ANNUAL STATUS AND OPTIONS REPORT

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OCTOBER 2020

Document Control

Document History

Version	Status	Date	Author	Changes from Previous Version
1.0	First Draft	Sept 2020	JMC	Not applicable
1.1	Review	Sept 2020	HON,CR	Additional tables, Photos amend some text. Formatting Etc.
1.2	Final Draft	Oct 2020	JMC	Amendments completed for review
1.3	Final Draft Updated	Oct 2020	JMC	Additional drainage information, update data formatting as required.

Document Control

Version	Status	Date	Comments
1.3	Head of Service Review	Oct 2020	

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Report Content

This report has been compiled based on current available data which may be subject to change as more information becomes available. Where little or no data exists then various assumptions and estimates have been made to provide illustrations or add context to the subject matter. The report provides a snapshot of road infrastructure assets within Argyll and Bute Council based on 2019-20 data for asset condition, previous investment, asset valuation and other relevant information. It provides indicative future investment options for consideration within each asset group based on available information and resource levels to develop same.

MANAGEMENT OF ROADS INFRASTRUCTURE ASSETS

ARGYLL AND BUTE COUNCIL 2020

This is a headline summary on the condition of Argyll and Bute Council Road infrastructure assets. It provides key information on inventory, condition, funding and the growing need for investment to address the maintenance backlog.

Our roads support thousands of journeys every day and are a vital component of a thriving economy for our remote communities. They benefit everyone, socially, commercially, educationally and enable access to the digital network (ie service ducts).

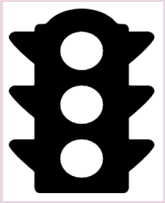
Our roads are currently safe and fit for purpose, although every year we record the poorest condition in terms of the Road Condition Index (RCI) in Scotland. This position on the RCI scale will not change without funding far beyond Argyll and Bute Councils reach. Nonetheless clever use of available capital investment and funding applications over the last decade has achieved marginal improvement over time from RCI 55% (2009) to 54.4% (2019) particularly noticeable on the strategic and timber haulage routes which benefit from external funding (STTS) support.

However, our road infrastructure assets are suffering from long term under-investment creating an aged and deteriorating asset base. The current maintenance backlog for road Infrastructure assets (Roads, Footways, Street lighting, Structures, Traffic Signals & Street Furniture) is circa **£140million**. The annual investment needed calculated as annual depreciation is **£22.9million** (2019/20 asset valuation) with current funding at **£14.1million / Year** (2019/20 Asset valuation).

Essential safety maintenance works on assets are being prioritised on a risk based, worst first basis due to funding constraints leading to more expensive whole life costs. Because we carry out less preventative maintenance, service life cannot be extended, therefore assets in good condition deteriorate further until defects are identified or reported. This cycle happens over time and does not represent good long term value. Policies and maintenance strategies combined with longer term financial planning are needed to break this cycle of under-investment and continued deterioration. This will support corporate objectives and demonstrate better value through well managed assets and is the recommended industry standard.

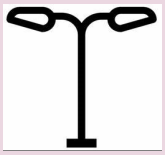
Argyll has over 2280Km of roads, equivalent to driving from Oban to Naples.

Over 900 bridges spanning 5Km equivalent to 10 Queensferry crossings



Only 24 signalled junctions or pedestrian crossings. This is the smallest road asset in Argyll.

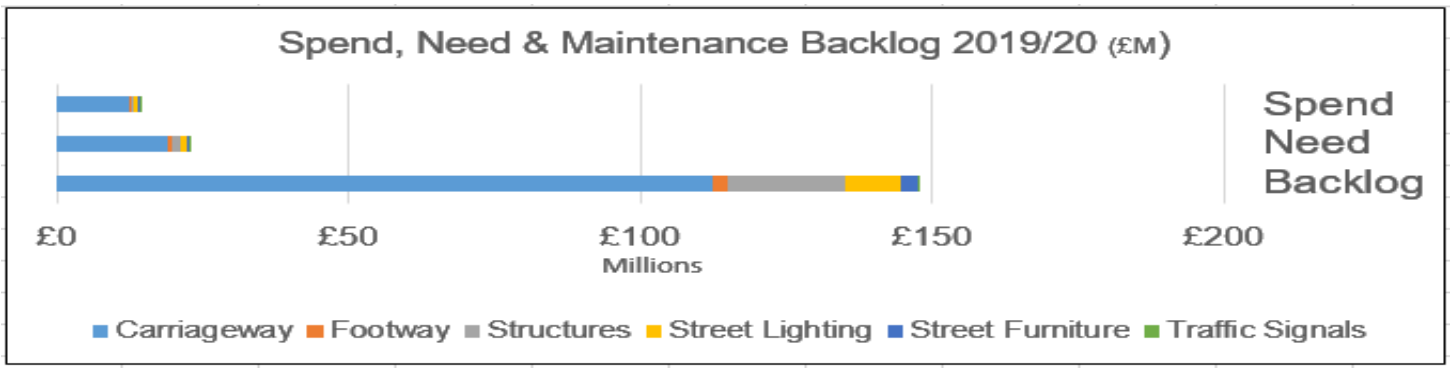
Over 500km of footways, equivalent to the distance from Arrochar to Birmingham.



Over 14,000 Street lights and 450km of cabling using enough energy to power over 1200 homes.

Several thousand street furniture items including over 70km of vehicle safety fencing.

Argyll and Bute Council is driving aspirations for population growth and greater economic activity and have been successful in securing a rural growth deal which aims to attract more visitors and employment opportunities. This is very welcome news, however these objectives need to recognise the corresponding impact on our fragile road infrastructure through greater volumes of traffic. Appropriate investment in road infrastructure assets is needed now to support achievement of council goals and realise the long term benefits to our communities health and well being.



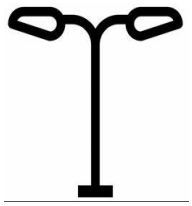
MANAGEMENT OF ROADS INFRASTRUCTURE ASSETS

ARGYLL AND BUTE COUNCIL 2020

A decade of capital investment has provided almost steady state RCI condition through a planned and prioritised programme of works. The maintenance backlog for carriageways is £112m. Revenue funding has reduced to the point where almost all activities are undertaken on a reactive basis, effectively when assets stop functioning. Road maintenance services are stretched to breaking point with resources being swallowed up by intensive reactive maintenance demands. This is a vicious maintenance cycle (ASOR Oct 2015) which requires more focus on delivering a planned programme of preventa tive maintenance works to break the cycle and deliver appropriate level of service standards.

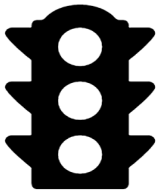
Footways have received minimal investment over time as capital has been prioritised towards the strategic road network. The £1m capital injection over last three years has tackled some of the worst condition with localised areas delivering approx. 3km of refurbished footway. Third party insurance claims have increased from none over three consecutive years to eleven last year. This trend is likely to continue without further investment. Asset valuation is £91.6m with annual depreciation (investment need) calculated as £871k/yr. There is currently no capital investment allocation for 2020/21.

The bridge condition index shows asset condition to have deteriorated over previous years with slight improvement recently due to prioritised repair works. Maintenance backlog is calculated at £20m. There is currently 15 bridges which have acceptable weight restrictions imposed. 28 bridges have failed the European Standard assessment and 23 bridges are subject to special monitoring measures. Asset valuation is £475m with annual depreciation (investment need) calculated as £1.3m/yr. Combined capital and revenue funding is £232k or 18% of annual depreciation.

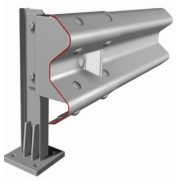


Energy consumption for street lighting has almost halved since the LED replacement project was undertaken. This success has highlighted further necessary works to replace aged columns and update 5th core electricity supply. Now that almost all lighting stock has been replaced with new LED Lanterns, then any reported dark lamp faults provide an indicator of a cabling or supply issue. A business case shall be developed from collated data obtained via LED project to explore future asset needs and investment options going forward.

Street Lighting Columns, some are Pre war and require a replacement programme.



The traffic signal asset condition has recently been surveyed highlighting a substantial number of issues to update and modernise assets to comply with current regulations. This requires the use of specialist contractors through a tendering process to undertake the works. The costs are expected to outweigh the current available budget and will require a prioritised list of works to be compiled in line with available funding.



The extent and condition of our street furniture asset isn`t fully recorded within the asset database. Vehicle safety barriers were assessed in 2015. This showed significant investment is needed to replace existing obsolete, damaged or non-compliant safety fencing. The estimated cost £2.1m far outweighs current budget allocation of £100k. This is a specialist operation requiring the use of external contractors and designers to survey and quantify the works needed to bring the asset up to the required standard.

Climate change has increased annual rainfall and the frequency of severe weather events. Water is the road's greatest enemy and can cause extensive damage very quickly. Funding of £500k was allocated to tackle flooding issues and enhance the gully cleaning operations. This funding is welcome and will allow action to ensure the road infrastructure drainage assets, ditches, gullies and associated pipework are improved. The completed works should be reported on a regular basis to clearly demonstrate prudent stewardship and ensure maximum protection is afforded against the risk of much more expensive damage when severe weather events do occur.

MANAGEMENT OF ROADS INFRASTRUCTURE ASSETS

ARGYLL AND BUTE COUNCIL 2020

Management of Road Infrastructure Assets

Argyll and Bute Council currently manages road infrastructure assets in line with available resources. Resources are very limited, particularly in terms of asset data to support more informed decision making which would reduce reliance on officer knowledge and experience. Robust and reliable asset data is a key driver in realising predictable outcomes through the use of well established asset management processes. It provides decision makers with confidence whilst delivering better value and demonstrating a well managed asset portfolio in line with the SCOTS Asset Management Framework.

Argyll and Bute Council participates in the SCOTS Road Asset Management (RAM) project with all other Scottish Local Authorities. The project facilitates collaboration and development of a consistent asset management approach across Scotland. The project recently commissioned consultants ATKINS to audit authorities progress with developing the SCOTS asset management framework practices. The audit when complete, provides individual authority reports and a national summary report for submission to the SCOTS Executive.

The Argyll and Bute audit draft report was completed in August 2020. The report highlighted a key factor limiting asset management progress was resource constraints. It provided three recommendations that are anticipated to provide significant benefits:

Develop a Data Management Plan.

Focus data collection on business needs, requirements and priorities.

Identifies, risks and supports mitigation

Documents data management processes

- Enables review and auditing of data, systems and processes
- Supports consistency of data collection and management

Provides data ownerships

Promotes continuous improvement

Development of local monitors and KPI's that:

Align with the corporate plan and assist in linking performance across the service to its influence on achieving the corporate objectives / priorities / outcomes.

Link monitors to key risks identified in the Road Asset Management Plan.

Develop an Asset Management Communication plan

Provides key asset management stakeholders

Identifies key stakeholder's asset management knowledge and competency

Stakeholder AM knowledge and competency gap analysis

Stakeholder AM knowledge and competency improvement plan

With suitable resourcing and support from the Senior Leadership team and Members, Argyll and Bute Council can utilise the experience/lessons learnt by neighbouring Scottish Authorities and unlock the benefits of implementing recommended road asset management practices.

