



**STREET LIGHTING LIFECYCLE PLAN
2010/11**
**PLANA CEARCALL-BEATHA SHOLAIS SHRÀIDE
2010/11**

March 2010

**TEC Services
Street Lighting
Diriebught Depot
Diriebught Road
Inverness
IV2 3QN**

This document is an appendix of the Road Asset Management Plan 2010/11.

For further information or copies of this plan please contact:-

E-mail: tecs@highland.gov.uk

Write to:-

The Highland Council
Transport, Environmental and Community Services
Glenurquhart Road
Inverness
IV3 5NX

Electronic copies of the plan are available via the Council website:

www.highland.gov.uk

Street Lighting Lifecycle Plan Plana Cearcall-beatha Sholais Shràide

Contents Clàr-innse

1.0	Current Status	6
	Inbhe Làithreach	6
1.1	Current Issues.....	6
	Cùisean Làithreach	6
1.2	Current Asset Management Strategies	7
	Ro-innleachdan Stiùiridh So-mhaoin Làithreach	7
2.0	The Asset: Physical Parameters	8
	An t-So-mhaoin: Paraimeatairean Corporra	8
2.1	Inventory	8
	Clàr-cunntais	8
2.2	Asset Register.....	8
	Clàr So-mhaoin	8
2.3	Asset Growth	11
	Fàs So-mhaoin.....	11
3.0	Service Expectations	12
	Dùilean Seirbheis	12
3.1	Customer Perceptions.....	12
	Tuigse Luchd-cleachdaidh	12
3.2	Council Goals and Objectives	13
	Amasan is Mion-amasan Comhairle	13
3.3	Safety Considerations	14
	Beachdachaidhean Sàbhailteachd.....	14
3.4	Public Utilities Activity	15
	Gnìomh Ghoireasan Poblach.....	15
3.5	Third Party Claims.....	15
	Tagraidhean Treas Pàrtaidh	15
3.6	Environmental Considerations	15
	Beachdachaidhean Àrainneachd	15
4.0	Management Practices	17
	Cleachdaidhean Stiùiridh	17
4.1	Policies.....	17
	Poileasaidhean.....	17
4.2	Inspection Regime	20
	Rèim Sgrùdaidh	20
4.3	Condition Assessment	20
	Measadh Staid	20
4.4	Routine Maintenance	22
	Cumail Suas Cunbhalach.....	22
4.5	Operational/Cyclic Maintenance	22
	Cumail Suas Obrachail/Cearcallach.....	22
4.6	Planned Maintenance: Renewals.....	22
	Cumail Suas Dealbhte: Ùrachaidhean	22
4.7	Disposal	22
	Cur An Dàrna Taobh	22

5.0	Investment	24
	Airgead an Seilbh	24
5.1	Historical Investment.....	24
	Airgead an Seilbh gu h-Eachdraidheil	24
5.2	Valuation	25
	Luachadh	25
6.0	Forward Works Programme	27
	Prògram Obraichean Adhartach	27
6.1	Existing Programmes	27
	Prògraman Làithreach	27
6.2	Programme Coordination	27
	Co-òrdanachadh Prògram	27
7.0	Risk	28
	Cunnart	28
7.1	Risk Register.....	28
	Clàr Cunnairt	28
8.0	Works Delivery and Procurement	29
	Libhrigeadh is Solar Obraichean	29
9.0	Performance Management	30
	Tomhas Coileanaidh	30
9.1	Performance Measurement.....	30
	Tomhas Coileanaidh	30
9.2	Performance Indicators: National	30
	Comharran Coileanaidh: Nàiseanta	30
9.3	Performance Indicators: Local	30
	Comharran Coileanaidh: Ionadail	30
9.4	Performance Reporting.....	31
	Aithris air Coileanadh	31
10.0	Future Strategies	32
	Ro-innleachdan Ama Ri Teachd	32
11.0	Service Improvement Actions	33
	Gnìomhan Leasachadh Seirbheis	33

Figures

Figearan

Figure 2.3.1: Development Example	11
Figure 3.1.1: CRM Street Lighting Data.....	13
Figure 3.3.1: Defect Example – Exposed Wires	14
Figure 4.1.1: Emissions by Sector 2007/08	19
Figure 4.3.1: Rusting Column.....	21
Figure 5.1.1: Energy Costs 2003-2010.....	24
Figure 10.1: Typical Lighting	32

Tables

Clàran

Table 2.1.1: Street Lighting Inventory.....	8
Table 3.1.1: Importance of Services: Appearance in Top 5.....	12
Table 3.1.2: Satisfaction with Services.....	12
Table 4.1.1: Projects Requiring Capital Funding.....	20
Table 4.2.1: Inspection Regime.....	20
Table 4.3.1: Structural Test Result Categories.....	21
Table 5.1.1: Historical Investment.....	24
Table 9.2.1: THC Lighting Statutory Indicators 2006/07 to 2008/09.....	30
Table 11.1: Street Lighting Improvement Actions.....	34

1.0 Current Status

Inbhe Làithreach

The Highland Council provides a range of services in association with the street lighting asset including statutory duties required by the Electricity at Work Regulations 1989 and the Roads (Scotland) Act 1984.

