

Policy/Strategy/Project/Procedure/Service/Function Title:
Residential Locations LED Lighting EqIA 20042019
New/Existing/Updating/Amending: Retrofit Lanterns in residential locations to achieve energy savings.

Who is responsible for developing and implementing the Policy/Strategy/Project/Procedure/Service/Function?	
Name: Gary Brown	Job Title: Operational Manager - Assets, Engineering and Operations
Service Team: Operational Manager - Assets, Engineering and Operations	Service Area: SPHT&T
Assessment Date: 20/04/2019	

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

Cardiff Council has the aspiration of becoming the most liveable European capital city. A key theme within this is enhancing the quality of environment, reducing carbon footprint within the context of effective budgetary control. The proposal to convert 23,750 street lights located on residential streets to LED street lighting is a positive step in achieving this objective in terms of the street environment.

Following the successful implementation of LED lighting on the strategic highway network, which comprises the major traffic routes through the City, the improvements experienced can be further spread by introducing the same lighting strategy to the remaining streets, that being the residential network, throughout the city.

The Well-being of Future Generations Act came into force for local authorities in April 2016. The legislation requires us to contribute positively to 7 national Well-being Goals and 5 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 One Planet Cardiff.

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.

This will be achieved by retrofitting existing lanterns to LED equivalents. Loans to fund the capital required will be repaid from the energy savings. The capital investment required will be circa £7m and addresses approximately 23,750 lanterns on the residential highway network. It is likely that the Works will be carried

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out over 18 months (30% in 19/20 and 70% in 20/21). The project is predicted to achieve 45% savings in Energy and Carbon emissions and also significantly reduce maintenance costs.

The stakeholders affected will vary depending on location and time of day, but generally includes local residents, cyclists, pedestrians, visitors to the local area, commuters, the emergency services, bus and taxi operators and other transport operators.

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 Climate Change Strategy and Environment Strategy set out our approach to reducing carbon emissions and managing the impacts of climate change.

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 committed to providing a sustainable environment for the residents and visitors to the city. This commitment has been historical and seeks to benefit all stakeholders. No particular protected characteristic groups experience environmental impacts in relation to changes to street lighting differentially.

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

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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%.

In order to investigate these possible issues further and select the best specification the Authority in 2016 erecting a “Test Bed” in the area behind City Hall. (App 7, 8) Eight major manufacturers were invited to offer up lanterns with an identical classification at 3000K CCT. Independent professional assessment was carried out to establish the most suitable and cost effective LED solution for the city. Further, the test bed was visited by engagement groups / focus groups in order to obtain feedback from the public, emergency services etc. (currently no complaint has been gathered)

Furthermore, 2018 / March – onwards. In order to establish specific considerations that may be related to residential locations. An LED test bed was created in the Radyr / Morganstown Ward. To date there have been no complaint or differential impacts identified or generated as a result of this LED test bed.

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.

Good quality Street lighting is integral to the health of a community.
The proposed Led project will have a positive impact on all the age groups listed above. 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

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Pedestrians recognise facial features easier
Provides a feeling of security

Studies have shown that the whiter 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.

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.

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. Furthermore this improvement in lighting will support the initiatives of the UN Rights of the Child and Rights of the Disabled person among other UN conventions.

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

At present no specific differential impact has been identified in respect of this particular protected characteristic. However this will be monitored and accounted for as may be necessary.

3.2 Disability

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

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	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.

The impact on community safety has two core dimensions: the impact on 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 factors such as localised crime rates, policing and quality of public spaces.

There may be potential for an increase in 'hate crime' against people with physical or learning disabilities.

Carers may have concern at lower levels of lighting when attending a relative or service user late at night/early in the morning. So the improved lighting should help alleviate these fears.

As a specific benefit. Those who lip read or have hearing impairments have been identified through engagement as directly benefitting from improved lighting. As such these improvements will facilitate social interaction and benefit community cohesion for the hearing impaired communities.

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

At present no specific differential impact has been identified in respect of this particular protected characteristic. However this will be monitored and accounted for as may be necessary.

3.3 Gender Reassignment

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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.

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?

