ROADS INFRASTRUCTURE

Status and Options Report 2015

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Executive Summary

1.0 Introduction

1.1 The Annual Status and Options Report is a product of our Road Asset Management Plan, which records the level of service that the council is aiming to achieve and provides a means of identifying and prioritising the overall funding needs of our road assets.

1.2 This Report summarises the status of our road assets in terms of size, value and condition and presents a number of investment options for our major road assets. The options presented and issues raised are designed to assist with the budget setting process.

1.3 Asset groups considered are; Carriageways, Footways, Lighting, Bridges & Structures, Street Lighting and the Clyde Tunnel. Land and Environmental Services has conducted an extensive programme of inventory collection and condition assessments over the course of the past six years. The information collected gives an accurate picture of the extent of the city's roads infrastructure and the impact recent investment has had on its condition. An accurate record of condition allows us to accurately identify overall funding needs and predict the impact investment options will have on condition.

1.4 Road infrastructure deterioration is slow and often unseen, meaning that the impact of investment cannot be assessed in the short term. The investment options presented consider the projected impact over a 20 year period. This allows decisions to be taken with an understanding of medium and long-term implications.

1.5 The financial tools used to develop forecasts consider the existing condition of our infrastructure and scope the remedial costs of network improvement. It should be noted that no allowance has been made for construction inflation; forecasts are based upon today's prices.

2.0 Current Status & Key Issues

The key issues concerning our major road assets are summarised below. Further detail is provided in the body of the Report.

2.1 Carriageways

The Council has invested an additional £61m in the last five years to improve the condition of our roads. This investment has slowed the overall deterioration of the road network, whilst improving the condition of our main roads. There has also been a significant reduction in the number of reported potholes.

It is important to recognise that although the current investment is optimised, as an ongoing strategy, to control the number of potholes across the city, the overall condition of the road network continues to deteriorate. The deterioration is compounded by increased levels of heavy vehicle and relatively high levels of utility excavations on our city roads. The Road Condition Index indicates that 601km (32.7%) of the road network still requires attention. These weakened roads are vulnerable to rapid deterioration, especially in the event of severe winter weather.

Investing early offers long term cost savings. The options modelled show that effective use of budgets and planned remedial and preventive measures, at the earliest stage of deterioration, is the most cost-effective strategy to maintain our assets. This general principle applies to all assets.

2.2 Footways

Although footway investment has increased in recent years, the level of investment requires to be increased to improve overall condition. There remains a significant length of our footways that are still in a poor condition. These footways expose the council liable to claims for personal injury and contribute to low levels of customer satisfaction. Furthermore, they do not support the Council's aspirations and efforts to promote and increase active travel.

Additionally, there is a significant repair backlog for footways associated with the former Glasgow housing stock. Since this infrastructure is not publicly adopted, it is not included in this Report. Options for maintaining this stock are being investigated.

2.3 Street Lighting

The age profile of Glasgow's lighting infrastructure is a significant issue. There are approximately 30,000 lighting columns and 35,500 lanterns that have exceeded their expected service life. The recent level of investment on lighting infrastructure is significantly below the annual depreciation cost and will not address poor age profile of the lighting assets.

The price of electricity is a significant issue. It is likely that electricity prices will continue to rise significantly in the coming years. Growth rates, between 3.5% and 10%, have been used to measure potential increases in electricity costs, over the next 20 years. If the projected energy cost increases are realised, the Council's annual electricity bill for street lighting could increase from £4.3m (2013/14) up to £7.5m in 5-years, and as high as £26m in 20 years.

Whilst a project to replace 10,000 lanterns with new energy efficient LED lighting has recently commenced, we must maintain investment in this area in order to prevent service failure and to mitigate against future price increases.

2.4 Bridges & Structures

Currently there are traffic restrictions on weak bridges as a measure to reduce loadings. The effect is significant, due to disruption to traffic flow and increased maintenance costs.

57 bridges and structures have been identified for strengthening and parapet improvements works. The estimated value of this work is £36m. In addition, there is a maintenance backlog for our structures assets; the cost of this backlog of work is £41.3m.

2.5 Traffic Signals

The current level of investment on traffic systems is significantly below the annual depreciation figure. Without significant investment these assets will continue to depreciate.

Sustained investment would bring traffic signal assets up to industry standards and delivers cost efficiencies in terms of power consumption and maintenance in the longer term.

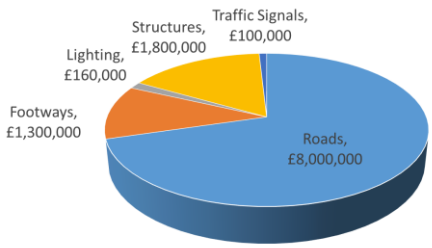
2.6 Clyde Tunnel

The Clyde Tunnel and its approaches (including the Shieldhall viaduct) are currently designated as local roads, rather than trunk roads, and are thus under-funded. Given the economic and strategic importance of this asset, engagement with the Scottish Government, to provide a sustainable funding option, is essential to the continued safe operation of the asset.

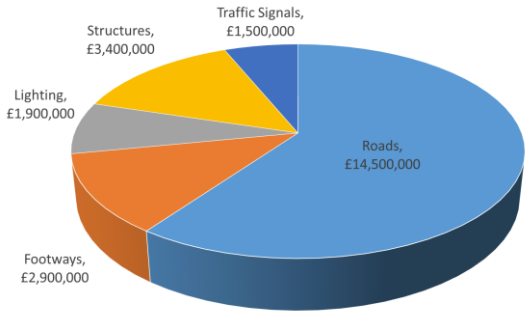
The current Grant Aided Expenditure allocation of £88k per annum is significantly below the required cost of operating and maintaining the asset. The funding required is £950k per annum. In addition, there is a requirement for £25m of essential capital investment over the next 10 years. Details and future funding options are detailed later within this report.

3.0 Level of Investment

3.1 The predicted impact that differing levels of investment would have on our road assets is discussed later within this report. The charts below summarise the current level of investment and the investment required to maintain the current condition.



