

Report To: EXECUTIVE CABINET

Date: 24 October 2018

Executive Member / Reporting Officer: Councillor Allison Gwynne, Executive Member- Neighbourhoods
Emma Varnam - Assistant Director – Operations & Neighbourhoods

Subject: LED STREET LIGHTING

Report Summary: A report was presented at the Council's Strategic Planning & Capital Monitoring Panel in December 2014, and subsequently approved by Executive Board, to consider the way forward for the Council's street lighting assets, including energy costs. It was recommended that a wholesale LED lantern replacement scheme for residential streets should be undertaken. Also recommended was an assessment on the viability of an LED lantern replacement for the main roads to be undertaken after 3 years (2018).

This report sets out the two options for the viability of replacing the main road lanterns with LED's.

Recommendations: A wholesale LED lantern replacement programme should be considered for the remaining main road traffic routes over two years at a cost of £3.6M. This will deliver revenue savings of £274,375 per year based on current prices.

Links to Community Strategy: The Street Lighting LED Main Road Programme seeks to provide an improved and more sustainable highway related asset for the residents and businesses of Tameside, thereby contributing to a safe environment, continuing economic regeneration and contributing to a low carbon economy; key priorities within the 2012-22 Tameside Sustainable Community Strategy.

Policy Implications: The proposed programme supports the Council's Corporate Plan priorities around the Sustainable Community Strategy.

It also supports the objectives of the Greater Manchester 3rd Local Transport Plan and associated strategies thereby underpinning its aims and objectives at a regional and local level.

Financial Implications: A previous report was presented at the Council's Strategic Planning and Capital Monitoring Panel in December 2014 for £5M to begin a wholesale LED lantern replacement programme starting initially with the residential roads. This was later approved by Executive Cabinet. At the time of the December 2014 report it was not economically viable to undertake a replacement programme for the Main Road lanterns due to the payback period being 28 years. The report recommended that after three years another feasibility assessment should be undertaken on the financial viability of an LED replacement scheme for the main roads, due to the anticipated improvements in this technology and expected reductions in lantern costs.

(Authorised by the Section 151 Officer)

This report discusses the outlay of £3.6M for LED lanterns on main roads which have been appraised in section 3. It has now

been projected to have a payback period of 13 years and the operational life is 25 years under the manufacturer's guarantee. However, it fails to take into account time value of money and does not factor in the additional cash flows beyond the payback period.

A total of £3.6M has been earmarked for LED Lighting in the capital programme in October 2017. The breakdown of this amount can be reviewed in Table 5 of this report. The scheme has been marked as 'business critical in the review of the capital programme paper to Board in July 2018. The scheme is deemed to be business critical due to the potential savings of £0.274M. Based on feedback from STAR procurement, there is a potential to achieve further savings which should be explored.

Table 8 provides an outline of on the project delivery over a period of two years. The analysis of forecast savings or cost avoidance expected from the delivery of LED street lamp replacement on residential and main roads is shown in tables 2 and 3.

The Medium Term Financial Plan assumes a net savings of £0.25M from 2019/20 as a result of undertaking this project. However, such savings are subject to inflation and change in energy costs, so the service area should ensure that energy usage is monitored alongside actual cost to track and demonstrate that savings are being delivered by this investment.

This project offers more sustainable and environmental friendly way of conducting operations as there will be less co2 emissions and hence council will improve its carbon foot prints targets.

Expenditure on capital scheme must comply with guidance from Code of Practice on Local Authority Accounting. Any none capital related expenditure will be transferred to revenue and funded from existing revenue budgets.

Legal Implications:
(Authorised by the Borough Solicitor)

The Council has statutory powers under s97 Highways Act 1980 to light highways for which it is responsible. It is also responsible for lighting some traffic signs under the Traffic Signs Regulations and General Directions 2016. However, any approach in respect of lighting must be undertaken as efficiently and effectively as possible. This is more important given the significant calls on budget.

