Table D - Lighting control

Totals in Tables C and D should be equal

Control	Number of lamps
---------	-----------------

Time switch - all night	3663
Time switch - part night	0
Photo cell - all night	21759
Photo cell - part night	0
24 hour operation	559
Dimmed equipment	0
Other	0

All	25981
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Appendix 2

STOCKTON-ON-TEES COUNCIL					
<u>CODE OF PRACTICE FOR HIGHWAY LIGHTING MANAGEMENT</u> <u>DELIVERING BEST VALUE IN HIGHWAY MAINTENANCE</u>					
ACTION PLAN					
Code Of Practice Recommendation	Current Stockton on Tees Practice	Action Required	Implications for Not Undertaking Action	Priority/ Timescale	Dep't Respon sible
<h1>PROVISION OF THE SERVICE</h1>					
<u>R3.2 Policy</u> <i>The authority's policy in relation to the provision of its public lighting service should be clearly stated and should cover all the organisation and services involved in delivering the service.</i>	There is no current policy which covers the whole of the public lighting service. Partnering Contract is not policy statement.	The Highway Network Management Plan will include statements relating to the service delivery arrangements, frequency of inspections, intervention and timescales to repair public lighting. These are being incorporated into new service delivery contracts.	The public would not know if the Council was delivering its service in accordance with good practice and consequently delivering quality local services.	HIGH APRIL 2006	STREET LIGHTING TEAM
<u>R3.3.3 Competence of Staff</u> <i>All personnel engaged in public lighting operations should be trained in accordance with national guidelines such as those produced by the Institution of Lighting Engineers and issued with the appropriate certification.</i>	DWL is a registered member of ASLEC and all staff/operatives are accredited accordingly. SBC do not have the appropriate accreditation.	DWL to supply details of ASLEC registration and accreditation. SBC as an authority and relevant staff, in particular, to be registered and accredited with ASLEC Annual review of accreditation In accordance with ASLEC requirements.	SBC may find itself compromised if not appropriately registered.	HIGH APRIL 2006	Cost implication to be confirmed with ASLEC

<p>R3.3 Management of Maintenance <i>Each authority should establish and maintain up to date and accurate inventory of all highway electrical equipment (including authority cable networks) as part of its asset management system.</i></p>	<p>EXOR database is live for recording and updating of inventory; daily update of records to sustain accurate records. New adoptions and amendments to highway network recorded. Certain cable records available but not recorded on EXOR system. Problem of 'roaming' inventory items</p>	<p>Continue to update inventory records for asset management. Review success of exor street lighting module; join exor street lighting user group. Resolve problem of street lights 'misplaced'</p>	<p>Failure of system and accuracy of records; DNO would question validity of EAC</p>	<p>On-going within existing budgets</p>	
<p>R3.3 Management of Maintenance <i>Authority cable networks should be recorded on Ordnance Survey based plans or alternatively on a Geographic Information System.</i></p>	<p>Cable records currently recorded on old GIS project. (Logistics)</p>	<p>Create new cable records database Record new installations accurately when undertaking works in the highway</p>	<p>Asset management system will fail accuracy and confidence in inventory will be lost. Liaise with GIS Team (DRENN) on project delivery</p>	<p>On-going within existing budgets</p>	<p>D RENN/EXOR</p>
<p>R3.4, 4 and 5 An asset management system should be used to control and record all cyclical and reactive maintenance activities.</p>	<p>EXOR system for recording repairs and maintenance.</p>	<p>Create cyclical maintenance regimes on EXOR database. Incorporate within EXOR delivery project plan</p>	<p>Inefficient, bureaucratic working and poor records will ensue</p>	<p>TBC - SEE EXOR PROJECT PLAN</p>	<p>Possibly need to buy in consultancy from exor £20k ???</p>
<p>R3.4 Structural Inspections and Testing <i>A risk assessment strategy for the management of the structural safety of lighting columns and illuminated traffic sign posts should be developed and implemented and where necessary structural testing of lighting columns and illuminated traffic sign posts should be carried out. The asset management systems should include sufficient data as to the</i></p>	<p>Visual inspection in accordance with ILE TR22 @ agreed m/tce cycle for inspection. But not recording on EXOR dbase</p>	<p>Agree cyclic structural m/tce regime and record accurately.</p>	<p>Failure to act could result in claim against the authority. Consider the implications for poor recording systems; whose responsibility to record and liability in absence of records??</p>	<p>HIGH - TBC</p>	<p>DWL/SBC</p>