Street Lighting is recognised as playing an important part in the reduction of night-time road traffic accidents, crime and also the fear of crime. Good standards of street lighting are seen as important in improving social inclusion, through encouraging the use of all streets at night, and supporting sustainable transport options - public transport, cycling etc.

All of The Highland Council's street lighting design, maintenance and installation works are registered under the British Standards Institution's (BSI's) Management System - Quality Management System ISO 9001:2000. This system is maintained annually by a series of internal and external (BSI) audits which review standards and operational procedures.

1.1 Current Issues

Cùisean Làithreach

Lack of Investment

There is a lack of investment in the street lighting infrastructure, which has expanded significantly over the last decade in particular. A high percentage (48%) of the Council's lighting columns are over 30 years old. [\(IA SL1\)](#)

Growth of Lighting Infrastructure

In particular, Inverness City has seen a huge increase in its private housing infrastructure, reportedly the fastest growing city in the UK. This increase in housing, distributor roads and footpaths has resulted in a year on year increase in the connected street lighting load. These developments have immediate cost implications when they are adopted by The Highland Council. [\(IA SL2\)](#)

Energy Costs

Energy price rises are common knowledge. The Highland Council now purchases un-metered electricity through the Scottish Procurement contract which has led to early savings. Currently, approximately 60% of the Street Lighting budget is spent on energy costs.

Staffing Issues

Due to the difference between external and Council pay rates, it is increasingly difficult to recruit and retain suitably qualified electrical staff. Electricians and lighting technicians are particularly difficult to recruit. (IA SL3)

1.2 Current Asset Management Strategies

Ro-innleachdan Stiùiridh So-mhaoin Làithreach

The Highland Council uses an asset management database to record information in connection with each lighting asset. There is an ongoing process to confirm the location of each item of lighting plant. Currently work is underway to confirm the age profile of the equipment. (IA SL4)

Structural and electrical testing is undertaken in accordance with relevant regulations. The ongoing development of the asset management system will also progress the maintenance operations of recording electrical and structural test results to the database. (IA SL5)

The adoption of practices in Well-lit Highways, Code of Practice for Highway Lighting Management^(RSL1) are being undertaken through development of asset management.

Although the Council Capital programme exists for various projects which include lighting assets, a more formal, long term, specific lighting programme is required. (IA SL6)

2.0 The Asset: Physical Parameters

An t-So-mhaoin: Paraimeatairean Corporra

2.1 Inventory

Clàr-cunntais

The Street Lighting asset in Highland currently consists of:

Group Type	No.
Lighting Columns	48,850
Feeder Pillars	2020
Illuminated Signs	2600
Illuminated Bollards	800
Traffic Signals	49
Pelican Crossings	7
Toucan Crossings	16
Puffin Crossings	30
Zebra Crossings	33

Table 2.1.1: Street Lighting Inventory

It should be noted that the above figures include lighting assets which are not part of the road, e.g. lighting columns within harbour areas. The ongoing collection of data will provide more detailed information. [\(IA SL7\)](#)

Other lighting assets such as navigation lights have not been included in this plan.

2.2 Asset Register

Clàr So-mhaoin

The Street Lighting asset is recorded on the asset management database where the following information is recorded for each lighting column:-

- Equipment Type
- Street Name
- Item Identity Code
- Location Description
- Town Name

- Column Position
- Gear Location
- Supply Cable Type
- Photo Cell Location
- Feeder Pillar
- Feed Location
- Maintenance Area
- Date Of Column Installation
- Column Height
- Column Material
- Column Profile
- Lantern Type
- Lantern Distribution
- Number Of Lamps
- Lamp Wattage
- Apparatus Code
- Apparatus Wattage
- Lamp Type
- Bracket Type
- Switch Regime Code
- Dimming Level
- Control Gear Type
- Control Type
- Switch Regime Description

The data on each column is recorded and updated by operatives visiting each lighting column using hand held data capture devices to record and verify the information relating to each unit. The location of each column is also logged using GPS.

The ongoing development of the asset management database will concentrate on the following areas:-

➤ **Confirmation of the date of installation of the lighting equipment**

Although all of the new lighting plant which has been added in the last 5 years has an accurate installation date, there is a considerable amount of work to be done to confirm accurate information for columns which were installed before a database was initiated. This process is ongoing and involves using the data recorded on 'as installed' record drawings and site inspections where necessary. (IA SL4)

➤ **Addition of underground cable records**

Data is currently held both in paper and Computer Aided Drawing (CAD) formats. This data requires to be transferred onto the asset management database to make the information more accessible to users within the Lighting Section and also to collate up to date service information for Statutory Undertakers requests. (IA SL8)

➤ **Addition of Electrical Test Certificates and Structural Test results**

Test results are scanned and recorded against the relevant control pillar/lighting columns which are then used when making future works programmes. (IA SL5)

As well as collecting data for street lighting columns, additional information is also being collected and verified for other items of electrical plant for inclusion in the asset management database. Examples include:-

- Illuminated Signs
- Illuminated Bollards
- Traffic Signal Installations
- Zebra Crossing Installations
- Ice Alerts

2.3 Asset Growth

Fàs So-mhaoin

The asset has grown by approximately 3% p.a. in the years up to 2007 when it has slowed down due to a drop in the housing market. Although the market has slowed down, there are still increases in lighting equipment due to some limited growth in the private and housing association developments.



