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AGENDA

Committee	ENVIRONMENTAL SCRUTINY COMMITTEE
Date and Time of Meeting	TUESDAY, 14 JUNE 2016, 4.30 PM
Venue	ROOM D - CITY HALL
Membership	Councillor Mitchell (Chairperson) Councillors Aubrey, Clark, Chris Davis, Hill-John, Lomax, White and Darren Williams

Time approx.

1 Appointment of Chairperson

To note that at the Annual meeting of Council held on 26 May 2016 Councillor Paul Mitchell was appointed as Chairperson of this Committee

2 Committee Membership

To note that at the Annual meeting of Council held on 26 May 2016 appointed the following Members to the Committee:

Councillors Aubrey, Clark, Davis, Hill-John, Lomax, White and Darren Williams (1 vacancy)

3 Terms of Reference

- To scrutinise, measure and actively promote improvement in the Council's performance in the provision of services and compliance with Council policies, aims and objectives in the area of environmental sustainability, including:
 - Strategic Planning Policy
 - Sustainability Policy
 - Environmental Health Policy
 - Public Protection Policy
 - Licensing Policy
 - Waste Management
 - Strategic Waste Projects

- Street Cleansing
 - Cycling and Walking
 - Streetscape
 - Strategic Transportation Partnership
 - Transport Policy and Development
 - Intelligent Transport Solutions
 - Public Transport
 - Parking Management
- To assess the impact of partnerships with and resources and services provided by external organisations including the Welsh Government, joint local government services, Welsh Government Sponsored Public Bodies and quasi-departmental non governmental bodies on the effectiveness of Council service delivery.
 - To report to an appropriate Cabinet or Council meeting on its findings and to make recommendations on measures which may enhance Council performance and service delivery in this area.

4 Apologies for Absence

To receive apologies for absence.

5 Declarations of Interest

To be made at the start of the agenda item in question, in accordance with the Members' Code of Conduct.

6 Cardiff's Transport Strategy (Pages 1 - 6)

4.40 pm

- (a) Councillor Ramesh Patel, Cabinet Member for Transport, Planning & Sustainability to make a statement on Cardiff's Transport Strategy relevant to his portfolio of responsibility (if he wishes).
- (b) An officer from the City Operations Directorate to deliver a presentation based on Cardiff's Transport Strategy relevant to the Transport, Planning & Sustainability portfolio.
- (c) Councillor Patel and officers from the City Operations Directorate will be available to answer Member questions.

7 Street Lighting - Member Briefing (Pages 7 - 38)

5.20 pm

- (a) Councillor Ramesh Patel, Cabinet Member for Transport, Planning & Sustainability to make a statement on the item titled Street Lighting – Member Briefing (if he wishes).
- (b) An officer from the City Operations Directorate to deliver a brief presentation on the item titled Street Lighting – Member Briefing.

(c) Councillor Patel and officers from the City Operations Directorate will be available to answer Member questions.

8 Work Programme 6.00 pm

Principal Scrutiny Officer to provide a verbal report on the development of a draft terms of reference for a task & finish exercise on river pollution in Cardiff and discuss the approach for developing the Environmental Scrutiny Committee Work Programme for 2016/17.

9 Way Forward 6.20 pm

10 Date of next meeting

The next meeting of the Committee is scheduled for 12 July 2016.

David Marr

Interim Monitoring Officer

Date: Wednesday, 8 June 2016

Contact: Graham Porter, 029 2087 3401, g.porter@cardiff.gov.uk

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CITY AND COUNTY OF CARDIFF
DINAS A SIR CAERDYDD

ENVIRONMENTAL SCRUTINY COMMITTEE

14 JUNE 2016

CARDIFF'S TRANSPORT STRATEGY

Purpose of Report

1. To brief Members on the approach being taken to develop Cardiff's new Transport Strategy prior to it being considered by Cabinet at their meeting on the 14 July 2016. In considering this report Members will:
 - Receive an outline of the purpose of the strategy and the proposals it contains;
 - Receive an explanation of the rationale and supporting evidence for particular transport interventions;
 - Have the opportunity to discuss a range of technical matters and the linkages between the Strategy and other areas of Council policy/service delivery;
 - Have the opportunity to discuss options for public consultation on Cardiff's new Transport Strategy;
 - Have the opportunity to discuss ways of raising and maintaining public awareness of/interest in the Strategy through communications.

Background

2. Cardiff's Local Development Plan (LDP) was approved in January 2016; the plan covers the period from 2006 to 2016. This important document highlights the need for a shift to sustainable transport to support the future growth of the city - in doing this it sets a target for 2026 of 50% of all journeys to be made by sustainable modes of travel.
3. Cardiff's new Transport Strategy will provide a summary of the Council's transport priorities and proposed transport projects which it is hoped will help achieve the 50% target by 2026.

Future Growth & Modal Shift

4. The City of Cardiff is set to grow. The recently-approved LDP provides for 41,000 new homes and up to 40,000 new jobs by 2026. It is estimated that this expansion of the city will generate a 32% (net) increase in road traffic which, in turn, will intensify pressure on the city's highway network.
5. In order to accommodate growth on this scale, the overall share of daily journeys made by car must decrease and a greater proportion of trips need to be made by walking, cycling and public transport. As stated previously the LDP also sets a target of 50% of all journeys to be made by sustainable transport by 2026. To enable this 'modal shift', policies in the LDP seek to secure significant improvements to the public transport and active travel networks in combination with new developments.

Liveable City

6. Cardiff was recently named the 'Most Liveable City' in the United Kingdom. The Council's ambition is for Cardiff to become Europe's 'Most Liveable Capital City'. Most of the world's most liveable cities have grown alongside the development of sustainable transport networks which allow people to travel freely by public transport, walking and cycling. Integrating new developments with the provision of sustainable transport infrastructure is seen as one of the key enablers in achieving the Council's Liveable City aspirations.

Cardiff Capital Region – City Deal

7. Cardiff is the economic driver of a major city region that is home to over 1.4 million people, i.e. half the population of Wales. The city provides one third of the region's employment.
8. People make approximately 1.5 million trips every day travelling within and to and from Cardiff (over 25% of trips in the South East Wales Region), with large numbers of journeys coming from the neighbouring local authorities such as the Vale of Glamorgan, Rhondda Cynon Taff and Caerphilly. These movements exert considerable pressures on Cardiff's transport network.

9. Development of the Cardiff Capital Region Metro project will form one of the central elements of the £1.2 billion package of investment secured through the Cardiff Capital Region City Deal. The Metro will provide the connectivity needed to support the growth of the City Region's economy and make it competitive with other UK cities and city regions. It will also support Cardiff's delivery of sustainable transport and its Liveable City ambition.

The need for a City Transport Strategy

10. Up to now, the Council's transport vision and priorities have not been outlined in an individual strategy document. However, with the LDP now adopted, and transport set to play a central role in its implementation and the City Deal initiative it makes sense for the Council to set out its Transport Strategy in a single document.

