

## **ECONOMY AND ENVIRONMENT OVERVIEW AND SCRUTINY PANEL 21 JULY 2020**

### **STREET LIGHTING**

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#### **Summary**

1. The Panel will receive an update on Street Lighting as part of its work programme, following an overview in 2018 and an update in 2019. The update will include progress with LED roll-out, outcomes so far from the concrete column survey and other related areas raised during the previous discussions.
2. Officers from the Economy and Infrastructure Directorate have been invited to attend the meeting.

#### **Background**

3. The Panel received an overview of Street Lighting during its meeting on 7 March 2018 and an update at its meeting on 5 March 2019. The Reports and Minutes of those discussion are available under Background Papers.
4. The Panel will recall that the Street Lighting service is led by Worcestershire County Council (the Council) and delivered by the Council's Lighting Maintenance contractor, Prysmian, who is responsible for maintaining all of the Council's street lights.
5. The Council has a duty of care under the Highways Act 1980 to maintain a safe highways network, including street lighting and illuminated signs and bollards. This is not a duty to provide lighting, but it does mean that all lighting and sign installations must be maintained in a safe condition.
6. The street lighting service in Worcestershire provides benefits to the communities of the County in many ways. Reduction in night-time accidents and reducing both crime and in the minds of many people, fear of crime. The economic development contribution to towns in the County cannot be under-estimated, good street lighting engenders a feeling of well-being by enabling people to continue their business and leisure activities during the hours of natural darkness. Recent Public Realm initiatives in many of our towns have included elements to upgrade the street lighting and this helps to improve the night-time environment.
7. The Council's street lighting service consists of a small team of specialist Council staff with expertise to enable effective operation of the service. This is supplemented, where required, by the current term street lighting Contractor, Prysmian Cables and Systems Limited, and Jacobs. The support given by the two external suppliers includes assistance with specific project management, undertaking new designs, additional lighting engineer capacity.

8. The street lighting service work with other highway teams within the Economy and Infrastructure Directorate when working on projects, highway safety schemes and new developments, together with regular engagement with the Liaison Engineers regarding street lighting matters raised by Local Members.

### **Service Aims and Objectives**

9. The aim of the Council's Street Lighting service is to create a safer and more secure night-time environment by providing energy efficient and cost-effective system of street lighting and illuminated signs.

10. The objectives of the street lighting service are primarily to:

- Ensure the safety of the public, contractors and staff
- Provide a high quality, cost effective service. All new lighting installation are specified to use the latest energy saving and effective LED lanterns resulting in energy saving and reduction of the carbon footprint
- Reduce crime and fear of crime
- Minimise environmental impact. The new LED lanterns provide very controlled distributions of light with almost zero light loss above the horizontal plane
- Implement best practice in systems and operations.

### **Street Light Part Night Switch Off**

11. The Street Lighting Initiative, or 'part night switch off' as it became known, was approved by Council in February 2014 and was rolled out across Worcestershire in residential areas with the project being completed at the end of 2016.

12. On average two out of three of the less efficient sodium lamps have been switched off between midnight and 6am (GMT). In total approximately 16,000no lights have been subject to this initiative resulting in a reduction in the use of energy (and therefore cost savings) and savings in carbon emission charges.

13. It is important to note that major traffic routes were exempt from the project. On average one in three lamps in the areas subject to switch off remain lit all night and these tend to be at more strategic locations such as on bends, junctions, near steps and other key sites. The objective was to achieve savings whilst still retaining a reasonably consistent and spaced distribution from the lights left on.

14. Today there are circa. 9,780 'part night' burning street lights in the County. In the last two years the Council has converted around 8,000 that had been previously been changed as part of the part-night switch off initiative. These lights have been converted to LED as part of the LED roll out where we've been targeting the obsolete SOX lanterns and are now back to dusk till dawn burning.

15. Despite changing from 'part night' to 'all night' burners these 8,000 LED lanterns will still save a significant amount of energy totalling approx. 595,000 kwh (monetary equivalent of £80,068 based on 13.445p per kwh) per annum.