Figure 2.3.1: Development Example

3.0 Service Expectations

Dùilean Seirbheis

3.1 Customer Perceptions

Tuigse Luchd-cleachdaidh

Specific street lighting customer surveys have not been undertaken recently, but an ongoing survey of a sample of Highland Residents which has been completed annually for the period 2003 – 2009 indicates a good level of satisfaction with the Service. (IA SL9)

This annual survey, which is undertaken independently by Sneddon Economics for The Highland Council, shows a fairly consistent level of satisfaction over the last six years.

The data in the tables below are extracts from the 2009 survey and show the information relating to street lighting. The full survey is available on the [Council website](#) ^(RSL2) with the relevant tables reproduced in RAMP appendix B.

Importance of services	2009 %	2008 %	2007 %	2006 %	2005 %	2004 %	2003 %
Street lighting	9	10	9	19	10	13	15

Table 3.1.1: Importance of Services: Appearance in Top 5

Street lighting is ranked around the middle of the overall table for importance of services. The satisfaction of the service is high with it being ranked fifth in the overall table.

Satisfaction with services	2009 score	2008 score	2007 score	2006 score	2005 score	2004 score	2003 score
Street lighting	58	53	51	62	64	61	59

Table 3.1.2: Satisfaction with Services

The current Customer Relationship Management (CRM) system was introduced in 2006. Appendix B of the RAMP contains the overall CRM data

relating to the road asset. Data relating to the street lighting asset is shown in [Figure 3.1.1](#) below.

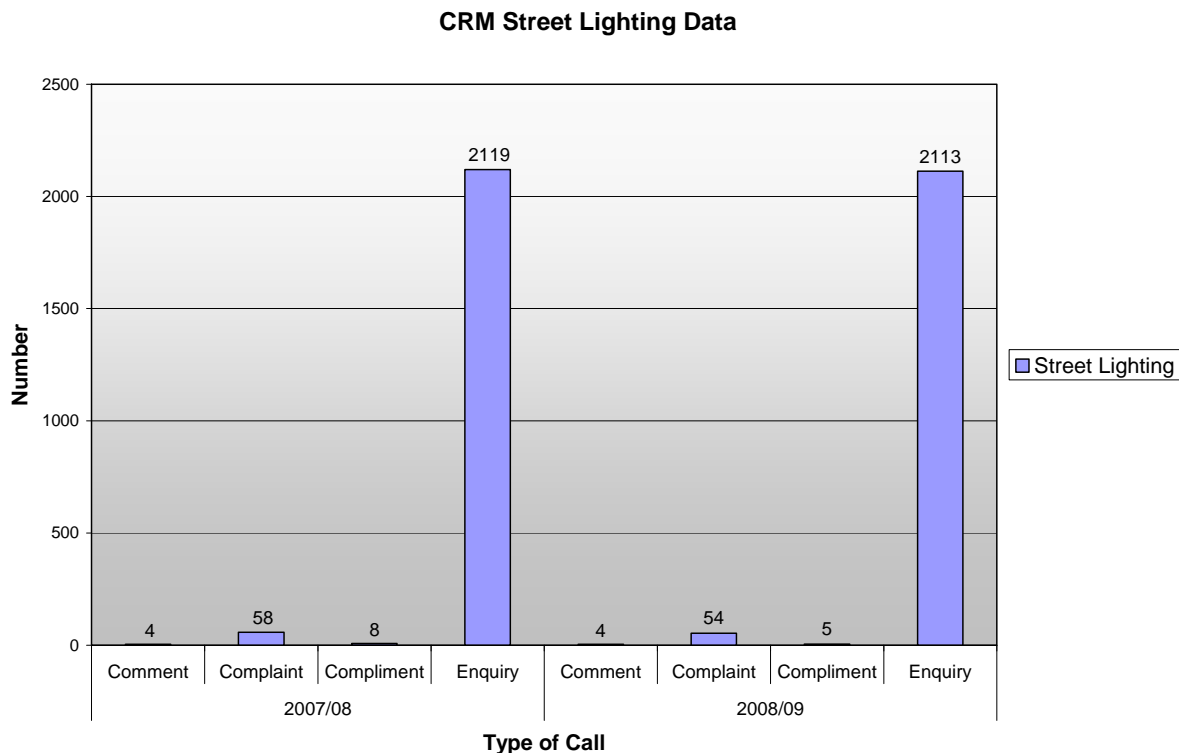


Figure 3.1.1: CRM Street Lighting Data

The numbers of enquiries are high which gives an indication of the number of faults reported by the public.

3.2 Council Goals and Objectives

Amasan is Mion-amasan Comhairle

The council has published its objectives in The Corporate Plan; The Programme for the Highland Council 2009 – 2011, Strengthening the Highlands which is available on the [Council website](#) ^(RSL3).

The TECS Service Plan is a strategic document which sets out how the service will achieve delivery of its commitments in relation to the Programme of the council. Details of the objectives and actions are available in the Service Plan which can be accessed through the [Council website](#) ^(RSL4). Operational Plans support the Service Plan.

At the time of writing this version of the RAMP, the Local Transport Strategy for Highland (LTS) was in draft form. The LTS will set out the transport

objectives for the area, impacting on a highland wide community to achieve sustainable integrated solutions.