<i>location, type and age of the equipment to allow the risk assessment to be carried out.</i>					
Code Of Practice Recommendation	Current Stockton on Tees Practice	Action Required	Implications for Not Undertaking Action	Priority/ Timescale	Responsible Officer
APPENDIX C COMPETENCE					
<i>No operatives should be placed at risk due to lack of skills on the part of themselves or others dealing with electrical equipment.</i>	See previous comments regarding ASLEC accreditation and training	See previous	See previous		
Code Of Practice Recommendation	Current Stockton on Tees Practice	Action Required	Implications for Not Undertaking Action	Priority/ Timescale	Responsible Officer
CYCLICAL MAINTENANCE					
<i>R4.1 Cyclical maintenance intervals for lighting installations should be determined to ensure the installation's correct operation and light output, minimise failures and maximise life.</i>	Currently undertaking partial cyclical maintenance activities. Policy/frequency not recorded nor established on EXOR module	Record policy statement Establish cyclical m/tce intervals on EXOR Dbase Comply with WLH and LIE recommendations for Good Practice. Establish painting etc frequencies - see below	Failure to deliver good practice Potential claims through poor records	HIGH - See EXOR project plan	BB
<i>R4.5 Lamp Replacement Lamp replacement policies should be carefully evaluated taking into account of local technical and geographic considerations, to maintain light output whilst limiting the number of lamp failures to an acceptable level.</i>	Current policy Bulk Lamp Change @ 25% p.a. 2004/5 undertook 50% bulk lamp change in Borough. (Options are to bulk lamp change or burn to extinction.)	Consider recommendations in the WLH C of GP but also in light of 50% replace to date – continue with practice? Review statistics of performance in areas where bulk lamp change has been undertaken.	Cost efficiencies and effectiveness of current practice may be questioned.	HIGH – APRIL 2006	MS/MB

<p><i>Each authority should determine the frequency of electrical inspection and testing and carry out such works at a frequency of not less than once every 6 years.</i></p>	<p>Last electrical inspection undertaken in 2003/4; testing held in abeyance.</p>	<p>Re-introduce and establish electrical testing in accordance with good practice Introduce cyclical m/tce on EXOR d/base</p>	<p>Potential liability for failure to follow procedures; in breach of regulations.</p>	<p>HIGH APR 06</p>	<p>20K PA within existing budgets EXOR /SBC/DWL</p>
<p><u>R4.6 Electrical inspection and testing</u> <i>The condition of all enclosures, including the general structural condition of lighting columns, illuminated traffic sign posts, feeder pillars, etc. should be recorded on the operative report at each maintenance visit.</i></p>	<p>As above</p>	<p>As above</p>	<p>As above</p>	<p>As above</p>	
<p><u>R4.7 Lighting columns and illuminated traffic sign posts</u> <i>New steel lighting columns should, as a minimum, be hot dipped galvanised and consideration should be given to the application of further protective coating by the lighting column manufacturer at the time of manufacture.</i></p>	<p>Columns are hot dipped galvanised and with G1 finish on root complying with current requirements</p>	<p>None</p>	<p>None</p>	<p>NO FURTHER ACTION</p>	
<p><u>R4.7.1 Protective coatings and their application</u> <i>A programme for the maintenance and reapplication of protective coatings for in situ lighting column or illuminated traffic sign post should be determined and implemented</i></p>	<p>Last painting programme undertaken in 2003/4 of columns and/or illuminated traffic sign posts.</p>	<p>Re-introduce painting programme and Cyclical m/tce activities to be installed on EXOR</p>	<p>No action will result in accelerated failure of columns. Not complying with good practice guidelines; potential claims from early failure of column due to lack of m/tce</p>	<p>HIGH APRIL '06</p>	<p>Within existing budgets; EXOR for cyclic routes?</p>

<i>taking account of the location, existing protective system and any other environmental factors including atmospheric conditions.</i>					
<u>R4.7.3 Structural Inspections and Testing</u> <i>A risk assessment strategy for the management of the structural safety of lighting columns and illuminated traffic sign posts should be developed and implemented and where necessary structural testing of lighting columns and illuminated traffic sign posts should be carried out. The asset management systems should include sufficient data as to the location, type and age of the equipment to allow the risk assessment to be carried out.</i>	See 3.4	See 3.4	See 3.4	See 3.4	See 3.4
Code Of Practice Recommendation	Current Stockton on Tees Practice	Action Required	Implications for Not Undertaking Action	Priority/ Timescale	Responsible Officer
REACTIVE MAINTENANCE					
<u>R5.2 Monitoring for Inoperative Lighting</u> <i>Each authority should establish and operate a system for monitoring the operational status of its equipment.</i>	2 week winter inspection and 4 week summer inspection in accordance with good practice. Paper based system	Consider development of hand held systems with EXOR/IKI	None, but scouting records could be improved and efficiencies gained	MEDIUM Within 2006/7	BB