16. The Lighting Team are still receiving enquiries where customers ask for lights to be changed back to all night burning but the volume of faults have reduced significantly since the LED roll out commenced.

17. A number of Local Members have used part of their Councillors' Divisional Fund to convert part night lights to LED for their constituents.

18. Regarding possible anti-social behaviour and other crimes being associated with the part night switch off scheme. The Lighting Team have been in liaison with West Mercia Police. It is generally viewed that the turning off of street lighting in the majority of areas has little or no impact on crime and disorder, but just occasionally a hot spot occurs. Where those occasional hot spots occur, the lighting team have assisted on an agreed case by case basis. One recent example being where 20 street lights were converted to LED and are now on all night.

### **Low Pressure Sodium Lanterns**

19. Low pressure sodium (SOX) lighting was introduced in the 1970's and quickly replaced the previous lamp type based on mercury. SOX lamps provided a 50% decrease in energy compared to other lighting around at the time. Quickly it became the standard light source in the UK and Europe.

20. Since this time alternative light sources have been developed including High Pressure Sodium, ceramic metal halide and most recently LED. Both High Pressure Sodium and ceramic metal halide have very limited application compared to LED.

21. Over 20,000 of the County's lanterns are Low Pressure Sodium (SOX). As part of the existing Term Lighting Contract these lanterns are bulk changed after a set number of hours to prevent (as far as possible) 'bulb failures'. This has proven to be the most cost effective way of dealing with maintenance of this type of lantern.

22. With the advent of LED lanterns, the call for these SOX Lanterns has diminished and the, already limited number of, manufacturers have significantly reduced the number they produce to the point where there are implications on supply, even with significant advanced orders being placed by our Contractor. Working with the Contractor we have agreed a new interim maintenance strategy to cope with any 'outages' which replaces these SOX lanterns with an LED equivalent.

23. There are a significant number of SOX lanterns atop of steel columns that are in good or reasonable condition. It is therefore feasible and cost effective to simply change the lantern to an LED type and retain the existing column.

### **Street Lighting Programme – Phase 2 and 3**

24. Phase two of the Street Lighting Programme, beyond the part night switch off, and the 2018 approval of the Highways Infrastructure Investment Fund provided for the roll out of two significant initiatives. The first helps deal with the ageing concrete column issue (see below) in addition to facilitating new LED lanterns, with the other replacing existing (relatively) low efficiency lanterns with new LED stock on existing steel columns.

25. The Lighting Team were asked to deliver the LED roll out and concrete column replacement project within two years rather than three. The reasons for this being twofold: to minimise the safety risk posed by the defective concrete columns and to maximise delivery of energy savings.

26. Phase 3: For 2020/21 and 2021/22 a further £1m per year has been allocated for the further roll out of LED replacements of SOX lanterns. There has been no specific additional capital allocation for further replacement, however current maintenance funds will enable replacement to continue, again on a worst first basis.

### **Progress to Date – Concrete Columns**

27. As of August 2017, the Council maintained 49,819 lighting columns. Of this, 10,884 (24%) were shown on the inventory as constructed of concrete around steel reinforcing. These were predominantly installed in the 1960's and 70's.

28. Recognising the service life, a detailed survey of the concrete columns on the Worcestershire County Council network was carried out and completed in 2018. The condition of the stock has been ranked from 1 (good condition) to 5 (requires immediate attention).

29. The detailed programme of replacing the concrete columns with both a new steel column and an LED lantern was and remains largely driven by the requirement to deal with the worst first.

30. All the Category 5 and 4 columns were dealt with very early on in the project. Category 3 columns test results were further assessed and dealt with on a needs basis. From the start of the project date close to 700 have been replaced to date, 387 in the last year at a cost of £465,000. This compares with the number of pure lantern replacements of approx. 15,880 during Phase 2.