3.3 Safety Considerations

Beachdachaidhean Sàbhailteachd

The safety of the street lighting asset is a large part of work undertaken by the Lighting Section. Electrical testing of the underground cable network is a legal requirement, which should be completed every six years. Structural testing of lighting columns is an increasingly important element taking into account the age profile of the units in the Council area. (IA SL10)

In addition to the above, The Highland Council maintains an Emergency Callout System which ensures that any dangerous occurrences associated with street lighting, traffic signal and illuminated signage are attended to and made safe. The current requirement is that the operative will be present on site within a maximum of 3 hours, although in most cases the time taken will be substantially less. Any damage to equipment potentially exposes the public to live electricity and public safety is of paramount importance.

The following typical incidents are dealt with by the Emergency Call Out staff:-

- Damage to lighting plant - usually as a result of a Road Traffic Accident
- Section of lighting out
- Door off lighting column – wires exposed
- Faulty Traffic Signal Installation

Figure 3.3.1: Defect Example –
Exposed Wires



3.4 Public Utilities Activity

Gnìomh Ghoireasan Poblach

Activities carried out on the network by statutory undertakers (utility companies) and private parties can have a major impact on the maintenance and management of the lighting asset, particularly buried cables and ducts. In some cases damage to underground cable goes unreported and the fault only presents itself some time after the damage occurred. At present, the impact of utility activities on the network is unknown as it is difficult to quantify.

The co-ordination of utility and authority works is undertaken by the lighting teams in accordance with the New Roads and Street Works Act 1991 (NRSWA).

A large element of the Lighting Section's involvement with the NRSWA is to provide information to utilities on the location of lighting equipment, e.g. underground cables, traffic signal loops etc. Where possible, this information is provided from existing record systems but, as this data is limited, plant identification has to be confirmed by a site visit where detection equipment is used to accurately locate cable locations. ([IA SL11](#))

3.5 Third Party Claims

Tagraidhean Treas Pàrtaidh

The Council receives third party claims relating to several aspects of the road network. Claims are handled by the Council's Insurance Section who keep electronic and paper records.

There are very few claims relating to the lighting asset. A more significant issue is the damage caused to the lighting asset by others, e.g. vehicle damage, vandalism. This is currently not recorded. ([IA SL12](#))

3.6 Environmental Considerations

Beachdachaidhean Àrainneachd

The environmental considerations of the street lighting asset begin at the design stage.

Obtrusive lighting has been identified as a Statutory Nuisance under the Public Health (Scotland) Act 2008. The Scottish Executive's document "Controlling Light Pollution and Reducing Lighting Energy Consumption"^(RSL5) gives guidance on the issues relating to the effective control of lighting, to eliminate lighting designs with associated issues such as light trespass, sky glow etc.

The lighting design issues identified are addressed through the procurement of lanterns which control the output of light in accordance with BS5489^(RSL6).

At the end of the street lighting equipment's life, the treatment of the redundant electrical items is governed by the Waste Electrical and Electronic Equipment Regulations 2007 (WEEE).

Categories of lighting equipment covered by these regulations are:-

- Street Lighting Lanterns
- Discharge lamps - including Low Pressure Sodium, High Pressure Sodium and Fluorescent lamps

These items are uplifted from the Council's Depots by approved contractors. The equipment, at this stage, is treated as special waste and taken to specialised recycling facilities where the materials (sodium, mercury etc.) are removed to be reused in the supply chain. The selection of suitable equipment at the procurement stage is critical. For instance, the selection of aluminium lantern bodies which are highly recyclable when compared to glass reinforced plastic (GRP) units.

4.0 Management Practices

Cleachdaidhean Stiùiridh

4.1 Policies

Poileasaidhean

The Highland Council has some policies which relate directly to the lighting infrastructure. Other policies relate less directly to lighting, but are linked to aspirations which the Council has relating to sustainability, safety and environmental issues.

Public Lighting Document

This document examines the objectives and standards relating to the provision of a public lighting service. The document is reviewed internally every three years. The following issues are examined in some detail:

- The benefits of street lighting
- The factors influencing the provision of new lighting
- Consultation with affected parties
- Design Criteria
- Obtrusive light
- Safety for road users and the public
- Protection of the night-time environment
- Enhancement of the night-time environment
- Security
- Cost effectiveness
- Visual Intrusion
- Electrical, structural and other safety issues

Reports to Council

'Energy Reduction – Street Lighting' (TEC/87/08)^(RSL7)

This report outlines the issues relating to the growth of the street lighting infrastructure and lists the various options available to reduce energy costs, e.g. switching off sections of lighting, part night dimming of lighting levels and the use of white light.

‘Street Lighting - Energy Reduction in Existing Installations’

(TEC/23/09)^(RSL8)

This report recommends the use of a dimmed white light source as a method of achieving financial and CO₂ savings.

Single Outcome Agreement (2)^(RSL9)

The Highland Council is committed to this document which is also endorsed by the Scottish Government, Local Enterprise Companies, Scottish Natural Heritage and other agencies. The purpose of the document is to identify better outcomes for the people of the Highlands and deliver these outcomes through multi agency action.