1.0 Carriageways

1.1 Road Length

A Class Roads 505.3km

B Class Roads 613.5km

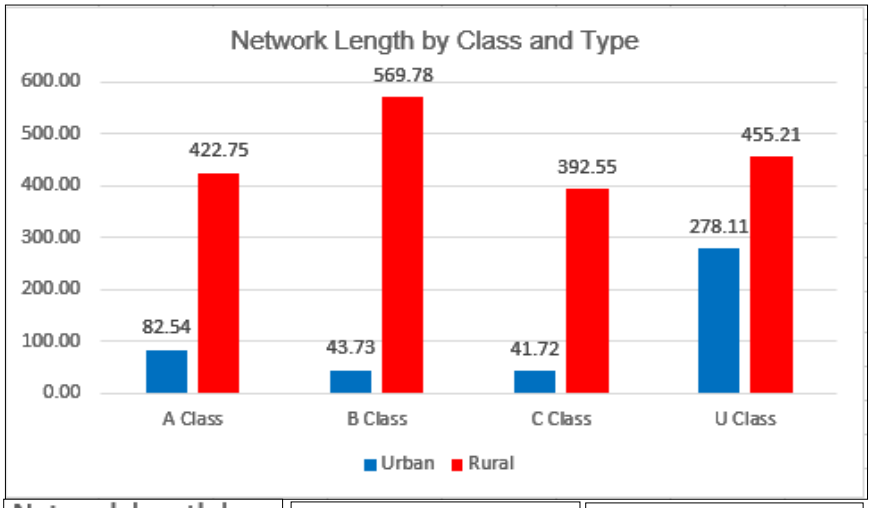
C Class Roads 434.3km

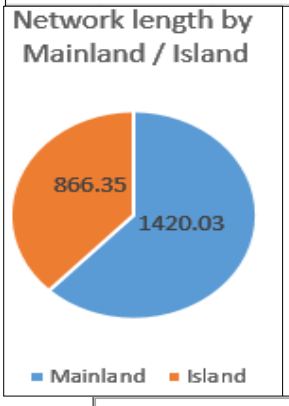
Unclassified Roads 733km

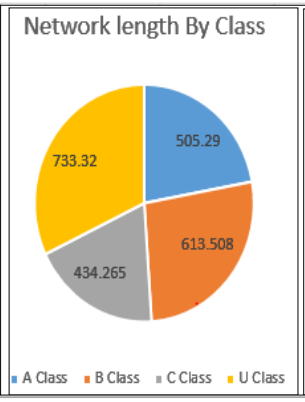
Total Network Length 2286km

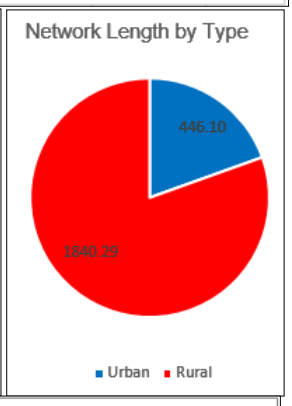
The chart opposite shows that nearly one third of our network is made up of unclassified roads (U Class). Most of the carriageway is rural with over 80% of the network in rural areas.

It should be noted that 38% of the network is located on an island. This incurs additional cost to maintenance operations through associated transportation and remote working costs. Careful planning is required to make the most of available resources when undertaking island road maintenance works.



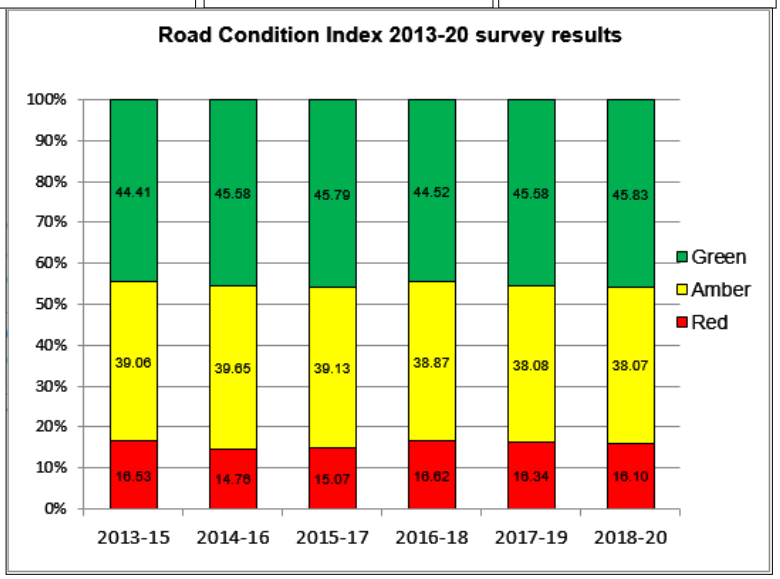






1.2 Condition

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



The 2020 survey results are currently unavailable due to impact of covid-19 pandemic delaying the survey start date. However the results are not expected to show significant change from previous years which showed marginal improvement from 16.34% to 16.10% . A slight improvement was shown for roads assessed as amber from 38.08% to 38.07% . Roads assessed as green also showed slight improvement from 45.58% to 45.83% in the same period. Overall continuation of this marginal improvement or steady state is expected when the latest RCI results become available. One consideration is that due to ferry restrictions and limited accommodation island routes may not be surveyed in 2020. Overall the RCI over previous years demonstrates effective delivery of the roads reconstruction programme by officers working within very tight budgets and timescales.

1.3 Asset Valuation

The asset valuation for carriageways is detailed within the table 3.7 opposite. It shows the Gross Replacement Cost as £2.17billion. This is the cost of a new replacement asset. The Depreciated Replacement Cost as £1.93billion. This is the present value of asset based on condition data. The Annualised Depreciation Cost as £18.92 million. This is the calculated level of annual investment needed to sustain current asset condition.

Table 3.7 Carriageways Valuation (These values include the regional and inflation factors for the current year)

Road Classification	Gross Replacement Cost	Depreciated Replacement Cost	Annualised Depreciation Cost
Principal (A) Roads (Urban)	£166,857,464	£150,661,506	£1,480,300
Principal (A) Roads (Rural)	£580,776,581	£534,985,741	£3,873,031
Classified (B) Roads (Urban)	£72,872,998	£65,599,532	£647,394
Classified (B) Roads (Rural)	£459,025,985	£414,652,855	£3,408,074
Classified (C) Roads (Urban)	£55,038,890	£48,625,587	£551,255
Classified (C) Roads (Rural)	£263,993,727	£231,427,134	£2,419,329
Unclassified Roads (Urban)	£327,047,504	£279,524,387	£4,077,487
Unclassified Roads (Rural)	£244,200,469	£208,801,077	£2,460,854
Total	**£2,169,813,618**	**£1,934,277,819**	**£18,917,725**

1.4 Investment

The capital reconstruction programme delivered £7.5m of investment on a range of surfacing projects aimed at improving network condition across Argyll. The table details the surfacing quantities and value within each activity. The percentage split across activities shows the bulk of investment (77%) is attributed to Surface Dressing (SD) and thin surfacing works to maximise network coverage . The aim being to seal and extend surface life with a SD treatment and tackle as much deteriorated surface as possible with thin surfacing works so as to help reduce demand for reactive treatment works.

Surface Treatment	Length (m)	Cost (£)	Percentage
Surface Dressing	82389	£2,263,946	30%
Thin/Micro Surfacing (up to 25mm)	1191	£108,125	1%
Thin Overlay (>25mm to 60mm)	39010	£2,244,509	30%
Moderate Overlay (>60mm to 100mm)	866	£94,181	1%
Structural Overlay (>100mm)	1130	£146,570	2%
Thin Inlay (>25mm to 60mm)	9079	£1,250,779	17%
Moderate Inlay (>60mm to 100mm)	3658	£565,766	8%
Structural Inlay (>100mm)	1019	£227,842	3%
Planned Patching	0	£24,366	0%
Reconstruction (250mm+)	3707	£599,584	8%
	Total	**£7,525,669**	

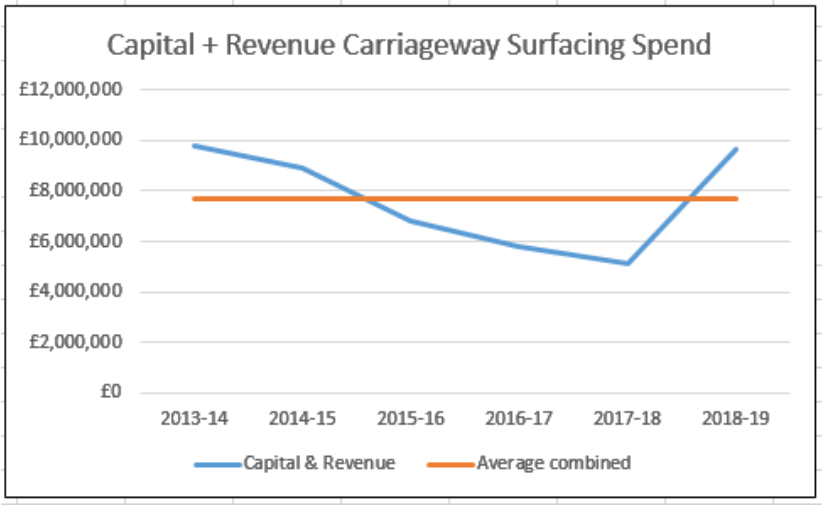
The adjacent table provides an indicative guide on asset sustainability by comparing annual works delivery via capital reconstruction programme against expected service life and asset inventory. This provides an indicative treatment cycle in years.

Treatment	Expected Service Life (Years)	Quantity Works (Km)	Inventory	Treatment Cycle (Years)
Surface Dressing	12-15	82.4	2286	28
Resurfacing Works	20-30	55.9	2286	41

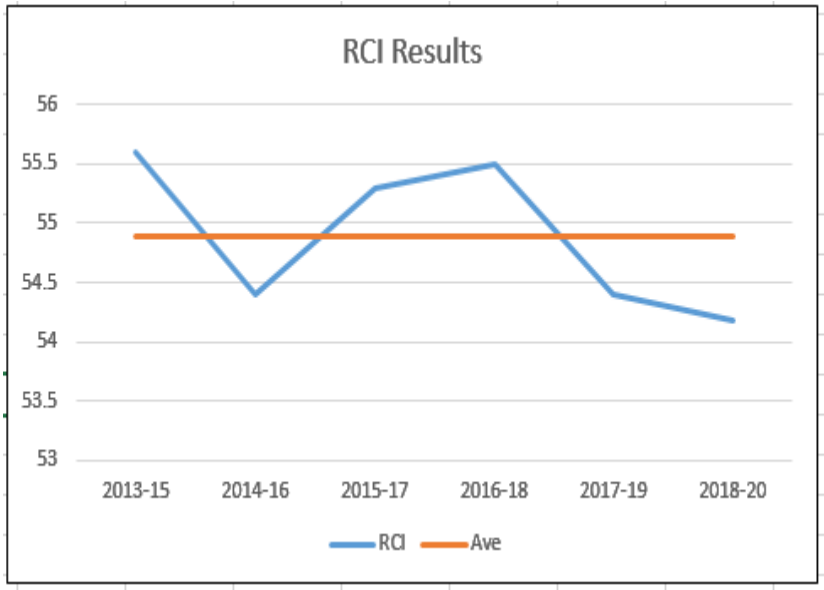
1.5 Capital

The tables and charts below illustrate the relationship between investment and the annual RCI results. By comparing the capital spend average against the RCI average, this shows a steady state road condition budget allocation of £7.688m/year for combined capital and revenue carriageway surfacing treatments would keep the carriageway from further deterioration.