Risk Management:

- Inclement weather preventing commencement and completion of schemes.

A comprehensive programme of works will be agreed between partners to ensure completion by approved dates. However, should the programme not be achieved it may be necessary to arrange for any outstanding financial resources to be transferred into the following financial year.

- Inability of suppliers to deliver materials within a time frame to meet completion targets.

If the successful supplier cannot meet the demand in line with the proposed installation schedule, then approval will be sought to carry over the project into the subsequent year for completion.

- The ability of the Council's own *Operational Services* or external contractors to implement the programme in the two year timescale of the project.

This risk will be managed by ensuring that should Operational Services or the external contractor be unable to complete the works during the timescale, approval will be sought to carry over the project into the subsequent year for completion.

Access to Information:

The background papers relating to this report can be inspected by contacting the report authors, Lee Holland



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1 EXECUTIVE SUMMARY

Proposed Investment

- 1.1 To replace all the main road street lighting lanterns with new energy efficient LED lanterns in order to reduce the Council's energy consumption and its CO2 emissions.

Options for Investment

- 1.2 Two options including a "do nothing" have been explored. Option 1 which is the wholesale replacement of the main road lanterns to LED lanterns is the preferred option and will ensure the Council achieves its revenue savings, the "do nothing" option will not achieve those revenue savings.

Project Delivery

- 1.3 The delivery of the project will be managed through the Council's Design & Delivery Service with aspects of the project procured via existing framework contracts.

Financial Investment Requirement

- 1.4 Option 1 is the preferred option and will require an investment of £3.6M.

Project Management and Monitoring

- 1.5 The project management will be undertaken by the Council's Design and Delivery Service, regular progress reporting will be via the Council's Strategic Planning and Capital Monitoring Panel

Conclusion

- 1.6 Option 1 is the preferred option which will result in the entire highway network being illuminated by LED lanterns. The replacement costs will be £3.6M phased over two years. This will deliver revenue savings of £274,375 per year based on current prices.

2 PROPOSED INVESTMENT

Background and Existing Arrangements

Introduction

- 2.1 A report was presented at the Council's Strategic Planning & Capital Monitoring Panel in December 2014 for £5m, and subsequently approved by Executive Board, to consider the way forward for the Council's street lighting assets, including energy costs. It was recommended that a wholesale LED lantern replacement scheme for residential streets should be undertaken. Also recommended was an assessment on the viability of an LED lantern replacement for the main roads to be undertaken after 3 years (2018) which is considered in this report.

Why are we proposing to do this?

- 2.2 The 1980 Highways Act empowers Highway Authorities to provide and maintain lighting on highways for which they are responsible (Section 97). The legal requirements for the illumination of traffic signs are set out in the 2002 Traffic Signs Regulations and General Directions. Street lighting is provided as an aid to road safety, to assist in the prevention of crime (public safety), and to improve the visual amenity of the street scene.

Existing Funding Arrangements

- 2.3 Street Lighting is a major area of expenditure for the Authority, with a revenue budget of just over £2 million per year, £1.56 million of which is for energy (see Table 1 below) and the remainder used for repairs and maintenance. The Council is responsible for the following total illuminated street furniture worth around £49m in Gross Replacement Cost terms (as submitted as part of Whole of Government accounts 2017/18):

- 17,000 side road lighting columns (previous LED project)
- 7,500 main road lighting columns

- 2,556 illuminated signs
- 912 illuminated bollards

2.4 As well as ensuring that the lights are adequately situated and that the lamps are providing adequate light, street lighting lamps need replacing approximately once every five years (meaning around 1,500 lamps will need to be replaced over the course of each year for the main roads). Electrical testing of all our installations needs to be carried out and the structure of the lighting equipment also needs to be maintained and monitored to ensure it is safe. In order to ensure that the columns remain in a safe condition it is estimated that up to 1,000 columns should be replaced every year.