Purpose of Strategy

11. The strategy document is intended to provide a complete overview of plans to improve Cardiff's transport system and, crucially, to explain why the proposed projects are needed to support the future growth of the city and the wider city region. The strategy will provide the principal reference for future communications and public engagement on transport matters. The aim for publishing the strategy is to generate a stronger public awareness of the transport challenges we need to address.
12. The document draws together the existing transport vision and priorities for Cardiff within the context of the LDP; the Local Transport Plan (LTP); the aspiration to make Cardiff Europe's Most Liveable Capital City and other important regional developments including the new 'City Deal'.

Contents of the Transport Strategy

13. The Transport Strategy will outline a number of key transport issues facing Cardiff, these include:
 - The main transport issues and challenges which the Council and its partners are working to address;

- How improvements to Cardiff's transport system are needed to support the development of new sustainable communities envisaged within the Local Development Plan;
- The Council's priorities for individual modes of travel and key proposals for improving the transport system including:
 - Development of the Active Travel Network including a bold new plan to increase cycling
 - Bus Corridor and wider network enhancements
 - Improving the integration of public transport services
 - Development of a new bus and multi modal interchange as part of the Central Square redevelopment
 - Better management of the highway network to improve its operation and support sustainable travel
 - Supporting the development of the Cardiff Capital Region Metro
 - Expanding the application of Digital technology to support sustainable travel choices

'Living' Document

14. The strategy will be a living document which will be updated periodically as delivery progresses or in response to developments in policy or other matters of strategic significance. Bulletins highlighting progress on the delivery of the strategy will be published periodically.

Timeline

15. Initial consultation was carried out with Members in August 2015. This, together with internal officer consultation, has informed the production of a draft City Transport Strategy document. Which will be made available at the meeting. An indicative timeline for progressing Cardiff's Transport Strategy is outlined below.
 - June 2016: Consideration of Draft Strategy by Environmental Scrutiny Committee;
 - July 2016: Cabinet for approval to carry out public consultation on the document;
 - Public consultation: July – October 2016;

- December 2016: Submission of Final Strategy and Strategy Action Plan to Cabinet for final approval.

Way Forward

16. Councillor Ramesh Patel, Cabinet Member for Transport, Planning & Sustainability and officers from the City Operations Directorate have been invited to attend. They will deliver a short presentation and answer Members' questions.

Legal Implications

17. The Scrutiny Committee is empowered to enquire, consider, review and recommend but not to make policy decisions. As the recommendations in this report are to consider and review matters there are no direct legal implications. However, legal implications may arise if and when the matters under review are implemented with or without any modifications. Any report with recommendations for decision that goes to Cabinet/Council will set out any legal implications arising from those recommendations. All decisions taken by or on behalf of the Council must (a) be within the legal powers of the Council; (b) comply with any procedural requirement imposed by law; (c) be within the powers of the body or person exercising powers on behalf of the Council; (d) be undertaken in accordance with the procedural requirements imposed by the Council e.g. Scrutiny Procedure Rules; (e) be fully and properly informed; (f) be properly motivated; (g) be taken having regard to the Council's fiduciary duty to its taxpayers; and (h) be reasonable and proper in all the circumstances.

Financial Implications

18. The Scrutiny Committee is empowered to enquire, consider, review and recommend but not to make policy decisions. As the recommendations in this report are to consider and review matters there are no direct financial implications at this stage in relation to any of the work programme. However, financial implications may arise if and when the matters under review are implemented with or without any modifications. Any report with recommendations for decision that goes to Cabinet/Council will set out any financial implications arising from those recommendations.

RECOMMENDATIONS

The Committee is recommended to:

- Consider the information in the report;
- Decide whether they would like to make any comments to the Cabinet;
- Decide the way forward for any future scrutiny of the issues discussed.

DAVID MARR
Interim Monitoring Officer
8 June 2016

**CITY AND COUNTY OF CARDIFF
DINAS A SIR CAERDYDD**

ENVIRONMENTAL SCRUTINY COMMITTEE

14 JUNE 2016

STREET LIGHTING – MEMBER BRIEFING

Purpose of Report

1. To brief Members on recent developments and proposals relevant to the street lighting in Cardiff. In particular this report will focus on:
 - The proposal of procuring a contract to deliver LED street lighting for Cardiff;
 - An update on the street lighting dimming contract.

Background – LED Street Lighting in Cardiff

2. The City of Cardiff Council aspires to become the most liveable European capital city. A key theme within this is enhancing the quality of environment and reducing carbon footprint within the context of effective budgetary control.
3. The proposal of the LED street lighting procurement is to convert 13,608 street lights located on strategic highway routes to LED street lighting, which it is hoped will contribute to the Council's aspiration of becoming the most liveable European Capital city.
4. The Well-being of Future Generations Act 2015 came into force for local authorities in April 2016. The legislation requires the Council to contribute positively to seven national Well-being Goals and five Ways of Working. The 'Prosperous Wales' goal promotes a low carbon society, and climate change

mitigation actions demonstrate both the 'Long term' and 'Preventative' Ways of Working. Climate change actions also contribute positively to the 'Energy' and 'Place' strands of the *One Planet Cardiff* Strategy.

Positive Impacts: Carbon Reduction

5. Street lighting in the City of Cardiff is responsible for 25% of the Council's operational CO2 emissions, therefore reducing energy and the resulting CO2 emissions in this area is a priority. Total CO2 emissions for the Council's operations in 2015/16 were 41,850 tonnes (Carbon Reduction Commitment (CRC) data) and street lighting contributed 10,331 tonnes to this figure.
6. The proposal to implement LED street lighting on the strategic highway routes would result in a total of 3,476 tonnes of CO2 being removed from Council operations. This equates to an 8% reduction in total Council emissions (based on 2015/16 CRC data). This reduction saving would contribute positively to the Council's carbon reduction target of 60% reduction in CO2 emissions from key Council operations by 2018 (from 2005/06 baseline).
7. It is anticipated that the LED procurement will provide a reduction in associated carbon emissions providing a projected carbon reduction commitment saving of £63,100 per annum; the details of this saving are illustrated in **Table 1**. The saving associated with carbon emissions will be seen against the budget for carbon emission payments. These savings are excluded from the cost benefit analysis.

Table 1: Savings associated with carbon emissions reduction

Type	Number	kWh Savings	CO2 Savings (tonnes)	CRC saving
8m	6,668	2,988,824	1,483.53	£26,927
10m	5,296	2,938,020	1,458.32	£26,469
12m	1,644	1,077,046	534.60	£9,704
TOTAL	13,608	7,003,890	3,476	£63,100

8. As well as the Council's own CO2 target there is also a wider city commitment to taking action at a local level on global climate change. The Council is a signatory to both the EU Covenant of Mayors and the Compact of Mayors. The former commits the Council to a citywide per capita CO2 reduction target of 26% by 2020 (based on 2005 baseline). Latest Department for Energy and Climate Change CO2 figures for the city (2013 data, as they are produced with 2 year lag) shows Cardiff has achieved a 27% reduction in per capita CO2 emissions and 20% reduction in absolute CO2 emissions. As the Council's operational emissions are included in this citywide data any reduction it makes will contribute towards these wider targets (the total Council operational CO2 emissions equate to roughly 2% of total city CO2 emissions).

Budgetary Impacts

9. If LED street lighting is implemented on strategic highway routes it is anticipated that there will be a reduction in energy costs of £791,440 per annum – assuming energy costs remain at current levels. The actual savings take account of installation costs, maintenance and financing of the project - estimated at a total of £4.858m. Once fully installed this equates to a potential return of investment over a 5.6 year period. The cost benefit analysis is shown in **Appendix 1** and includes a 12 year capital repayment schedule.