This value differs from the SCOTS Steady state figure £11.5m which can be attributed to the SCOTS methodology using a more robust treatment matrix in the context of nationwide networks as opposed to treatments specifically aimed at Argyll and Bute Council's variable network. Surfacing treatments in Argyll are based on several factors often unique such as island works that are not necessarily truly reflected in a national modelling tool unless specifically formulated for that purpose.



Year	Capital & Revenue
2013-14	£9,826,466
2014-15	£8,896,996
2015-16	£6,799,499
2016-17	£5,821,104
2017-18	£5,149,311
2018-19	£9,639,640
Average Spend	£7,688,836



Year	RCI
2013-15	55.6
2014-16	54.4
2015-17	55.3
2016-18	55.5
2017-19	54.4
2018-20	54.17
Average	54.895

1.6 Strategic Timber Transport Fund

Argyll and Bute Council has consistently secured significant funding support from the Strategic Timber Transport Fund (STTF). The STTF funding is earmarked for projects which minimise the impact of timber lorries on our rural road network. It means that for every £1 Argyll and Bute Council spend the STTF funding support, on average more than doubles this investment.

The works being undertaken will make it easier for local residents and businesses to share the roads. Getting timber off our own road network and improving journey times when shifting timber from forests to processing facilities is another major benefit of improving the network.

Roads which have seen improvements from the joint funding between the council and STTF are:

- A816 Lochgilphead – Oban strategic route;
- Lochawe haulage routes- B840, C30 and C29;
- Kintyre B842; and
- B8000 Strathlachlan, Cowal.

Forestry is a key industry sector in Argyll and Bute, growing our economy and providing employment in management and harvesting whilst providing forest trails for communities to enjoy.

1.7 Maintenance Backlog

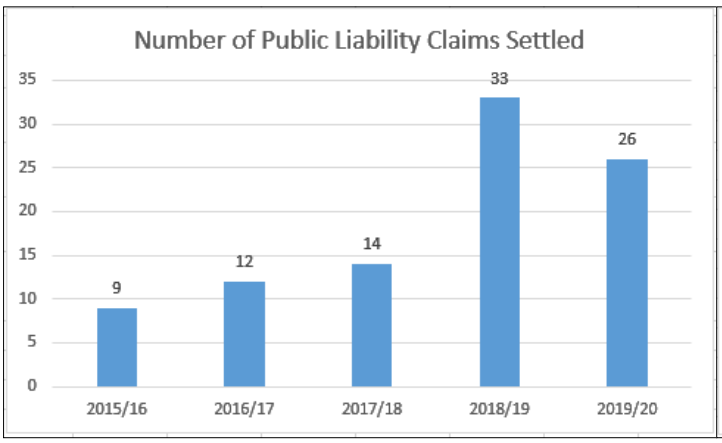
The SCOTS Headline Maintenance Backlog figure is calculated every two years using road condition data collected via the Scottish Road Maintenance Condition Survey (SRMCS). The calculation uses surveyed condition data with a surfacing treatment matrix and unit rates to determine the extent of maintenance required to bring whole network surfacing to an 'A1' condition.

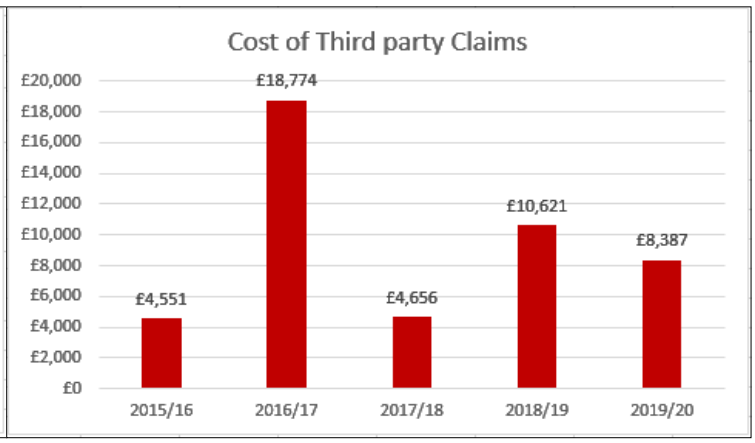
For the steady state calculations the model was run and values were output so that each authorities red RCI percentage was held at the current level by treating any amber RCI values which would otherwise deteriorate into red values in the subsequent year. This has been evidenced as best value.

SCOTS Headline Maintenance Backlog	2019 SCOTS Report	Average Annual Investment
Headline Backlog Figure	Steady State Figure	Capital and Rev (2012-2019)
£112,251,000	£11,507,000	£8,095,428

1.8 Public Liability Claims

The number and cost of public liability claims for carriageways is illustrated in the graphs below. The cost of settled claims over last three years has averaged £325 each.





1.9 Capital Road Reconstruction

The photos below show some of the road reconstruction and resurfacing works being undertaken as part of the 2019-20 capital investment programme. The photo opposite is part of the Islay retread process which involves churning up existing deteriorated surfacing, adding some bitumen and regrading and compacting the surface to restore surface condition. The process reduces the quantity of new materials required and contributes to lower carbon emissions for the project as well as delivering best value on the Island Road Network.

The photos below shows new surfacing and passing place improvements in Bute & Cowal and Oban Lorn & Isles Districts

The photo below shows part of the surface dressing process which is a preventative treatment aimed at sealing the road surface from the ingress of water whilst restoring surface texture to worn or slippy surfacing. The treatment enables surfacing service life to be extended by 5-10 years prior to a more robust resurfacing project being undertaken to strengthen and reshape the carriageway.

1.10 Winter Maintenance

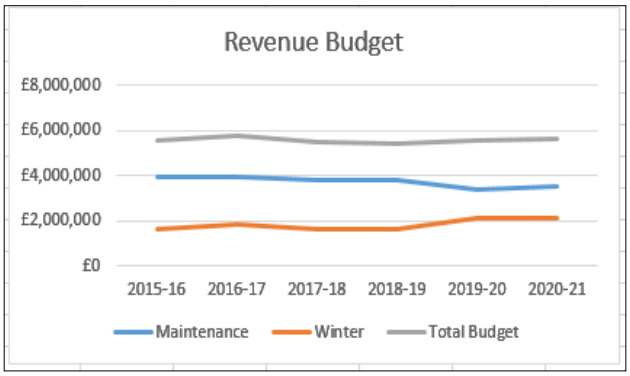
Keeping our roads 'open for business' is vital for our economy and the health and well being of our communities. This includes carrying out winter maintenance services aimed at keeping our roads safe during periods of snow and ice through the winter months. This requires substantial resources to monitor weather conditions, predict treatments , procure and store de-icing salt, gritters, loaders and drivers to deliver same across Argyll and the Isles every day of the winter period.

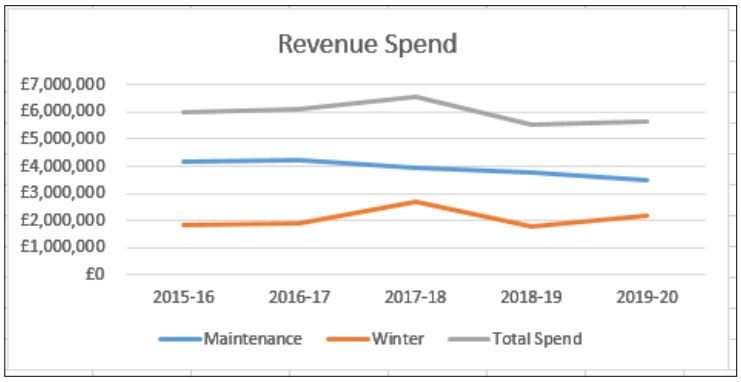
Climate change is affecting how we deliver the service with winter weather becoming more marginal and less predictable requiring more responsive treatments and actions all within the confines of complying with driver hours legislation. The table below provides some details of the scale of winter operations over the last ten years undertaken on 31 planned treatment routes using a fleet of 33 gritting vehicles.

Winter Treatment Information	Ten Year Average	
Total number of planned treatment runs (equiv Full Fleet)	81	Runs
Total aggregate annual treatment mileage travelled by all gritting vehicles on all planned routes	83186	Miles
Total tonnage of salt used on carriageways	15073	Tonnes
Total Winter actual spend carriageways	£2,278,209	Spend

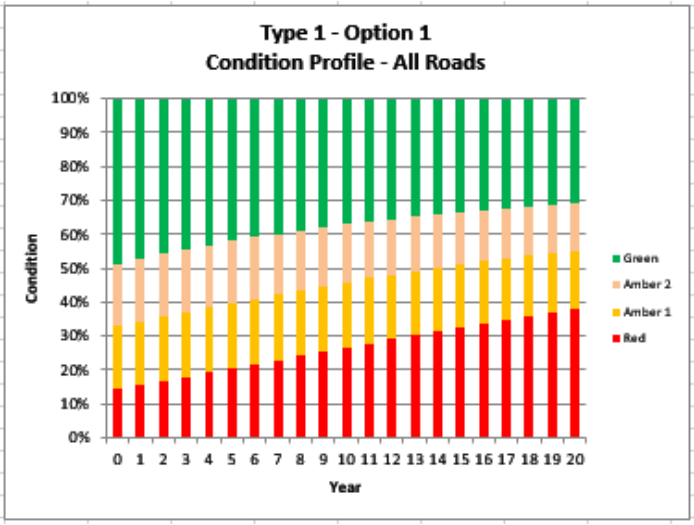
The cost of providing this vital service is a significant portion of annual road maintenance spend at almost 40% of existing total revenue budget. This impacts other essential preventative maintenance activities with less works being afforded. Consideration may be needed on alternative funding mechanisms for winter services so that the full extent of revenue budget allocation can be utilised to achieve more extensive planned preventative maintenance to extend service life of assets. Delivering these tasks to appropriate service standards can better support council corporate goals whilst demonstrating well managed assets.