The elements of this document which relate to lighting are:-

- 2. ‘People are, and feel, safe from crime, disorder and danger’**
- 6. ‘Carbon emissions are reduced and communities are protected from the consequences of changing weather patterns’**

Highland Council’s Carbon Management Plan 2009-2012^(RSL10)

The purpose of this document is to monitor and record the emissions from all of the Councils Services. It has stated targets to reduce CO₂ emissions in all Council Services by 2012.

The Highland Council baseline CO₂ emissions for 2007/2008 are 65,427 tonnes.

Figure 4.1.1, taken from the Carbon Management Plan, shows the Highland Council Emissions by Sector for the baseline year of 2007/08.

Highland Council Carbon Emissions by Sector 2007/08

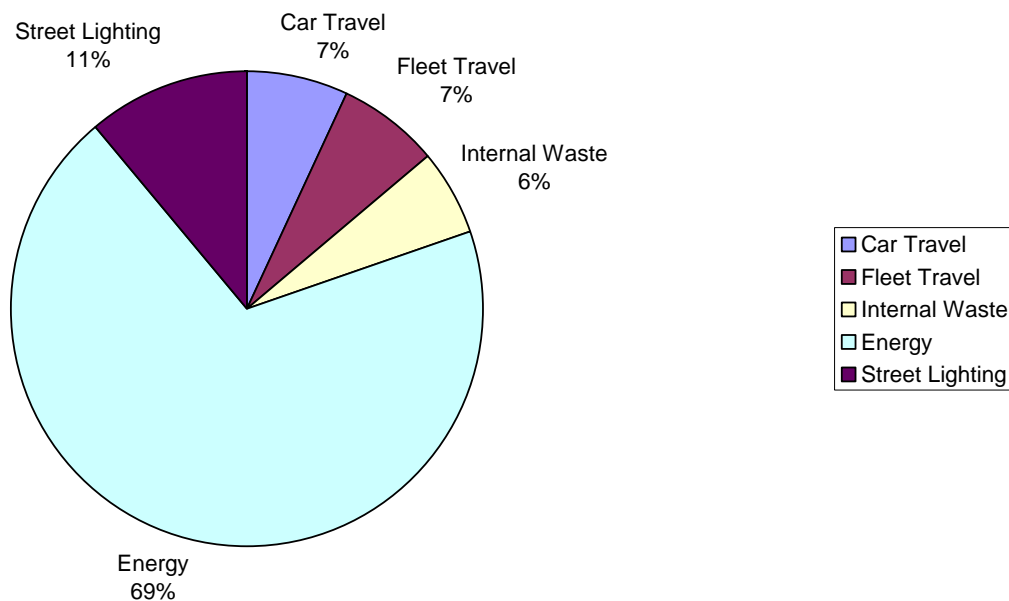


Figure 4.1.1: Emissions by Sector 2007/08

Emission Reduction Targets

The Carbon Management Plan targeted reduction for street lighting emissions is set at no less than 5% by 2012. In reality, this figure will be very difficult to achieve. Although several lighting projects have been designed which would result in both CO₂ and financial savings, to date no funds have been made available to install these schemes. (IA SL13)

The CO₂ reduction target is a contradiction to the annual increase in the number of lighting columns connected and added to the database as a result of housing and other developments.

Projects Requiring Capital Funding

The following emission reduction projects in [Table 4.1.1](#) require funding to enable them to be implemented.

Action	Costs	CO ₂ Saving (Tonnes/per annum)
Nairn lighting dimming project- change lanterns in existing scheme to use dimmed white light source	£48,000	15
Inverness Riverside - change lanterns to white light source	£71,500	24
Caithness/Sutherland (A) Roads – change lanterns to white light source	£68,000	26
Badenoch (A) Roads – change lanterns to white light source	£75,000	30
Ross (A) Roads – change lanterns to white light source	£72,000	28
Lochaber/Skye (A) Roads- change to white light source	£66,000	26

Table 4.1.1: Projects Requiring Capital Funding

4.2 Inspection Regime

Rèim Sgrùdaidh

The following table details the inspection regime.

Activity	Service Standard	Standard/Technical Report Reference
Electrical Testing	Every 6 years	BS 7671: 2008 Wiring Regulations
Structural Testing	As necessary within resources available	ILE Technical Report 22 ^(RSL11)
Lantern Cleaning	Every 2 years	ILE Technical Report 19 ^(RSL12)

Table 4.2.1: Inspection Regime

The current structural testing regime is on an as required basis. There is no formal programme. ([IA SL14](#))

4.3 Condition Assessment

Measadh Staid

Column Structural Testing

An annual programme is set up which allows for the structural testing of approximately 1000 lighting columns. A specialised contractor is employed to test the columns in line with the Institution of Lighting Engineers Technical Report (TR) 22^(RSL11).

TR22 provides technical guidance for a planned inspection regime for lighting columns including testing methods and risk assessments.

The tests use ultrasound techniques to measure the relative loss of section in the construction of the column to evaluate its condition. The following areas are identified in having the highest risk of catastrophic failure:-

- Hot swaged joint
- Bottom of the door
- Below the door
- Just below ground level



Figure 4.3.1: Rusting Column

The test results from the contractor are used to evaluate the structural condition of each column tested. The results are presented in the following format which quantifies the loss of section in the column thickness and the recommended action required within set timescales.