10. Other savings identified but not included in the return on investment calculation are a carbon reduction commitment of £63,100 (as stated above); a reduction in maintenance costs of £35,000; faults and failure prediction £20,000; option of trimming £26,600 and total option of dimming costs of £47,900. In total this creates total potential further savings of £192,600 per annum.
11. The project supports reducing financial pressures identified in Corporate Plan. The savings associated with the introduction of LED street lighting on strategic highway routes have been accepted in the Medium Term Financial Plan (MTFP) although only the budget savings for 2016/17 have been formally accepted.
12. The business case for the project has been scrutinised at the Council's Investment Review Board, with project costs being funded from a combination of interest free loans from Salix¹ and other Council borrowing.
13. The savings have been optimised by utilising the Salix 'Energy Efficiency Loan Scheme'. Subject to Section 151 Officer agreement of the terms and conditions of any such loans, this will provide interest free capital funding to deliver the scheme with repayments being made over the subsequent 6 years.
14. A trial of different LED lantern manufacturers has been completed in the city centre (behind City Hall) and associated testing and stakeholder feedback exercises have taken place. The specification for the procurement exercise has been defined to meet the best results of this trial.
15. The exercise undertaken identified a preference away from white / blue light (5,000 Kelvin) to a warmer light (3,000 Kelvin). By utilising 3,000 Kelvin LED lights the light will match the streetwise lanterns placed during the dimming contract. This will provide a unified light colour and temperature across the City.

¹ <http://salixfinance.co.uk/>

Positive impacts: New Central Management System

16. At present there is no Central Management System (CMS) for street lighting in Cardiff. As a part of the LED street lighting project it is proposed that a CMS system will be implemented on the strategic road network.

A CMS will allow officers to raise lighting levels if issues occur, for example, during events or after an accident. Having this degree of flexibility will reduce ongoing risks or concerns which could potentially arise as a result of the project.

Numerous media articles has described where other local authorities have been criticised for their approach in implementing LED street lighting, and it is felt that this option provides a solution to limit the likelihood of criticism or negative feedback.

17. A CMS may allow integration with other technology in a SMART City. This would not support improved savings relating to this specific project, however, it could support collaborative work to reduce aspects such as crime and disorder.

Issues

18. The project will be tendered via OJEU open procedure via 'Sell to Wales' as it was felt that the South East Wales Contractor framework did not offer the scope for competition for this specialist contract. The Council will utilise the Welsh Government SQUID pre-qualification document for the purposes of the selection process. Within the selection process (Part A) failure to meet the mandatory requirements, and achieve a minimum score of 37 out of 74 within sections B, C, D, E, F and G will result in bidders not being considered further.
19. Tenders will be evaluated to determine the Most Economically Advantageous Tender, taking into consideration the award criteria of 80% cost and 20% quality.

20. The proposed procurement timetable is shown in **Table 2** below. At this point in time the procurement timetable is merely intended as a guide and it entirely possible that the actual dates quoted below may move.

Table 2 – Potential Procurement Timeline

Stage	Date(s)/time
Issue of Invitation to Tender	Friday 1 st July, 2016
Closing date for the downloading of documents and for requests for information.	23:00:00, Friday 29 th July, 2016.
Final Issue of clarification responses	By Tuesday, 2 nd August, 2016
Closing date for submission of Tenders	12:00:00, Noon on Friday 12 th August, 2016.
Evaluation of Tenders	By Friday 19 th August, 2016.
Notification of result of evaluation	By Friday 26 th August, 2016.
Standstill period	Friday 26 th May to Monday 5 th September, 2016.
Expected date of award of Contract	Monday 5 th September, 2016
Contract Start Date	26 th September, 2016.

21. The term of contract will be NEC Engineering and Construction Contract Option B – Priced Contract with Bill of Quantities, April 2013. As per the projection in **Table 2** the proposed start date for the contract will be September 2016 and it is estimated the contract implementation period will be two years.
22. Since 2008 Salix Finance has committed funding to over £55.2 million of street lighting projects, working with over 50 local authorities across England and Wales. In recent years Salix Finance has seen a steady growth in interest for LED street lighting technology. The first LED project to be committed was in 2011 with Gloucestershire County Council through their recycling fund.

The Experience of Other Local Authorities

23. A number of Local Authorities in Wales have in recent years commenced the introduction of LED street lighting, including Rhondda Cynon Taf Council, The Vale of Glamorgan Council, Merthyr Tydfil Council, Powys County Council, Monmouth County Council, Gwynedd Council and Wrexham Council. Further to this Welsh Government has commenced the installation of LED lighting on sections of the Welsh Government trunk road network.
24. Due to the nature of heritage and non-strategic highway lanterns the costs for these lanterns are high in comparison to the modern LED lights. The saving payback term will be addressed in the business case. Further work will be undertaken to determine the exact payback period once a suitable product has been identified and trialled.
25. Currently out of scope is street lighting in Parks and on Housing Land where the Street Lighting Service do not hold any asset data or direct budgetary control. These street lights could be brought within scope during the delivery of the contract if timescales permit. If timescales do not permit, subsequent smaller contracts or direct labour operatives could undertake the work based on the Council's strategic approach.
26. If the quality of LED product is deemed unsuitable in certain locations then there may be a dilution of the ongoing cost savings. The risks associated with the new LED lighting being deemed unsuitable has been mitigated by a detailed review which has been commissioned with Jacob Consultancy to provide information on lumen or lighting levels for our roads.
27. If LED costs decrease in coming years, there could be an adjustment of savings associated with the project. Again the Council has mitigated this risk by monitoring the average savings associated with LED installation and it is estimated that the savings are currently in the region of 75%. There has been increased competition in the market for the provision of LED street light lanterns

which has driven the costs of lanterns down, and this competition has now stabilised lanterns at a reduced cost.

28. In order to fully understand the impacts of LED on city streets, a trial of LED street lighting lanterns has taken place and included consultation with vulnerable users, the night sky group and the individual who took Trafford Council to court. The specification has been set for white light of 3,000 Kelvins – this is a warmer light colour which matches the Council’s existing lighting in residential areas. To date the Council has not received any complaints as a result of this trial.
29. Street lighting officers and the Senior Management Team have set the specification to 3,000 Kelvins to mimic current street lighting and reduce the potential of ongoing concerns. There is no legislation or specific guidance with respect to the specification of LED street lighting Kelvin levels, however, officers have set the specification by reviewing literature and considering the issues encountered by other local authorities. By installing on the strategic routes first the Council will be able to gauge citizen concerns prior to delivering LED street lighting in residential areas.
30. An Equality Impact Assessment has been carried out and is attached to this report as **Appendix 2**. The purpose of the Equality Impact Assessment is to ensure that the Council has understood the potential impacts of the proposal in terms of equality so that it can ensure that it is making proportionate and rational decisions having due regard to its public sector equality duty. The decision maker must have due regard to the Equality Impact Assessment in making its decision and the assessment should be regularly updated as the procurement progresses.