31. We are currently expanding on last year's testing of the remaining Concrete columns with a view to forming a new replacement programme. Numbers will be dependent on the results of the testing. We anticipate at least a further 300 will be changed to steel.

### **Progress to Date – LED replacements**

32. We reported previously that where appropriate we had started using a new 'retro fit' lamp to directly replace an old SOX lamp in an existing lantern. Where this has been the case the 'control gear' was not changed and therefore if the lighting point was subject to part night switch off, it will still be so. This should have enabled a better response time in repairing simple SOX lamp faults going forward.

33. Unfortunately, the product turned out to be so unreliable we stopped using it. This has had a slightly detrimental effect on the overall programme as now all faults have to be dealt with by replacing the whole lantern. Relatively, a much more time consuming remedy.

34. In 2018/19 4,481 SOX to LED replacements were carried out. In 2019/ 20 a further 10,100 have been completed

35. The remaining 2,000 or so from Phase 2 will have been fitted by the end of September and these will be in Evesham, Droitwich and the Headless Cross area of Redditch.

36. As stated previously, the intention was to endeavour to complete all the conversions by 31 March 2020. However, this has not been possible. The two main reasons being the need to divert crews away from efficient conversion of lanterns by area to dealing with the growing number of individual faults occurring due to failing SOX lanterns and the inevitable impact of the COVID-19 pandemic. Although Prysmian have done a great job in keeping their crews working on our network throughout the COVID-19 period, productivity was slowed due to the additional practices and precautions the operatives had to take when attending each site.

37. The table below shows where the conversions have taken or will take place since April 2019 and the cost of those conversions.

<b>AREA</b>	<b>Lanterns fitted 19/20</b>	<b>Lanterns to be fitted by September</b>	<b>Cost</b>
North Claines/Fernhill Heath	102		18,360
Astwood Bank	52		9,360
Wythall	292		52,560
Barnt Green	90		16,200
Redditch	884	580	159,120
Droitwich	1,750		315,000
Kidderminster	3,204	720	576,720
Worcester	2,439		439,020
Pershore	492		88,560
Evesham	795	700	143,100
<b>Number of lanterns fitted in 2019/20 and 2020/21 to complete the project</b>	<b>10,100</b>	<b>2,000</b>	<b>1,818,000</b>
<b>Predicted annual energy saving KWH</b>	<b>1,282,700</b>	<b>254,000</b>	

## **Total Energy Savings**

38. Once all of the proposed 16,581 LEDs are fitted by the end of September, the annual energy savings will total approximately 2,104.883kwh or equivalent to annual energy savings of £283,212 (based on 13.455p per kwh)

## **Percentage of LEDs in across our street lighting asset**

39. Following Phase 2, when all the 16,600 are fitted by September and added to the existing number of LED lanterns installed before the £4m Highways Infrastructure Improvement Fund (HIIF) project, there will be approx. 23,000 LEDs lanterns which represents 42% of the total number of street lights. Currently there are around 54,500 street lights.

40. This figure of 42% is equal to the national average across all highway authorities.

## **Problems encountered**

41. As there are still significant numbers of concrete columns in the County, we have been fitting LED lanterns on these assets providing they are in satisfactory condition. When these concrete columns and older steel columns are replaced then these LED lanterns can be re-installed on the new galvanised steel columns.

42. Due to access problems (being unable to get motorised or hydraulic platforms to the asset) Columns on divorced footpaths or 'alley ways' have not been targeted in great numbers as there would be additional costs for structural testing and recently developed 'safe' ladder work. We are looking to carry out more extensive LED conversions on footpaths with the £1m additional funding allocated this year.

43. Where we have rolled out LEDs in areas, i.e. converting all lanterns in the street, we seem to receive minimal adverse comment from residents.

44. We do receive small numbers of complaints mostly about the brightness of the LED light source. These issues can usually be addressed by fitting baffles/shields.