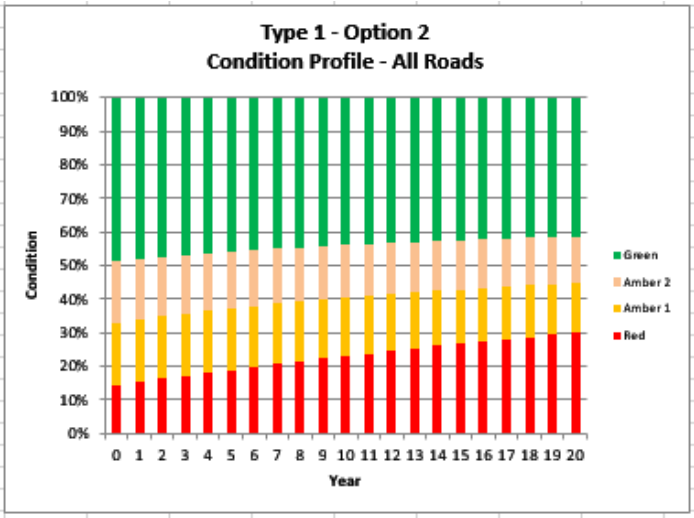
Budgets	Roads	Winter	Total	Winter %
2015-16	£3,957,298	£1,644,490	£5,601,788	29.36%
2016-17	£3,972,055	£1,836,286	£5,808,341	31.61%
2017-18	£3,832,056	£1,636,828	£5,468,884	29.93%
2018-19	£3,832,056	£1,621,674	£5,453,730	29.74%
2019-20	£3,411,055	£2,122,154	£5,533,209	38.35%
2020-21	£3,506,058	£2,122,618	£5,628,676	37.71%

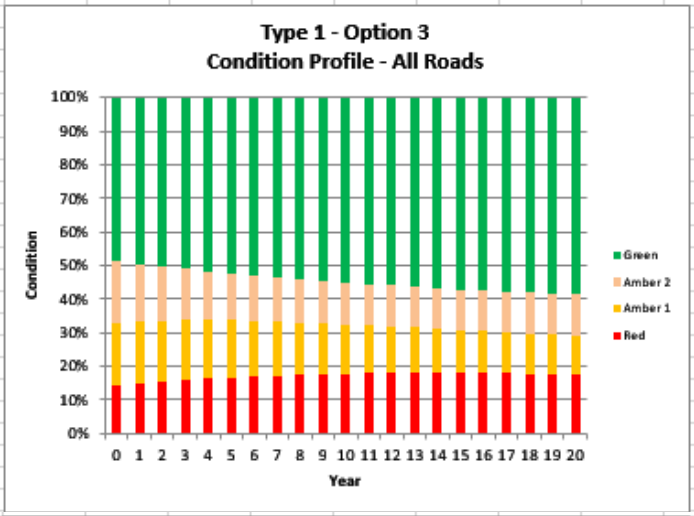


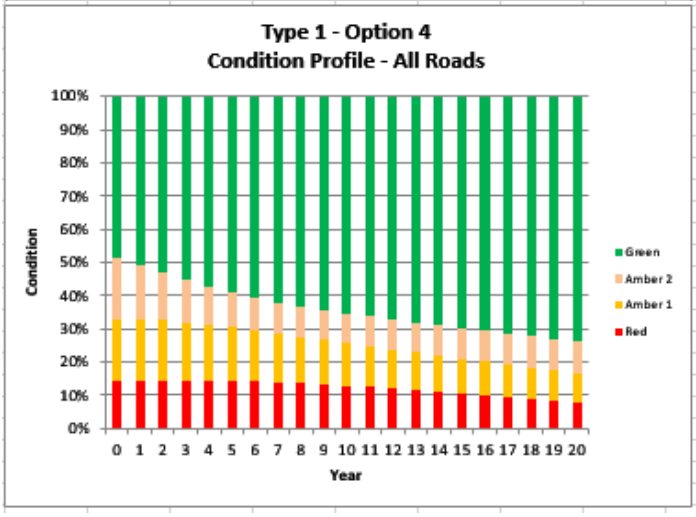


Spend	Roads	Winter	Total	Winter %
2015-16	£4,173,702	£1,832,248	£6,005,950	30.51%
2016-17	£4,243,332	£1,885,851	£6,129,183	30.77%
2017-18	£3,926,258	£2,669,341	£6,595,599	40.47%
2018-19	£3,765,604	£1,791,150	£5,556,754	32.23%
2019-20	£3,485,315	£2,165,845	£5,651,160	38.33%









1.11 CAPITAL RESURFACING INVESTMENT OPTIONS

OPTION 1— £3M

An annual investment of £3m would lead to a substantial deterioration on overall RCI with 69% of our roads requiring attention after 20 years including 38% of roads considered in the red category, this would significantly increase risk to road users safety. 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 2 — £5M

An annual investment of £5m would lead to a slower deterioration on overall RCI with 59% of our roads requiring attention after 20 years including 30% of roads considered as red category. This is almost double the latest result (16.34%)for red category roads. 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 — £8M

An annual investment of £8m would lead to steady state in overall RCI with 41% of our roads requiring attention after 20 years including 18% of roads considered as red category which is on par with current red condition (16.34%). The volume of reactive temporary repairs would likely remain similar to current levels over initial period and would be expected to remain similar over time as road condition remains constant. Public liability claims would also be expected to remain similar. Customer satisfaction levels would also remain in steady state.

OPTION 4 — £11M

An annual investment of £11m for the next 20 years should lead to a substantial improvement in overall RCI with only 27% of roads requiring attention including only 8% of roads in red category , half the current red condition (16.34%). This differs slightly from the projected value from the SCOTS Backlog and Steady State model, due to a different method of predicting future carriageway condition. This would potentially make Argyll and Bute council the leading Scottish authority in terms of RCI. A substantial reduction in reactive repairs and public liability claims can be expected. Demands on limited resources would be lessened and customer satisfaction levels will also be greatly improved through this investment.

1.12 Revenue Funded Preventative Maintenance Investment Options

The value of undertaking adequate preventative maintenance works cannot be over stated. It is the most vital and fundamental function required to extend infrastructure service life, strengthen network resilience and minimise demand for capital investment.

Below are a number of initial revenue budget investment options for consideration. These will all require further investigation, research and development to progress more detailed information on which option is best suited to support council objectives within the confines of available resources.

OPTION 1 Reduced investment levels for preventative maintenance activities due to continuing pressure on council budgets to realise savings. This needs careful consideration and will impact the quantity of works afforded necessary to provide adequate protection to vital road assets. It will increase demand for more expensive reactive works, which is the vicious cycle the operations section are currently experiencing. It will increase future demand for capital investment far greater than initial savings realised.

Benefits	Drawbacks	Considerations
Delivers short term budget savings	Less maintenance works afforded	Doesn`t support corporate objective
	Increased asset deterioration	Difficult to demonstrate value
	Greater demand for expensive reactive works over time	Future demand for capital investment far greater than initial savings realised
		May impact current internal service delivery

OPTION 2 Maintain existing investment levels and consider prioritising activity funding using a risk based approach. Prioritised activities should be delivered through a planned programme of works to maximise value for money through appropriate service standards. Combined with improved recording of maintenance works asset information can be enhanced to assist driving an improved asset management approach which can break the current vicious cycle of reactive maintenance demands.

Benefits	Drawbacks	Considerations
Maintains existing budget	No council budget saving	Supports some corporate goals but requires better data capture to confirm improvements
Retains internal service delivery	Requires change in approach	Training to focus efforts on prioritised business needs and more planned works programmes
Better value works can be afforded	Needs commitment to deliver	Some investment in better mobile technology
		Development of appropriate service standards
		Additional resources needed to implement any changes

OPTION 3 Maintain or increase investment levels through a zero based budget approach (through business case applications). This would essentially allocate a percentage budget for reactive maintenance with the balance of funding allocated through planned schedules and programmes of works to effectively justify and approve funding allocation against a measured works quantity to meet appropriate service standards. This requires determined effort on delivering measured work packages whilst improving capture of asset information to assist delivery of the benefits by implementing recognised asset management practices.

Benefits	Drawbacks	Considerations
Better control of costs	No Council budget savings	Supports council objectives
Delivers better value maintenance services	Potential increased budget required	Implementing SCOTS Asset Management recommended practices
	Requires changes in approach	Investment in better mobile technology
More informed decision making	Needs commitment and support to deliver	Training & additional resources to implement

OPTION 4 Consider funding some maintenance activities using a capital funding allocation. Preventative maintenance is a critical activity some of which can be easily quantified (Ditching, Gully cleaning, Patching etc.). Delivering planned measurable works would greatly enhance ability to demonstrate value and prudent stewardship of assets.

Benefits	Drawbacks	Considerations
Vital maintenance activities delivered	Compliance with capital investment rules	Supports council objectives
Ability to demonstrate value	May impact capital investment on other assets	Implementing SCOTS Asset Management recommended practices
Improved asset management		Investment in better mobile technology
		Staff training & Additional resources to implement

2.0 Footways

2.1 Length

The footway asset is approx. 520km in length as detailed in tables 2.1a & 2.1b opposite. The extent of the asset is not fully known and is updated as new data becomes available.

Table 2.1a Footways Quantities by Hierarchy

Footway Hierarchy	Length (m)	Area (sqm)
Higher Amenity Footways	41,977	117,536
Other Footways	470,174	1,001,471
Total	**512,151**	**1,119,006**

2.2 Condition

Asset condition surveys are not currently undertaken due to limited resources and cost implications.

Table 2.1b All Footpath Quantities

Quantity	Length (m)	Area (sqm)
All Footpaths	9,349	11,219
Total	**9,349**	**11,219**

Generally footways are considered safe and fit for purpose with maintenance works undertaken in response to identified defects or public complaints as investment and resources permit.

2.3 Asset Valuation

Details of the asset valuation are shown in table 2.3 below;

Table 2.3 Footway Valuation by Hierarchy

Footway Hierarchy	Gross Replacement Cost	Depreciated Replacement Cost	Annualised Depreciation Cost
Higher Amenity Footways	£9,569,925	£8,123,890	£61,717
Other Footways	£82,046,682	£63,697,544	£809,223
Total	**£91,616,607**	**£71,821,434**	**£870,941**

2.4 Maintenance backlog

The maintenance backlog for footways is based on officers estimation of condition calculated as three percentage of gross replacement cost of the asset.

Gross Replacement Cost (GRC)	Backlog Estimate 3% GRC	Investment Need based on Annualised Depreciation Cost
£92,535,721	£2,776,072	£870,491

2.5 Investment

Footways investment of £1m over previous 3 years has tackled some of the worst identified sections of the network aimed at reducing reactive maintenance demands. There is currently no planned capital investment for 2020-21.

Table 2.5a details the extent of capital works undertaken 2019-20.

Table 2.5b provides indicative information on the current footways treatment cycle.