Current Investment - £11.36m



Steady State Investment - £24.2m

3.2 The table below summarises investment options that improve the condition of our road assets.

Asset Group	Investment Option	Comment
Carriageway	5-year (£110m) Improvement Plan	An annual capital investment of £22m would lead to significant improvement, with 85% (currently 67%) of our roads in good condition after 5 years. Investment levels of £9.3m, per annum, would be required to maintain this condition)
	10-year (£180m) Improvement Plan	An annual capital investment of £18m would lead to significant improvement, with 85% (currently 67%) of our roads in good condition in 10 years. Investment levels of £9.3m, per annum, would be required to maintain this condition.
Footway	5-year (£22.5m) Improvement Plan	An annual capital investment of £4.5m would eliminate all major defects after 5 years, with 10% of our footways having minor defects.
	10-year (£39m) Improvement Plan	An annual capital investment of £3.9m would eliminate all major defects after 10 years, with 10% of our footways having minor defects.
Street Lighting	£3.9m per annum	A substantial improvement in condition is achieved after 9 years (2023), with only 5% of columns exceeding the expected service life after 20 years.
	£2.5m per annum	A steady improvement in condition is achieved annually, with approximately 15% of columns exceeding the expected service life after 20 years.
Traffic Signals	4-year (£39m) Improvement Plan	This option would bring traffic signal assets up to industry standards and delivers cost savings in terms of power consumption and maintenance in the longer term
Structures	£6.9m per annum	This option will improve the overall condition of the City's road structures, remove traffic / load restrictions from bridges and reduce the cost of maintenance in the long term.
Clyde Tunnel	£950k per annum and £25m capital.	This level of investment would maintain the operation of the asset and address the essential maintenance required.

ROADS INFRASTRUCTURE

Status and Options Report 2015

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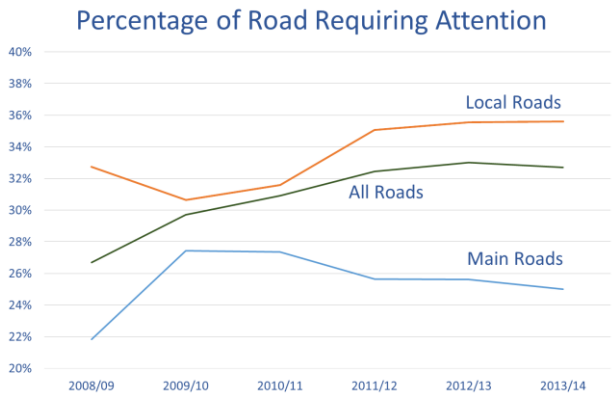
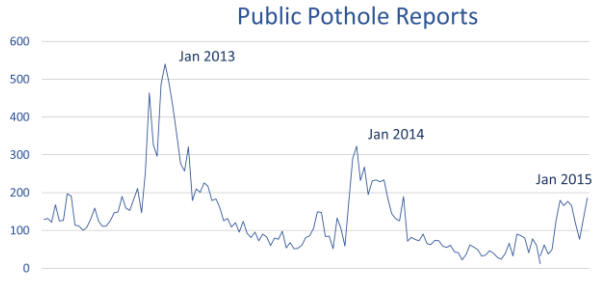




1.0 CARRIAGEWAY STATUS

Road Length

A Class Roads	191 km
B Class Roads	72.5 km
C Class Roads	245 km
Unclassified Roads	1,328 km
Total Road Length	1,837km

Road Condition

Road condition is measured by the Scottish Road Maintenance Condition Survey (SRMCS) that assesses parameters such as, smoothness, rutting, surface texture and surface cracking. This provides an indication of the residual life of the road structure.

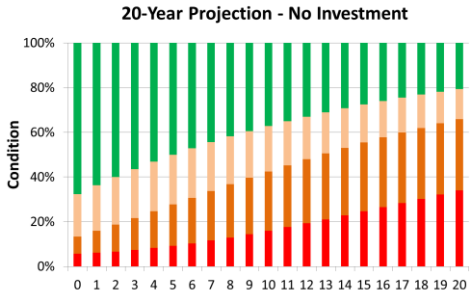
The Road Condition Index (RCI) is a measure of the percentage of our roads that require attention. The RCI graph to the top left shows the trend over the last 6 years, for main and local roads.

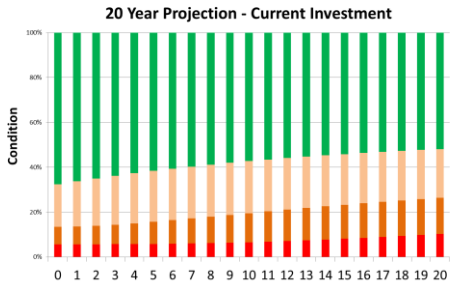
The overall condition of the road network continues to deteriorate due to historical under investment in Roads across the UK. Recent investment has halted the rate of decline, with a measured improvement in the condition of main roads seen since 2011.

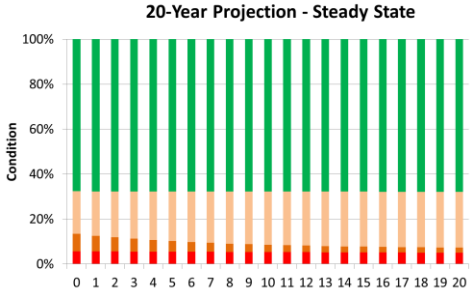
Customer Satisfaction

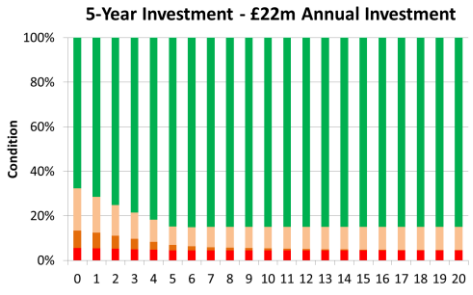
Customer satisfaction levels remain low. Targeted investment to permanently repair potholes, first time, and higher levels of investment have resulted in a sustained decline in the number of public pothole reports and a consequential increase in levels of customer satisfaction, over the past three years.

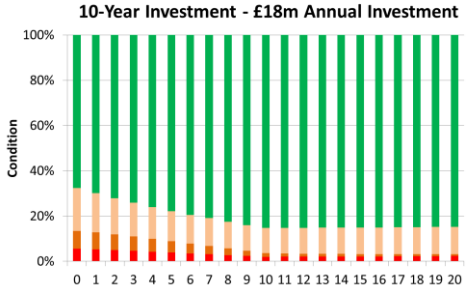
Gross Replacement Cost - £2,929m











2.0 CARRIAGEWAY INVESTMENT OPTIONS

Option 1 - NO INVESTMENT

Zero investment would lead to severe deterioration, with 79% of our roads requiring attention after 20-years. The volume of reactive temporary repairs would rise rapidly, year on year, as would public liability claims. Customer satisfaction levels can be expected to decrease significantly.

Option 2 - CURRENT LEVEL OF INVESTMENT

An annual capital investment of £8m would lead to sustained deterioration, with 48% of our roads requiring attention after 20-years. The volume of reactive temporary repairs would steadily rise, year on year, as would public liability claims. Customer satisfaction levels can be expected to steadily decrease.