At present no specific differential impact has been identified in respect of this particular protected characteristic. However this will be monitored and accounted for as may be necessary.

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.

The vulnerability of individuals may be reduced as a result of improved lighting.

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

At present no specific differential impact has been identified in respect of this particular protected characteristic. However this will be monitored and accounted for as may be necessary.

3.5 Pregnancy and Maternity

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

	Yes	No	N/A
Pregnancy	x		
Maternity	x		

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

In addition to the potential to feel less vulnerable to crime as a result of improved lighting, there is also a positive issue to be raised in relation to impact on travel to access maternity unit/hospital care.

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

At present no specific differential impact has been identified in respect of this particular protected characteristic. However this will be monitored and accounted for as may be necessary.

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.

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

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At present no specific differential impact has been identified in respect of this particular protected characteristic. However this will be monitored and accounted for as may be necessary.

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. It is recognised that this is particularly relevant to faith communities who may be at risk of hate crime.

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

At present no specific differential impact has been identified in respect of this particular protected characteristic. However this will be monitored and accounted for as may be necessary.

3.8 Sex

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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 section 3.1. However, females may feel safer when in public areas during the hours of darkness.

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

At present no specific differential impact has been identified in respect of this particular protected characteristic. However this will be monitored and accounted for as may be necessary.

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.

It is likely that those who may identify within this protected characteristic may feel less vulnerable to "hate crime" as a result of improved lighting.

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

At present no specific differential impact has been identified in respect of this particular protected characteristic. However this will be monitored and accounted for as may be necessary.

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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 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. effectively improved lighting will advance the opportunity to communicate in Welsh and therefore support the promotion of the Welsh language.

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

All Cardiff Council schemes and policies comply with the regulations and order of the Welsh Language Commissioner, under new Welsh Language standards set out in the Welsh Language [Wales] Measure 2011. This

This scheme will make it easier for families to access the school and this will improve their UN rights of the child, access to differing / choice education.

4. Consultation and Engagement

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

Building on previous engagement as outlined in section 2, the authority has used data gathered from engagement with a wide range of community groups generated from the “LED Test Bed” constructed in 2016 on King Edward 7th Ave and Museum Place. (This location was specifically chosen for easy pedestrian and vehicular access and is geographically central).

Furthermore, 2018 / March – In order to establish specific considerations that may be related to residential locations. An LED test bed was created in the Radyr / Morganstown Ward. To date there have been no complaint or differential impacts identified or generated as a result of this LED test bed.

Whilst formal Member consultation is not required an information pack and programme will be developed and circulated prior to commencement of the contract. This will contain frequently asked questions to ensure that Local Members are fully informed and are able to engage and correspond directly with constituents as required.

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

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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 : Gary Brown	Date: 20/04/2019
Designation: Operations CEX Directorate > Planning, Transport & Environment / Operational Manager - Assets, Engineering and Operations	
Approved By: Operational Manager - Assets, Engineering and Operations	
Designation: Director in Operations CEX Directorate, Planning, Transport & Environment	
Service Area: Operations CEX Directorate > Planning, Transport & Environment.	

- 7.1 On completion of this Assessment, please ensure that the Form is posted on your Directorate's Page on CIS - *Council Wide/Management Systems/Equality Impact Assessments* - so that there is a record of all assessments undertaken in the Council.

For further information or assistance, please contact the Citizen Focus Team on 029 2087 3059 or email citizenfocus@cardiff.gov.uk

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1. <http://www.alternet.org/environment/led-streetlights-save-energy-could-have-some-serious-side-effects>
2. <http://www.dailymail.co.uk/news/article-2609957/Coming-street-near-lights-awake-make-people-ill.html>
3. <http://www.ledsmagazine.com/articles/2011/09/outdoor-lighting-research-suggests-strong-led-impact-in-suppressing-melatonin.html>
4. http://www.seesmartled.com/kb/choosing_color_temperature/
5. https://www.fer.unizg.hr/download/repository/en_13201-2.pdf



6. IEA_4E_SSL_Annex_Health_Aspects_Stu
7. Test bed pdf
8. Test area details.xls
9. Presentation in EqIA LED PROJECT 2015