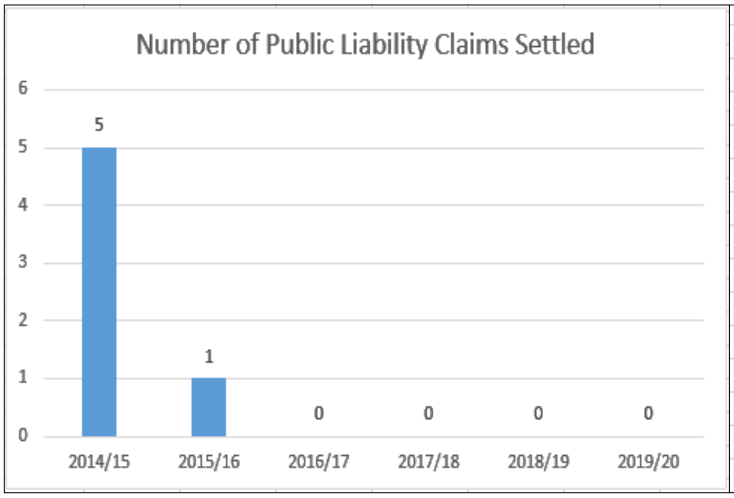
2.5a Footways		
Treatment	**Length (m)**	**Cost (£)**
Surface Treatment	802	£20,641.74
Resurfaced	1,913	£139,205.57
Reconstruction	471	£74,045.90
Totals	**3,186**	**£233,893.21**

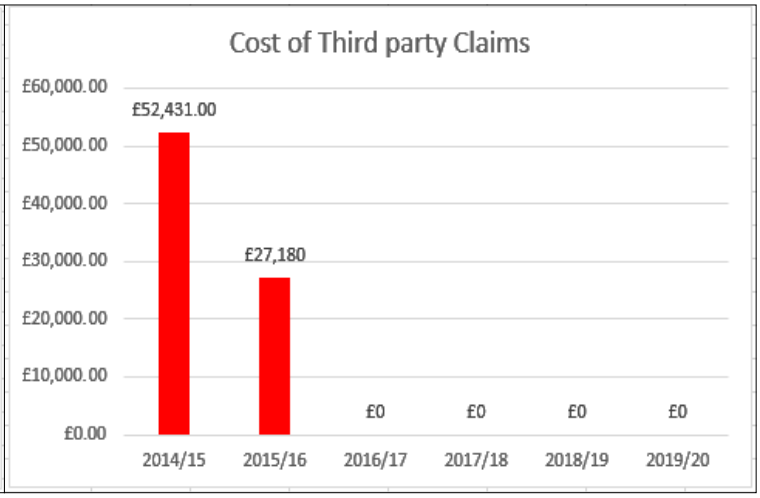
2.5b Footway Treatment Cycle

Treatment	Expected Service Life (Yrs)	Quantity (Km)	Inventory (Km)	Treatment Cycle (Years)
Surface Treatment	15-20	0.802	529	660
Resurfacing Works	30-40	1.913	529	277
Reconstruction	50-60	0.471	529	1123
All Works		3.186	529	166

2.6 Public Liability Claims

The number of public liability claims settled and resultant costs has remained zero for the last four consecutive years. This can be attributed to the recent £1m investment over the last three years which has been targeted towards rectifying known defect hotspots. There is currently no further planned capital investment in the footway asset and available revenue budget will be prioritised to undertaking essential reactive maintenance works. It is likely that footway deterioration will increase the risk of increased public liability claims in future.





2.7 Investment Options

Below are a number of initial revenue budget investment options for consideration. These will all require further investigation, research and development to progress more detailed information on which option is best suited to support council objectives within the confines of available resources. Investment options should be inked to the long term maintenance strategy for the asset .

Option 1 Undertake maintenance only on a reactive basis to repair defects within existing revenue budget allocation		
Benefits	**Drawbacks**	**Considerations**
Continues service delivery for defect repairs	Continued long tern asset deterioration	Adopting risk based approach to managing the asset
	Growing demands for capital investment	Resource condition survey of asset to gain information on asset needs
	Rising number of public liability claims	Development of long term maintenance
	Reactive maintenance is expensive and poor value	Resource development of a prioritised list of planned works

Option 2 Increased investment in revenue planned maintenance activities		
Benefits	**Drawbacks**	**Considerations**
Investment tackles asset deterioration	limited asset information and condition data	Implementing SCOTS asset management
Planned works deliver better value	resources required to identify, quantify and works	Resource development of a prioritised list of planned works
Reduced demand for reactive works	Level of works limited within available revenue	Development of long term maintenance
Less complaints		

Option 3 Develop business case for investment through capital budget for resurfacing/reconstruction of sub standard footways and footpaths. Extend the capital programme of improvements undertaken 2017-20 via a rolling 3 - 5 year programme of works that can be prioritised in line with available resources.		
Benefits	**Drawbacks**	**Considerations**
Investment tackles deterioration and gradually improves whole asset	limited asset information and condition data	Development of long term maintenance strategy for asset group
Demonstrates prudent stewardship of assets	resources required to identify scope of works	Investment in mobile technology to capture asset data
Supports corporate objectives	Requires increased levels investment	Implementing SCOTS asset management
		Development of long term maintenance strategy for asset group

Option 4 Capital investment for improvement in kerbing in conjunction with carriageway surfacing and street lighting projects. Requires a holistic planned approach across all road asset groups to collaborate works programmes to support overall council goals and objectives. A streetscene approach to delivering improvements.		
Benefits	**Drawbacks**	**Considerations**
All asset approach to maintenance	requires substantial capital investment	Use of SCOTS asset management tools
		Investment in mobile technology
		Development of appropriate maintenance

3.0 Street lighting

3.1 Inventory

The extent of street lighting asset is detailed in Tables 3.1a,b,c ,d & e below;

Table 3.1a Street Lighting Column Quantities	
Column Material	**Quantity**
Non Galvanised Steel	2,381
Galvanised Steel	9,505
Concrete	29
Aluminium (pre 2000)	1,123
Aluminium (post 2000)	0
Stainless Steel	9
Cast Iron	0
Total	**13,047**

Table 3.1b Street Lighting Luminaire Quantities	
Luminaires	**Quantity**
All	14,640
Total	**14,640**

Table 3.1c Other Street Lighting Assets	
Other Street Lighting Assets	**Quantity**
Wall Bracket	1,191
Wooden Pole	110
High Mast Column	0
Control Cabinet	751
Total	**2,052**

Table 3.1d Street Lighting Cable Quantities	
Cable Assets	**Quantity (m)**
Cable under Carriageway	43,050
Cable under Footway	215,250
Cable under Verge	172,200
Total	**430,500**

Table 3.1e Illuminated Sign Assets	
Illuminated Signs	**Quantity**
Signs	433
Bollards	46
Total	**479**

There is no available data on the extent of cabling associated with street lighting assets. The quantities within table 3.1d have been estimated based on 30 Lin.m per column. The estimated quantities have also been sub-divided into likely cable tracking location as 10% carriageway, 50% Footway and 40% in Verge.

3.2 Condition

The condition of street lighting assets is normally determined based on the age of assets. Unfortunately there is no available historic data on the installation dates for the majority of street lighting assets. However following the recent investment in replacement of luminaires with new low energy LED Lanterns data has been collected on the condition of columns and apparatus across the network. Work is ongoing to collate the data so that it can be fully assessed to determine the extent of asset deterioration. Initial LED replacement works highlighted a substantial number of columns in very poor condition and unsuitable for installing new LED lanterns.

Additionally the project also highlighted issues with supply cabling with many columns connected by 5th Core supply which incurs substantial costs when dark lamp complaints highlight a cable supply problem requiring electricity supply company to attend. Generally these faults

3.3 Valuation

The asset valuation has been undertaken in accordance with the CIPFA Transport Asset Code recommendations using the SCOTS asset management framework tools and guidance. The valuation is detailed in Tables 3.3a,b & c below;

Table 3.3a Street Lighting Luminaire Valuation			
Street Lighting Luminaires Assets	**Gross Replacement Cost**	**Depreciated Replacement Cost**	**Annualised Depreciation Cost**
Total	£2,589,518.34	£2,096,612.52	£129,475.92

Table 3.3b Street Lighting Column Valuation			
Street Lighting Column Assets	**Gross Replacement Cost**	**Depreciated Replacement Cost**	**Annualised Depreciation Cost**
Non Galvanised Steel	£3,704,459	£148,178	£148,178
Galvanised Steel	£14,834,284	£7,160,258	£494,476
Concrete	£24,882	£829	£829
Aluminium (pre 2000)	£996,657	£100,500	£24,916
Aluminium (post 2000)	£0	£0	£0
Stainless Steel	£7,710	£7,380	£110
Cast Iron	£0	£0	£0
Cable Assets			
Cable under Carriageway	£3,197,909	£1,893,786	£53,298
Cable under Footway	£14,293,483	£8,465,394	£238,225
Cable under Verge	£9,691,278	£5,739,128	£161,521
Other Street Lighting Assets			
Wall Bracket	£536,191	£487,750	£13,405
Wooden Pole	£94,237	£26,386	£1,885
High Mast Column	£0	£0	£0
Control Cabinet	£189,088	£98,416	£3,782
Total	**£47,570,178**	**£24,128,005**	**£1,140,626**

Table 3.3c Illuminated Signs Valuation			
Illuminated Signs Assets	**Gross Replacement Cost**	**Depreciated Replacement Cost**	**Annualised Depreciation Charge**
Signs	£216,270.51	£106,047.47	£8,650.82
Bollards	£15,499.24	£7,695.71	£619.97
Total	**£231,769.75**	**£113,743.18**	**£9,270.79**

3.4 Investment

The street lighting asset has seen investment directed towards new LED lanterns as part of a spend to save initiative aimed at lowering energy usage to reduce annual energy costs. Reduced energy usage supports council objective to meet its climate change targets by reducing carbon footprint. The LED project is almost completed and has clearly demonstrated the positive impact investment can make towards achieving council objectives.

However the project has highlighted a number of issues with the asset as many columns were unable to accept new LED lanterns due to their deteriorated state. An exercise is ongoing to collate data from the project to ascertain the extent of columns needing replaced so that a suitable business case can be progressed. It is known that a large but undetermined quantity of the inventory of street lights is still powered from the "5th core" electrical supply system, which is pre-2nd world war in origin. This dated infrastructure is a source of regular failure requiring the electricity supply company to attend and repair outages. Table 3.4 below details the cost of reconnections in previous year. There are currently 19 power supply defects requiring attention with repair costs to date in Bute and Cowal at almost £20k representing almost 30% of the annual maintenance budget for the area.

The costs for repairing power outages is unpredictable due to the unknown element of works involved until repairs have commenced to expose the full extent of the fault. This requires further design work and cost benefit analysis to enable the most appropriate solution within confines of available resource. However the continued allocation of individual power connection fault costs to the revenue maintenance budget as part of dark lamp or section fault repairs is unsustainable both in the short to medium term and within the longer term need for asset improvement.

Table 3.4 Power Supply Outages				
Year	**Description**	**No**	**Cost**	**Average**
2019-20	Reconnection	20	£65,678	£3,284

3.4 Investment (Cont).

The replacement of deteriorated assets which have reached the end or beyond their expected service life is currently not part of a longer term maintenance strategy or plan. For many years the need to deliver investment savings has over ridden the need for asset renewals. This reduced funding has delayed asset renewal projects creating an even older and more fragile asset base leading to a growing backlog of outages and reactive maintenance demands on very limited resources.

Between 2010—2017 lighting column replacement schemes dwindled due to funding constraints with annual renewal of columns averaging approx. 20—50 units per year. The adoption of new roads generally in urban areas added circa 40 additional column assets annually to inventory database. Since 2017 the LED replacement programme has taken precedent over column and cable renewal and has delivered substantial savings in energy consumption and carbon emissions. Over this period no planned column and cable replacement works were undertaken other than as part of reactive works to restore outages. The LED project highlighted the condition of assets and the growing need for urgent action to develop a longer term maintenance strategy for investment in asset renewals. Table 3.4 provides and indicative treatment cycle based on current average expected asset renewal and clearly illustrates the present investment strategy is unsustainable.

