ITEM No …7……..

REPORT TO: **CITY DEVELOPMENT COMMITTEE – 21 AUGUST 2017**

REPORT ON: **STREET LIGHTING PARTNERSHIP PERFORMANCE 2015/16**

REPORT BY: **EXECUTIVE DIRECTOR OF CITY DEVELOPMENT**

REPORT NO: **109-2017**

1 PURPOSE OF REPORT

1.1 This report provides an update on the progress and performance of the Street Lighting Partnership with Tayside Contracts on the delivery of the street lighting services within Dundee City Council to 31 March 2016.

2 RECOMMENDATION

2.1 It is recommended that the Committee notes the content of the report and agrees the following:-

- That the Executive Director of City Development continues to report back annually to the committee advising on the progress and performance of the Partnership.

3 FINANCIAL IMPLICATIONS

3.1 There are no direct financial implications arising from this report.

4 BACKGROUND

4.1 Reference is made to Article XV of the City Development Committee of 23 February 2015 (Report 72-2015 refers) when approval was given to extend the Street Lighting Partnership with both Perth & Kinross Council and Tayside Contracts for a further 3 years to 31st March 2018.

4.2 The Partnership operates as an integrated team under a single Street Lighting Partnership Manager covering both Dundee City Council and Perth & Kinross Council areas and has many benefits for both Councils and Tayside Contracts:

- The larger team is more adaptable when dealing with peaks and troughs in workload.
- The production of a common specification has reduced the costs of storage of materials and encourages cost savings through bulk purchase. This approach is supported by Scottish Government initiatives, Procurement Scotland, Scotland Excel and the Tayside Procurement Consortium (TPC).
- The arrangement also meets the Scottish Governments objectives in increased partnership working and shared services in line with the Efficient Government agenda.
- It has the potential for expansion, for example by other Councils considering joining as experience grows over time.
- This structure has provided opportunities for efficiencies and reduced staff costs for both the Councils and Tayside Contracts.

4.3 An Executive group comprising of two senior officers from each Council and Tayside Contracts meet three times a year to review the performance of the Partnership against a number of agreed criteria.

4.4 The Street Lighting Partnership is fully committed to the Roads Asset Management Planning framework. All Street lighting inspections, repairs, inventory and records are held and updated electronically.

4.5 The Street Lighting Partnership has gained national recognition of its level of service and service approach. In 2010 it was a finalist in the APSE Best Performing category and in 2013, Dundee City Council (street lighting) was shortlisted for a UK National Award for "Best and Most Improved Performer". In 2016 the team won the Tayside Excellence Award for "Excellence in Health & Safety".

4.6 Appendix A contains benchmarking information taken from the SCOTS/APSE (Society of Chief Officers Transportation in Scotland/ Association of Public Service Excellence) benchmarking exercise for 2015/16 which collects and compares the annual performance of all 32 Scottish Local authorities against agreed key service performance indicators. Dundee City Council forms part of the SCOTS cities family grouping and is compared against Aberdeen, Edinburgh and Glasgow City Councils. Scottish averages are also referred to where appropriate. Year on year figures are also contained within the report to give an internal annual comparison and an indication of trends.

4.7 Some highlights from this exercise are listed below:

Scottish Cities Comparison

- Dundee City Council consumes the least amount of electricity annually per street light and has the lowest CO^2 emissions of any Scottish city.
- The City has the most reliable street lights averaging 8.1 years between repairs.
- In 2015/16 Dundee was able to replace more columns and lanterns than any other Scottish city by continued investment in the street lighting infrastructure.
- Dundee has the highest percentage of dimmable street lights of any Scottish city.

Scottish Councils Comparison

- To assist with facial recognition and reduce the fear of crime, Dundee City Council has the highest percentage of modern white light sources of any Scottish Council.

4.8 As part of the Roads Asset Management Planning framework projections are made in relation to the increasing price of electricity. Through capital investment and spend to save policies, the Street Lighting Partnership has sought to mitigate these increases largely due to the proactive approach of taking advantage of the advancements in lighting technology to reduce electricity consumption and reduce maintenance. As a result of this work the annual electricity consumption in 2015/16 was reduced by 1,107,563 kWhr (11% of the previous years total).

4.9 The Street Lighting Partnership has a proactive approach to utilising new technologies for the benefit of the city, such as the use of energy efficient white light sources and also part night variable lighting levels. LED luminaires are now widely available and economically viable as a suitable lighting source for external lighting and this makes them attractive for invest to save initiatives. As of 31 March 2016 Dundee had 4200 LED streetlights. The Partnership continues to roll out LED lighting as part of all our capital works and have now installed more than 4500 throughout the city. Last year this reduced our energy consumption by another 4%, bringing the overall total reduction since 2012/13 to 23.2% and saving 2165 tonnes of CO2 over that period.

4.10 The Street Lighting Partnership was the first in the UK to trial a new LED replacement lamp to the market. This lamp is designed as a retrofit solution which allows the Council to utilise the remaining lifespan of an existing luminaire and simply swap out the lamp instantly achieving a reduction in energy consumption and reducing required ongoing maintenance. Following a successful small scale trial in a residential area, the North Marketgait tunnel has now been relit using these lamps, saving 67,888 kWhr per annum, a saving of 59.7% on the previous lighting arrangement.