Option 3 - STEADY STATE

An annual £14.5m capital investment would maintain existing Road Condition of 32%. The volume of reactive temporary repairs, public liability claims and levels of customer satisfaction can also be expected to be maintained. The overall condition of our roads is worse than 2008 and is vulnerable to significant deterioration in the event of a severe winter.

Option 4 - £110M INVESTMENT OVER 5 YEARS

An annual capital investment of £22m would lead to significant improvement, with 15% of our roads requiring attention after 5 years. The volume of reactive temporary repairs would significantly reduce, as would public liability claims. Customer satisfaction levels would improve significantly.

Option 5 - £180M INVESTMENT OVER 10 YEARS

An annual capital investment of £18m significant improvement, with 15% of our roads requiring attention after 10 years. The volume of reactive temporary repairs would significantly reduce, as would public liability claims. Customer satisfaction levels can be expected to improve significantly.

3.0 CARRIAGEWAY KEY ASSET ISSUES

Structural Vulnerability

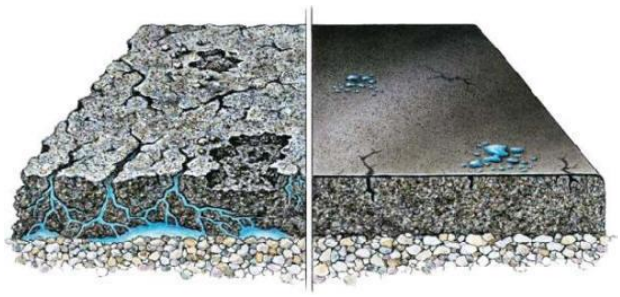
The underlying structural condition remains a concern, with 601km of our road network vulnerable to deterioration, especially in the event of severe winter weather. Our roads remain ahead of the Scottish average, although the gap is closing.

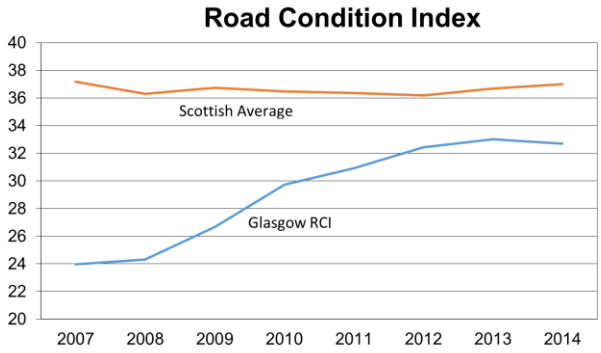
Unclassified Roads

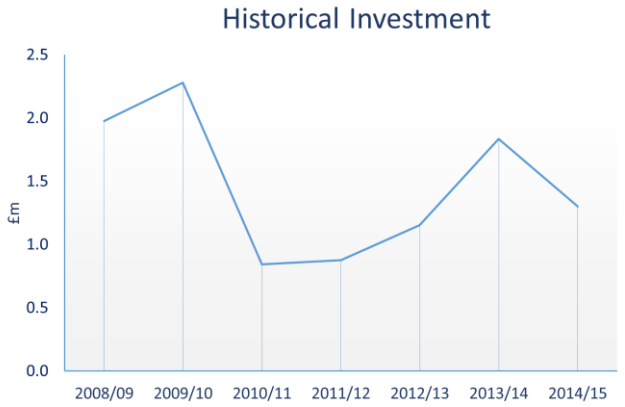
The condition of roads in residential areas is attracting increasing concern. The Road Condition Index for residential U class roads is 36% compared to 28% for A-class roads.

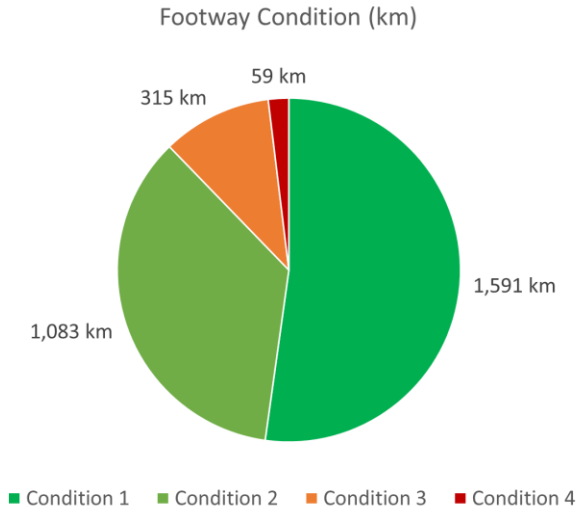
Level of Investment

Recent investment has not been sufficient to curtail a decline in the overall condition of the network.









4.0 FOOTWAY STATUS

Footway Length

Bituminous	2,863 km
Slabs / Flags	48 km
Natural Stone	36 km
Concrete	76 km
Blocks	24 km

Total Footway Length = 3,046 km

Footway Condition

88% of the overall footway network is currently maintained at a satisfactory condition.

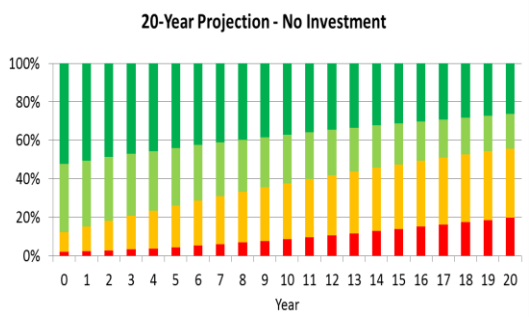
Good Condition	52.21% (1,591 km)
Acceptable Condition	35.54% (1,083 km)
Minor Deterioration	10.32% (315 km)
Major Deterioration	1.93% (59 km)

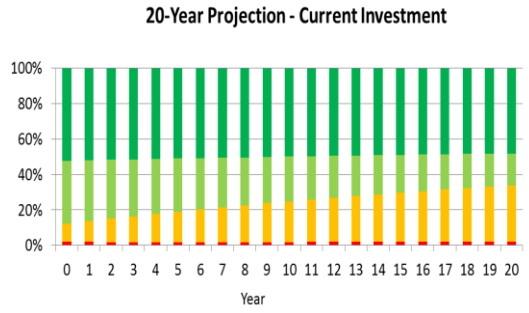
The chart to the top left shows investment on planned footway improvements over the last five years. Investment has reduced sharply after a steady three-year rise, and remains below the levels required to maintain the existing condition.