Background Information – Street Light Dimming Contract

31. The Council provided budget approval for a Street Light Dimming Contract on 28 February 2013; the estimated cost of the work was £1.9m. The aim of the contract was to provide the capability for street lighting dimming to 22,395 existing street

lighting units in residential streets throughout Cardiff in the financial years 2014/15 and 2015/16.

32. The Street Light Dimming Contract supports the Council's commitment to reduce energy usage and associated carbon emissions across its estate and Cardiff as a whole. The overall street light stock in Cardiff is 38,000 units. The street light dimming trial held during 2012/13 was able to demonstrate significant savings in the future cost of energy attributed to street lighting.
33. The main aim of the Street Light Dimming Contract is to implement dimming in residential streets throughout the city between the hours of midnight and 6am which in turn has the benefit of producing savings and reducing carbon emissions.
34. At the start of the exercise a number of potential risks were identified around the implementation of the Street Light Dimming Contract. The risks included a failure to securing cost savings; a failure to reduce carbon emissions; the reliability of the new dimming equipment and a negative public perception towards street lighting being dimmed.
35. At the start of the Street Light Dimming Contract the projected future cost savings at the current energy tariff were approximately £477,000 per annum. This figure was based on a cost saving £21 per lighting unit per annum.
36. Radyr Dimming Trial Costs & Projections - As previously stated in this report the Street Light Dimming Contract was preceded by a street light dimming trial in Radyr. This trial involved the installation of 1,250 units between January and March 2013 which were placed on a 50% street light dimming setting between midnight and 6am. Each unit cost £70.12 to install making the total trial installation cost worth £87,650. The results of this one year trial were positive in that energy saving per unit was measured at £13.20 per annum; this equates to an investment payback period of five years and four months. The Radyr street light dimming trial was funded through the Salix Finance scheme.

37. The implementation phase of the Street Light Dimming Contract has recently been completed. At this meeting officers from the City Operations Directorate will provide Members with a verbal progress update on the Street Light Dimming Contract.

Way Forward

38. Councillor Ramesh Patel, Cabinet Member for Transport, Planning & Sustainability and officers from the City Operations Directorate have been invited to attend. They will deliver a short presentation and answer Members' questions.

Legal Implications

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Financial Implications

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RECOMMENDATIONS

The Committee is recommended to:

- Consider the information in the report;
- Decide whether they would like to make any comments to the Cabinet;
- Decide the way forward for any future scrutiny of the issues discussed.

DAVID MARR
Interim Monitoring Officer
8 June 2016

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Appendix 1 – Cost benefit analysis for LED with CMS – 12-year repayment

LED on Principal Roads repaid over 12 years including Central Management System (CMS) - Current electricity prices																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total (check)
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2026/27	2027/28	2028/29	2029/30	
	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
Capital Financing Costs																	
Opening CFR	0	2,429,000	4,655,583	4,250,750	3,845,917	3,441,083	3,036,250	2,631,417	2,226,583	1,821,750	1,416,917	1,012,083	607,250	202,417	0	0	
New expenditure 2016/17																	
Cost of Light Emitting Diodes (LEDs)	1,454,500																1,454,500
Cost of Central Management System (CMS)	693,000																693,000
Cost of Installation & Project Management	281,500																281,500
Principal Repayment		202,417	202,417	202,417	202,417	202,417	202,417	202,417	202,417	202,417	202,417	202,417	202,417	202,417			2,429,000
New expenditure 2017/18																	
Cost of Light Emitting Diodes (LEDs)		1,454,500															1,454,500
Cost of Central Management System (CMS)		693,000															693,000
Cost of Installation & Project Management		281,500															281,500
Principal Repayment			202,417	202,417	202,417	202,417	202,417	202,417	202,417	202,417	202,417	202,417	202,417	202,417			2,429,000
Closing CFR	2,429,000	4,655,583	4,250,750	3,845,917	3,441,083	3,036,250	2,631,417	2,226,583	1,821,750	1,416,917	1,012,083	607,250	202,417	0	0	0	
Interest	0	0	0	0	0	0	56,677	48,580	40,483	32,387	24,290	16,193	8,097	2,024	0	0	228,731
Principal repayments	0	202,417	404,833	404,833	404,833	404,833	404,833	404,833	404,833	404,833	404,833	404,833	404,833	202,417	0	0	4,858,000
Total Capital Financing Costs **	0	202,417	404,833	404,833	404,833	404,833	461,510	453,413	445,317	437,220	429,123	421,027	412,930	204,441	0	0	5,086,731
Columns replaced	6,804	6,804															
Columns Generating savings (Mid point)	1,701	11,907	13,608	13,608	13,608	13,608	13,608	13,608	13,608	13,608	13,608	13,608	13,608	13,608	13,608	13,608	
Energy Saving on current prices per column (£)	58.16	58.16	58.16	58.16	58.16	58.16	58.16	58.16	58.16	58.16	58.16	58.16	58.16	58.16	58.16	58.16	
Est Savings from reduced energy bills	98,927	692,489	791,416	791,416	791,416	791,416	791,416	791,416	791,416	791,416	791,416	791,416	791,416	791,416	791,416	791,416	11,871,240
Difference (Deficit)/Surplus	98,927	490,072	386,583	386,583	386,583	386,583	329,906	338,003	346,099	354,196	362,293	370,389	378,486	586,975	791,416	791,416	6,784,509
Savings Target (Budget 2016)	(150,000)	(250,000)	(300,000)	(300,000)	(300,000)	(300,000)	(300,000)	(300,000)	(300,000)	(300,000)	(300,000)	(300,000)	(300,000)	(300,000)	(300,000)	(300,000)	
Difference (Deficit)/Surplus compared to Savings	(51,073)	240,072	86,583	86,583	86,583	86,583	29,906	38,003	46,099	54,196	62,293	70,389	78,486	286,975	491,416	491,416	
Cumulative (Deficit)/Surplus	(51,073)	188,999	275,582	362,165	448,747	535,330	565,236	603,239	649,338	703,534	765,827	836,216	914,702	1,201,677	1,693,093	2,184,509	
Sensitivity																	
Energy Saving on current prices - 2% increase energy	57.77	57.37	56.96	56.55	56.12	55.69	55.25	54.80	54.34	53.87	53.40	52.91	52.42	51.91	51.39	50.87	
Est Savings from reduced energy bills	98,262	683,080	775,124	769,475	763,712	757,834	751,839	745,724	739,486	733,124	726,634	720,015	713,263	706,377	699,352	692,187	
Difference (Deficit)/Surplus	98,262	480,663	370,291	364,641	358,879	353,001	290,329	292,310	294,170	295,904	297,511	298,988	300,333	501,936	699,352	692,187	5,988,757
Savings Target (Budget 2016)	(150,000)	(250,000)	(300,000)	(300,000)	(300,000)	(300,000)	(300,000)	(300,000)	(300,000)	(300,000)	(300,000)	(300,000)	(300,000)	(300,000)	(300,000)	(300,000)	
Difference (Deficit)/Surplus compared to Savings	(51,738)	230,663	70,291	64,641	58,879	53,001	(9,671)	(7,690)	(5,830)	(4,096)	(2,489)	(1,012)	333	201,936	399,352	392,187	
Cumulative (Deficit)/Surplus	(51,738)	178,925	249,216	313,857	372,735	425,736	416,065	408,376	402,545	398,449	395,960	394,948	395,282	597,218	996,570	1,388,757	
Energy Saving on current prices - 5% increase energy	57.18	56.15	55.07	53.94	52.75	51.51	50.19	48.82	47.37	45.86	44.26	42.59	40.83	38.99	37.05	35.02	
Est Savings from reduced energy bills	97,263	668,616	749,459	734,052	717,875	700,889	683,053	664,326	644,662	624,015	602,336	579,573	555,671	530,575	504,224	476,555	
Difference (Deficit)/Surplus	97,263	466,200	344,626	329,219	313,042	296,055	221,543	210,913	199,345	186,795	173,213	158,546	142,741	326,134	504,224	476,555	4,446,415
Savings Target (Budget 2016)	(150,000)	(250,000)	(300,000)	(300,000)	(300,000)	(300,000)	(300,000)	(300,000)	(300,000)	(300,000)	(300,000)	(300,000)	(300,000)	(300,000)	(300,000)	(300,000)	
Difference (Deficit)/Surplus compared to Savings	(52,737)	216,200	44,626	29,219	13,042	(3,945)	(78,457)	(89,087)	(100,655)	(113,205)	(126,787)	(141,454)	(157,259)	26,134	204,224	176,555	
Cumulative (Deficit)/Surplus	(52,737)	163,463	208,089	237,308	250,350	246,405	167,948	78,861	(21,794)	(134,998)	(261,786)	(403,239)	(560,498)	(534,364)	(330,140)	(153,585)	
** Note any Capital Financing Costs will need to be met by the Directorate irrespective of whether it meets the required level of savings identified.																	
Simple Payback - including CMS																	
Capital cost of the scheme	4,858,000																
Estimated yearly savings (excluding maintenance and CRC)	791,416																
Simple Payback in Years	6.14																
Assumptions																	
Salix required payback over 6 years																	
Financial impact of CRC not currently included																	
First principal repayments commence in year following expenditure																	
Assumes columns implemented mid year on average																	
No provision has been made for cost avoidance i.e. that doing nothing will result in an increase in electricity costs																	
Following repayment of SALIX loan, balance of capital financing requirement (CFR) outstanding to be borrowed with interest																	