4.11 DMX control technology has now been introduced to the public lighting stock with the opening of Slessor Gardens. This allows the coloured lighting within the public open space to be customised in a variety of ways to suit particular events. For example, on Burns night the lighting

was set up to show as blue and white and throughout the festive period the lights were displaying as red and green and gold. Furthermore a number of public holidays/events have been programmed to display differently throughout the year.

4.12 In line with national guidance and recommendations, street lights with adaptable lighting levels have been introduced where traffic volumes and pedestrian movements reduce significantly outwith peak social hours. This innovative approach reduces energy consumption and assists the Council in meeting its statutory carbon reduction obligation.

4.14 With the continual development of new technologies there are always opportunities for improvement and the Partnership has a reputation as one of the leading Councils in the introduction of new technologies to further enhance and build on the successes that have been realised to date. The Partnership will strive to improve the following areas of work:

- Continue to review, challenge and utilise new technologies in order to reduce energy consumption and maintenance costs.
- Continue to monitor and review the quality of service provided through the partnership focusing on operational quality and customer satisfaction.
- Through the SCOTS Asset Management project the Partnership is undertaking an active role in the introduction and development of asset management tools and techniques to help further improve the service.
- Continue to work with local and national partners to deliver the Scottish Governments objective to increase partnership working in line with its Efficient Government agenda

5 POLICY IMPLICATIONS

5.1 This Report has been screened for any policy implications in respect of Sustainability, Strategic Environmental Assessment, Anti-Poverty, Equality Impact Assessment and Risk Management. There are no major issues.

6 CONSULTATIONS

6.1 All members of the Council Management Team have been consulted and are in agreement with the contents of this report.

7 BACKGROUND PAPERS

7.1 None.

Mike Galloway
Executive Director of City Development

Neil Gellatly
Head of Roads and Transportation

NHG/LC/EC

8 August 2017

Dundee City Council
Dundee House
Dundee

Appendix A

Annual Status Report

Street Lighting

2015/16

1. INTRODUCTION

This report presents a summary of the council's lighting assets as at 31st March 2016. The report complements the Road Asset Management Plan (RAMP). It provides information to enable choices about future levels of investment in the lighting asset and contains the following sections;

2. Status

The status of the lighting asset is reported in terms of condition, the outputs delivered, the standards achieved and an indication of customer satisfaction.

3. Service Standards

This section details the current service standards which are being delivered against the existing budgets and expenditure.

4. Asset Performance and Benchmarking

This report provides an overview of the operational and financial performance for street lighting both in terms of yearly trends and also using the data from the annual APSE/SCOTS performance report 2015/16.

Dundee City is in the SCOTS Cities family group and comparisons are made with the performances of Aberdeen, Edinburgh and Glasgow city councils. Average performance figures for all 32 councils are also provided where available for an overall comparison across Scotland.

5. Energy and Energy Efficiency

Information on how the Partnership is driving down energy use.

6. Routine and Reactive Maintenance

Considerations for future maintenance of the asset.

7. Inspection and Testing

Obligations for inspection and testing.

2. STATUS REPORT

Asset Group: Street Lighting

The Asset

Statistics

Material Type	Total No.
Non Galvanised Steel	5,222
Galvanised Steel	8,638
Concrete	2,398
Aluminium (pre 2000)	567
Aluminium (post 2000)	7095
Cast Iron	155
Total	**24,075**

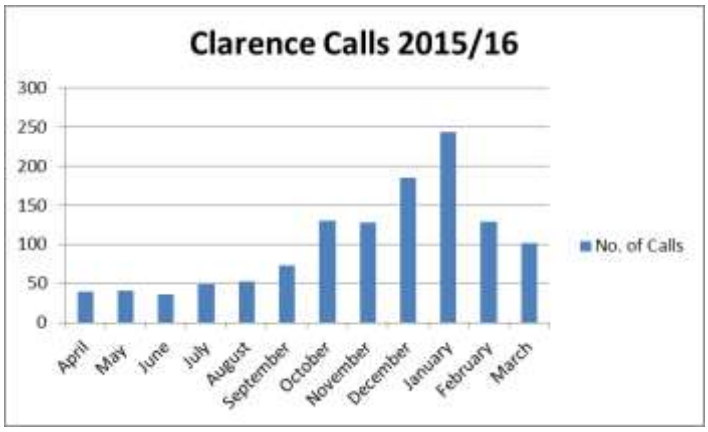
Lantern Types	Total No.
CDOTT	226
HPIT	0
LED	4200
PLL	11,687
PLT	2,048
SON	4,608
SON (Dimmed)	1,258
SOX	583
Total	**24,610**

Cable Location	Total (m)
Carriageway	0
Footway	747,440 (estimate)
Verge	0
Total	**747,440**