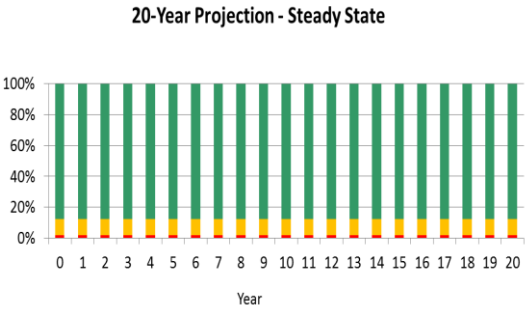
Customer Satisfaction

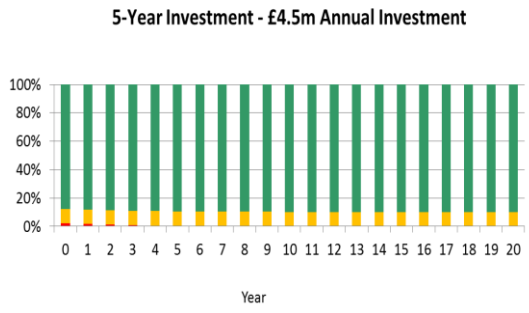
Recent improved condition as a result of increased investment has assisted in improving customer satisfaction levels since 2011. A strategic focus on city centre public realm areas and cost-effective Early Intervention Treatments (EITs) in residential streets have had a particular positive impact. Customer satisfaction is significantly higher than carriageways.

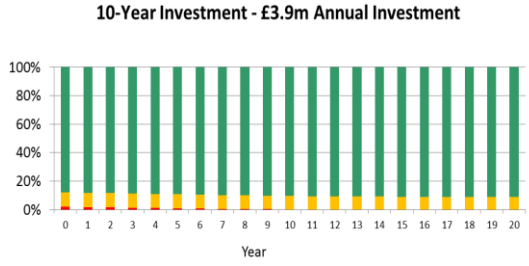
Gross Replacement Cost - £668m











5.0 FOOTWAY INVESTMENT OPTIONS

Option 1 - NO INVESTMENT

Zero investment would lead to severe deterioration, with 56% of our roads requiring attention after 20-years. The volume of reactive temporary repairs would rise rapidly, year on year, as would public liability claims. Customer satisfaction levels can be expected to decrease significantly.

Option 2 - CURRENT LEVEL OF INVESTMENT

An annual investment of £1.3m would lead to sustained deterioration, with 34% of our roads requiring attention after 20-years. The volume of reactive temporary repairs would steadily rise, year on year, as would public liability claims. Customer satisfaction levels can be expected to steadily decrease.

Option 3 - STEADY STATE

An annual £2.9m investment would maintain the proportion of footways requiring attention at 12%. The volume of reactive temporary repairs, public liability claims and levels of customer satisfaction can also be expected to be maintained.

Option 4 - £22.5M INVESTMENT OVER 5 YEARS

An annual capital investment of £4.5m would eliminate all major defects after 5 years, with 10% of our footways having minor defects. The volume of reactive temporary repairs would significantly reduce, as would public liability claims. Customer satisfaction levels would improve.

Option 5 - £39M INVESTMENT OVER 10 YEARS

An annual capital investment of £3.9m would eliminate all major defects after 10 years, with 10% of our footways having minor defects. The volume of reactive temporary repairs would significantly reduce, as would public liability claims. Customer satisfaction levels would improve.

6.0 FOOTWAY KEY ASSET ISSUES

Major Defects

There remains a significant length (59km) of our footways that have major defects. These defects leave the council liable to claims for personal injury and are the cause of low levels of customer satisfaction.

Investment

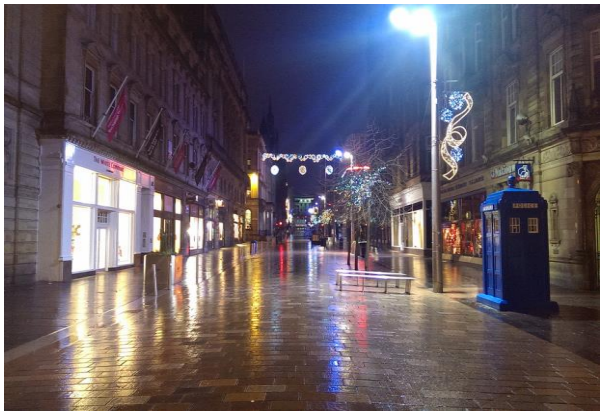
Although investment in improving the condition of our footways has increased in recent year, the level of investment remains below the level required to improve condition.

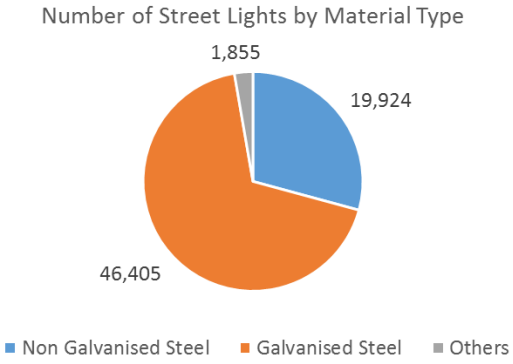
Ex-Glasgow Housing Stock

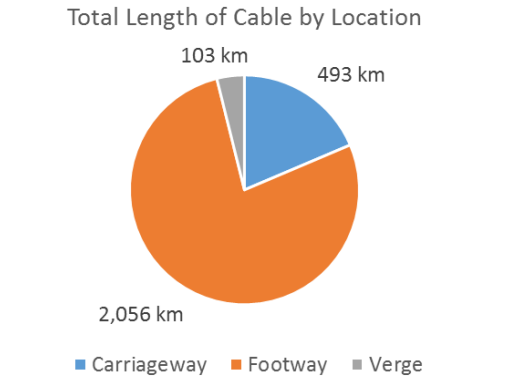
There is a significant repair backlog of ex-Glasgow housing stock. This infrastructure is not included in the status and options report. Future maintenance options are currently being investigated.

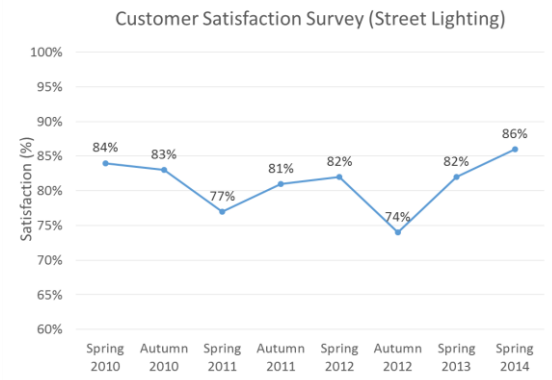
Priorities

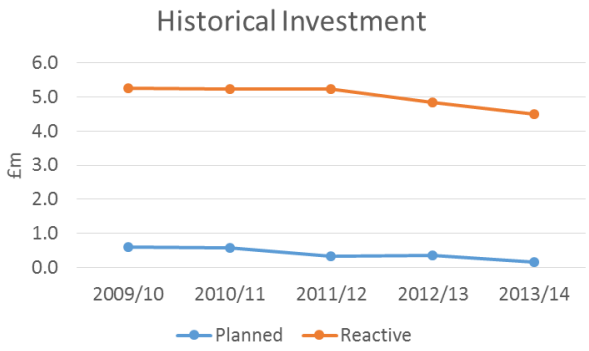
Our condition data allows a more targeted approach. The main areas of focus for planned investment are the city centre footways and the worst residential areas.