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Policy/Strategy/Project/Procedure/Service/Function Title: Street Lighting
New/Existing/Updating/Amending: Retrofit Lanterns on main highway network to achieve energy savings circa 45 – 50%

Who is responsible for developing and implementing the Policy/Strategy/Project/Procedure/Service/Function?	
Name: Chris Jones	Job Title: Electrical Lead
Service Team: Electrical	Service Area: SPHT&T
Assessment Date: 25 th May 2016	

1. What are the objectives of the Policy/Strategy/Project/ Procedure/ Service/Function?

Objective

To achieve predicted energy savings and reduce CO² emissions on the higher street lighting wattages from 90Watt to 250Watt. Having considered a number of alternatives such as dimming existing assets, part night lighting etc. the decision was made to investigate a roll out of LED technology. As such dimming technology on the higher wattages was considered and trailed at Longwood Drive, however, the trial proved unsuccessful due to component reliability.

This will be achieved by retrofitting existing lanterns to LED equivalents.

Funding

Any loans to fund the capital required will be repaid from the energy savings. The capital investment required will be circa £7m and addresses approximately 14,000 lanterns on the main highway network. It is likely that the works will be carried out over two nine month periods – 7000 units each period. The project is predicted to achieve 45% savings in Energy and Carbon emissions and also significantly reduce maintenance costs.

Management of carbon emissions also has financial benefits for the Authority due to our involvement in the Carbon Reduction Commitment (CRC) Energy Efficiency Scheme. A reduction in carbon emissions indirectly benefits the whole community by contributing towards mitigation of climate change. Our Carbon reduction Strategy set out our approach to reducing carbon emissions and managing the impacts of climate change.

Stakeholder - It is anticipated that whilst there will be no negative differential impact on stakeholders regardless of their protected characteristic, location and time of day / year and ambient light levels; consideration has been made towards a large range of stakeholders including local residents, cyclists, pedestrians, visitors to the local area,

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commuters, emergency services, bus and taxi operators and other transport operators.

2. Please provide background information on the Policy/Strategy/Project/Procedure/Service/Function and any research done [e.g. service users data against demographic statistics, similar EIAs done etc.]

Cardiff Council is historically committed to providing a sustainable environment for the residents and visitors to the city, seeking to create benefits for all stakeholders. Limited Environmental impact being experienced in relation to changes to street lighting.

Technology Background

LED Street lighting is a fast moving technology and there is recent evidence to suggest there are problems surrounding glare and the CCT (Core Colour Temperature) of the LEDs employed. LEDs are basically a blue light source with a phosphor coating to achieve the white light.

This is an area of concern ie. The amount of “blue rich” light not being filtered out. There is evidence to suggest that the higher most efficient colour temperatures currently being pushed by the large LED companies can effect melatonin levels in humans, effecting sleep patterns.

“Unfortunately, exposure to blue-rich light at night can lead to decreased melatonin secretion in humans. Melatonin is a hormone secreted at night by the pineal gland that helps balance the reproductive, thyroid, and adrenal hormones and regulates the body’s circadian rhythm of sleeping and waking. Lower Melatonin levels have been tenuously linked to increased risk of cancer. “(app 1,2,3)

The evidence also suggests that these “blue rich” LEDs also have an adverse impact on wildlife and the wider general environment.

There are three typical levels of LED; (app 4)

Cold White – above 4500Kelvin

Neutral White - 3500 to 4500 Kelvin

Warm White – 2700 to 3000 Kelvin

It is generally accepted that limiting the colour temperature to a “warm” 3000K CCT will remove these issues and also reduce glare to well within the current British Standard. (BS EN 13201-2:2003 – app 5, 6) Although this will reduce the energy saved over the harsher 5000K units by approx. 15%.

Engagement and Investigation

In order to investigate these possible issues further and select the best specification the Authority is presently erecting a “Test Bed” in the area behind City Hall which was considered as indicative of a typical Cardiff location, but one that could safely be used as a test location for all considered lantern types. (App 7, 8) Eight major manufacturers were approached, who offered up lanterns with an identical classification at 3000K CCT to be tested. An independent professional assessment was then carried out to establish from a technological perspective the most suitable and cost effective LED

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solution for the city.

Further, in November 2015 several focus groups comprising representatives from the broad community including those from emergency services, local councillors and officers with individually with a range of impairments e.g. mobility and visual / hearing impairments, was escorted around the "Test Bed" in order to assess the human factors and impact / effect of the different LEDs and gain public feedback.

This feedback completed during the focus group "Test Bed" visit comprised of a 3 stage qualitative questionnaire presented to over 25 participants.

Stage 1 designed to assess the individual's perceived experience of the lighting in given defined zones e.g. glare, brightness, spread of light etc.

Stage 2 was a scientific testing of individuals perception of colour interpretation.

And Stage 3 being a legibility test at distance of number plate style holdups.

In addition the same questionnaire was made available to all Cardiff residents via the Councils local media platform. This again offered another opportunity for the residents of Cardiff to feed back their opinions on the "Test Bed" and therefore, the decision making process.