TR22 Category	%Loss of thickness	Diagnosis	Action
2U	+ 50	Very severe loss of section	Immediate removal of column
1U	25 to 50	Severe loss of section	Schedule for replacement as soon as practicable
2G	17 to 24	Significant loss of section	Re-test within 2 years
3G	11 to 16	Moderate loss of section	Re-test within 3 years
6G	0 to 10	Little loss of section	Re-test within 6 years

Table 4.3.1: Structural Test Result Categories

4.4 Routine Maintenance

Cumail Suas Cunbhalach

Lighting outages have a target reaction time of 7 days, which is measured as part of The Highland Council's Statutory Performance Indicators (SPIs).

Emergency attendance works have a target time of 3 hours to attend the site. Again, this is measured annually as an SPI.

4.5 Operational/Cyclic Maintenance

Cumail Suas Obrachail/Cearcallach

The following cyclic activities are undertaken:

- Electrical Testing - Every 6 Years
- Structural Testing – As necessary within resources available
- Routine Maintenance - Every 2 Years (Cleaning Lanterns/Base)

4.6 Planned Maintenance: Renewals

Cumail Suas Dealbhte: Ùrachaidhean

There are a number of planned activities that are available for the cyclic maintenance and renewal of the lighting asset. Activities and indicative costs, relating to industry recommended standards, will be produced as the lifecycle process develops. ([IA SL15](#))

4.7 Disposal

Cur An Dàrna Taobh

The disposal of street lighting assets generally relates to damaged and redundant equipment being returned to Depots. Currently, the waste materials which are returned through upgrades or damage to plant include the following items of equipment:-

- Galvanised Steel
- Aluminium
- Lanterns (as defined in BS 5489)
- Discharge Lamps

The last two items, Lanterns and Lamps, are required under the WEEE Regulations to be disposed of by an authorised waste disposal company. A premium is paid on the cost of lanterns and lamps at the time of purchase. This sum is then used to fund the recycling costs incurred by the compliance schemes. Although the compliance schemes are non profit making, there are considerable costs incurred through the recycling process. These costs are passed on to the users which add additional financial pressures.

The compliance schemes for lanterns and lamps disposal are:-

- Lanterns – Lumicom
- Lamps – Recolight

There is no suitable electrical recycling facility located in the Highland area and additional costs are incurred in transporting this equipment to Central Scotland. The transportation of this waste requires the completion of a Hazardous Waste Consignment Note (Hazardous Waste Regulations 2005).

5.0 Investment

Airgead an Seilbh

5.1 Historical Investment

Airgead an Seilbh gu h-Eachdraidheil

The actual historical investment, excluding energy costs, in £000s for the last 5 years is detailed below.

Cost Category	2004/05	2005/06	2006/07	2007/08	2008/09
Revenue	£000s	£000s	£000s	£000s	£000s
Lighting maintenance	1,145.7	1,339.2	1,066.6	1,184.6	1,107.1
Traffic Lights	84.8	65.9	86.0	78.8	91.8
Illuminated Signs & Bollards	90.8	79.3	87.4	75.8	98.2
Capital					
Capital	703	633	490	471	796
TOTAL	2,024.3	2,117.4	1,730	1,810.2	2,093.1

Table 5.1.1: Historical Investment

Street Lighting Energy Costs (£000's)

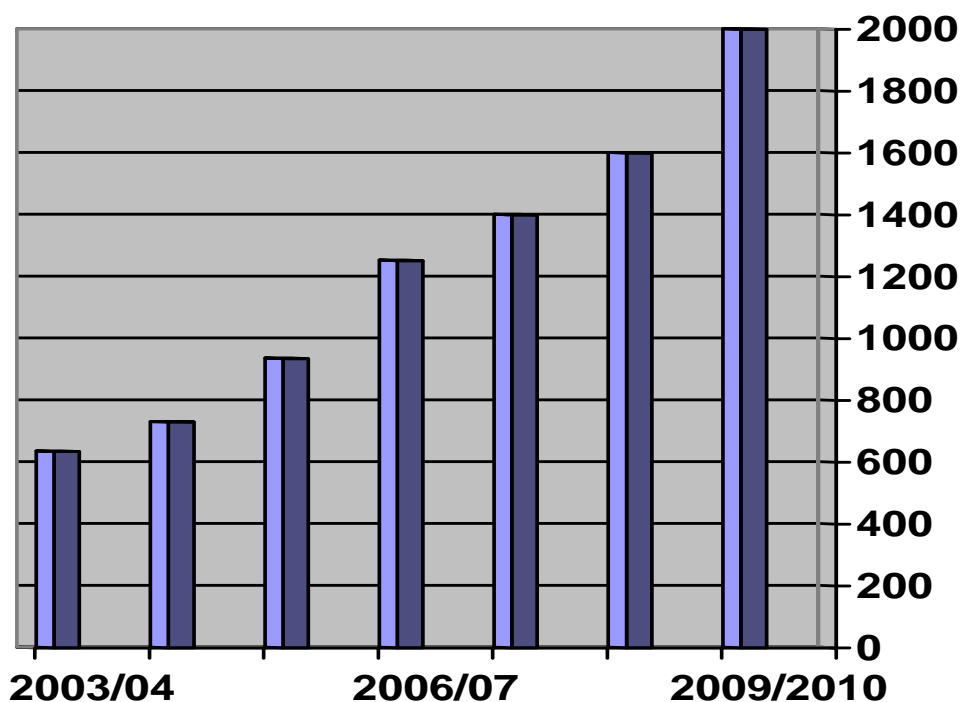


Figure 5.1.1: Energy Costs 2003-2010

The recorded increases in electrical energy costs have two main causes:-

- An annual increase in the stock of street lighting equipment maintained by The Highland Council, as a result of growth in the private housing sector in the last 10 years, particularly in the Inverness area. Many of the developments are large and, as a consequence, have associated distributor roads, footpaths, cycle routes etc. In urban areas these will all have interconnected lighting installations.
- There has been a steep rise in the KWhr (Kilo Watt hour) rate for un-metered electricity from 4.73p per unit in 2002 to the 2009 rate of 12.6p per unit.