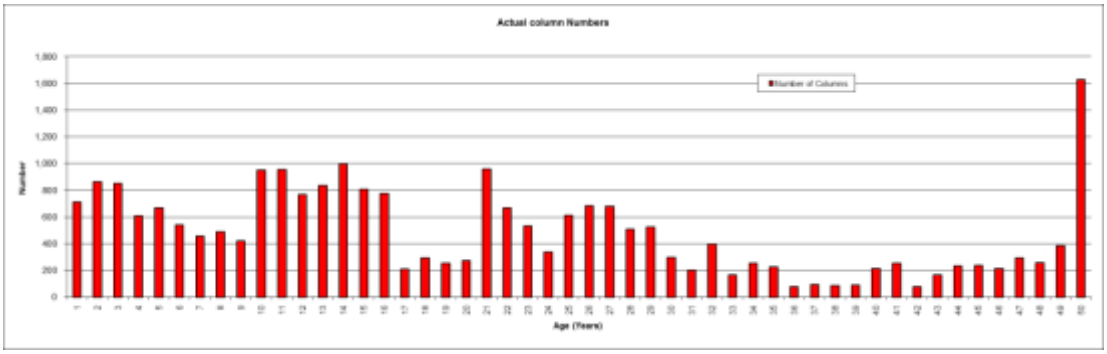
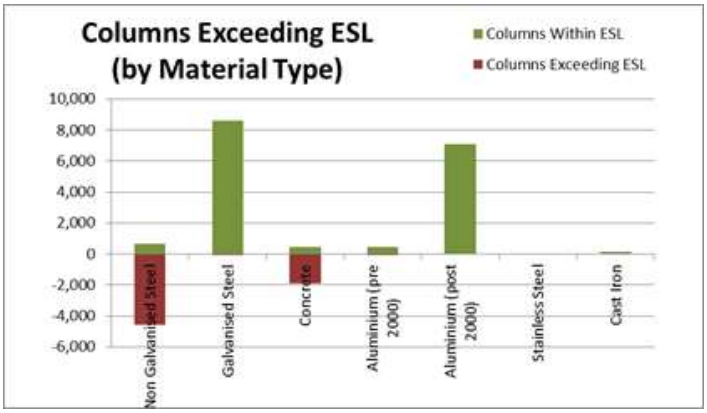
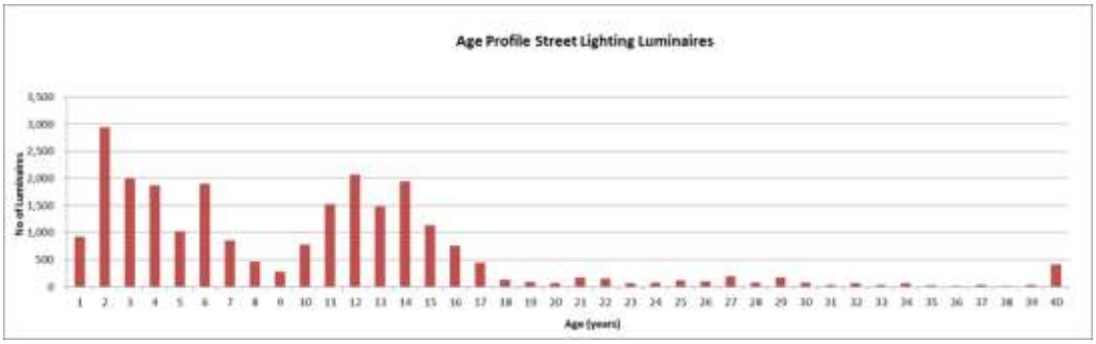
Commentary

- The level of street lighting inventory is good. It is stored in the WDM Asset Management System and is continually updated as works take place.
- The impact of the investment in LED lighting is now starting to show (4,200 compared to a total of just 617 in 2013/14).

Customer Contact



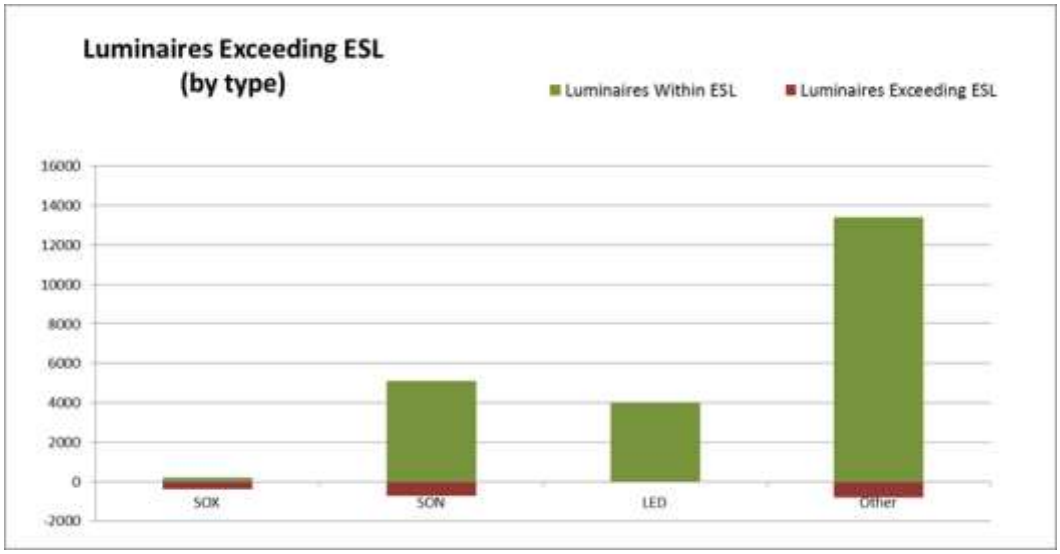
- Dundee City Council Customer Services received 1,210 street lighting faults from the customers in 2015/16.
- The effect of the clocks changing is reflected in the increased number of calls during the winter months.

