

## BRIEFING NOTE

**To: Neighbourhoods Scrutiny and Performance Panel**

**Date: 27 March 2008**

**Re: Street Lighting Review - Energy Considerations of Public Lighting and Traffic Signals**

### Purpose

To advise the Scrutiny Panel in relation to matters concerning Traffic Signals, Public Lighting and Traffic Signs within Walsall Borough and M6 Junction 10 to include consideration of applicable regulations, operation and opportunities for cost savings.

### Summary

The design, construction, implementation, operation and maintenance of traffic signs, signals and street lighting must comply with regulations. In light of the ever increasing cost of energy and potential impact on the environment of its use opportunity is taken at all stages of the process to incorporate the latest technology wherever practicable. It is essential that we ensure our procurement for the provision of energy is carried out as effectively as possible within the budgetary constraints. Many of the well publicised initiatives are still undergoing trials as reliability is still yet to be proven. All involve capital investment to achieve modest revenue savings. Specifications will have to be developed and approved. The risk to adopting any new initiative or change to current practice is that an event could lead the Council to be involved in costly and time consuming litigation. The costs involved will inevitably far outweigh any initial budgetary savings.

### Background

Within the UK the design, installation and operation of all of the above is covered by Regulations, Statutory Instruments, Standards and Guidance including:

1. Traffic Management Act 2004
2. Traffic Signs Regulations and General Directions 2002
3. Highways Act 1980
4. Road Traffic Act 1984

In this country regulations are quite prescriptive and currently do not permit traffic signals to be modified to any great degree as they are primarily installed to either achieve effective traffic management and/or for safety reasons. There are significant risks of potential litigation if the Highway Authority does not operate signals in accordance with these requirements. Likewise with street lighting where there is also a need to contribute to the reduction in crime and fear of crime particularly in residential areas. As an indication within the Borough there are:

1. Public Lighting - approx 26,000 lighting columns (of a total of 30,000 lighting points),  
- energy used per year approx £930k
2. Traffic Signals - approx 250 sets,  
- energy approx £80k per year

## **Report Detail**

### **Traffic Signs**

These must comply with the requirements of the Traffic Signs Regulations and General Directions 2002 and any subsequent Statutory Instruments. However there are various relaxations for Warning Signs, Regulatory Signs, Signs for Bus, Tram and Pedal Cycle Facilities, and Miscellaneous Information Signs. These relaxations are applied wherever possible.

During routine maintenance of signs or as a result of damage or destruction of signs we take the opportunity to implement certain relaxations by replacing sign face material with 'diamond' grade and as a result we can decommission the luminaires (ie illuminating electric bulbs) together with the electric service. This requires some capital expenditure and the return on capital is about five years. This is therefore a 'spend to save/energy efficiency/environmentally friendly' initiative. We have a duty to maintain but explore alternatives and remove as many luminaires as we possibly can.

Battery, solar and wind are all alternative energy sources for illuminated signs and where major connection costs are required they have been considered. The illuminated elements for signs is covered within the Lighting PFI project and maintained by Amey. Many of these options have inherent problems but many trials are still underway. This is under constant review and as the situation becomes more certain we will implement these initiatives within value for money considerations and approved budgets.

### **Conclusion**

Every opportunity to reduce energy consumption is considered based on innovation and introduction of improved equipment. For example working with our Public Lighting Partner we have already introduced the use of LEDs as replacements within illuminated bollards to improve reliability and reduce the energy consumption.

### **Traffic Signals (part time traffic signals / energy & communication costs)**

Traffic signals and pedestrian crossings are originally installed to address road safety concerns, to assist with actively managing traffic congestion and/or to provide safe crossing facilities for pedestrians. It is technically possible to operate traffic signals on a part time basis but to do so would in most cases defeat the original purpose of the installation.

#### **Inherent problems with part time signals:**

- Demonstrable increase in accident rate
- Confusion for visually impaired pedestrians
- Part time removal of formal / informal pedestrian crossing facilities, particularly from vulnerable road users
- Adverse impact on BV165
- None compliant tactile paving Red / Buff
- Increased maintenance costs as lining needs to suit signal and none signal operation
- Limited energy & no communications saving, controller and detection equipment needs to remain operational but in standby state.

## Network Management

In order to effectively manage the network we need to actively manage the traffic signal network through the application of UTC / SCOOT control. This is a tool we are expected to employ in delivering the statutory network management duty and is specifically highlighted in the network management duty guidance as being an example of good practice. To undertake successful network management we have to retain appropriate communication links that allow us to optimise and implement traffic signal timings that reflect the constantly changing traffic pattern.

Existing communication options are very limited and mainly to specialist circuits only provided by BT. Developments in technology and DfT specifications will shortly allow the wider use of alternative IP based communication solutions. However, this will require capital investment in new infrastructure and therefore has been incorporated as a key element of the West Midlands UTC major scheme bid. This project valued at some £26m has recently received conditional approval from DfT.

## Existing costs

Currently there are 240 sets of traffic signals / pedestrian crossings within the borough. All have mains electricity connections as this is the only type approved traffic signal solution in this country. Not all of the installations have or require communication links. We only utilise the communication option when there is a clear need to monitor and coordinate the operation of traffic signal installations.