2.5 Managing these replacements is a major task with heavy reliance being placed on the inventory records held by the Authority which need to provide accurate information regarding the position of the street lighting, the type of equipment that is being used and the date any components were last replaced in order to ensure the right columns and lamps are replaced at the right time.

2.6 As budgets across the Authority are reduced it is important to ensure that the controls in place within street lighting are robust and effective in order to ensure that a potentially reduced service does not result in increased risk to the Authority or to the safety of the general public.

Revenue Budgets (2017/18)

2.7 Revenue budgets to support the delivery of this service are detailed below (Table 1) indicating the relative expenditure levels for street lighting related functions:

Table 1: Revenue Budgets 2017/18

Function	Budget £000's	% of Total
Street Lighting energy	1,561	76.5%
Street Lighting reactive maintenance	243	11.9%
Street Lighting Bulk Change & Clean (planned maintenance)	164	8.0%
Bollards maintenance	4	0.2%
Bollards Bulk Change & Clean	28	1.4%
Signs Maintenance	20	1.0%
Signs Bulk Change & Clean	10	0.5%
Street Lighting painting	10	0.5%
Total	2,040	100%

2.8 The revenue budget for energy costs has previously been reduced to reflect anticipated energy savings from the installation of LED lamps in residential areas. The Medium Term Financial Plan assumes further net savings of £250k from 2019/20 after inflationary pressures for energy costs.

Business Needs/Council policies, strategies and plans

2.9 This proposal is an invest to save project which when complete will save the council £274,395 per annum in energy and maintenance costs. It will also provide an opportunity to ensure the council's street lighting inventory is accurate and up to date, enabling those assets to be managed effectively.

Spending Objectives

2.10 The successful outcome can be summarised as below:

- contributing to a low carbon economy
- safe environment
- continuing economic regeneration
- reduced energy consumption

Previous Report

- 2.11 The report presented at the Council's Strategic Planning & Capital Monitoring Panel in December 2014 and subsequently approved by Executive Board contained the following information regarding the street lighting assets and maintenance regime.
- Planned Maintenance (Bulk Change and Clean Programme)
 - Strategic Risk Management (Visual Inspections)
 - Electrical Inspections.
 - Structural Testing.
 - Column Replacement Programme.
 - Inventory / Data Collection.
- 2.12 For further information on these items please refer to the previous report

Street Lighting LED Residential Roads Project

- 2.13 The LED report in December 2014 recommendation for a wholesale LED lantern replacement programme starting initially with the residential roads (circa 17,000 lanterns) at a cost of £5M, over a three year period. This was subsequently approved by the Executive Cabinet.
- 2.14 The council's in-house Design and Delivery team started this project in April 2015 and are due to complete by December 2018. Table 2 below shows the costs / savings envisaged in the December 2014 report and the anticipated outturn figures:

Table 2: LED Residential Roads Project Forecast Outturn

	December 2014 Report	Estimated outturn figures
Capital Expenditure	£5,000,000	£5,000,000
Annual Energy Savings	£451,270	£494,053

These energy savings have been calculated based on January 2018 tariffs.

- 2.15 As can be seen from the table above the project will be delivered on budget and the energy cost savings (or cost avoidance) should exceed the original forecast. The revenue budget reductions referenced above are a net saving after taking account of inflationary pressures on energy costs.
- 2.16 At the time of the December 2014 report it was not economically viable to undertake a replacement programme for the Main Road lanterns. It was estimated that a capital investment of £4.1M for these lanterns would have a payback period of 28 years.
- 2.17 The report recommended that after three years another feasibility assessment should be undertaken on the financial viability of an LED replacement scheme for the main roads, due to the anticipated improvements in this technology and expected reductions in lantern costs.

3 OPTIONS FOR INVESTMENT

Do Nothing Summary

3.1 The Council would continue with existing cyclic bulk change and clean and general maintenance of main road columns.

Benefits

3.2 There is no additional cost incurred over and above the existing revenue allocations, however energy savings would not be achieved.