In total 33 individual responses were gained from all activities and can therefore be considered as a statistically relevant sample response.

The findings of this investigation will be made public to ensure transparency of decision making prior to the project being rolled out.

3 Assess Impact on the Protected Characteristics

3.1 Age

Will this Policy/Strategy/Project/Procedure/Service/Function have a **differential impact [positive/negative/]** on younger/older people?

	Yes	No	N/A
Up to 18 years	X		
18 - 65 years	X		
Over 65 years	X		

Please give details/consequences of the differential impact, and provide supporting evidence, if any.

It is proposed that adoption of LED street lighting and the improvements in energy efficiency, financial savings to the Local authority and the overall reduction in CO² emissions to the environment will not have a negative differential impact on the protected characteristics.

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Indeed it is suggested that through the community based approach to choosing the most appropriate solution and lantern, the use of LED technology will significantly benefit the whole community not only in relation to financial savings, and the overall environmental benefit but also in practical terms. These practical terms will now be outlined in the next section.

What action(s) can you take to address the differential impact?

Good quality Street lighting is integral to the health of a community and its ability to socially interact.

The proposed LED project will have a positive impact on all protected characteristics for the below reasons.

- The human eye sees white light (in a different manner to the old “ orange glow” streetlights and in general
- Provides better visual guidance
- Reveals obstacles more clearly
- Allows pedestrians to easier recognise hazards
- Facilitates better pedestrian orientation and wayfinding
- Pedestrians recognise facial features easier which is of benefit in respect of security as well as communications
- Provides a feeling of security

(please see Appendix 9)

Research information used to inform the decision making process have shown that the whiter light nightscape benefits local communities -

- Reduction of street crime and the fear of street crime in residential areas.
- Lighting improvements can decrease crime by up to 30 per cent.
- Stimulating the night time economy and use of public amenities and transport.
- Development of safer routes to school. (app 10)

While research on the effects of improved street lighting on crime rates is not entirely definitive, an analysis of eight different studies found that improved street lighting—either through more lights or brighter lights— reduced crime by an average of 7%. 1 With improved visibility, potential offenders are more exposed and less likely to commit crimes. Enhanced lighting can signal more community investment, pride, and cohesiveness, which also can discourage crime.

There are two main theories of why Improved street lighting may cause a reduction in crime. The first suggests that improved lighting leads to increased surveillance of potential offenders (both by improving visibility, surveillance cameras etc., and by increasing the number of people on the street) and hence to increased deterrence of potential offenders.

The second suggests that improved lighting promotes community investment in the area and that the area is improving, leading to increased community pride, community

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cohesiveness, and informal social control.

Improved street lights can make a community feel safer. They allow safer operation of vehicles and bicycles at night, reduce accidents, and assist traffic flow. Better light can also promote the night time operation of businesses and increase pedestrian street use after dark, all of which leads to a more active, enhanced neighbourhood. (app 11)

It is envisaged the improved lighting will have a positive impact on social cohesion e.g. attendance at community groups such as WI, scouts, church, day centres, sports clubs etc.

It is recognised that in many instances the location of lighting is a consideration. As such this will be monitored as new lighting might be included in schemes, so as to alleviate any unforeseen differential impacts that may arise.

3.2 Disability

Will this Policy/Strategy/Project/Procedure/Service/Function have a **differential impact [positive/negative]** on disabled people?

	Yes	No	N/A
Hearing Impairment	x		
Physical Impairment	x		
Visual Impairment	x		
Learning Disability	x		
Long-Standing Illness or Health Condition	x		
Mental Health	x		
Substance Misuse	x		
Other	x		

Please give details/consequences of the differential impact, and provide supporting evidence, if any.

It is proposed that adoption of LED street lighting and the improvements in energy efficiency, financial savings to the Local authority and the overall reduction in CO² emissions to the environment will not have a negative differential impact on the protected characteristics.

Indeed it is suggested that through the community based approach to choosing the most appropriate solution and lantern, the use of LED technology will significantly benefit the whole community not only in relation to financial savings, and the overall environmental benefit but also in practical terms. These practical terms will now be outlined in the next section.

What action(s) can you take to address the differential impact?

Good quality Street lighting is integral to the health of a community and its ability to

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socially interact.

The proposed LED project will have a positive impact on all protected characteristics for the below reasons.

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- Pedestrians recognise facial features easier which is of benefit in respect of security as well as communications
- Provides a feeling of security

(please see Appendix 9)

Research information used to inform the decision making process have shown that the whiter light nightscape benefits local communities -

- Reduction of street crime and the fear of street crime in residential areas.
- Lighting improvements can decrease crime by up to 30 per cent.
- Stimulating the night time economy and use of public amenities and transport.
- Development of safer routes to school. (app 10)
The impact on community safety has two core dimensions: prevented crime and the impact on fear of crime.
- People with visual or mobility impairments may find the improved street lighting helpful in assisting them to navigate and avoid hazards, as such, there is a potentially positive impact on risk of falling and accessibility.
- People with disabilities may feel less vulnerable to crime as a result of improved lighting, but much depends on the specific circumstances as well as other
- Deaf and hearing impaired individuals who lip read will benefit from improved lighting as they will be better able to distinguish facial features, lip read and see sign language at times of diminished light. This will improved communications and opportunities for social interaction for this community.
- factors such as localised crime rates, policing and quality of public spaces. (app 12)
- There may be potential for an increase in ‘hate crime’ against people with physical or learning disabilities as they will be more easily identified in the community. (app 13)
- Improved lighting will help alleviate carers fears about lower levels of lighting when attending a relative or service user late at night/early in the morning.
- Improved lighting will it is suggested lead to an improved recognition of any potential hazards in the walkway e.g. risen curbs, loose pavers etc. this reducing any potential harm from slips trips or falls.

It is recognised that in many instances the location of lighting is a consideration. As

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such this will be monitored as new lighting might be included in schemes, so as to alleviate any unforeseen differential impacts that may arise.

3.3 Gender Reassignment

Will this Policy/Strategy/Project/Procedure/Service/Function have a **differential impact [positive/negative]** on transgender people?

	Yes	No	N/A
Transgender People (People who are proposing to undergo, are undergoing, or have undergone a process [or part of a process] to reassign their sex by changing physiological or other attributes of sex)	x		

Please give details/consequences of the differential impact, and provide supporting evidence, if any.

It is proposed that adoption of LED street lighting and the improvements in energy efficiency, financial savings to the Local authority and the overall reduction in CO² emissions to the environment will not have a negative differential impact on the protected characteristics.

Indeed it is suggested that through the community based approach to choosing the most appropriate solution and lantern, the use of LED technology will significantly benefit the whole community not only in relation to financial savings, and the overall environmental benefit but also in practical terms. These practical terms will now be outlined in the next section.

The Transgender community may feel less vulnerable to “hate crime” as a result of improved lighting, but much depends on the specific circumstances as well as other factors such as crime rates, policing and quality of public spaces.

What action(s) can you take to address the differential impact?

Good quality Street lighting is integral to the health of a community and its ability to socially interact.

The proposed LED project will have a positive impact on all protected characteristics for the below reasons.