Asset Group: Street Lighting		
	Statistics	**Commentary**
Age (Columns)	Dundee City Council Column Age Profile 	
Columns Exceeding ESL (by Material)		• In 2015/16 27% of columns exceeded their Expected Service Life (ESL). • The chart shows that a high proportion of non-galvanised steel and concrete columns have exceeded their ESL. • These column types have a high priority rating in the column replacement forward programme.
Age (Luminaires)	Dundee City Council Luminaire Age Profile 	

Asset Group: Street Lighting

	Statistics	Commentary

Luminaires Exceeding ESL (by Type)



- In 2015/16 7.8% of luminaires exceeded their Expected Service Life. (Note: ESL is assumed to be 20 years for all luminaire types)

Valuation

Gross Replacement Cost	£63,299,722
Depreciated Replacement Cost	£32,624,418
Annualised Depreciation Cost	£1,826,069

- The annualised depreciation (AD) represents the average amount by which the asset will depreciate in one year if there was no investment in the renewal of the asset.

2015/16 Investment and Output

Cost Category		Output
Capital Expenditure	£1,203,075	
Planned Maintenance - Preventative	£35,235	- 602 No. columns corrosion protected
Planned Maintenance - Corrective (Renewals)	£62,100	- Tarring and reinstatements
Routine Cyclic Maintenance	£16,469	- 1,906 No. Group lamp replacement
Reactive Maintenance (Emergency)	£93,156	- Emergency attendance/repairs Emergency attendance/repairs (out of Hours) - Vandalism - 49 No. Unplanned dangerous column replacements
Reactive Maintenance (non-safety related)	£195,864	- 553 No. Daytime routine repairs - 2616 No. Night-time routine repairs - 48 No. Cable faults - 129 No. Unserviceable lantern replacements - Ancillary materials - Tree trimming

Asset Group: Street Lighting			
	Statistics		**Commentary**
	Inspections & Survey	£81,659	- Electrical Test and Inspection - 24 Scouts, Night scout and inspection - Inventory updates and numbering
	Operating Costs	£1,436,594	- Workshops and recycling - 9,236,959kWhrs Electricity consumption - Carbon Reduction Commitment charge
	Staff Costs	£195,072	- Staff costs
	Overheads	£704,728	- Office rent - Other expenses - Transport costs - Support services - Capital charges
	Losses	£77,884	- Cost of accident damages
	Income	£166,761	- Rechargeable works and shared services

3. SERVICE STANDARDS

Reactive Maintenance Services

The Council is responsible for providing and maintaining good quality street lighting throughout the City of Dundee making our communities feel safer and reducing the fear of crime as well as extending both the leisure and working day for residents and visitors alike.

Routine and Reactive Maintenance

Street lighting routine and reactive maintenance comprises:

- Routine Cyclic Maintenance; Bulk lamp changing and cleaning
- Reactive Maintenance (Emergency); High priority repairs
- Reactive Maintenance (non-safety related); lower priority repairs

This part of the service currently costs the Council £485,458 per annum.

Maintenance activities are prioritised within the limits of available budgets as follows:

1. Ensure the safety of existing equipment
2. Keep existing lights working
3. Improve reliability of existing lighting
4. Upgrade lighting standards in areas already lit
5. Provide lighting in unlit areas (only if funded by others)

Evening Inspections of Lights (Scouting)

- Street lights, illuminated signs and bollards are inspected for illumination after dark every two weeks Monday to Friday.
- To expedite repairs and reduce the administration costs of processing public defect reports, a repair team work in conjunction with a Night Inspector to repair faults as they are identified.
- Observed defects and repairs are entered into the fault management system the next working day.
- This policy applies to all areas, including remote footpaths and underpasses.
- The public are encouraged to report faults by phone on the Councils free phone customer care number 0800 23 23 23 between 9am and 5pm Monday to Friday.

Emergencies

Emergencies are responded to within 4 hours and cover the following

- Lighting columns, control pillars or lit sign poles damaged by vehicles
- Loose lanterns brackets, signs likely to fall and endanger the public
- Damage to lighting cables or overhead lines
- Lighting column or control pillar door missing and wiring disturbed
- Groups of lights and single lights out are not normally classed as emergencies and will be passed for repair the next working day.

Out of Hours Emergencies

An out of office hours and weekend emergency callout service is in place 365 days a year to deal with the Emergencies listed above.

- The Council Out of hours Contact Centre will record and process all calls received from the Police and the Public.
- Any issues identified are either rectified immediately if public safety is involved or programmed for upgrading at a later date.
- In cases of direct Public Safety, the Standby Operative will be called by the Contact Centre to investigate and decide on the appropriate action to be taken.
- On the first working day after any holiday shut down, all non-urgent requests will be dealt with speedily.

Inspection and Testing

Inspection and testing activities for street lighting comprise:

- 6 yearly electrical safety inspection and testing (legal requirement)
- Structural testing – Period between tests is determined by the results of the inspection

These activities currently cost the Council £57,369 per annum.

Repair/Response Times

- Repairs above ground to street lighting, signs and bollards are to be completed within 7 calendar days.
- Performance on repairs is measured and the target is currently set at 95% completed within 7 calendar days
- Repairs to underground cable faults (those which are Dundee City Council's responsibility) to be completed within 28 days. If the cables are the responsibility of Scottish & Southern Energy the faults will be reported to SSE and a regular monitor of the situation kept until resolution of the fault.
- Provide an effective emergency response within 4 hours.
- Evaluate and respond to written enquiries within 5 working days from receipt.