7.0 LIGHTING STATUS

Lighting Assets

Lighting Columns	68,184
Cable Length	2,652km

Condition

A structural testing programme is ongoing to identify columns in poor condition for replacement. An electrical test and inspection programme is now in place, which includes circuit and control pillar test details and circuit schematic diagrams. It is intended to carry out cyclic inspections over a 6-year cycle.

Over 45% of our lighting columns have exceeded their service life, compared to the Scottish average of 29.4%.

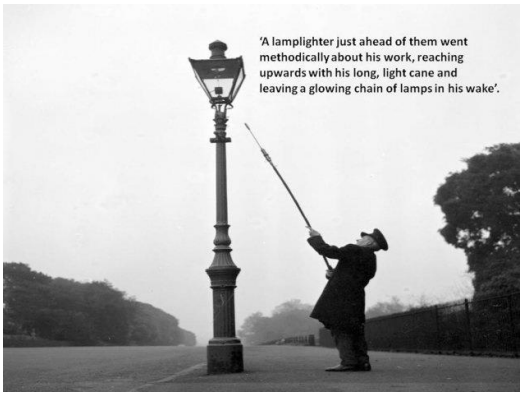
Approximately 52% of lanterns exceed their expected service life.

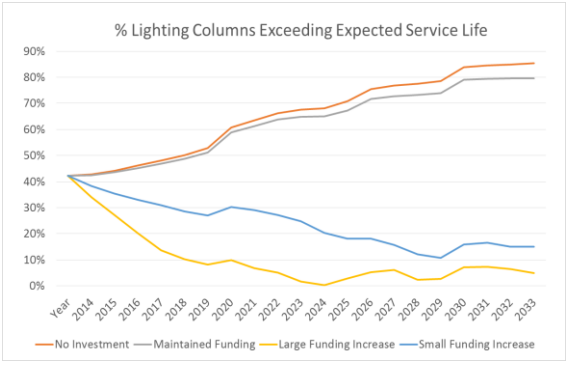
A programme to replace 10,000 lanterns with new energy efficient (LED) luminaires, over a two year period, has commenced. After this initial programme, over half the remaining columns will be unsuitable for retro-fitting lanterns.

Customer Satisfaction

Customer satisfaction levels are relatively high when compared to roads and footways, reaching a high of 86% in 2014.

Gross Replacement Cost - £169m





8.0 LIGHTING INVESTMENT OPTIONS

Option 1 - No Investment

Zero investment would mean significant risk of structural failure (column collapse) and a substantial increase in reactive repairs, with 85% of columns exceeding the expected service life after 20 years. Customer satisfaction levels can be expected to decrease significantly.

Option 2 - Current Level of Funding - £160k per annum

The age profile will continue to deteriorate. This level of investment continues to present a risk from structural column failure, with approximately 80% of columns exceeding the expected service life after 20 years. Customer satisfaction levels can be expected to decrease significantly and reactive repairs will increase annually.

Option 3 - £3.9m per annum over 20 years.

A substantial improvement in condition is achieved after 9 years (2023) which will significantly reduce the risk of structural column failure, with approximately 5% of columns exceeding the expected service life after 20 years.

Option 4 - £2.5m per annum over 20 years

A steady improvement in condition is achieved annually which will significantly reduce the risk of structural column failure, with approximately 15% of columns exceeding the expected service life after 20 years.

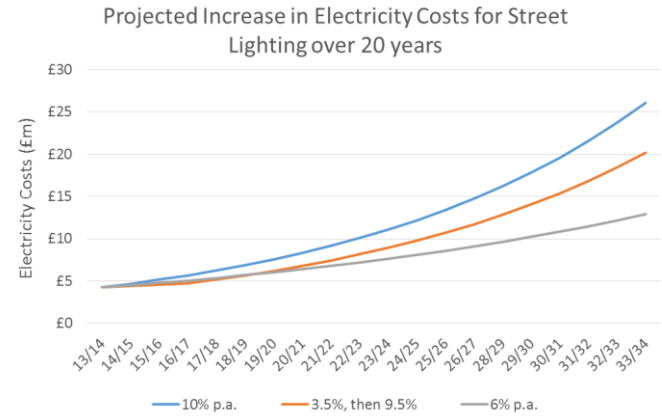
The luminaire / lantern age profile will also improve, if there is an increase in spend on column replacement, as the lanterns are renewed at the same time. Any increase in funding would be targeted at the oldest installations.

9.0 LIGHTING - KEY ASSET ISSUES

Energy Prices

The biggest factor influencing street lighting is the price of electricity. Over the last decade the cost of electricity has increased significantly. It is likely that electricity prices will rise significantly in the coming years. If the recent trend is to continue, the additional cost to the street lighting service is significant.

In the graph opposite, growth rates between 3.5% and 10% are used to illustrate potential increases in electricity costs, over the next 20 years.



If the projected energy cost increases are realised, the energy bill could increase significantly, from £4.3m (2013/14) up to £7.5m in 5-years and as high as £26m in 20 years.

Energy Efficiency

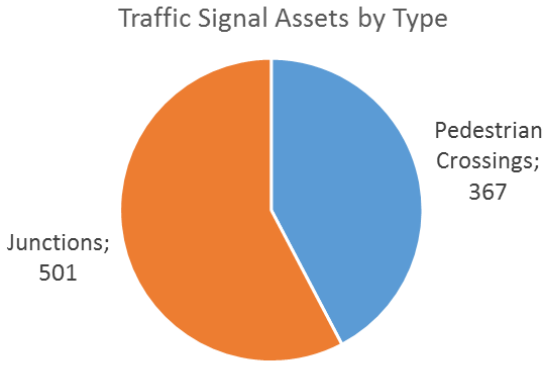
Approximately 69% of the remaining Low Pressure Sodium luminaires (orange-coloured lamps) have exceeded their expected service life and the replacement of these luminaires is a high priority for future maintenance programmes.