- The human eye sees white light (in a different manner to the old “ orange glow” streetlights and in general
- Provides better visual guidance
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- Pedestrians recognise facial features easier which is of benefit in respect of security as well as communications
 - Provides a feeling of security
- (please see Appendix 9)

Research information used to inform the decision making process have shown that the whiter light nightscape benefits local communities -

- Reduction of street crime and the fear of street crime in residential areas.
- Lighting improvements can decrease crime by up to 30 per cent.
- Stimulating the night time economy and use of public amenities and transport.
- Development of safer routes to school. (app 10)
- Improved lighting will it is suggested lead to an improved recognition of any potential hazards in the walkway e.g. risen curbs, loose pavers etc. this reducing any potential harm from slips trips or falls.

While research on the effects of improved street lighting on crime rates is not entirely definitive, an analysis of eight different studies found that improved street lighting—either through more lights or brighter lights— reduced crime by an average of 7%.¹ With improved visibility, potential offenders are more exposed and less likely to commit crimes. Enhanced lighting can signal more community investment, pride, and cohesiveness, which also can discourage crime.

There are two main theories of why Improved street lighting may cause a reduction in crime. The first suggests that improved lighting leads to increased surveillance of potential offenders (both by improving visibility, surveillance cameras etc., and by increasing the number of people on the street) and hence to increased deterrence of potential offenders.

The second suggests that improved lighting promotes community investment in the area and that the area is improving, leading to increased community pride, community cohesiveness, and informal social control.

Improved street lights can make a community feel safer. They allow safer operation of vehicles and bicycles at night, reduce accidents, and assist traffic flow.

Better light can also promote the night time operation of businesses and increase pedestrian street use after dark, all of which leads to a more active, enhanced neighbourhood. (app 11)

It is envisaged the improved lighting will have a positive impact on social cohesion e.g. attendance at community groups such as WI, scouts, church, day centres, sports clubs etc.

It is recognised that in many instances the location of lighting is a consideration. As such this will be monitored as new lighting might be included in schemes, so as to

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alleviate any unforeseen differential impacts that may arise.

3.4. Marriage and Civil Partnership

Will this Policy/Strategy/Project/Procedure/Service/Function have a **differential impact [positive/negative]** on marriage and civil partnership?

	Yes	No	N/A
Marriage			X
Civil Partnership			X

Please give details/consequences of the differential impact, and provide supporting evidence, if any.

No differential impact has been identified that may have a direct effect on the protected characteristic of marriage or civil partnership. This will be monitored and addressed if any are identified.

It is proposed that adoption of LED street lighting and the improvements in energy efficiency, financial savings to the Local authority and the overall reduction in CO² emissions to the environment will not have a negative differential impact on the protected characteristics.

Indeed it is suggested that through the community based approach to choosing the most appropriate solution and lantern, the use of LED technology will significantly benefit the whole community not only in relation to financial savings, and the overall environmental benefit but also in practical terms. These practical terms will now be outlined in the next section.

What action(s) can you take to address the differential impact?

Not Applicable

3.5 Pregnancy and Maternity

Will this Policy/Strategy/Project/Procedure/Service/Function have a **differential impact [positive/negative]** on pregnancy and maternity?

	Yes	No	N/A
Pregnancy	X		

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Maternity	x		
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Please give details/consequences of the differential impact, and provide supporting evidence, if any.

It is proposed that adoption of LED street lighting and the improvements in energy efficiency, financial savings to the Local authority and the overall reduction in CO² emissions to the environment will not have a negative differential impact on the protected characteristics.

Indeed it is suggested that through the community based approach to choosing the most appropriate solution and lantern, the use of LED technology will significantly benefit the whole community not only in relation to financial savings, and the overall environmental benefit but also in practical terms. These practical terms will now be outlined in the next section.

What action(s) can you take to address the differential impact?

In addition to the considerations already identified

Those who may be identify within the protected characteristic of pregnancy and maternity; will it is expected benefit from LED lighting in the following ways:-

- Feel less vulnerable to crime as a result of improved lighting, resulting in a positive impact on travel to services related to their characteristic e.g. access maternity unit/hospital care.
- Improved lighting will it is suggested lead to an improved recognition of any potential hazards in the walkway e.g. risen curbs, loose pavers etc. this reducing any potential harm from slips trips or falls.

3.6 Race

Will this Policy/Strategy/Project//Procedure/Service/Function have a **differential impact [positive/negative]** on the following groups?

	Yes	No	N/A
White	x		
Mixed / Multiple Ethnic Groups	x		
Asian / Asian British	x		
Black / African / Caribbean / Black British	x		
Other Ethnic Groups	x		

Please give details/consequences of the differential impact, and provide supporting evidence, if any.

Community safety is an important issue for all including people from minority ethnic backgrounds, with prevention of street crime and racially motivated crime being Particularly relevant.

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As such it is suggested that through the community based approach to choosing the most appropriate solution and lantern, the use of LED technology will significantly benefit the whole community not only in relation to financial savings, and the overall environmental benefit but also in practical terms. These practical terms will now be outlined in the next section.

What action(s) can you take to address the differential impact?

Good quality Street lighting is integral to the health of a community and its ability to socially interact.

The proposed LED project will have a positive impact on all protected characteristics for the below reasons.

- The human eye sees white light (in a different manner to the old “ orange glow” streetlights and in general
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(please see Appendix 9)

Research information used to inform the decision making process have shown that the whiter light nightscape benefits local communities -

- Reduction of street crime and the fear of street crime in residential areas.
- Lighting improvements can decrease crime by up to 30 per cent.
- Stimulating the night time economy and use of public amenities and transport.
- Development of safer routes to school. (app 10)

While research on the effects of improved street lighting on crime rates is not entirely definitive, an analysis of eight different studies found that improved street lighting—either through more lights or brighter lights— reduced crime by an average of 7%. 1 With improved visibility, potential offenders are more exposed and less likely to commit crimes. Enhanced lighting can signal more community investment, pride, and cohesiveness, which also can discourage crime.

There are two main theories of why Improved street lighting may cause a reduction in crime. The first suggests that improved lighting leads to increased surveillance of potential offenders (both by improving visibility, surveillance cameras etc., and by

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increasing the number of people on the street) and hence to increased deterrence of potential offenders.

The second suggests that improved lighting promotes community investment in the area and that the area is improving, leading to increased community pride, community cohesiveness, and informal social control.

Improved street lights can make a community feel safer. They allow safer operation of vehicles and bicycles at night, reduce accidents, and assist traffic flow.

Better light can also promote the night time operation of businesses and increase pedestrian street use after dark, all of which leads to a more active, enhanced neighbourhood. (app 11)

It is envisaged the improved lighting will have a positive impact on social cohesion e.g. attendance at community groups such as WI, scouts, church, day centres, sports clubs etc.

It is recognised that in many instances the location of lighting is a consideration. As such this will be monitored as new lighting might be included in schemes, so as to alleviate any unforeseen differential impacts that may arise.

3.7 Religion, Belief or Non-Belief

Will this Policy/Strategy/Project/Procedure/Service/Function have a **differential impact [positive/negative]** on people with different religions, beliefs or non-beliefs?

	Yes	No	N/A
Buddhist	X		
Christian	X		
Hindu	X		
Humanist	X		
Jewish	X		
Muslim	X		
Sikh	X		
Other	x		

Please give details/consequences of the differential impact, and provide supporting evidence, if any.