The current un-metered electricity contract is issued through Procurement Scotland and the document includes the majority of the local authorities in Scotland. The energy purchased under this contract is purchased from Scottish Power and is defined as 100% renewable.

Although early indications are that the cost will be reduced in the short term as a result of this contract, the long term expectation is that the price is likely to rise again.

Various strategies to reduce the electrical load associated with street lighting are currently being trialled including dimming of lighting sources and the use of new technologies, including Light Emitting Diode (LED).

5.2 Valuation

Luachadh

An initial valuation for the Gross Replacement Cost (GRC) of the lighting asset has been completed. The valuation is based on available data and will be refined as data collection progresses.

The GRC for the lighting asset has been calculated at approximately £119,600,000 (£119.6 million). This is based on data from the asset

management database, an estimation of the length of electrical cable and a unit replacement cost calculated from historic rates. The valuation summary is contained in appendix E.

The valuation will be developed as data is collated. This will result in the eventual production of the Depreciated Replacement Cost (DRC) and Annualised Depreciation cost (ADC). ([IA SL16](#))

6.0 Forward Works Programme

Prògram Obraichean Adhartach

6.1 Existing Programmes

Prògraman Làithreach

The Highland Council Lighting Section produces an annual programme of planned lighting works. This list is based on the results of both electrical and structural tests but can also involve the planned works programme of Electricity Utility Companies, where they have a programme to underground overhead cable systems, which will impact on lighting services.

6.2 Programme Coordination

Co-òrdanachadh Prògraim

Any coordination which occurs in the works programme in The Highland Council is based on planned works which are presented at local Roads Authority and Utilities Committee (RAUC) meetings.

As an example, when a footpath is being reconstructed, the opportunity may be available to renew street lighting services with resulting savings and reduced disruption to services. This currently works fairly well for small projects, but there can be problems with budgetary issues due to the timing of the works and the limited timescale to make materials available. The development of asset management within the Council should lead to improvements in the advance planning of hybrid projects.

7.0 Risk

Cunnart

Risk Management is a systematic approach to identifying and dealing with the risks that threaten our plans and projects and impacts on service delivery.

The Council's Strategy for Risk Management commits us to the "intelligent management of risk". This means trying to understand the likelihood and impact of future events, whether they are favourable or otherwise in order to maximise future performance.

Risk management is about understanding the things which could help or hinder us in trying to deliver our objectives. This can be summarised in the following questions:

- What is the worst that could happen?
- What is the likelihood of it happening?
- What would be the impact if it did?
- What can we do about it? (How can we prevent it from happening; or what can we put in place to manage it, if it should happen?)

The Highland Council has developed a risk management framework, the purpose of which is to define in a controlled way how risks and opportunities will be handled. The framework provides information on roles, responsibilities, processes and procedures. It sets the context in which risks are identified, assessed, managed and reviewed.

7.1 Risk Register

Clàr Cunnairt

A risk register for the street lighting asset has yet to be developed. ([IA SL17](#))

8.0 Works Delivery and Procurement

Lìbhrigeadh is Solar Obraichean

All electrical work on the street lighting asset is undertaken by teams of Council employed electricians who are based in the following areas – Thurso, Brora, Dingwall, Inverness and Fort William.

Capital or major works are tendered using the processes set down within The Highland Council Standing Orders.

Electrical equipment used to maintain and refurbish the asset is purchased in accordance with Council Standing Orders through a three year contract split into the following categories:

- Control Pillars
- Luminaries
- Discharge lamps
- Electrical Goods
- Photo electric Controls
- PVC Ducting
- Control Gear
- Illuminated Signs
- Cable
- Aluminium Lighting Columns
- Tubular Steel Lighting Columns

These tenders are revised before issue to update specifications, taking into account alterations to British and European Standards and changes to equipment due to new lighting technology.

The Highland Council also employs Scottish & Southern Energy to undertake disconnection and connection of live electricity services to control pillars.

9.0 Performance Management

Tomhas Coileanaidh

9.1 Performance Measurement

Tomhas Coileanaidh

Statutory Lighting performance indicators are reported to the TEC Services Annual Performance Review.