<p><u>R5.2 Monitoring for Inoperative Lighting</u> Each authority should establish and operate a system for the reporting of faults by the public. The system should allow for the reporting of emergencies 24 hours per day each day.</p>	<p>Faults may be reported by the public via web site; e-mail; telephone; emergency surveillance centre – 24 hour service available Faults reported on to street lighting d/base and repairs audited through EXOR system Reports of performance are measured through 'Discoverer' software. Need to consider CFYA/EXOR interface with new CRM system</p>	<p>Need to consider CFYA/EXOR interface with new CRM system</p>	<p>None @ present but need to consider the 'one stop shop'</p>	<p>LOW In line with CRM developments</p>	<p>BB</p>
<p><u>R5.4 Repairs and Replacements</u> Each authority should establish and enforce specific response times for each maintenance task.</p>	<p>2 hour response times for emergencies. < 5 days for routine repairs but performance plan says 3.15 days</p>	<p>Establish Baseline for BVPI DNO and non-DNO Review response times in accordance with C of GP</p>	<p>Current targets are too ambitious -</p>	<p>HIGH APRIL 2006</p>	<p>BB/MS</p>
<p>Code Of Practice Recommendation</p>	<p>Current Stockton on Tees Practice</p>	<p>Action Required</p>	<p>Implications for Not Undertaking Action</p>	<p>Priority/ Timescale</p>	<p>Responsible Officer</p>
<p>SERVICE AGREEMENTS WITH THE DISTRIBUTION NETWORK OPERATOR</p>					
<p><u>Each authority should negotiate a formal service level agreement with the Distribution Network Operator (DNO).</u></p>	<p>2005/6 BVPI 215B requires reporting of performance on DNO performance. Figures have been sporadic.</p>	<p>Contact DNO and review/ establish robust systems for reporting repairs response times</p>	<p>Audit will not accept or may qualify bvpi results</p>	<p>HIGH FEB 06</p>	<p>BB/MS</p>
<p><u>R6.9 Performance Monitoring</u> Each authority should ensure that their procedures, and those of any contractor, do not prevent the DNO from meeting agreed performance standards.</p>	<p>The placement of orders with the DNO has been delegated to the street lighting contractor, DWL. To improve communication links with DNO. QA checks for scheme works and m/tce activities introduced</p>	<p>None req'd</p>	<p>None</p>	<p>NO ACTION</p>	
<p>Code Of Practice Recommendation</p>	<p>Current Stockton on Tees Practice</p>	<p>Action Required</p>	<p>Implications for Not Undertaking Action</p>	<p>Priority/ Timescale</p>	<p>Responsible Officer</p>

PROCUREMENT					
<p><u>R7.1 Maintenance Contracts</u> <i>Each authority should consider the use of competitive tendering for highway electrical maintenance as part of its Best Value policy.</i></p>	<p>A partnering contract has recently been agreed between SBC/DWL. A term m/tce contract with KPI performance measures .</p>	<p>Annual review to be undertaken as part of agreement</p>	<p>Service improvement may not develop if review not undertaken</p>	<p>MEDIUM APRIL 2006</p>	<p>TWBA(SBC) / MC(DWL)</p>
<p><u>R7.2 Electricity Procurement</u> <i>Each authority should seek competitively tendered supplies of electricity for its highway electrical equipment.</i></p>	<p>The supply of electricity is procured through NEPO for 'economies of scale'</p>	<p>No action</p>	<p>None</p>	<p>No action – continue with NEPO agreement</p>	

Derby City Council – PFI Outline Business Case

1. BACKGROUND TO THE PROJECT AND THE STRATEGIC CONTEXT

1.1 Introduction

As a Unitary Authority established in 1997, Derby City Council has incorporated former County Council functions to successfully sustain the continuity and quality of services. Derby is a relatively compact city with a clearly defined centre and distinct neighbourhoods. The road network comprises about 778 kilometres of highway.

1.2 Corporate Plan

This Expression of Interest (EOI) takes forward key themes and development priorities set out in the City Council's Corporate Plan for 2003/2006. The City Council's long term vision is to make Derby a place where people are proud to live and work. Investment to bring the quality of the city's street lighting infrastructure and services up to modern standards will make a significant contribution towards delivery of the following six (out of seven) key themes from the Corporate Plan:

- **A great place to live**

The Council aims to make the city a place where both residents and visitors want to spend their work and leisure time by improving transport, by looking after the environment and by increasing choice and participation in recreation and sporting activities. A good standard of street lighting will enhance the night time accessibility of transport services and encourage greater night time use of leisure and recreation facilities as well as generally improving the night time environment throughout the city.