## **Additional Council Capital (£2m over two years) 2020/21 and 2021/22**

45. As predicted, we are now experiencing growing failures of the SOX lanterns on a regular basis as predicted as the 'bulk change' programme obviously had to be suspended. The intention is therefore to use the additional capital funding to further roll out the replacement of SOX lanterns with LEDs.

46. The plan is to action those main areas where we would anticipate most failures of the exiting SOX assets and to that end Redditch and Malvern will be first in line. There are some 4,500 points in Redditch that will be replaced with LEDs.

47. We are finalising the exact assets to be treated in Malvern as there are many ornate columns/ lanterns to be considered along with conservation areas. We anticipate approximately 2,400 assts will be converted.

48. Prysmian have now developed a safe method of working for gaining access to those columns sited in divorced Footpaths and alleyways where it impossible to gain access with powered equipment. Structural testing must be carried out on all columns where safe ladder access needs to be deployed. This currently being undertaken and a bespoke programme of works to these assets will be developed following the tests. This will eradicate a number of longstanding issues and complaints. There are over 4,000 such lighting points across the County.

## **Consequence of converting all street lights to LED**

49. It is estimated that the Council could realistically reduce the energy bill (pre-LED), by 40 to 45%. The savings on the smaller wattage lanterns are significant, but less so on the traffic routes where it is more critical to light the roads to more compliant lighting levels to meet current standards. LED wattages for bigger lanterns on the traffic routes will be closer to the wattages of the existing conventional sodium lanterns and therefore energy savings will not be so significant.

## **Electric Vehicle (EV) Charging**

50. The Council was due to take part in a trial site for street lighting combined with EV charging, in the Arboretum area of Worcester City. It transpired that the chosen site was not suitable due to location of existing columns and the Council not being able to specifically allocate Public Highway for EV parking

## **Fault Reporting**

51. In response to issues reported at the last Scrutiny, it can now be reported that customers are only informed when work is complete and not when an order has been placed with the Contractor.

52. The Council is also endeavouring to ensure that the Lighting fault reporting service can be better integrated with the rest of the Highways and Transport Control Centre.

## **Innovations**

53. There is an increasing view that the amount of blue light emitted from 4000k LED lanterns can have an effect on local ecology. There is an option to change the colour temperature of LED to a warmer white light with less blue light content to help address these issues. However, it comes at a cost. Where a 3000k LED lantern is used, an increase of energy costs of 5 – 10% can be expected compared to neutral white LED of 4000k.

54. Street lighting can have dramatic effects on local light sensitive creatures. Where there are sensitive lesser horseshoe bat populations Red and amber LEDs lighting is being specified, so lighting has less of an impact on the bat's behaviour. An example of this in the recently installed Toucan crossing on Trotshill Way, Worcester.

55. A Central Management System (CMS) is being considered on a new development site in Lea Castle, Kidderminster. This is due to acute ecological issues in the area which a CMS may well be able to assist in mitigating. Initial costs to be borne by the Developer.

56. Solar lighting is being considered as an option on a Council project in Norton, Worcester where there is currently no mains supply.

57. Passive infrared sensors (PIRs): The possibility and cost effectiveness of retro fitting this technology to existing lighting stock was investigated. It was found that as all our street lighting assets are on unmetered supply, PIR installation could not be supported as there is no definitive burning hour duration. Any PIR installation would need to be on a metered supply, therefore we have not taken this idea any further for our existing lighting stock

## **Purpose of the Meeting**

58. The Panel is asked to:

- consider and comment on the latest information on Street Lighting
- determine whether any further information or scrutiny is required at this stage
- agree any comments to highlight to the Cabinet Member.

## Contact Points

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## Background Papers

In the opinion of the proper officer (in this case the Assistant Director of Legal and Governance) the following are the background papers relating to the subject matter of this report:

- Economy and Environment Overview and Scrutiny Panel on 7 March 2018 and 5 March 2019 - [Agendas and Minutes](#)
- Council on 8 November 2018 - [Agenda and Minutes](#)