Risks

3.3 The council will continue with its usual maintenance regime, with no proactive night inspections reliance is placed on reports from members of the public to actively manage repairs to its lamp outages.

Risks with this Option:

Risk	Likelihood	Outcome/impact	Mitigation
There will be a gradual deterioration of the lighting provision across the main road network	High	Decline in maintenance standards and increased risk of outages.	Increase the revenue budget to optimise maintenance frequency.

Wider impacts

3.4 The benefits of good lighting are well known, especially in the fields of accident reduction and crime/vandalism prevention. At the moment, however, the council relies solely on public reports to actively manage repairs to its lamp outages. We do not currently carry out any proactive night inspections to monitor our non-operational street lighting assets around the borough. There is therefore a possibility that the number of night time accidents and criminal activities will increase. Visiting our assets less often also means that there are fewer opportunities to visually inspect our columns and signs, which increases the potential risk to the council.

Option 1: Wholesale LED replacement of the main road lanterns

Summary

3.5 A wholesale LED replacement programme for the main road lanterns, similar to the side road lantern scheme. It is envisaged that this project would take two years to complete.

Benefits

3.6 The new modern LED lanterns will produce energy savings circa £227,797 per annum, together with guaranteed 25 years useful life expectancy of the lantern. Reductions in associated CO2 emission and maintenance costs. Also it provides the opportunity to ensure the inventory is up to date and correct.

Costs

3.7 The investment required to replace the main road lanterns with energy efficient LED lanterns is estimated at £3.6M. Table 3 below indicates the amount of investment required for the main road scheme and payback period.

Risks with this Option

Risk	Likelihood	Outcome/impact	Mitigation
Delays to delivering the project over the 2 years forecast	Low	Energy savings would be delayed and have an impact on revenue budgets	Ensure appropriate project management and monitoring is undertaken

Financial Viability Assessment for LED Main Road Lanterns

- 3.8 The energy budget for 2017/18 is £1.56M. This figure will significantly reduce next financial year due to the installation of the residential roads LED scheme. The amount of this budget attributable to the main road energy costs is £627K.
- 3.9 There are not only energy savings when the lanterns are changed to LED's, additional savings are achieved in the CO2 emissions, although this is a notional saving at present because we are not charged for these emissions yet. Further savings will be achieved in maintenance costs due to fewer lamp changes and lamp failures associated with LEDs. The lamp changes savings are based on a 6 year life expectancy for non LED lamps, with one sixth of our lamps being replaced per year. The lamp failures saving is based on a 17% failure rate during the 6 year life expectancy of the non LED lamps. Table 3 below shows the anticipated total savings attributable to the main road LED lantern replacement scheme (per year) based on current energy costs:

Table 3: Forecast Savings

Lamp Number	Lamp Type	Existing energy cost	New energy cost	Co2 saving	Energy savings	Saving in lamp changes	Saving in lamp failures
2152	100w	£131,784	£98,075	£1,728	£33,709	£11,658	£1,333
3584	150w	£315,970	£208,395	£5,516	£107,575	£19,732	£2,274
1016	250w	£137,844	£69,720	£3,493	£68,124	£5,713	£665
220	90w	£15,098	£10,026	£260	£5,072	£1,875	£252
273	135w	£25,653	£12,441	£677	£13,212	£2,644	£367
5	180w	£649	£544	£5	£105	£74	£11
7250		£626,998	£399,201	£11,679	£227,797	£41,696	£4,902
Total Savings:						£274,395	

- 3.10 As can be seen savings totalling £274,395 (based on current energy costs) can be achieved per year if the main road lanterns were replaced with LED lanterns.

Wider impacts

- 3.11 The installation of LED lanterns on the main roads throughout the borough will not only have energy savings but will also reduce the CO2 emissions which will be more beneficial to the environment. It will also reduce the maintenance demand on the street lighting service.