Table 3.4 Street lighting Column and Cable Treatment Cycle

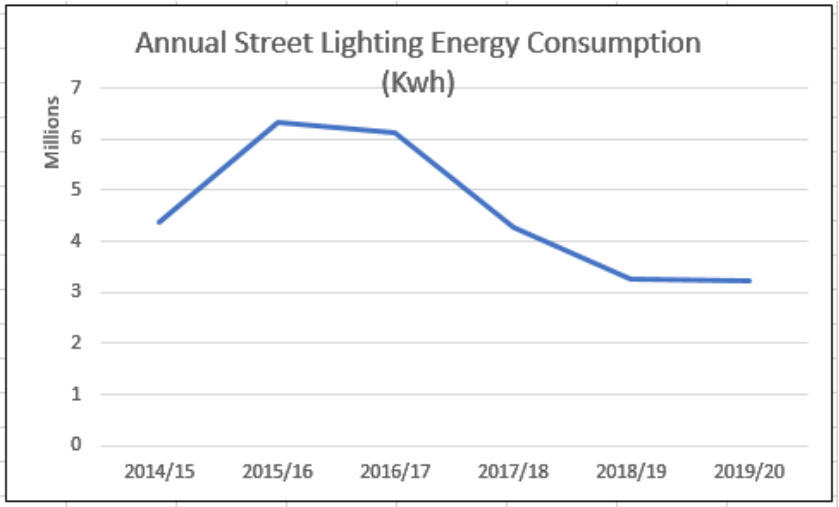
Treatment	Expected Service Life (Yrs)	Annual Quantity (Ave)	Inventory (No.)	Treatment Cycle (Years)
Column Replacement (Galv Steel)	30	25 No.	13047	522
Cable replacement	60	750 Lin m.	430,500 (Lin.m)	574
Luminaire (LED)	20	N/A	14640	All new assets

3.5 Energy Consumption

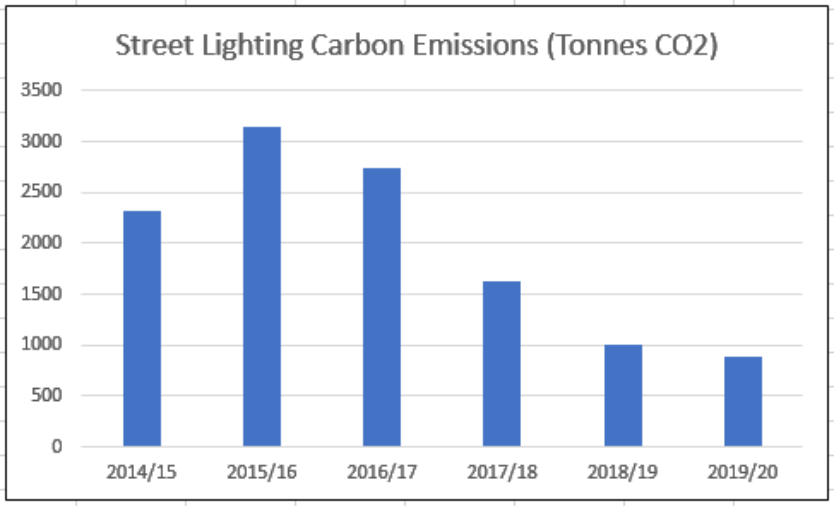
Annual energy consumption for street lighting has been significantly reduced since 2017/18 following the investment in new LED lanterns. Table below clearly illustrates the benefits delivered from this investment package.

Table 3.5 Annual Energy Consumption

Year	Total	Unit
2014/15	4361341.9	kWh
2015/16	6325655.3	kWh
2016/17	6119183.7	kWh
2017/18	4288415.2	kWh
2018/19	3267835.1	kWh
2019/20	3232557.7	kWh



Year	Carbon Total	Units
2014/15	2325	tonnes CO2
2015/16	3140	tonnes CO2
2016/17	2733	tonnes CO2
2017/18	1636	tonnes CO2
2018/19	996	tonnes CO2
2019/20	889	tonnes CO2



3.6 Investment Options

Below are a number of initial revenue budget investment options for consideration. These will all require further investigation, research and development to progress more detailed information on which option is best suited to support council objectives within the confines of available resources. Investment options should be linked to development of a long term maintenance strategy for the asset.

OPTION 1 Suspend all 5th Core reconnection works due to limited revenue budget.

Benefits	Drawbacks	Considerations
Manage costs within existing revenue Budget constraints	Reduction in performance figures for the repair of dark lamps and section faults	Doesn`t support corporate objectives
	Increased requests for service repairs & complaints escalate and multiply	Increased pressure on communications and technical teams
		Damage to council reputation

OPTION 2 Continue to deal with dark lamps and section faults through loss of power supply on a reactive basis and divert additional costs to capital budget allocation.

Benefits	Drawbacks	Considerations
Manage costs within existing revenue Budget constraints	Cost pressures on capital budget through unplanned reactive works	Supports corporate objectives within the constraints of limited resources
Continues to deal with necessary fault repairs on a reactive basis	Doesn`t deal with the underlying lack of investment in lighting infrastructure	Pressure on communications and technical teams still remains an unsustainable demand
		Development of a business case for increased investment will require additional inventory survey data and resource to compile

OPTION 3 Develop a business case for investment through capital budget for replacement columns and cabling assets together with enhanced asset data information to drive future investment decisions. Part funding for this option can be gained from the LED Budget which would allow approximately £500k to be utilised in line with the previous Council Members funding agreement for the LED

Benefits	Drawbacks	Considerations
Allow asset improvement through planned works programmes.	Requires additional investment	Requires additional resource to capture necessary data to support business case development
Capital investment would reduce impact on reactive maintenance budget	Weakness in current data to inform business case development	Additional tendering and contract supervision resources required.
Improve performance outputs		Require external resources to deliver works programmes due to limited existing internal capacity.
Better public perception and council reputation		

OPTION 4 Carry out an inventory update towards presenting a fully detailed and costed programme for future capital investment

Benefits	Drawbacks	Considerations
Provides a robust long term investment plan	Requires additional investment	Implementation of the SCOTS asset management recommended practices
Demonstrates effective strategic management of assets	Weakness in current data to inform business case development	Employing additional staff resource to manage increased use of external contractors
Provides the council with robust information to support confident investment strategy	Delays asset improvement until business case fully developed	Consider a phased implementation based on prioritised list of service deficiencies

4.0 Structures

4.1 Assets

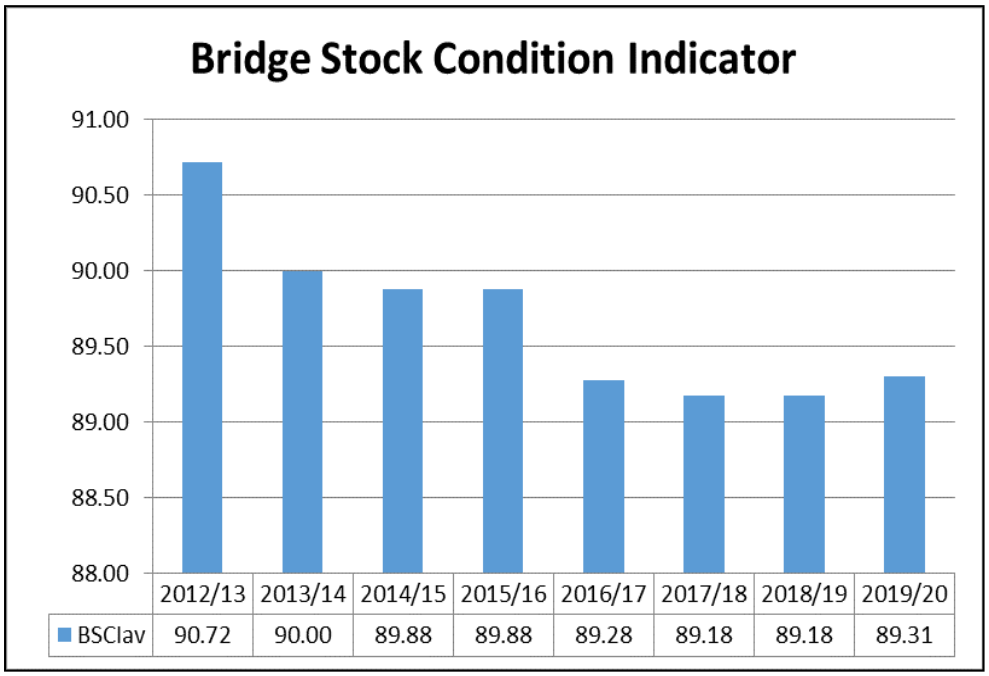
Table 4.1 : Structures Quantities	
	Quantity
Road Bridges	888
Footbridges	11
Unusual Structures	2
Retaining Walls	7
Height, Sign and Signal Gantries	0
Culverts	295
Subways	0
Total	**1203**

4.2 Condition

Our bridges and structures are inspected and assessed to comply with the Management of Highway Structures Code of Practice. Data gathered from bridge inspections is used to calculate a Bridge Stock Condition Indicator value which can enable analysis and trending of condition information. The condition results since 2012/13 are illustrated in the chart below which shows a steady decline in overall bridge stock condition from a reduction in capital investment with revenue investment being prioritised towards retaining wall repairs. The latest results show slight improvement attributable to essential maintenance works being prioritised and a targeted works programme being delivered. However condition of less critical structures is expected to decline further without increased levels of investment.

There are currently 23 bridges subject to special monitoring precautions and 28 bridges that have failed the European standard assessment (prior to restrictions).

Structures are subject to regular inspections with principal inspections every 6 years and general inspections every 2 years.



4.3 Abnormal Loads

There has been a significant increase in the number of abnormal load requests since 2008, from 187 to 792 last year. This demand is mainly generated from the renewable energy sector and timber extraction works. Technical evaluation of these requests combined with bridge inspections and other management tasks are all funded from bridge maintenance budget allocation. These competing demands leave little scope for officers to capture other data sources or update inventory Etc. and effectively reduce the extent of preventative maintenance activities that can be undertaken within the confines of available resources.

4.4 Asset Valuation

Table 4.4 Structures Valuation Summary			
Structure Type	**Gross Replacement Cost**	**Depreciated Replacement Cost**	**Annualised Depreciation Cost**
Road Bridges	£115,034,774	£108,752,407	£1,267,044
Footbridges	£2,934,648	£2,926,004	£2,117
Unusual Structures	£2,286,856	£1,876,450	£18,390
Retaining Walls	£351,836,129	£351,716,013	£46,487
Height, Sign and Signal Gantries	£0	£0	£0
Culverts	£3,547,853	£3,542,437	£294
Subways	£0	£0	£0
TOTALS	**£475,640,260**	**£468,813,311**	**£1,334,333**

4.5 Investment

Funding for the refurbishment or renewal of bridges has dwindled over time to meet with required budget savings needs. A number of structures have been replaced following severe storm damage on a reactive basis to reopen vital transport or community links. Very few structures are the same due to size, construction or span therefore it has been assumed an average of between one and four structures are refurbished or replaced annually. The table below provides an indicative illustration of the bridge renewal cycle .

Item	Expected Service Life of Assets	Annual Replacement Quantity (Estimated)	Current Inventory	Indicative Asset Renewal cycle
Bridge	120-150 years	3	901	300 years

4.6 Maintenance backlog

The maintenance backlog for structures is detailed in table below. It has been calculated using the SCOTS asset management framework guidance provide an estimated value for maintenance needed to bring the asset to very good condition in one year.

Headline Backlog Figure	Steady State Figure	Source
£20,000,000	N/A	RAC Foundation Report Feb 2020

4.7 Flood Prevention

Argyll and Bute Council has a statutory duty under the Flood Risk Management Act (Scotland) 2009 to reduce the overall flood risk. This includes flood risk assessment, maps, plans and management of the risk. These works are undertaken in conjunction with the Scottish Environment Protection Agency (SEPA) using local historical data to assess the risk and impact of flooding events. Table 4.7 below shows the current budget allocation for flood risk management.