A comprehensive listing of all types of call and their respective priority rating is shown in the table below. Responses are classified into 2 categories as follows:

PRIORITY 1 – EMERGENCY (matters that require immediate attention)

PRIORITY 2 – ROUTINE (matters that require to be notified to the Street Lighting Office at the start of the next working day)

STREET LIGHTING				
ACTIVITY	**PRIORITY**	**SERVICE REQUEST**	**PASS TO**	**COMMENTS**
Street Lighting	1	Lighting column, control pillar or lit sign pole damaged by vehicles.	Standby Operative called out to attend	
	1	Loose lanterns brackets, signs likely to fall and endanger the public.	Standby Operative called out to attend	
	1	Damage to lighting cables or overhead Lines	Standby Operative called out to attend	
	1	Lighting column or control pillar or lit sign pole door off/ missing and wiring disturbed.	Standby Operative called out to attend	
	1	Groups or single lights out reported by the Police	Standby Operative called out to attend	Only at the request of the Police
	1	Reports of Columns corroded, likely to fall and endanger the public	Standby Operative called out to attend	
	2	Equipment loose/ bracket swung round but unlikely to fall or endanger public	The Street Lighting Partnership Depot Office next working day	
	2	Groups or single lights out reported by the Public		
	2	Mandatory lit signs and bollards		
	2	Lighting continuously on		
Illuminated Traffic Bollards	1	Bollard base unit damaged / Uprooted and wires exposed	Standby Operative called out to attend	
	2	Bollard shell missing	The Street Lighting Partnership depot office next working day	

4. ASSET PERFORMANCE

Asset performance is measured using a suitable suite of APSE (Association for Public Service Excellence) and SCOTS (Society Chief Officers Transportation Scotland) Performance Indicators (PIs). These PIs grouped under applicable categories are shown in the table below with our council's results over the last four years.

- Indicators: Mandatory Indicator; - all authorities should provide this data.
- Statistic: Other Important asset performance data that authorities should also consider collecting.

Table 4.1 APSE/SCOTS Performance Indicators - Yearly Trend Comparison

	PI Ref:	SCOTS / APSE PI Description	Base Year 2000/01	Council Results			
				2012/13	2013/14	2014/15	2015/16
Safety	Stat	Total number of street lights	Not dev	24,591	25192	24125	25492
	Stat	Total number of street lighting columns	Not dev	23,183	23996	24403	24610
	39	Percentage of columns with a valid Structural Test Certificate	Not dev	54.23%	50.6%	73.39%	No data
	40	Percentage of street lights with a valid Electrical Test Certificate	Not dev	46.19%	71.9%	88.85%	52.17%
Condition and Asset Preservation	29a	Faults as a percentage of street lighting stock	41.2%	16.94%	14.58%	12.73%	12.36%
	Stat	Percentage of columns which have exceeded their Expected Service Life	Not dev.	37.04%	32.56%	33.12%	27.05%
	Stat	Percentage of lanterns which have exceeded their Expected Service Life	Not dev.	17.67%	15.44%	7.53%	7.88%
	29b	Mean time between failures (MTBF) in years	2.43	5.90	7.14	7.9	8.1
	Stat	Percentage of columns replaced	Not dev.	2.01%	3.46%	3.14%	3.51%
	Stat	Percentage of lanterns replaced	Not dev.	6.23%	0.00%	11.32%	5.04%
Customer Service	3	Percentage of repairs within 7 days	Not dev.	96.00%	94.00%	89.0%	92.3%
	20	Average time taken to repair (elapsed days)	Not dev	3.16	4.09	4.2	3.0
	27	Public calls as a percentage of faults	30.8%	30.72%	30.73%	44.96%	44.27%
	28	Public calls as a percentage of street lights	12.8%	5.21%	4.51%	5.72%	5.47%
	Stat	Percentage of street lights modern white light	Not dev.	58.05%	60.72%	72.7%	74.0%
	Stat	Percentage of street lights which are LED (NEW 13/14)	Not dev.	-	-	15.29%	17.1%
Availability	2b	Percentage of street lights not working as planned on any one evening	Not dev.	0.50%	0.45%	0.41%	0.36%
	Stat	Number of night inspections annually	Not dev.	24	24	24	24

Table 4.1 APSE/SCOTS Performance Indicators - Yearly Trend Comparison							
	PI Ref:	SCOTS / APSE PI Description	Base Year 2000/01	Council Results			
				2012/13	2013/14	2014/15	2015/16
Financial	35	Actual capital investment as a percentage of annual depreciation (from AMP)	Not dev	41.98%	59.74%	48.80%	58.97%
	36	Depreciated Replacement Cost (DRC) as a percentage of Gross Replacement Cost (GRC)	Not dev	47.66%	47.66%	52.04%	51.18%
	33	Average cost (client) of repairing routine faults (eg. component replacement)	£37.79	£29.24	£22.38	£59.58	£80.37
	34b	Individual cost of night inspecting a street light per light	Not dev	£0.03	£0.06	£0.06	£0.04
	42	Revenue allocation per street light excluding electricity costs	Not dev	£25.86	£22.81	£31.76	£58.30
	43	Capital allocation per street light - replacement	Not dev	£31.57	£43.85	£41.96	£46.68
	1c	Total investment in infrastructure per street light	Not Dev	£57.42	£66.66	£73.72	£105.18
	Stat	Percentage Capital allocated to previously unlit areas	Not dev.	0%	0%	0%	0%
	6a	Energy cost per street lamp (NEW)	Not dev.	-	-	-	£47.78
Environmental	18b	Average annual electricity consumption per street light (kWhrs))	Not dev	405.84	409.93	340.22	332.06
	37b	Average annual CO_2 emissions per street light (kg)	Not dev.	218	221.77	181.37	177.02
	38b	Percentage of street lights Dimmable or Part Night Operation	Not dev.	4.09%	6.19%	18.36%	22.06%
	Stat	Change in energy consumption from year to year (kWhr) (NEW13/14)	Not dev.	-	-3.07%	-19.61%	-1.57%