- **Safer and healthier communities**

The Council believes that people should be able to live without fear of others and enjoy good health. Street lighting improvements will make the city's streets safer at night by reducing road accidents and crime and by combating fear of crime.

- **Prosperity for all**

The Council aims to enhance and sustain economic activity and the vitality of the local economy and ensure the benefits of prosperity are shared by all parts of the city. All aspects of the physical infrastructure, including street lighting, will be improved to produce more business and jobs and support economic success. Improved lighting standards will contribute to developing and sustaining the vitality of the night time economy.

- **Value for money**

Best value requires provision of services local people want at an affordable cost, and that those services continue to improve. The results of a recent survey¹ showed that whilst over 99% of respondents felt it was important to have a good street lighting service, 34% do not **rate the**

¹ Derby Pointer Survey 2002

current service as good and 27% were not satisfied with the level of maintenance. The proposed street lighting project would be designed and procured to deliver Best Value through achieving and sustaining delivery of high quality services in line with the views and expectations of local people.

- **A fairer society**

Through its Neighbourhood Renewal Strategy, the Council is working to improve the life chances of disadvantaged people and communities and reduce inequalities between different parts of Derby to achieve a socially cohesive city. Better street lighting will make an important contribution in terms of promoting night time access to local facilities and services, including transport services and social activities, particularly in disadvantaged parts of the city, by enabling people to live the independent lives they choose without fear of using the city's streets and services at night.

- **A sustainable environment**

A healthy, clean and attractive environment is an essential ingredient in the overall quality of life in the city. The Council is working to sustain Derby's development by balancing economic, social and environmental concerns. Modern, well designed street lighting infrastructure will enhance the city street scene by day and night as well as through reducing light pollution.

1.3 Derby Joint Local Transport Plan

The Derby Joint Local Transport Plan (LTP) 2001/02–2005/06, covers the city of Derby and the surrounding rural area in Derbyshire and aims to promote an integrated transport environment which removes unnecessary traffic from the city centre and improves access for pedestrians, cyclists, buses, taxis and service vehicles. The LTP also aims to improve road safety and travel awareness through continued investment in safety schemes, publicity, education and training. Other key LTP initiatives include implementation of walking and cycling strategies to improve access and safety for pedestrians and cyclists and measures to increase use of public transport services and to reduce reliance on car use. Proposals for street lighting infrastructure and service improvements as set out in this Expression of Interest are, therefore, fully consistent with LTP objectives.

1.4 Derby City Partnership

Derby City Partnership is an alliance of organisations working together to create a better Derby. It is also the Local Strategic Partnership for Derby, and has a particular focus on supporting the more deprived neighbourhoods. Representatives from the public, private, voluntary and community sectors work together within the Partnership to improve services, facilities and opportunities for the people who live and work in the city. The City Partnership has produced a Community Strategy, covering economic, social and environmental objectives, and which is based on consultation with the public and key stakeholders and is consistent with the City Council's Corporate Plan. This Community Strategy ensures that the people of Derby influence the development of the integrated services that the city needs for the future. Proposals for street lighting infrastructure and service improvements are fully consistent with Derby City Partnership objectives.

2. SPECIFIC OBJECTIVES FOR STREET LIGHTING

The City Council, wishes to undertake this street and sign lighting project to:

- improve road safety, in particular by reducing the incidence and severity of night time accidents
- reduce the incidence of night time crime

- improve the perception of street safety and security by reducing fear of crime
- increase leisure and commercial activity after dark to enhance the vitality of the city
- encourage walking, cycling and use of public transport as alternatives to private car use
- develop safer routes to schools
- create a quality environment for local people, business and tourism
- aid and sustain community regeneration
- enhance the profile of individual quarters, routes and **landmark buildings**
- provide a Best Value, cost effective, environmentally friendly and sustainable approach to lighting the city.

The need for improvements in the quality, effectiveness and design of street lighting across the city is identified regularly in research and consultation exercises undertaken by both the Council and partner agencies and is reflected specifically in the following Council strategies:

- Community Safety Strategy
- Health Improvement programme
- Housing Strategy
- City Centre Design and Development Strategy
- Transportation Strategy, and
- Public Realm Strategy.

The Council recognises the need to modernise street lighting infrastructure both to secure the long term structural integrity of the stock and to bring lighting levels up to recognised European lighting standards.

The project proposals set out in this EOI have been developed to deliver the investment and service improvements needed to achieve these objectives over an anticipated five year timescale and thereafter to sustain the quality and performance of the Council's street lighting services.