Table 4.7 Flood Risk Management Budget			
Year	**Capital**	**Revenue**	**Project**
2020-21	£387k	£323k	General Flood Risk Management Plans
2021-22	£955k	£323k	Campbeltown Flood Prevention
2022-23			
2023-24			

4.8 Match Funding Opportunities

The Scottish Government currently offers 80% funding opportunity for local authorities towards development of necessary flood prevention schemes. A key factor in securing this funding is participation in the Scottish Governments defined process for assessing flood risk and prioritising investment across Scotland. Efforts should be made to ensure participation in the Scottish Governments defined process to enable capture of any potential funding for Argyll.

4.9 Flood Prevention Maintenance Backlog

The current maintenance backlog for flood prevention assets is estimated at Circa £250k. This is partly due to designated Flood prevention assets being relatively new. However historically across Argyll there are many un-designed assets which are currently not recognised as part of the flood prevention asset portfolio or owned by the council but nonetheless serve a purpose Eg. The Banks of the Black Lynn Burn in Oban. The backlog of repairs needed for these assets is not quantified but is expected to be tens of millions of pounds to bring assets up to good condition.

The photo opposite shows the extent of flooding at Lochavullin Road Oban October 2014 which caused extensive damage to vehicles and property. The photo below shows a similar flooding event at Lochavullin car park in October 2018.

Following these incidents some temporary flood prevention works have been undertaken to help protect property from flooding damage.

There is a need for much more extensive projects to help alleviate the issues causing these events which are beyond the scope of existing budget allocation.

4.10 Investment Options

Below are a number of initial revenue budget investment options for consideration. These will all require further investigation, research and development to progress more detailed information on which option is best suited to support council objectives within the confines of available resources. Investment options should be linked to development of a long term maintenance strategy for the asset.

Option 1 Undertake maintenance only on a reactive basis to repair defects within existing revenue budget allocation		
Benefits	**Drawbacks**	**Considerations**
Continues service delivery for defects	Continued Asset deterioration	Development of a long term maintenance
	Increased risk of more weight restrictions or road closures	Strengthen the business case for investment
	Impacts Economy and vital transport links	Explore funding opportunities Etc. (Flood pre-
	Reactive maintenance is expensive and poor value	

Option 2 Increased investment in revenue planned maintenance activities		
Benefits	**Drawbacks**	**Considerations**
Continues service delivery for defects	Asset deterioration remains greater than investment	Development of a long term maintenance strategy
Tackles some preventative maintenance	Impacts Economy and vital transport links	Strengthen the business case for investment
Contributes to lowering risk of more weight restrictions or road closures	Reactive maintenance is expensive and poor value	Explore funding opportunities Etc. (Flood prevention Etc)

Option 3 Develop business case for investment through capital budget for strengthening and refurbishment of structures. Development and implementation of an appropriate long term maintenance strategy for the asset group. Continued improvement in asset management.		
Benefits	**Drawbacks**	**Considerations**
Contributes to development of more sustainable asset management regime	Requires investment	Development of a long term maintenance strategy
Planned preventative maintenance programme of works	Requires resource to develop business case	Strengthen the business case for investment
More sustainable asset condition		Explore funding opportunities Etc. (Flood pre-
Supports corporate objectives		Resources to undertake increased workload

Option 4 Development of a successful business case for investment to tackle deterioration and improve overall asset condition as part of a developed asset management process.		
Benefits	**Drawbacks**	**Considerations**
Sustaniable asset management regime	Requires substantial level of investment	Development of a long term maintenance
Improves asset condition	Requires resource to develop successful busi-	Resources to undertake/ manage increased
Reduced weight restrictions	May require additional data capture to support business case development	Explore funding opportunities Etc. (Flood prevention Etc)
Supports corporate objectives		

5.0 Traffic Signals

5.1 Assets

The extent of traffic system management assets is detailed in table 5.1a & b below;

Table 5.1a Traffic Management System Quantties	
Traffic Signal Types	**Quantity**
Traffic Signal (Junction) Subtypes	
Minor Junction	0
Medium Junction	10
Major Junction	0
Complex Junction	0
Traffic Signal (Pedestrian Crossing) Subtypes	
Single Carriageway	14
Double Carriageway	0
Total	**24**

Table 5.1b Other Traffic Management System Quantities	
Other Traffic Management System Types	**Quantity**
Information Systems	2
Safety Cameras	0
Variable Message Signs	2
Vehicle Activated Signs	18
Wig Wags	4
Zebra crossing	13
FAS	110
Total	**149**

5.2 Condition

The traffic management system asset is subject to condition survey which is being undertaken by specialist consultants. Survey data is being collated and should provide a comprehensive insight on the current status of assets. Initial survey results show significant evidence of asset deterioration particularly control cabinets and poles. There are a number of issues where existing assets do not meet current standards requiring a number of updates to tactile paving, road markings, traffic lights and detector loops Etc. The full results of the survey will need to be assessed and a prioritised list of repairs compiled. A business case may be needed to support the case for investment to address the issues highlighted within the survey report.

5.3 Valuation

Traffic Signal Types	Inventory Quantity	Gross Replacement Cost	Depreciated Replacement Cost	Annualised Depreciation Cost
Junctions	10	£450,000	£330,000	£18,750
Pedestrian Crossings	14	£280,000	£156,625	£12,250
Total	**24**	**£730,000**	**£486,625**	**£31,000**

5.4 Investment

Traffic management systems require specialist contractors to undertake regular inspection and necessary maintenance. Increasing reactive maintenance costs are being incurred as some assets are functioning beyond their expected service lives and when problems arise replacement of obsolete parts is difficult to procure. Last year £128k was spent on maintenance of assets.

Many traffic management assets have had essential works postponed over time due to budget restrictions. Although it is the smallest asset group delays in asset renewal particularly electronic hardware can lead to parts becoming obsolete as advances in technology become available. A recent survey has highlighted the need for some urgent repairs to bring systems up to date. Historically junctions and pedestrian crossing have been replaced ad hoc in response to system failures or inability to obtain replacement components. Generally this equates to approx. one junction or crossing per year. The table below provides an indicative illustration of the asset renewal cycle.

Item	Expected Service Life	Annual Replacement Quantity	Current Inventory	Indicative Renewal cycle
Traffic Control Unit	20 Years	1	24	24 Years

5.5 Maintenance Backlog

The maintenance backlog is calculated at £225k based on initial condition survey data and local officer estimate of upgrading assets to meet current standards. It provides an indicative measure of the level of investment needed to sustain the asset in good condition.

5.6 Investment Options

Below are a number of initial revenue budget investment options for consideration. These will all require further investigation, research and development to progress more detailed information on which option is best suited to support council objectives within the confines of available resources. Investment options should be linked to development of a long term maintenance strategy for the asset.

Option 1 Continue to fund Traffic Signals within existing annual allocation of £45k revenue budget

Benefits	Drawbacks	Considerations
Maintains existing service	Specialised works undertaken by external contractors	Revised tender for routine inspection and maintenance
	Deteriorated asset base drives increasing reactive maintenance costs	Requires additional resource to develop appropriate business case.
	Requires occasional capital investment to re-	

Option 2 Utilise latest condition survey data to develop an appropriate business case for investment in renewal of apparatus

Benefits	Drawbacks	Considerations
Improved asset reliability	Requires investment	Resource and staff training to improve asset
Reduced maintenance costs	Requires resource to develop suitable business case for investment using capital budget	Development of a suitable maintenance strategy for asset
		Requires resource to procure tenders and administer/supervise potential contract works

Option 3 Produce a business case based on latest survey data to upgrade all apparatus to meet compliance with current standards over a three to five year period

Benefits	Drawbacks	Considerations
Modernises asset to meet current stand-	Requires investment	Resource to manage and supervise works
Improves reliability	Requires resource to develop suitable business case for investment using capital budget	resource required to procure tender documentation and administration of same
reduces reactive maintenance costs		Use SCOTS Asset management tools
Improves user experience		

Option 4 Utilise latest condition survey data to identify asset needs. Address any priority repairs and progress a maintenance strategy as part of the RAMP to develop a long term investment plan over next three - five years to bring asset condition to meet compliance with current standards.

Benefits	Drawbacks	Considerations
Modernises asset to meet current stand-	Requires investment	Resource to manage and supervise works
Improves reliability	Requires resource to develop suitable business case for investment using capital budget	Resource required to procure tender documentation and administration of same
reduces reactive maintenance costs		Use SCOTS Asset management tools
Improves user experience		Assess need for individual assets. Can they be removed? Are alternative control measures available?

6.0 Street Furniture

6.1 Assets

The street furniture asset covers a wide range of items . The full extent of these items is often unknown with little information currently held on asset database systems. Table 6.1 provides details of the current information held for each of the identified item which is subject to change as more information becomes available.

Table 6.1 Street Furniture Quantities

Street Furniture Assets	Quantity of Assets	Unit
Traffic Signs (non-illuminated)	5,007	Number
Safety Fences	61,629	Length (m)
Pedestrian Barriers	198	Length (m)
Bollards	276	Number
Bus Shelters	124	Number
Grit Bins	579	Number
Cattle Grids	162	Number
Verge Marker Posts	2,322	Number
On-Street Parking Meter	92	Number
Weather Stations	14	Number
Total	**70,403**	

6.2. Condition

There is currently no condition data available other than for some individual items such as vehicle safety barriers. The nature of street furniture assets is such that individual assets are generally not subject to condition survey rather they are replaced when items are no longer fit for purpose or cannot function as intended. Items where possible are generally replaced in response to identified need or public complaints within the confines of available revenue budget allocation.

The condition of vehicle safety barriers has been reported previously and requires substantial investment to address. Initial local officer estimates indicate £2.1m investment need which requires resource to develop an appropriate business case. It should be noted that vehicle barriers are a specialist work requiring appropriate national certification and staff training to enable progress. There is currently no staff resource with required certification so design works will need external consultants to survey and quantify full extent of works.

6.3 Valuation

The asset valuation is detailed in Table 6.3 below. The valuation is based on current available data within the street furniture asset group which has numerous different asset types.

Table 6.3 Street Furniture Valuation

Street Furniture Assets	Gross Replacement Cost	Depreciated Replacement Cost	Annualised Depreciation Cost
Traffic Signs (non-illuminated)	£136,791.24	£68,405.18	£6,839.56
Safety Fences	£4,040,397.24	£2,020,228.12	£202,019.86
Pedestrian Barriers	£12,980.88	£6,386.86	£519.24
Bollards	£15,080.64	£7,405.91	£603.23
Bus Shelters	£1,315,516.00	£659,879.80	£65,775.80
Grit Bins	£63,267.33	£32,737.29	£4,217.82
Cattle Grids	£708,087.42	£347,399.93	£28,323.50
Verge Marker Posts	£50,735.70	£26,215.63	£3,382.38
On-Street Parking Meter	£230,000.00	£115,250.00	£11,500.00
Weather Stations	£216,300.00	£111,240.00	£10,815.00
Total	**£6,789,156.45**	**£3,395,148.71**	**£333,996.38**

6.4 Investment

The street furniture asset consists of many different individual assets all of which deteriorate at different rates. Generally assets deteriorate to the point where they stop performing their intended function and are replaced with new items in line with available funding. Table 6.4 below provides an indication of the renewal cycle for some street furniture assets based on previous year budget allocation and estimated asset renewal rates to calculate an indicative renewal cycle based on current funding allocation.