Table 4.2 Benchmarking Comparison with other Cities and Scottish Averages							
	PI Ref:	SCOTS / APSE PI Description	Scottish Average	Council Results 2015-16			
				Dundee	Council A	Council B	Council C
Safety	Stat	Total number of street lights	28608	24610	32724	64410	71147
	Stat	Total number of street lighting columns	27499	25492	30857	58077	68194
	39	Percentage of columns with a valid Structural Test Certificate	43.18%	No data	No data	No data	No data
	40	Percentage of street lights with a valid Electrical Test Certificate	53.13%	52.17%	26.43%	9.37%	17.39%
Condition and Asset Preservation	29a	Faults as a percentage of street lighting stock	15.17%	12.36%	18.08%	No data	18.56%
	Stat	Percentage of columns which have exceeded their Expected Service Life	30.69%	27.05%	26.71%	No data	42.95%
	Stat	Percentage of lanterns which have exceeded their Expected Service Life	26.73%	7.88%	39.24%	No data	52.29%
	29b	Mean time between failures (MTBF) in years	7.3	8.1	5.5	No data	5.4
	Stat	Percentage of columns replaced	1.91%	3.51%	2.51%	No data	0.27%
	Stat	Percentage of lanterns replaced	13.47%	5.04%	4.58%	0%	3.50%
Customer Service	3	Percentage of repairs within 7 days	89.88%	92.31%	58.30%	No data	87.76%
	20	Average time taken to repair (elapsed days)	6.66	3.01	11.47	No data	7.98
	27	Public calls as a percentage of faults	73.09%	44.27%	86.60%	No data	No data
	28	Public calls as a percentage of street lights	11.33%	5.47%	15.66%	24.35%	No data
	Stat	Percentage of street lights modern white light	39.96%	74.04%	47.02%	29.74%	17.59%
	Stat	Percentage of street lights which are LED (NEW)	20.35%	17.07%	3.48%	12.96%	4.35%
Availability	2b	Percentage of street lights not working as planned on any one evening	4.42%	0.36%	9.61%	No data	9.68%
	Stat	Number of night inspections annually	7	24	No data	No data	No data
Financial	35	Actual capital investment as a percentage of annual depreciation (from AMP)	84.9%	58.97%	52.79%	No data	38.63%
	36	Depreciated Replacement Cost (DRC) as a percentage of Gross Replacement Cost (GRC)	49.44%	51.18%	44.41%	No data	43.74%
	33	Average cost (client) of repairing routine faults (eg. component replacement)	£97.17	£80.37	£50.85	No data	No data
	34b	Individual cost of night inspecting a street light per light	£0.056	£0.04	No data	No data	No data

Table 4.2 Benchmarking Comparison with other Cities and Scottish Averages							
	PI Ref:	SCOTS / APSE PI Description	Scottish Average	Council Results 2015-16			
				Dundee	Council A	Council B	Council C
	42	Revenue allocation per street light excluding electricity costs	£38.19	£58.30	£16.93	£246.10	£74.31
	43	Capital allocation per street light - replacement	£43.57	£46.88	£46.63	£22.32	£26.66
	1c	Total investment in infrastructure per street light	£92.35	£105.18	£63.56	£268.42	£100.98
	Stat	Percentage Capital allocated to previously unlit areas	0.14%	0%	0%	0%	0%
	06a	Energy cost per street lamp	£41.97	£47.78	£65.42	£50.98	£58.68
Environmental	18b	Average annual electricity consumption per street light (kWhrs))	357.70	332.06	497.74	436.49	585.80
	37b	Average annual CO_2 emissions per street light (kg)	190.69	177.02	265.34	232.69	312.29
	38a	Percentage of street lights dimmable or part night operation	16.87%	22.06%	5.75%	0.10%	4.33%
	38b	Percentage of street lights dimmable	14.06%	22.06%	5.75%	0.10%	4.33%
	Stat	Change in energy consumption from year to year (kWhr) NEW13/14	-7.61%	-1.57%	-5.10%	3.72%	-0.74%