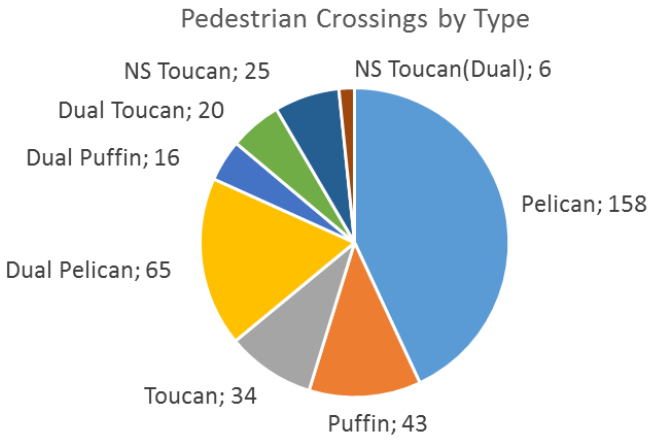
It is important to explore options for reducing street lighting energy usage that will protect the Council against predicted energy cost rises. There is also the possibility of an additional cost due to the introduction of the CRC (Carbon Reduction Commitment) which is currently exempt, but involves a £16 charge per tonne of CO2. The proposed lantern replacement project, with energy efficient (LED) lanterns, will contribute towards the Councils Carbon Reduction Commitment by delivering a reduction in energy usage and carbon emissions.

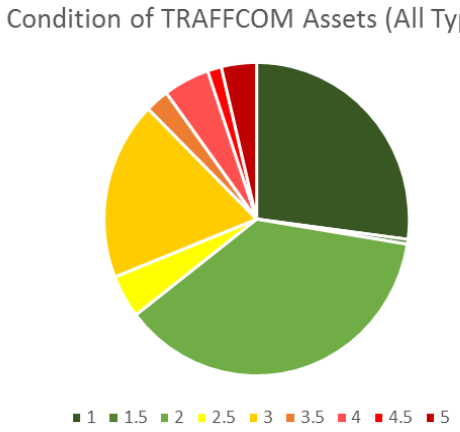
Consideration is being given to utilising new lighting technologies that reduce energy consumption and carbon emissions, while maintaining an acceptable level of service for the residents and travelling public.

Level of Investment

The age profile of Glasgow's lighting hardware is a significant issue. There are approximately 30,000 lighting columns and 35,500 lanterns that have exceeded their expected service life. The existing level of investment on hardware does not address the ageing profile of the lighting assets.







10.0 TRAFFCOM STATUS

(TRAFFIC CONTROL AND MANAGEMENT)

Traffic Signal Assets

The charts to the left provide a summary of the TRAFFCOM inventory.

Explanation of Types

Pelican crossings feature poles with a standard set of traffic lights facing vehicular traffic, a push button and two illuminated coloured pictograms facing the pedestrian from across the road.

Puffin crossings have lights for pedestrians on near side of road (rather than opposite side, as in the older pelican crossing it replaces).

Toucan crossing: Pedestrian and bicycle crossing - “two can cross”.

Condition

As part of the current maintenance contract, during ‘Period Inspections’, the traffic signal maintenance contractor gives the main items of equipment a scoring from 1 to 5 based on condition, with 1 being recently installed and 5 being old and in need of replacement.

The condition of the TRAFFCOM assets (controllers, poles, heads, cable, haldo/mains pillars, and tactile paving) can be seen in the chart to the left.

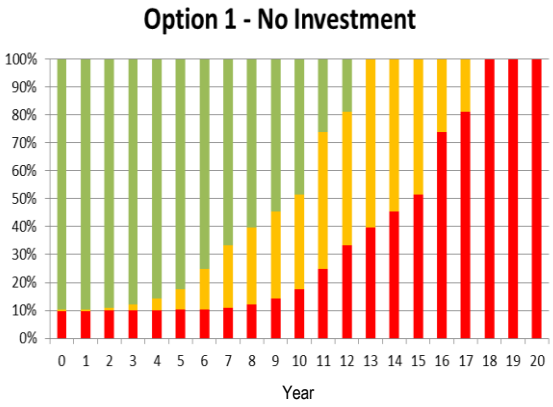
Two-thirds of assets are currently considered to be in good condition.

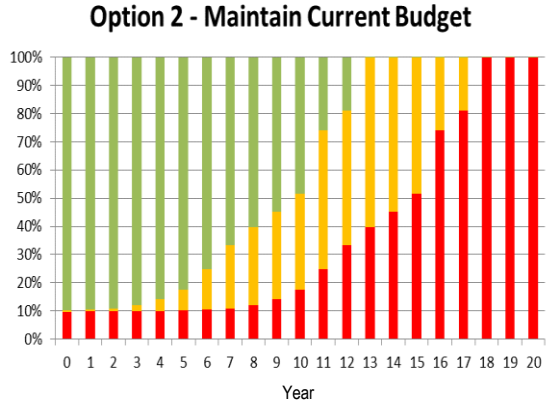
24% of assets are in fair condition and may need attention in the coming years.

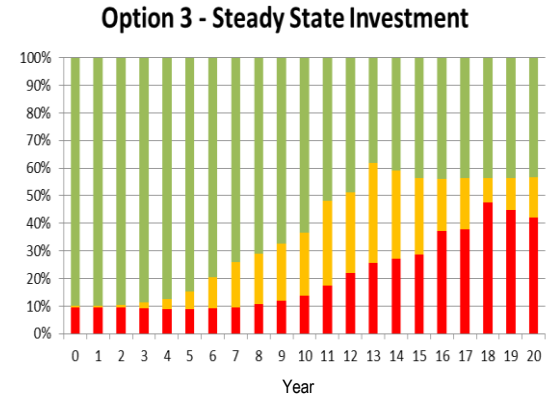
Approximately 10% of assets are currently considered to be in poor condition and in need of replacement.

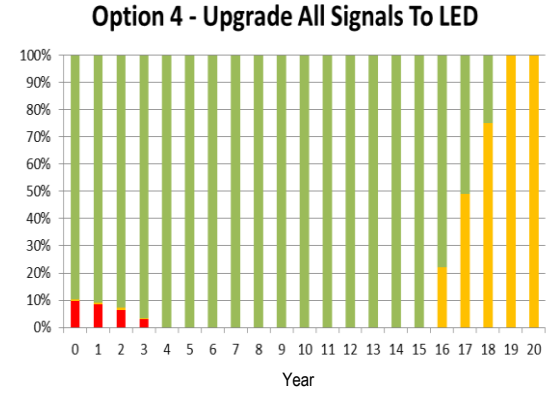
Gross Replacement Cost - £44.6m

Key: Good / Fair / Poor condition









11.0 TRAFFCOM INVESTMENT OPTIONS

Option 1 - No Investment

Zero investment would see a significant deterioration in condition. The rate of deterioration accelerates beyond year 4, with the cost of reactive maintenance increasing significantly and all traffic signal assets in a poor state of repair after 20 years. Currently, there are no 3rd Party Claims for the traffic signal asset. There is a high risk of 3rd party claims beyond year 10.