2.1 Asset Management Plan and Capital Strategy

The client function for street lighting services is provided by the Council's Development and Cultural Services Department. Street lighting maintenance services are currently provided in house under CCT contract arrangements. The street lighting inventory and performance information is held on the Council's 'Highways by EXOR' suite of highway management programmes. Significant steps have been taken to verify the inventory and GIS information, and are showing a high level of consistency with the database

Maintenance policy is based on a bulk clean and change regime applied annually to illuminated signs and bollards with a three-year cycle for street lights, interspersed with an annual clean and visual inspection for units not scheduled for change. No other routine maintenance is undertaken.

Given the age profile and deteriorating condition of the stock, columns are subject to structural survey/inspection every six years. Over the last five years, it has been necessary to replace or sleeve an average of over 460 columns a year to maintain the structural integrity of the stock. Over the last five years, therefore, column replacements have been determined by the results of structural testing with replacements being installed on a one for one basis with very little overall improvement in lighting standards.

Current Stock

Information from the EXOR street lighting database was used to develop the investment options assessed as part of the preparation of this EOI. Details of the current lighting stock are shown in the following table.

Equipment Item & Type	*Quantity
Concrete Columns	3,235
Steel Columns and Bracket Units	22,803
Cast Iron Columns	271
Aluminium Columns	199
High Mast Units	16
Feeder Pillars	413
Sub Total Columns	26,937
Illuminated Traffic Signs	2,013
Illuminated Traffic Bollards	927
Beacons	82
Sub Total Signs and Bollards	3,022
Grand Total	29,959

*Equipment quantities include units on detrunked roads accruing to Council

2.2 Age Profile of Columns

The age profile for columns indicated by the Council's database is shown in the following table.

Age Range	Quantity	Percentage
0-10 years	2,616	10%
11-20 years	6,004	22%
21-30 years	6,773	25%
31+ years	11,544	43%
Total	26,937	100%

2.3 Heritage Columns and Urban Design Areas

A limited amount of Heritage lighting is used in conservation areas. Any requirement for special columns or lighting requirements in urban design areas, and heritage units as necessary to meet local planning requirements in conservation areas, has been treated as an "extra over" cost for the purposes of options appraisal.

2.4 Column Condition

Most of the city's concrete columns are 40 years or older and are effectively life expired. About 2,700 have been fitted with galvanised steel sleeves to combat structural cracking and deterioration and to sustain their safety and performance. About half the city's stock of steel columns pre-dates modern galvanising processes and was not treated effectively to **resist**

corrosion. These older units are prone to rust attack often within the column shaft and at joints, changes in cross-section, door openings, and at ground level. Problems have been experienced with inherited Cohen and Stewart and Lloyd mild steel column types with known structural weaknesses, but most have now been replaced under the structural testing regime. Despite these replacements and structural repairs to concrete columns, some structural failures have occurred in recent years, including the collapse of four bracket arms on principal roads and a column collapse during maintenance operations resulting in injury to a Council employee.

2.5 Lighting Standards

Over 83% of the stock uses Low Pressure Sodium (SOX) lanterns, which provide poor quality lighting significantly below recommended modern standards. Also, orange light from SOX units provides no colour rendering and gives very poor night time visual recognition. There has been no formal, purpose designed column replacement programme over the last five years because priority has necessarily been given to replacing those failing columns detected under the structural testing programme. Most column replacements have been undertaken on a one for one basis, perpetuating excessive lighting column spacings and producing very little overall improvement in lighting standards. Lighting standards, therefore are generally below BS 5489 standards except for recently adopted roads and in a few areas where lighting improvements have been achieved using LTP funding. Additional columns will need to be installed to meet EN13201 lighting standards.

Overall, it is estimated that current levels of illumination in approximately 76% of streets are significantly below recognised British (BS 5489) and European (EN13201) lighting design standards. The relatively poor quality of the lighting has a large negative impact on the Council's community and social agenda, including initiatives to reduce road accidents and crime and to alleviate fear of crime. Recent relighting schemes have resulted in an increase in the number of columns by up to 33% in some areas, with an average uplift of 29% overall being required.

2.6 Performance Indicators

Over the last three years the Council's record as measured against the national Performance Indicator for the percentage of street lighting not working at any time (BV98) was as follows:

2000/01 – 0.78%	2001/02 – 0.99%	2002/03 – 1.28%
------------------------	------------------------	------------------------

Investment is needed to standardise and improve the street lighting infrastructure to reduce the incidence of faults and outages.

2.7 Spending Profile

The profile of Council spending on street lighting services incurred over the last 5 years is shown in the following table.