Current energy and communication costs are:

- Annual energy costs for all 240 installations £75k +VAT.
- Efficiency savings of 21% have already been realised by procuring the energy for traffic signals through the Public Lighting energy contract. Under the previous contractual arrangements the annual energy bill was £95k + VAT
- Annual communication costs for all traffic signals/ pedestrian crossings connected to the UTC centre (92 sites) is £52k +VAT
- Annual energy cost for M6 junction 10 is £1,338 + VAT
- Annual BT communication cost for M6 junction 10 is £900 + VAT

## Conclusion

In general terms the Traffic Management Act will require us to invest further in control and coordination of our traffic signal infrastructure in order to manage traffic congestion and associated pollution. This will result in an increase in the number and coverage of communication links required to manage the highway network. We will continue to explore all options in order to reduce ongoing revenue costs, but we are limited by developments in technology, DfT specifications and available capital investment.

To consider switching off traffic signals, even on a part time basis, would be difficult to justify in terms of our road safety and Traffic Management Act responsibilities

## **Public Lighting**

The Council, as a Highway Authority, has the power but not a duty to provide, but must maintain street lighting under the Highways Act 1980. In exercising these powers with regard to the extent, operation and maintenance of its street lighting, a Highway Authority must act reasonably. Should this not be the case, the actions of the authority could be challenged and subject to review by the Courts. For instance, a Highway Authority may be challenged if it removes a system of road lighting or fails to maintain one in operation unless it can clearly demonstrate that the reason for which the system of street lighting was installed is no longer applicable. Similarly, an Authority would be negligent if its street lighting apparatus was in such a state of disrepair as to cause an accident.

Also within the UK in accordance with the Road Traffic Regulations Act 1984, restricted roads and their associated 30 mph speed limits are established by the presence of an 'appropriate system of street lighting' unless provided by a separate Order. If such lighting were removed, a new Traffic Regulation Order would be required to reinstate the 30 mph limit.

The provision of street lighting has many community benefits, including the prevention of night time road accidents, the provision of a safe environment for both car drivers and pedestrians, and assisting in the reduction of street crime and the fear of crime and contributing to the local night time economy. However, there is no overriding duty on an authority, as highway authority, to provide or keep street lighting systems lit to prevent crime.

### Junction 10 M6

Junction 10 is defined as a 'conflict' area. Such areas often present difficulties due to both layout of the junction and the movement of traffic, particularly as the widths of the entry roads vary. Technical Guidance by the Institution of Lighting engineers currently advises that conflict areas should not be dimmed. At present the cost of energy of the street lights, illuminated signs and bollards at Junction 10 is approx. £3320 per year.

The lighting at this junction reveals the positions of kerbs and road markings, the direction of roads, the presence of any pedestrians or obstructions and the movement of any vehicles in the vicinity of the junction. The lighting takes into consideration the lines of traffic flow, the sight lines for merging flow and the areas of possible collision. Defining Off peak hours at this particular junction would involve taking traffic counts during a reasonable period of time both when the traffic tails off and when they start to peak during the winter months. This Junction has a pedestrian walkway which increases the risk of accidents and pedestrian involvement.

Switching off lighting at the Junction during off peak hours from midnight until 5am would incur a capital cost of £15,000 plus an increased maintenance cost of £1120 per year which saves £1424 per year in energy. Payback period is approx is 50 years.

### Roads classified as High Speed roads, Principal Roads, and District distributor Roads

Lighting on High Speed, Principal and District Distributor roads are intended for drivers of motorized vehicles on traffic routes of medium to high driving speeds. Options available for consideration are:

- 1 Dimming (variable lighting levels)

- 2 Trimming (reducing the hours of operation)
- 3 Electronic control gear
- 4 White light sources
- 5 Switch off
- 6 Part night lighting

In Walsall, these roads are very few in number and run mostly through residential areas. Trials are being carried out in rural areas in other parts of the Country. The lighting in Walsall has been installed to the minimum approved standard since 2002 through the PFI project. To make changes will involve significant capital cost combined with new rates for maintenance and so little or no benefit will be obtained over the pay back period in excess of the PFI contract period. However, every opportunity will be taken to consider options available on a case by case basis.

Within residential roads streetlights are generally operated throughout the hours of darkness as a service to the residents and road users of the area. There is very little difference in the cost of operating a streetlight all night as against part of the night and it is generally considered that the additional cost is more than offset by the added benefit of greater security to people and property, the potential reduction in traffic accidents and the assistance provided to the emergency services by the all night operation of streetlights. In residential areas there is very strong evidence that providing light significantly reduces crime. A case study has been completed which demonstrates the reduction in crime and the fear of crime resulting from the Public Lighting PFI Project in Walsall.

## Conclusion

The lighting in the borough of Walsall has been improved significantly through the PFI Project since 2002. This is a 25 year project where the costs have been calculated for its maintenance and energy throughout the life of the project.

The lighting standards to which Walsall have been upgraded are the **minimum** standards because it met affordability constraints of the Council as per the conditions laid out in the PFI Credit agreement. Hence there is little or no scope for dimming or trimming or switching off for Walsall. The UK Lighting board and the Institution of Lighting Engineers suggest roads be lit to a reasonable level. Other Counties and Councils have lit their roads to a far higher level than Walsall and have used far more lighting points to achieve their results.

However every opportunity is being considered as there is a potential for the partner to invest where possible and save the energy consumption for which he is responsible. The Contract stipulates that a share is made to the Council after a certain saving is made by the Contractor. This could eliminate the need for any investment on the part of the Council and any variation in maintenance cost. The savings will provide the incentive to the contractor to invest in the most appropriate solution.

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