Table 4.3: Comparison of Measures: Scotland Average verses Dundee City Council (2015/16)			
Measure Description	**Scotland Average**	**Dundee City Result**	**Comments**
Percentage of columns with a valid Structural Test Certificate	43.18%	No data	
Percentage of street lights with a valid Electrical Test Certificate	53.13%	52.17%	Highest in cities family group.
Faults as a percentage of street lighting stock	15.17%	12.36%	Dundee City Council has a lower than average percentage of street lighting faults.
Percentage of columns which have exceeded their Expected Service Life	30.69%	27.05%	This indicates the need to continue investment in infrastructure replacement.
Percentage of lanterns which have exceeded their Expected Service Life	26.73%	7.88%	The investment in new energy efficient street lighting shows a lower than average risk for this part of the lighting infrastructure. Lowest in the cities family group.
Mean time between failures (MTBF) in years	7.3	8.1	Highest in cities family group
Percentage of columns replaced	1.91%	3.51%	Highest in cities family group
Percentage of lanterns replaced	13.47%	5.04%	The result of increased investment due to energy efficiency measures. Highest in cities family group
Percentage of repairs within 7 days	89.88%	92.31%	Highest in the cities family group
Average time taken to repair (elapsed days)	6.66	3.01	Lowest in the cities family group
Public calls as a percentage of faults	73.09%	44.27%	More faults are identified proactively without the public having to report them. Lowest in the cities family group.
Public calls as a percentage of street lights	11.33%	5.47%	Lowest in the cities family group
Percentage of street lights modern white light	39.96%	74.04%	Highest in the cities family group
Percentage of street lights which are LED (NEW)	20.35%	17.07%	Highest in the cities family group although below Scottish average.
Percentage of street lights not working as planned on any one evening	4.42%	0.36%	This is the lowest of all authorities in Scotland and reflects the success of having a night-time repair crew combined with continued night scouting of the asset.
Number of night inspections annually	7	24	
Average cost (client) of repairing routine faults (eg. component replacement)	£97.17	£80.37	

Individual cost of night inspecting a street light per light	£0.056	£0.04	Dundee is the only city to continue to "scout" for faults. The benefit of this is shown in having the lowest percentage of lights dark in any one evening.
Revenue allocation per street light excluding electricity costs	£38.19	£58.30	
Capital allocation per street light - replacement	£43.57	£46.88	
Total investment in infrastructure per street light	£92.35	£105.18	
Percentage Capital allocated to previously unlit areas	3.27%	0%	There is a list of unlit sites which require street lighting investment. Only one authority in Scotland invested in unlit areas in 2015/16.
Energy cost per street lamp	£41.97	£47.78	Whilst higher than the Scottish average, this is the lowest cost within the cities family group. The introduction of LED lighting is driving this cost down year on year.
Average annual electricity consumption per street light (kWhrs))	357.70	332.06	The Introduction of new technologies such as LED has reduced the average annual consumption per street light. Lowest in the cities family group.
Average annual CO_2 emissions per street light (kg)	190.69	177.02	The Introduction of new technologies such as LED has reduced the average CO2 emissions per street light. Lowest in the cities family group.
Percentage of street lights Dimmable or Part Night Operation	16.87%	22.06%	Highest in the cities family group.
Change in energy consumption from year to year (kWhr)	-7.61%	-1.57%	Investment in new LED lighting is driving down energy consumption.

Headline Results for Dundee City 2015/16

Scottish Cities Comparison

- Dundee City Council consumes the least amount of electricity annually per street light and has the lowest carbon footprint of any Scottish city.
- The City has the most reliable street lights averaging 8.1 years between repairs.
- In 2015/16 Dundee was able to replace more columns and lanterns than any other Scottish city by continued investment in the street lighting infrastructure.
- Dundee has the highest percentage of dimmable street lights of any Scottish city.

Scottish Councils Comparison

- Dundee City Council has the lowest percentage of streetlights not working as planned on any given night. This is the best performance of all authorities in Scotland and reflects the value of having a night-time repair crew combined with continued night scouting of the asset in providing a service to the residents of the city.

5 ENERGY

The biggest factor influencing future street lighting costs involves the price of electricity. Over the last decade the cost of electricity has increased significantly. The scale of future price

increases is unknown however it is highly probable that energy will become more expensive due to growing competition for resources and increased generation costs. It is therefore prudent to explore options for reducing street lighting energy usage while still maintaining an acceptable level of service for residents, visitors and the travelling public.

Developments in the past 5 years have meant that LED lighting has now become the norm for street lighting in the UK. European directives have also removed a number of materials and equipment from circulation making replacement parts for older lights unobtainable thereby accelerating the move to LED.

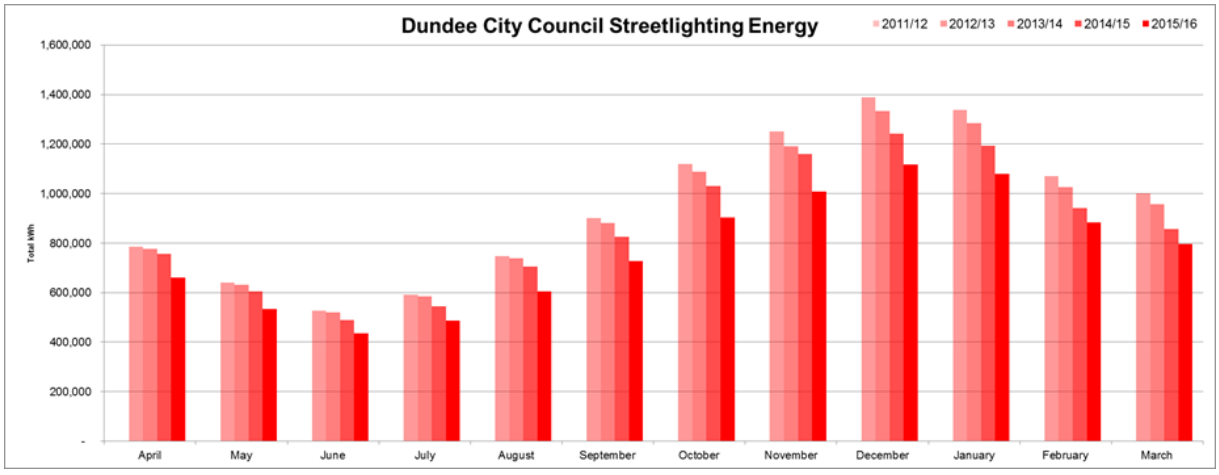
Energy Efficiency

The biggest factor influencing future street lighting costs involves the price of electricity.