Street Lighting Resources	1999/00	2000/01	2001/02	2002/03	2003/04
£'000s	Spend	Spend	Spend	Spend	Budget
Maintenance	344	413	364	473	479
Energy	405	384	381	491	428
Column Replacement	108	182	168	72	104
Management/overheads	153	166	212	156	211
Total Revenue	1,010	1,145	1,125	1,192	1,222

Capital Replacements and Improvements	20	20	20	243	100
Total Revenue & Capital	1,030	1,165	1,145	1,435	1,322

Significant resources have been allocated to fault rectification and structural repairs and replacements as determined by the rigorous regime of inspection and testing, which the Council maintains. However, current spending levels are not sufficient to sustain existing service standards and deliver improvements in lighting standards and significant new investment funding would be required to meet Council aims and project objectives. The proposed fast-track investment solution would subsume the current, largely reactive programme of column repairs and replacements to ensure a planned, integrated programme of column replacements prioritised and targeted to remove life expired stock and deficiencies in lighting standards.

3. OPTIONS APPRAISAL

The Council has evaluated a range of potential investment options as part of project development with a view to identifying the optimum project solution that complies with wider corporate strategies and meets core Council objectives. The Options Appraisal was carried out in line with best practice guidance published by the 4Ps, Department for Transport (DfT) and HM Treasury and included evaluation of the core options summarised in the following table.

Option	Summary Description
1 Do Nothing	The option of not investing in street lighting infrastructure improvements is not an acceptable way forward given the basic need to sustain the safety of the street city's street lighting stock. This option was, therefore not subject to detailed appraisal.
2. Do Minimum	Introduce additional investment to seek to sustain delivery of the current service in the medium term.
3. Steady State Replacement	Introduce investment to replace a significant proportion of the infrastructure needing replacement.
4. Fast Track Replacement	A fast track investment to bring the whole of the lighting infrastructure up to modern standards.

The above options, except Do Nothing, were evaluated as part of the development of this Expression of Interest based on an assumed project commencement date of April 2005. Public sector based estimates and benefits have been calculated in line with current DfT and 4Ps guidance. The results of the appraisal are summarised in the following table.

Options Appraisal: Results of Financial and Non Financial Evaluation

(All NPVs discounted at 3.5% real)	Unit	Do Minimum	Steady State Replacement	Fast Track
Total Costs (excl. risk)-NPV	£000	31,528	37,871	55,253
Existing Columns Replaced in first five years	No. of units	850	6,250	20,258
New columns installed in first five years (Growth)	No. of units	Nil	Nil	5,897
Capital cost first 5 years (NPV)	£000	996	5,924	31,259
Non Financial benefits scores	Points score	100	145	270
Road Traffic Accident Reduction Benefits (NPV)	£000	0	4,395	28,494
Crime Reduction Benefits (NPV)	£000	0	7,223	46,823
Total Benefits (NPV)	£000	0	11,618	75,317
Cost Benefit Ratio		0	1:2.4	1:2.8

3.1 Preferred Investment Option

The option appraisal indicates that the Fast-track investment programme delivers the required outcomes in strategic, corporate and street lighting service delivery terms. It achieves positive Cost to Benefits Ratio (CBR) and also attracts the highest score for Non-financial Benefits. In present value terms the estimated value of crime and road accident benefits totals £75.32 million over the full project period.

4. STREET LIGHTING PROJECT SCOPE

Through an initial 5-year fast-track programme of investment, the proposed street lighting improvement project would replace all life expired, outdated and poorly performing street lighting, illuminated traffic signs and illuminated traffic bollards, including lighting to specified surface car parks and floodlighting to specified buildings and monuments. This initial programme of investment would be designed to achieve European lighting standards (EN13201) throughout the City. The project would also include the maintenance of the entire stock over a 25-year project period and the supply of energy.

4.1 Fast-track Programme

It is anticipated that 20,258 existing columns, almost 76% of the stock, would need to be replaced over the first 5 years of the project and a further 5,897 new columns installed to achieve the required European lighting standards (EN13201). This would result in an uplift of around 29% in the number of columns to achieve the required lighting standards. Over this period the project would also include replacement of about 2,501 poor quality illuminated traffic signs, beacons and bollards to improve road safety and night time direction finding. This programme of column replacements required to achieve European lighting standards throughout the area has been reviewed independently by Derek Rogers and Associates.

4.2 Service Improvements and Community Benefits

The proposed project would be structured to achieve rapid improvements in the standards and quality of street lighting throughout the city. At the same time, the quality, critical mass and continuity of the investment programme is expected to produce substantial savings in unit capital and revenue costs. Savings estimates are based on experience of recent PFI procurements in street lighting in other local authorities.

Lighting improvements would be designed and prioritised to deliver real benefits to local communities in terms of reducing crime, fear of crime and road accidents during hours of darkness. Recent studies in Sinfyn and Sunnyhill identified crime and fear of crime as significant local issues and residents placed street lighting improvements high on the list of service improvement priorities.