People may feel less vulnerable to crime as a result of improved lighting, and it is recognised that this is particularly relevant to faith communities who may be at risk of hate crime e.g. anti-Semitism, Islamophobia, but much depends on the specific circumstances as well as other factors such as crime rates, policing and quality of public spaces

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What action(s) can you take to address the differential impact?

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It is recognised that in many instances the location of lighting is a consideration. As such this will be monitored as new lighting might be included in schemes, so as to alleviate any unforeseen differential impacts that may arise.

3.8 Sex

Will this Policy/Strategy/Project/Procedure/Service/Function have a **differential impact [positive/negative]** on men and/or women?

	Yes	No	N/A
Men	x		
Women	x		

Please give details/consequences of the differential impact, and provide supporting evidence, if any.

All genders will enjoy the benefits of improved lighting as outlined in previous sections however, it is anticipated that women may feel safer when in public areas during the hours of darkness, due to improved LED lighting and its associated benefits.

It is proposed that adoption of LED street lighting and the improvements in energy efficiency, financial savings to the Local authority and the overall reduction in CO² emissions to the environment will not have a negative differential impact on the protected characteristics.

Indeed it is suggested that through the community based approach to choosing the

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most appropriate solution and lantern, the use of LED technology will significantly benefit the whole community not only in relation to financial savings, and the overall environmental benefit but also in practical terms.

What action(s) can you take to address the differential impact?

Please see

3.9 Sexual Orientation

Will this Policy/Strategy/Project/Procedure/Service/Function have a **differential impact [positive/negative]** on the following groups?

	Yes	No	N/A
Bisexual	X		
Gay Men	X		
Gay Women/Lesbians	X		
Heterosexual/Straight	x		

Please give details/consequences of the differential impact, and provide supporting evidence, if any.

In general those who may be considered within this protected characteristic group may feel less vulnerable to “hate crime” as a result of improved lighting.

It is proposed that adoption of LED street lighting and the improvements in energy efficiency, financial savings to the Local authority and the overall reduction in CO² emissions to the environment will not have a negative differential impact on the protected characteristics.

Indeed it is suggested that through the community based approach to choosing the most appropriate solution and lantern, the use of LED technology will significantly benefit the whole community not only in relation to financial savings, and the overall environmental benefit but also in practical terms. These practical terms will now be outlined in the next section.

What action(s) can you take to address the differential impact?

Good quality Street lighting is integral to the health of a community and its ability to socially interact.

The proposed LED project will have a positive impact on all protected characteristics for the below reasons.

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- The human eye sees white light (in a different manner to the old “orange glow” streetlights and in general
- Provides better visual guidance
- Reveals obstacles more clearly
- Allows pedestrians to easier recognise hazards
- Facilitates better pedestrian orientation and wayfinding
- Pedestrians recognise facial features easier which is of benefit in respect of security as well as communications
- Provides a feeling of security

(please see Appendix 9)

Research information used to inform the decision making process have shown that the whiter light nightscape benefits local communities -

- Reduction of street crime and the fear of street crime in residential areas.
- Lighting improvements can decrease crime by up to 30 per cent.
- Stimulating the night time economy and use of public amenities and transport.
- Development of safer routes to school. (app 10)

While research on the effects of improved street lighting on crime rates is not entirely definitive, an analysis of eight different studies found that improved street lighting—either through more lights or brighter lights— reduced crime by an average of 7%.¹ With improved visibility, potential offenders are more exposed and less likely to commit crimes. Enhanced lighting can signal more community investment, pride, and cohesiveness, which also can discourage crime.

There are two main theories of why Improved street lighting may cause a reduction in crime. The first suggests that improved lighting leads to increased surveillance of potential offenders (both by improving visibility, surveillance cameras etc., and by increasing the number of people on the street) and hence to increased deterrence of potential offenders.

The second suggests that improved lighting promotes community investment in the area and that the area is improving, leading to increased community pride, community cohesiveness, and informal social control.

Improved street lights can make a community feel safer. They allow safer operation of vehicles and bicycles at night, reduce accidents, and assist traffic flow.

Better light can also promote the night time operation of businesses and increase pedestrian street use after dark, all of which leads to a more active, enhanced neighbourhood. (app 11)

It is envisaged the improved lighting will have a positive impact on social cohesion e.g. attendance at community groups such as WI, scouts, church, day centres, sports clubs etc.

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It is recognised that in many instances the location of lighting is a consideration. As such this will be monitored as new lighting might be included in schemes, so as to alleviate any unforeseen differential impacts that may arise.

3.10 Welsh Language

Will this Policy/Strategy/Project/Procedure/Service/Function have a **differential impact [positive/negative]** on Welsh Language?

	Yes	No	N/A
Welsh Language	x		

Please give details/consequences of the differential impact, and provide supporting evidence, if any.

It is proposed that adoption of LED street lighting and the improvements in energy efficiency, financial savings to the Local authority and the overall reduction in CO² emissions to the environment will not have a negative differential impact on the protected characteristics.

Indeed it is suggested that through the community based approach to choosing the most appropriate solution and lantern, the use of LED technology will significantly benefit the whole community not only in relation to financial savings, and the overall environmental benefit but also in practical terms. These practical terms will now be outlined in the next section.

What action(s) can you take to address the differential impact?

It is envisaged the improved lighting will have a generally positive impact on social cohesion e.g. attendance at community groups such as WI, scouts, church, day centres, sports centres, pubs and clubs etc.

This in turn should have a positive impact on the Welsh speaking community and media in relation to making all forms of evening travel easier to attend events, adult evening classes etc.

4. Consultation and Engagement

What arrangements have been made to consult/engage with the various Equalities Groups?

As outlined in section 2, the Authority has engaged and will continue to engage with a wide range of community groups focusing around the "LED Test Bed" constructed on King Edward 7th Ave and Museum Place (July 2015 – Present; Ongoing Evaluation) as

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well as the broader consideration as may be implemented.

As a location King Edward 7th Ave and Museum Place was specifically chosen for easy pedestrian and vehicular access and is geographically central as well as being a typical example of a street scape within Cardiff.

5. Summary of Actions [Listed in the Sections above]

Groups	Actions
Age	Please see specific protected characteristic
Disability	Please see specific protected characteristic
Gender Reassignment	Please see specific protected characteristic
Marriage & Civil Partnership	Please see specific protected characteristic
Pregnancy & Maternity	Please see specific protected characteristic
Race	Please see specific protected characteristic
Religion/Belief	Please see specific protected characteristic
Sex	Please see specific protected characteristic
Sexual Orientation	Please see specific protected characteristic
Welsh Language	Please see specific protected characteristic
Generic Over-Arching [applicable to all the above groups]	Please see specific protected characteristic

6. Further Action

Any recommendations for action that you plan to take as a result of this Equality Impact Assessment (listed in Summary of Actions) should be included as part of your Service Area's Business Plan to be monitored on a regular basis.

7. Authorisation

The Template should be completed by the Lead Officer of the identified Policy/Strategy/Project/Function and approved by the appropriate Manager in each Service Area.

Completed By : Chris Jones	Date:
Designation:	25 th May 2016
Approved By:	6 th June 2016
Designation:	
Service Area:	