Option 2 - Maintain Current Budget

£100k pa. Reactive maintenance increasing annually. Rate of deterioration accelerates beyond year 4. The cost of reactive maintenance will increase significantly, with a high risk of 3rd party claims beyond year 10.

Option 3 - Steady State Investment

£1.5m pa. Reactive repairs remain similar over time. Energy cost should reduce as the assets are upgraded to LED.

Option 4 - Upgrade to LED

Approx. £39m to bring assets up to industry standards over three/four years. This option delivers cost savings in terms of power and maintenance by converting from (old) incandescent technology to (new) LED technology. The infrastructure will look better and perform better. This proposal is flexible in scale and scope, to suit funding.

The existing Tungsten Halogen lamps perform poorly on an energy rating and on whole life costs.

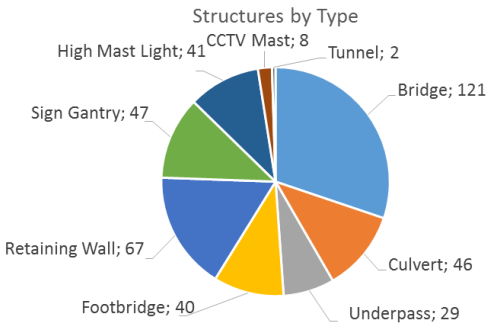
12.0 TRAFFCOM - KEY ASSET ISSUES

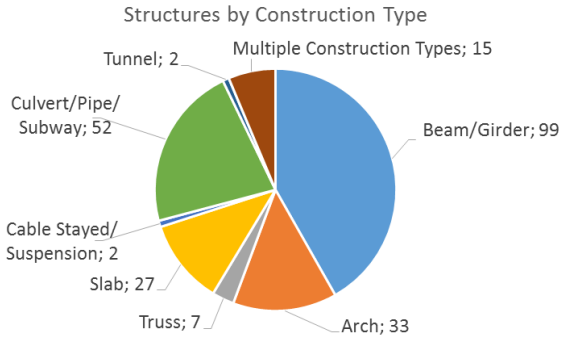
Level of Investment

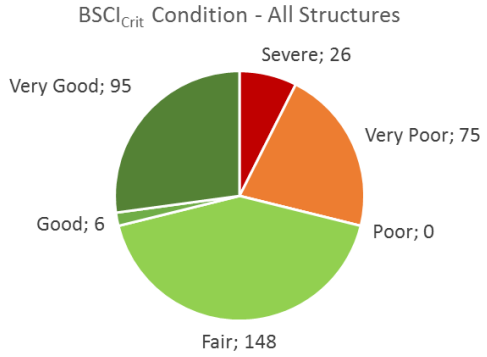
The current level of investment on traffic systems is significantly below the annual depreciation figure. Without significant investment these assets will continue to depreciate. As traffic signals (junctions and pedestrian crossings) account for the vast majority of TRAFFCOM equipment, and associated maintenance costs, they are the focus of this report. In addition, due to the age of some traffic signal installations, signals failures has added pressure on the revenue budget.

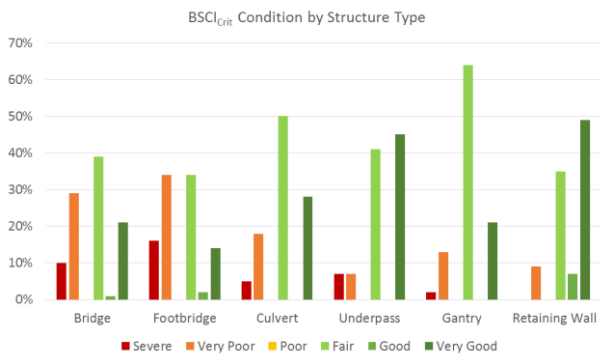
Key asset issues are summarised as follows:

- The communications network is nearing the end of its serviceable life;
- Traffic signals failing electrical testing;
- Increase in faults;
- Signal controllers failing;
- Corroded poles;
- Sites not complying with Disability Discrimination Act (DDA) requirements;
- Cable failures.









13.0 STRUCTURES STATUS

Assets

121 Road Bridges	40 Footbridges
67 Retaining Walls	29 Underpasses
46 Culverts	47 Sign Gantries
41 High Mast Lights	08 CCTV Masts

There is one footbridge under construction.

Condition

Our bridges and structures are inspected and assessed in compliance with the Management of Highway Structures Code of Practice.

20 council owned/maintained bridges failed strength assessment. 65 privately owned bridges, that form part of the public road network, failed strength assessment (most are owned by Network Rail, who have a limited liability for the load carrying capacity of their structures).

The latest Bridge Stock Condition Index (overall condition) indicates the bridge stock is in a fair condition. Some bridges present a risk to public safety without mitigation measures. Structures with a low condition score have been identified and mitigation measures are in place. Refurbishment works are required to remove the mitigation measures in place (i.e. lane restrictions).

The 'critical condition index' of structures stock, taking into account critical structural elements, is 'Poor'.

Structures in 'Very Poor' condition or lower have been investigated and remedial works prioritised.

Gross Replacement Cost - £675m

14.0 STRUCTURES INVESTMENT OPTIONS

Option 1 - Maintain Current Level of Funding (£1.8m per annum)

The current level of funding is insufficient to maintain the existing condition. The average annual budget, for the last 6 years, was £1.8m. With this level of investment, the stock will deteriorate. This baseline option is predicted to result in increased reactive repairs and reduced levels of customer satisfaction, as a result of further lane/road closures.

Option 2 - Steady State (£3.4m per annum)

The average annual investment to maintain the assets in a 'steady state' condition is £3.4m. If this option is adopted, the overall condition of the structure stock will not deteriorate. Existing measures, such as lane and weight restrictions, will remain. The ongoing implications of the critical stock condition are outlined in the table below.

Option 3 - Improvement Plan (£6.9m per annum)

To enhance the condition and performance of the structures stock, including upgrading, would require an average annual budget of £6.9m. Using this option whole life cost will be minimised while prioritising the required levels of performance, i.e. removal of traffic restrictions band. This option is the best value and would shift the Critical Stock Condition into the 'Fair' condition category.

Overall structures stock is categorised as in Fair Condition (some structures may be in a severe condition) and Critical Condition (a significant number of structures may be in severe condition). Increased funding beyond the steady state level would be necessary to improve the overall condition of structures stock; if steady state investment is not provided then there is potential for a rapid decrease in condition. Our strategy is to ensure that essential repairs are funded and prioritised with risks assessed and managed. Essential maintenance work comprises the greatest proportion of structures spending.