Summary/Preferred Option

- 3.12 Option 1 is the preferred option because it will deliver energy savings and reduce CO2 emissions, the do nothing option will not achieve these savings. Option 1 also will ensure

that our street lighting inventory is accurate and up to date with the relevant information required to manage these assets.

Table 4: Summary of Options

	Do nothing	Option 1 Wholesale LED lanterns replacement for main roads
Replacement of the main road lanterns	x	✓
Energy Cost Savings	x	✓
Reduce CO2 Emissions	x	✓
Update street lighting inventory	x	✓
Potential achievability	✓	✓
Potential affordability	✓	✓
Summary	Discounted	Preferred

4 FINANCIAL INVESTMENT REQUIRED

Table 5: Proposed Main Road LED Investment

	Main Roads
Number of Lanterns in need of replacement	7,500
Lantern replacement cost	£2,400,000
Installation costs (including electrical testing)	£900,000
Design Fees	£100,000
Traffic Management Costs	£200,000
Total Capital Investment required	£3,600,000
Payback period based forecast savings in Table 3	13 years

(Payback Period - The length of time required to recover the cost of an investment. The payback period of a given investment or project is an important determinant of whether to undertake the project, as longer payback periods are typically not desirable for investment proposals).

- 4.1 Current estimates as outlined above indicate that an initial capital outlay of £3.6M on the main roads would payback over a period of 13 years. The LED lanterns installed would be expected to be operational for a total of 25 years under the manufacturer's guarantee.
- 4.2 It is proposed to undertake the main road lantern replacement scheme using the Council's in-house Design and Delivery team over a two year timescale. The procurement of the LED lanterns will be undertaken via an existing Greater Manchester Supplier Framework (if suitable) or a tendering process similar to the side road lantern purchase. The intended profiling of Capital Expenditure and lantern replacements is shown in Table 6 below.

Table 6: Investment Profile

	Year 1	Year 2	Year 3
Capital Expenditure	£1,600,000	£2,000,000	
Number of Lanterns Replaced	3,500	4,000	
Forecast Energy Savings	£0	£109,494	£241,670

- 4.3 The anticipated energy saving (or cost avoidance) over the 25 year useful life of the lanterns is shown in Table 7 below. The current and LED energy costs are based on current tariffs, assuming inflationary increases of 3% per annum. There will be additional savings in a reduction to lamp changes and lamp failures that are costs associated with maintaining the current inventory.

Table 7: Forecasted Future Savings

Year	Current Main Rd Energy Costs (3% inflation)	Forecast LED Main Rd Energy Costs (3% Inflation)	Forecast Annual Energy Savings (3% Inflation)	Forecast Annual Energy Savings (5% Inflation)	Annual Energy & Maintenance Savings (3% Inflation)	Annual Energy & Maintenance Savings (5% Inflation)
1	£626,998	£399,201	£227,797	£227,797	£274,395	£274,395
2	£645,808	£411,177	£234,631	£239,187	£282,627	£288,115
3	£665,182	£423,512	£241,670	£251,146	£291,106	£302,520
4	£685,138	£436,218	£248,920	£263,704	£299,839	£317,647
5	£705,692	£449,304	£256,388	£276,889	£308,834	£333,529
6	£726,863	£462,783	£264,079	£290,733	£318,099	£350,205
7	£748,668	£476,667	£272,002	£305,270	£327,642	£367,716
8	£771,128	£490,967	£280,162	£320,533	£337,471	£386,101
9	£794,262	£505,696	£288,566	£336,560	£347,595	£405,406
10	£818,090	£520,867	£297,223	£353,388	£358,023	£425,677
11	£842,633	£536,493	£306,140	£371,057	£368,764	£446,961
12	£867,912	£552,588	£315,324	£389,610	£379,827	£469,309
13	£893,949	£569,165	£324,784	£409,091	£391,222	£492,774
14	£920,768	£586,240	£334,528	£429,545	£402,958	£517,413
15	£948,391	£603,827	£344,563	£451,022	£415,047	£543,283
16	£976,842	£621,942	£354,900	£473,574	£427,498	£570,447
17	£1,006,148	£640,600	£365,547	£497,252	£440,323	£598,970
18	£1,036,332	£659,818	£376,514	£522,115	£453,533	£628,918
19	£1,067,422	£679,613	£387,809	£548,221	£467,139	£660,364
20	£1,099,445	£700,001	£399,443	£575,632	£481,153	£693,382
21	£1,132,428	£721,001	£411,427	£604,413	£495,588	£728,052
22	£1,166,401	£742,631	£423,770	£634,634	£510,456	£764,454
23	£1,201,393	£764,910	£436,483	£666,366	£525,769	£802,677
24	£1,237,435	£787,858	£449,577	£699,684	£541,542	£842,811
25	£1,274,558	£811,493	£463,064	£734,668	£557,789	£884,951
Total	£22,859,886	£14,554,575	£8,305,311	£10,872,090	£10,004,240	£13,096,077