The Highland Council is considering the development of additional local lighting performance indicators in conjunction with the SCOTS Lighting Group. [\(IA SL18\)](#)

9.2 Performance Indicators: National

Comharran Coileanaidh: Nàiseanta

The SPI results relevant to the street lighting asset are:-

Performance Indicator	2006/07	2007/08	2008/09
Total number of street light repairs to be completed	7,699	8,706	8,544
Number of street light repairs completed with 7 days	7,076	8,121	8,108
Percentage of street light repairs completed within 7days	91.9%	93.3%	94.9%
Total number of street lighting columns	46,507	47,321	48,239
Number of street lighting columns over 30 years old	22,229	22,192	22,131
Proportion of street lighting columns over 30 years old	47.8%	46.9%	45.9%

Table 9.2.1: THC Lighting Statutory Indicators 2006/07 to 2008/09

9.3 Performance Indicators: Local

Comharran Coileanaidh: Ionadail

Currently there are no local lighting performance indicators reported by TEC Service. This is an area which will be developed along with the SCOTS Lighting Group and can be used to quantify various areas of the asset including customer satisfaction, energy efficiency and service costs.

The development of these internal performance indicators can only be taken forward as the current asset management database is validated and becomes populated with installation dates.

9.4 Performance Reporting

Aithris air Coileanadh

TEC Services Lighting SPIs are reported annually to the Council's Chief Executive. The figures are compared to previous years and any significant variance to the figures has to be justified by the Lighting Manager. The methodology used to establish the presented figures are examined by Internal Audit.

The Scottish Performance Indicators are published annually by Audit Scotland. Particular attention is drawn to Councils who have PI's which are performing poorly with respect to the quartile ratings:

- Councils which are ranked 25th or below in the ratings and who do not make any material improvement in their performance in the following years.

Reference is also made to any unreliable information which has been entered on the reports.

Factors which can negatively affect Lighting PI's include:-

- **Staffing Issues** – Any long term sickness with a staff member being absent from a local team for a period of weeks is likely have a negative effective on PI's. Difficulties in recruiting staff have also in the past reflected on the figures due to the inability to meet target response times.
- **Weather conditions** – Severe weather conditions can reduce the sections ability to attend to faults within the prescribed periods.
- **Funding** – A lack of investment in replacing old lighting stock means that the percentage of columns over 30 years is not improving at a fast enough rate.

10.0 Future Strategies

Ro-innleachdan Ama Ri Teachd

Documenting a lifecycle plan should enable the evolution of improved strategies for the management of the asset. Focusing on better long term outcomes may identify a need to invest in different treatments or in different parts of the asset. ([IA SL19](#))

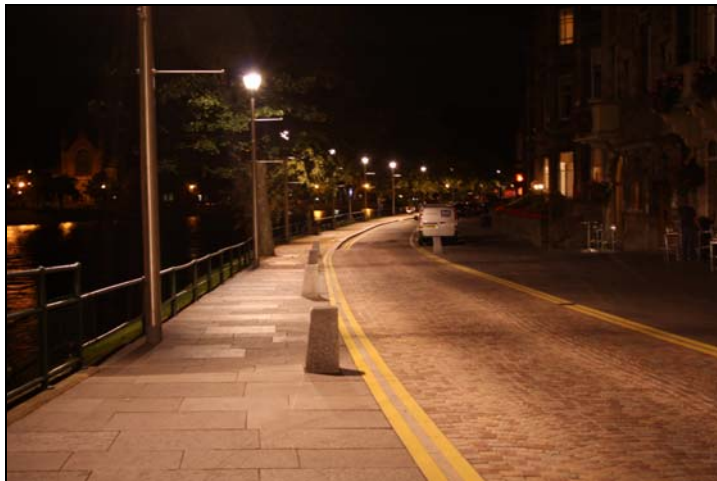


Figure 10.1: Typical Lighting

11.0 Service Improvement Actions

Gnìomhan Leasachadh Seirbheis

The following improvement actions were identified through development of the street lighting lifecycle plan.

IA Number	Action	Proposed Implementation Date	Responsibility
IA SL1	Monitor and reduce the number of columns >30 years old.	TBC	TBC
IA SL2	Calculate cost per year of each additional asset adopted.	TBC	TBC
IA SL3	Monitor staff levels.	TBC	TBC
IA SL4	Confirm and record on the asset management database, an installation date for all of the lighting equipment.	TBC	TBC
IA SL5	Develop asset management database to include electrical and structural tests electronically.	TBC	TBC
IA SL6	Develop a long term Capital programme.	TBC	TBC
IA SL7	Complete the collection/validation process for lighting on the asset management database.	TBC	TBC
IA SL8	Transfer existing lighting underground plant information currently held on CAD to the asset management database.	TBC	TBC
IA SL9	Develop an asset specific survey.	TBC	TBC
IA SL10	Develop a policy to identify lighting columns which should be structurally tested, based on age, height and location.	TBC	TBC

IA Number	Action	Proposed Implementation Date	Responsibility
IA SL11	Develop and update a process for verifying and recording underground plant information.	TBC	TBC
IA SL12	Develop a method of recording damage by third parties.	TBC	TBC
IA SL13	Investigate funding options for emission reduction lighting projects.	TBC	TBC
IA SL14	Develop a programme for structural testing.	TBC	TBC
IA SL15	Develop indicative costs of planned maintenance activities.	TBC	TBC
IA SL16	Complete valuation as data improves.	TBC	TBC
IA SL17	Develop an asset specific risk register.	TBC	TBC
IA SL18	Develop local lighting Performance Indicators.	TBC	TBC
IA SL19	Identify future management strategies and update the LCP accordingly.	TBC	TBC

Table 11.1: Street Lighting Improvement Actions