15.0 STRUCTURES - KEY ASSET ISSUES

Funding Prioritisation

54 bridges and structures have been identified for strengthening improvements. The estimated value of this work is £32.9m. Three structures have been identified for parapet upgrading. The total value of this work is £3.1m. Maintenance needs are prioritised by combining the condition values with network criticality. Timescale of priorities are not specified as they will depend on availability of funding.

Maintenance Backlog

There is a maintenance backlog of £41.3m for our bridges and structures. Currently only urgent maintenance tasks are being progressed. Other tasks are set aside for future programmes when there may be money available.

Ex Housing Stock

Glasgow Housing Association are seeking to add a significant number of retaining walls to the roads structures stock. With no commuted sum for future maintenance, this will have an adverse impact on our maintenance backlog and budget.

Bridge Strengthening

Currently there are traffic restrictions on weak bridges as a measure to reduce loadings. The effect is significant cost to the city due disruption to traffic flow and increased maintenance costs. Funding is required to strengthen those bridges.

Capital Investment

Significant capital investment is required for a number of structures. Shieldhall Overpass remedial works are estimated at £12m, with Finnieston Overpass works estimated to be £2m.

16.0 CLYDE TUNNEL AND APPROACHES

Background

The Clyde Tunnel and its approaches, from the M8 south of the river and along the Clydeside Expressway to the M8 north of the river, are not designated as trunk roads and are maintained by Glasgow City Council.

No special allowance has been made in the Grant Aided Expenditure (GAE) calculation for complex or historic road structures such as the Tunnel which require a higher level of funding and we therefore receive the same amount of funding per kilometre as for a standard stretch of local road.
There are strict regulations on the safety and management of tunnels which require us to maintain a workforce in attendance at the tunnel 24hrs a day. Motorists driving through the tunnel are largely unaware of the complex ventilation systems, communication systems, fire systems and control room staff working in the background to operate the tunnel safely.

An independent study commissioned in 2004, into the economic value of this **busiest stretch of non-trunk road network in Scotland**, clearly states that the Tunnel has regional and national, rather than just local, importance. It also advises that were the Tunnel to be closed there would be severe adverse impact on the movement of goods and people in the west of Scotland. It further stated that the effect on this would be felt in the Clyde valley to the west of the Tunnel and threaten the viability of commerce and industry.

The study concludes:

> *"Whilst the Clyde Tunnel does not form part of the trunk road network, it is clear from the analysis in this report, that it fulfils a strategic function for the Scottish economy. Its role needs to be recognised as such and this suggests that there is a case for capital funding from national rather than local sources."*

Since this report was published there has been further development of the new Southern General Hospital and the SECC/Hydro complex to both the West and East of the tunnel. These developments will attract additional national traffic to the area, strengthening the argument that this road system serves a strategic role. This argument has been presented to and rejected by Scottish Government on three occasions: in 2003, 2009 and 2011.

Costs

The annual cost to Glasgow City Council of operating the tunnel is £950k per annum. In addition to this annual revenue spend, the tunnel and its approaches needs capital investment of £25m over the next 10 years to maintain their safety and availability to the public. £12m of this is required for necessary repairs to the Shieldhall viaduct, a significant tunnel approach structure that is currently subject to weight restriction and needs restoring to full capacity.

The combination of necessary Capital and Revenue funding for these extraordinary road assets cannot reasonably be expected to be funded by the council alone and is estimated to be:-

Capital Investment requirement	**£25.8m**
Annual Revenue requirement	**£0.95m**

The Gap between GAE funding and Operating costs

A very simple calculation was carried out to illustrate the gap between GAE funding and the cost of operating the tunnel.

GAE allocation for the tunnel road length[1]	£87.6k per annum
Actual Revenue cost	£950k per annum
Average Annual capital requirement	£2.58m per annum

Clearly the GAE funding allocation will not cover the actual cost of operating the Clyde Tunnel and providing this service to the West of Scotland area is diverting resources from Glasgow's local roads.

Funding Option: Request additional funds from Scottish Government

Approach Scottish Government again with a new argument for additional funds on the basis that the Clyde Tunnel is not properly accounted for in the GAE formula.

All previous attempts to either reclassify the Clyde Tunnel as a trunk road, and therefore transfer responsibility for its operation and maintenance to Scottish Government, or to make a case for additional funds available to Glasgow City Council have been met with strong resistance. The last approach to David Middleton, Chief Executive of Transport Scotland, was made in 2011.

A new approach should be made with supporting evidence to show that the actual cost of operating the tunnel over the last three years is significantly different from the GAE allocation for it.

[1] We receive £26.36m for Road Maintenance, Winter Maintenance and Lighting. We have approximately 1800km of carriageways, meaning we get approximately £14.6k per km of road. The tunnel and approaches are approximately 3km long in each direction, attracting a total of £87.6k per annum; well short of the £950k actual operating costs

Maintenance Priorities

The current Asset Renewal programme outlines an investment backlog of £13.8m, with £5.3m worth of work needing done now. As you can see from the following summary, many of the high priority items are safety related:

Clyde Tunnel Asset Renewal Programme		
Priority	**EXAMPLES OF REQUIRED WORK**	**Est. Cost**
Very High - Required now	• Provision of **fire evacuation & Emergency Services communications system**: essential life preserving enhancements to comply with International Best Practice • **Replace carriageway lighting** (that is 10 years beyond its 25 year service life) with efficient LED lighting • Replace 30-50 year old **electrical switching installation** that is very fragile, obsolete and liable to fail	**£5.3m**
High (1-3 years)	• Essential **ventilation buildings repairs** that are insecure and prone to storm damage • Renew **tunnel safety systems control equipment and network** that is becoming obsolete • **Replace pedestrian tunnel lighting** (7 years beyond service life) with efficient LED lighting • **Upgrade Cathodic protection system** that prevents corrosion (now at end of service life)	**£2.9m**
	• **Shieldhall flyover** on the South approach to the tunnel is already restricted and requires investment of approximately £12M to restore it to capacity	**£12m**
Medium (3-10yrs)	• Install **heat detectors** in the roof that confirm fire location • **Emergency Escape Route** (EU Directive) • Tunnel **Approach Ramp grouting** • External and internal **extension of CCTV**	**£3.9m**
Low (10 to 20yrs)	• **Resurface pedestrian tunnels** – cycling initiative • **Replacement of fire alarm** • Replacement and refurbishment of **Ventilation fans** • Replacement of end of life **high voltage switchgear**	**£1.7m**
		£25.8m