5. PROJECT DELIVERY

- 5.1 If the council was to approve the installation of LED lanterns on the main roads, then we would need to establish a supplier for the LED lanterns, we would consult with STAR to source an appropriate framework contract or undertake a procurement exercise, in accordance with Council's Standing Orders. During this procurement period the installation

programme would be agreed to determine which areas should be delivered first and in what order. Once the supplier contract has been secured the lighting design for each of the main roads can be finalised. It is envisaged that a start on site to replace the lanterns would commence in March 2019

- 5.2 Installation of the lanterns would be delivered in-house via the Design and Delivery Service, similar to the recently installed LED side road programme.

Table 8: Project Delivery Forecast

Activity	Y1				Y2			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Lantern Procurement								
Lighting Design								
Installation								

Procurement Risks

- 5.3 There are no significant procurement risks associated with the delivery of the preferred option as the design skills and construction deliverables are either in-house or within existing framework contracts. Also the products are standard items and readily available.

Risk	Likelihood	Outcome/impact	Mitigation
The project could be delayed due to the availability of some key contractors and suppliers	Low	Project will take longer to deliver	Alternative contractors / suppliers appointed
Inclement weather during construction	Low / medium	Delay to overall project timescale	Phase construction over a number of seasons

6 Project Management and Monitoring

Project Management, governance and reporting arrangements

- 6.1 The project will be procured and project managed by Operations & Neighbourhood – Head of Design & Delivery. Engineers / QS Supervisors will manage and monitor each package of work which will include quality, timescales and budget control in accordance with section 4.

Project monitoring

- 6.2 Regular monitoring and reporting will be provided to the Capital Monitoring Group and Strategic Capital Group.

Contract Management

- 6.3 All external contracts will be managed by the Head of Design & Delivery and will be mainly delivered through the Engineers existing framework contracts or STAR frameworks. Alternative contractors will be sourced if existing framework contractors are not available.

Risks and Contingency

- 6.4 The biggest single risk to this project is the availability of contractors to deliver the installation within the given timescales. As this is being delivered via the in-house service and existing framework contracts this risk is minimal, however if during the monitoring of

the project if it felt that additional resources are required a further framework contractor(s) will be appointed.

Post Implementation Review

- 6.5 The ongoing revenue monitoring process will be used to measure the success of this project to ensure it achieves the savings envisaged.

7 CONCLUSION

- 7.1 The use of LED technology is fundamental in order for the council to achieve its savings targets by reducing energy consumption and associated costs. Energy prices are likely to increase in the future requiring additional corporate support. The fact that other councils are employing this technology and taking more drastic measures will reduce demand which is only likely to drive the cost of raw energy up further. The availability of a new generation of LED technology increases the attraction in terms of cost savings and serious consideration of replacing the remaining main road lanterns needs to be made.

8 RECOMMENDATIONS

- 8.1 As set out on the front of the report.