Street lighting improvements, particularly in and around the city centre, would increase the effectiveness of CCTV and support the Council's commitment to improving CCTV coverage to deter anti-social, disorderly and criminal behaviour. Wider community benefits would also be available through the street lighting contribution to the Council's wider transport, community and regeneration strategies by encouraging night time use of local facilities and increasing the number of pedestrians using city streets at night.

4.3 Procurement Options

Given that the resources necessary to implement the preferred fast-track investment solution would be unlikely to be available through conventional funding routes, the Council has evaluated the feasibility and value for money of a Private Finance Initiative (PFI) solution and tested this against a Public Sector Comparator (PSC).

The Council, in conjunction with its expert advisors, has modelled the likely financial and non-financial benefits of the PFI/DBFO route as compared to a Public Sector Comparator (PSC). Following this evaluation, the Council confirmed the PFI/DBFO route as potentially the Best Value route for successful project funding and delivery.

Value for Money

Before adopting the PFI route it is necessary to demonstrate that the approach is likely to deliver value for money when compared with a Public Sector Comparator (PSC).

A PSC figure was developed based on the fast-track solution incorporating risk and optimism bias. The methodology used reflects the guidance published by DfT and the 4Ps and HM Treasury and the guidelines set out in the New Green Book published by HM Treasury incorporating assessments for Optimism Bias. The levels of Optimism Bias are based on guidance and analysis undertaken by our advisors and have been assessed as follows:

Pessimistic Case	– 40% optimism bias
Most Likely Case	– 35% optimism bias
Optimistic Case	– 30% optimism bias

The option appraisal process demonstrates that the best value option is the fast track solution. However, this can realistically only be financed through PFI (DBFO) procurement.

To provide a comparison to judge likely value for money, a private sector bidder price was also developed by Deloitte & Touche using standard private sector funding and tax structures.

PFI (DBFO) Value for Money Data (£000s 2006/07 Prices)

NPV discounted at 3.5% real (£'000)	Pessimistic Case	Most Likely	Optimistic Case
PSC	68,731	67,244	65,756
PFI Costs	59,407	59,407	59,407
Value for Money	9,324	7,837	6,349
Sensitivity	+1,487	-	-1,488

The above results demonstrate clearly that the PFI (DBFO) route offers substantial value for money advantages over the Public Sector Comparator. A summary of financial models used in the value for money assessment is included in Appendix C.

The VFM solution delivered by the proposed PFI (DBFO) option accrues from:

- Economies of scale – from the critical mass and contiguity of the fast-track investment programme underpinned by long term contractual agreement thereby conveying significant purchasing and supply chain advantages
- Management economies from a whole contract/whole life approach
- Potential for significant and sustained service delivery improvements following completion of fast-track investment programme
- Improved management of risk by the private sector.

5. PFI CREDITS AND AFFORDABILITY

The calculation of the PFI credit has been based on 4Ps guidance, to deduct the NPV of the first five years capital costs of the Do Minimum option from the equivalent costs for the PFI solution. The capital costs include for a prudent evaluation of risk and an estimate of the capitalised development costs that a PFI provider would incur. This calculation is included as Appendix E and generates a PFI credit of £32.47m

The special grant flows from the calculated PFI credit have been added to the Council's existing street lighting maintenance resources. The result indicates that there will be a deficit of funds of approximately £438k per year at 2006/07 prices, and £407k per year at 2003/04 prices, when compared to the unitary charge level assumptions. This level of gap is within the affordability threshold of the Council, however it is felt that private sector costs assumed within the financial models are prudent and that there may be further scope for reducing this gap.

Consideration will be given to maximising third party income at the procurement stage of the project consistent with wider road safety and environmental considerations. However, it is not expected that these will be significant based on experience to date on other street lighting PFI projects.

6. PROJECT IMPLEMENTATION

6.1 Risk Transfer

An initial analysis of the risks inherent in the project has been undertaken as part of the development of this Expression of Interest, based on the indicative risk matrix in the 4Ps PFI Street Lighting Procurement Pack. The Council intends to allocate risk in accordance with this guidance. A detailed strategy for allocating risks and the management of retained residual risks will be developed at Outline Business Case (OBC) stage.

Our advisors have undertaken Accounting Treatments for a number of street lighting projects and have indicated that provided the project was procured in line with the Street Lighting Procurement Pack, then it should pass Regulation 40.