Over the last decade the cost of electricity has increased significantly and current DEC forecasts predict a doubling of costs over the next 10 years. If this trend was to continue (with no reduction in street lighting energy demand) then this could add substantial costs to the street lighting service budget over the next 20 years.

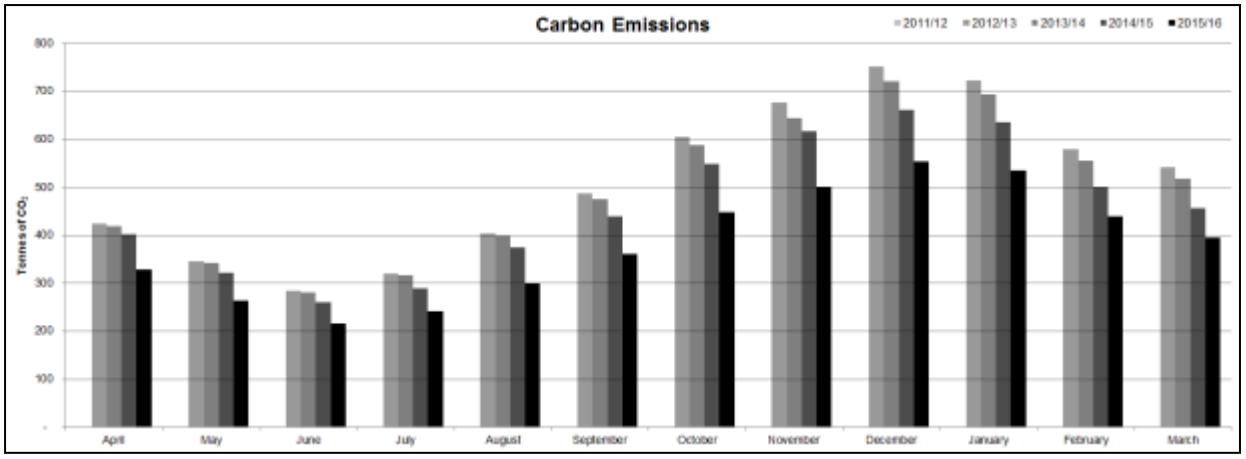
The scale of future price increases is unknown. It is however highly probable that energy will become more expensive due to growing competition for resources and increased generation costs. It is therefore prudent to explore options for reducing street lighting energy usage while still maintaining an acceptable level of service for the residents and travelling public.

In order to combat these increases, the Council has invested in replacing older, less efficient lighting with LED. We now have 4200 Led fittings throughout the city which equates to 17% of the lighting stock. The graph below demonstrates the effect of this investment on the monthly energy consumption:-



By March 2016, we had reduced our energy consumption by 1,107,563kWhr equating to an 11% saving on the previous years total consumption.

The energy required for street lighting alone produces 4,585 tonnes of CO2 from which Carbon Reduction Commitment (CRC) tax at £15.70/tonne equates to a cost of £71,985.
The Councils Carbon Management plan has a target to reduce carbon emissions by 5% per annum to 2020 and it can be seen from the graph below that investment in good quality street lighting is one way to achieve this:-



Energy Saving Initiatives

As new technologies develop, the Council must be open to trialling and testing these new products. Through pilot schemes and testing the Council can determine which technologies are most suitable and cost effective for use in this area.

The Partnership continually seeks to embrace new technologies. For example, following a successful small trial of a replacement LED lamp in a residential area, tunnel lighting at North Marketgait was refitted with these new lamps producing an immediate 59.7% reduction in energy consumption with no loss of lighting level for the drivers using the tunnel.

6. ROUTINE AND REACTIVE MAINTENANCE

Changes to the equipment specification such as the introduction of LED lighting brings with it benefits in terms of maintenance requirements. LED lighting has a projected lifespan of 20+ years and so it is right to anticipate that as LED becomes more widespread, there will be a reduction in the requirement for reactive maintenance. This does not, however, remove the need for statutory requirements such as electrical testing (see section 7below) and the need to provide a safe, well maintained asset.

Changes to the Traffic Signs and Regulations now enable local authorities to make their own judgement on the illumination of certain signs and bollards on a risk based approach. This requires a significant input in terms of assessing each individual location and determining the Councils liabilities and responsibilities before any savings can be identified and realised. It is intended that in conjunction with the forthcoming 20mph pilot scheme in the city, such changes can be investigated and trialled if necessary to inform future choices.

7. INSPECTION AND TESTING REGIMES

Electrical Inspection and Testing is governed by the IEEE wiring Regulations and, as such, are required to be carried out on a 6 yearly cycle. There is no scope for reducing this vital element of maintenance.

Inspection and testing activities for street lighting comprise:

- 6 yearly electrical safety inspection and testing
- Structural testing – Period between tests is determined by the results of the previous inspection and any subsequent damage or deterioration.

Forward capital investment programmes are then informed from the results of these tests.