6.2 Market Soundings

Nationally, PFI procurement has become an established method of procurement for large scale investment projects to modernise street lighting infrastructure. The industry has responded positively to the development of PFI solutions for street lighting, for example through the formation of new consortia and the entry of major civil engineering and electricity companies into the street lighting market. There are established lighting PFI contracts within a fifty mile radius of the city, (Stoke, Staffordshire and Walsall), demonstrating an established interest in the area. The Council has already received informal enquiries from three street lighting service providers (ABB, Amey and Webster) and believe that the project would attract a high level of market interest and that innovative and competitive bid proposals would be received. Specific market soundings will be undertaken at Outline Business **Case** stage.

6.3 Stakeholder Support

The need for improved lighting has been acknowledged for some time. A study 2 years ago identified that this would require significant investment and the Council has subsequently sought to identify how this can best be achieved.

This proposal has the support of Members of the Council, and was approved at Cabinet on 24th June 2003.

Consultation with key stakeholders, including customers, staff, trade unions and partners is ongoing.

6.4 Project Management and Delivery

The City Council has a track record of successful delivery of PFI projects, namely:

- Derbyshire Magistrates Courts PFI (jointly with Derbyshire County Council and The Lord Chancellors Department)
- Pathfinder Private Sector Housing PFI
- Revenues and Benefits IT PFI

Additionally, the Council is progressing with a Schools PFI, and is a partner in a Health Service LIFT project, both of which are currently at ITN stage. The experience gained in these projects means that the Council is well placed to anticipate and deal with the difficulties likely to arise with a major PFI project of this nature.

The Council is developing a small, high-level Project Team, which will be established to oversee all PFI projects, from initial conception through to contract commencement. Membership will comprise lead officer representatives from the following Council Directorates/Teams:

- Chief Executive Department, including Finance
- Corporate Services including Legal Officer
- Director of Development and Cultural Services

It is expected that the Council's sponsor and owner for this project will be Jonathan Guest, the Director of Development and Cultural Services.

A project manager will be charged with the delivery of the project, together with the multi-disciplinary team already formed to steer the project to completion. This team will report regularly to chief officers, members and all stakeholders. The team will be supported by significant input from external technical, financial and legal consultants. The Council recognises the importance of effective project management in achieving the required project outcomes and successfully delivering the street lighting service improvements and wider benefits sought. Accordingly, it intends to follow the Gateway process, introduced into the local authority sector by the 4Ps, throughout the project development and procurement process.

6.5 External Advisors

The Council has appointed Deloitte & Touche as financial advisers and Derek Rogers and Associates as technical advisers to provide supplementary expertise and to assist with the preparation of this Expression of Interest. Experienced legal advisors will be appointed to advise on legal issues at OBC and subsequent procurement stages.

6.6 Project Timetable

The proposed timetable for project approval and procurement is shown in Appendix A.

GLOSSARY

Ambient Light	The total light level or effect, or amount of light perceived, in one's surroundings.
Ballast	Electrical devices used in conjunction with a discharge lamp to start and control it.
Bulb	Popular name for a filament lamp
Colour rendering/ Rendition	The perceived effect on objects of different colours of lights of different types.
Control Gear	A device to regulate and control the current through a fluorescent tubular lamp
Discharge Lamp	Any kind of lamp in which light is generated by the passage of a diffuse electric arc through a gas, including all fluorescent lamps
Column	The post upon which a lamp is mounted
Fluorescent	A long-life, relatively cheap whitish light source based on a gas discharge process, where electrons pass through a tube and interact with a phosphor coating.
GLS Lamp	Term used in the electrical trade for a filament lamp
High Pressure Mercury Lamp	Blue light, Usually used commercially for large interiors
ILE	The Institution of Lighting Engineers. The UK's professional guidance body for lighting engineers
KWh	Kilowatt-hour - unit of energy equal to the work done by one thousand watts of power acting for one hour.
Lamp	Any kind of light source and sometimes include the fitting.
Luminaire	The lamp and its surrounding casing and optics.
Lux (lx)	The SI unit of illumination, being a luminous flux of 1 lumen (q.v.) per square metre.
Photoelectric Switch	A light sensitive switch which can be employed to turn lights on automatically at dusk and turn them off at dawn
SON	Another name for high-pressure sodium sources, a warm

orange tinted light

SOX

Another name for low-pressure sodium sources.
Produces a bright yellow light

Street Furniture

All manufactured items commonly seen along roadsides.
e.g. lighting columns, telephone poles.

Visibility

Clarity of vision; how well we see something. The purpose of a good light should be to increase visibility: to reveal and not conceal.

Watt

A standard international unit of measurement of power. In the case of electric lamps, the "wattage" of the lamp defines the amount of electrical power that it consumes and also is related to the brightness of the lamp.

Up Lighter

A lighting fitting designed to direct all its light upward to the ceiling to provide indirect general lighting. An uplighter can be wall-mounted or free-standing on a slim column which supports a light-reflecting bowl, so that its edge is above normal eye level.