Table 6.4 Indicative Treatment Cycle for Asset Renewals

Item	Budget Allocation 2019-20	Current Inventory Data	Annual Replacement Quantity	Indictative Renewal cycle
Cattle Grid	£24,000	162	1.6	101
Traffic Signs	£52,000	5007	173	29
Vehicle Safety Fence	£98,000	61629	653	94

6.5 Backlog

There is currently no condition data available for all street furniture assets to assess and calculate an accurate backlog value. However a backlog estimate can be gauged from some of the major items an officer estimates. Vehicle barriers condition previously reported in ASOR estimated investment need at circa £2.1m. This combined with officer estimate for smaller assets at £0.9m provides an indicative value circa £3million maintenance backlog figure for street furniture assets.

6.6 Asset Data and Knowledge

There is limited data available on the extent and condition of the street furniture asset. Many items were installed by the previous Argyll County Council or district council. Over time and several restructuring processes for the authority some data has not been retained or local staff knowledge lost due to retirements or redundancies. Consideration is needed on developing a suitable maintenance strategy for this asset group particularly in terms of updating asset data, inspecting and obtaining condition data and associated maintenance records. This will require resource and appropriate investment however there may be scope to combine this with other asset groups needs to achieve better value. Acquiring and maintaining a reliable and robust database will enable future investments needs to be more accurately calculated and the outcomes from same better able to support corporate objectives. This will ultimately allow demonstration of a well managed asset portfolio with investment tailored to asset needs and council aims.

The SCOTS asset management project provides a range of tools and guidance to assist authorities implement better asset management practices. The photos below illustrate the diverse nature of this asset group which can have many bespoke items.

6.7 Electric Vehicle Charging

There is growing demand for the installation of electric vehicle charging points across Argyll. A number of units have already been installed since 2017 as detailed in tables below. Future installations are also shown based on current funding until 2021. Consideration is required on the ongoing management and future maintenance and inspection of these assets. This will require resource and budget allocation moving forward together with an associated maintenance strategy for an asset that is likely to see accelerated growth over future years.

Electric Vehicle Charging points	
Year	**Units**
2017	4
2018	3
2019	8
2020	1

Asset Inventory	
Type	**No.**
Rapid	11
Fast	10
Slow	0

Planned Future Installation		
Year	**Type of Unit**	
	Fast	**Rapid**
2020	2	2
2021	1	1
2022	Nil	Nil

6.8 Weather Stations

Argyll and Bute council operate and maintain a number of weather stations situated in key locations to capture weather data. The data includes road surface and air temperature, rainfall, and other key climate monitoring information. Some stations also have cameras that can provide a visual history of conditions at these locations. These stations provide vital information to officers managing the winter maintenance operations across the authority. The enable pre planned winter treatments to be organised in advance of forthcoming sub zero weather conditions to ensure our roads are safe for road users within the practicalities and resource limitations of service delivery.

6.9 ROAD SAFETY BARRIERS

Barrier replacement and maintenance is underfunded and major investment is required across the whole network. It is vital that the Council maintains and upgrades its safety/crash barrier and bridge parapet stock to ensure the safety of road users.

Policy, Assessment and Inspection processes need to be revised and at the moment we are currently reliant on specialist contractors and consultants to maintain our barrier stock.

Vehicle barriers – A general appraisal / condition survey of our safety barrier inventory was carried out August / September 2015 (See Table below for Results)

The survey identified almost 14km (18.5%) of barrier considered to be in poor condition and requiring to be replaced at an estimated cost of circa £2M. The barriers in poorest condition and those that are Non-Compliant because of their construction have been prioritised for replacement/repair within the confines of existing revenue funding at circa £100k/year since 2016/17. The replacement of our barrier stock through utilising the current funding allocation will take up to 20 years dependant on the locus.

A follow up detailed survey to identify the condition of all remaining safety barriers is being considered, to fully assess and prioritise future necessary barrier maintenance and inform the budget process. This is likely to require the assistance of a specialist consultant or contractor to deliver this initial data gathering project.

The photo below shows a new section of barrier erected at Kilmaha.

The table below shows historical investment for each area since

District	2015-16	2016-17	2017-18	2018-19	2019-20
01 Mid Argyll	£1,440	£27,322	£6,370	£18,011	£6590
02 Kintyre	0	0	£43,959	£5,556	
03 Islay	0	0	0		
04 Lorn	£24,368	£15,112	£5,338	£25,136	£16134
05 Mull	£232	£8,006	£23,132	0	
06 Bute	£475	£668	0	£110	
07 Cowal	£183	£11,209	£26,567	£23,257	£8525
08 Lomond	£18,917	£31,214	0	£25,204	
Grand Total	**£45,615**	**£93,531**	**£105,366**	**£97,274**	**£31,249**

The table below shows the results of the 2015 condition survey.

		SAFETY BARRIER INVENTORY - CONDITION SURVEY AUGUST / SEPTEMBER 2015								
item		Mull	Lorn	Mid-Argyll	Kintyre	Islay/Jura	Lomond	Bute	Cowal	Totals
Total Barrier length	lin.m	8022	10937	5413	2179	4217	23675	138	20928	75509 lin.m
Good / Moderate Condition	lin.m	3632	6790	4692	1794	3754	21760	38	18974	
percentage of total in good Condition	%	45%	62%	87%	82%	89%	92%	28%	91%	
Poor condition -requiring replacement	lin.m	4390	4147	721	385	463	1915	100	1825	13946 lin.m
percentage of total in poor Condition	%	55%	48%	13%	18%	11%	8%	72%	9%	

6.10 Investment Options

Below are a number of initial revenue budget investment options for consideration. These will all require further investigation, research and development to progress more detailed information on which option is best suited to support council objectives within the confines of available resources. Investment options should be linked to development of a long term maintenance strategy for the asset.

Option 1 Undertake maintenance on a reactive basis to repair defects within existing revenue budget allocation.

Benefits	Drawbacks	Considerations
Continues service delivery for defects	Continued long tern asset deterioration	Adopting risk based approach to managing the
	Growing demands for capital investment	Resource condition survey of asset to gain information on asset inventory, condition Etc.
	Rising number of public liability claims	Development of long term maintenance strate-
	Reactive maintenance is expensive and poor value	Resource development of a prioritised list of planned works

Option 2 Increased investment in planned revenue maintenance activities

Benefits	Drawbacks	Considerations
Investment tackles worst asset deterioration	limited asset information and condition data	Implementing SCOTS asset management recommended practices
Planned works deliver better value	resources required to identify and quantify works	Current use, Is it needed? Can it be removed?
Reduced demand for reactive works	Level of works limited within available revenue budget allocation	Resource development of a prioritised list of planned works
Less complaints		Development of long term maintenance strate-

Option 3 Develop a business case for investment through capital budget for replacement of obsolete, damaged and deteriorated assets particularly vehicle safety barriers. Align the business case to a suitable long term maintenance strategy for the asset group.

Benefits	Drawbacks	Considerations
Investment tackles deterioration and gradually improves whole asset	limited asset information and condition data	Development of long term maintenance strategy for asset group
Demonstrates prudent stewardship of assets	resources required to identify scope of works	Investment in mobile technology to capture asset data
Supports corporate objectives	Requires increased levels investment	Implementing SCOTS asset management rec-

Option 4 Business case development for capital investment in conjunction with other asset groups that aligns with the Road Asset management Plan (RAMP) and council priorities.

Benefits	Drawbacks	Considerations
Whole asset approach to maintenance	requires substantial capital investment	Use of SCOTS asset management tools
	Requires significant improvement in asset data	Investment in mobile technology
		Deveolpment of appropriate maintenance

7.0 Climate Change and a Resilient Network

Climate change is global but can be evidenced locally through more frequent severe weather events and greater annual rainfall. This requires action to ensure drainage assets are functioning properly and have the capacity to deal with these more regular events. Water is road infrastructures greatest enemy and is capable of destroying structures and transportation links very quickly. Good drainage management is vital to protect valuable assets from the effects of water. The illustrations below shows the affect standing water has on a newly resurfaced road over a relatively short time as vehicles effectively pump the water into the surface accelerating the deterioration process. Lack of investment in drainage assets impacts the outcome and benefits realised from the original resurfacing works undermining the substantial investment made and incurring further avoidable expense in repair of the defect.

7.1 Investment

Drainage Budget allocation and Spend								
	2016-17		2017-18		2018-19		2019-20	
Activity	Budget	Spend	Budget	Spend	Budget	spend	Budget	spend
Drainage/Culverts	£233,000	£330,601	£253,000	£274,815	£251,700	£274,881	£218,500	£370,701
Drainage/Ditches	£304,600	£369,100	£292,000	£420,593	£285,700	£278,830	£244,998	£328,501
Gully Emptying	£245,000	£261,438	£227,000	£258,174	£221,400	£230,319	£288,000	£268,993
Totals	£782,600	£961,139	£772,000	£953,582	£758,800	£784,030	£751,498	£968,195

7.2 Condition

The 2015 ASOR provided details of a sample drainage survey with results based on the SCOTS condition index. This survey identified 53.9% of ditches on B,C & U Class roads required attention .

7.3 Maintenance Backlog

The ASOR 2015 provided a maintenance backlog figure for carriageway ditching based on results of the sample survey. This clearly illustrated need for investment in road drainage management. Efforts are required to maximise the effectiveness of available investment for cleaning or servicing assets and capturing data on maintenance records to demonstrate prudent stewardship of assets. Reliable and robust data will properly inform the most efficient and effective future management of drainage assets. This can enable a more data driven approach to be developed and the optimum value maintenance programme delivered that aligns with asset needs and customer expectations.

Carriageway Ditching Maintenance Backlog (A Class condition estimated as 15% Good 15% Fair, 30% Poor,30% Very Poor)								
Ditch Condition	Road Classification				Total Length (Km)	Service Cost (£/Lin.m)	Estimated Cost	Comments
	A Class (Est Condition)	B Class	C Class	U Class				
Good	50.7	84.9	34.3	87	256.9	£2.50	£642,250	Cost does not include for Scrub Clearance
Fair	50.7	121.3	62.9	48.7	283.6	£3.00	£850,800	
Poor	101.5	133.4	41.9	83.6	360.4	£3.75	£1,351,500	
Very Poor	101.5	64.7	51.5	128.8	346.5	£4.50	£1,559,250	
						Estimated Total Cost	£4,403,800	

7.4 SCOTS Asset Management Project Case Study—Stirling Council Gully Cleaning

The SCOTS project presented a case study on Stirling Council approach to gully cleaning. This provided valuable insight on the issues, solutions and lessons learnt from implementing a revised approach to gully cleaning. The investment made in this data driven approach has proved a great success for Stirling Council with a much improved service delivering better value combined with significant savings on reactive flooding callouts and public complaints. An outline of their approach is detailed below. Argyll shares similar issues with gully maintenance and servicing and may wish to consider appropriate investment implementing a comparable data driven approach.

Context

- Over 1,000 km network with 18,400 recorded gullies.
- Two complete cycles per year
- Paper based reporting system.

Desire

- To move to a targeted cleansing cycle
- Greater visibility
- Improve the service

Risks

- Compliance with the Flood Risk Management Act (Scotland)2009
- Paperwork missing or illegible
- Asset information quality, Location, Condition data, Trend data, Work records
- Budget reductions, Operating costs
- Complaints

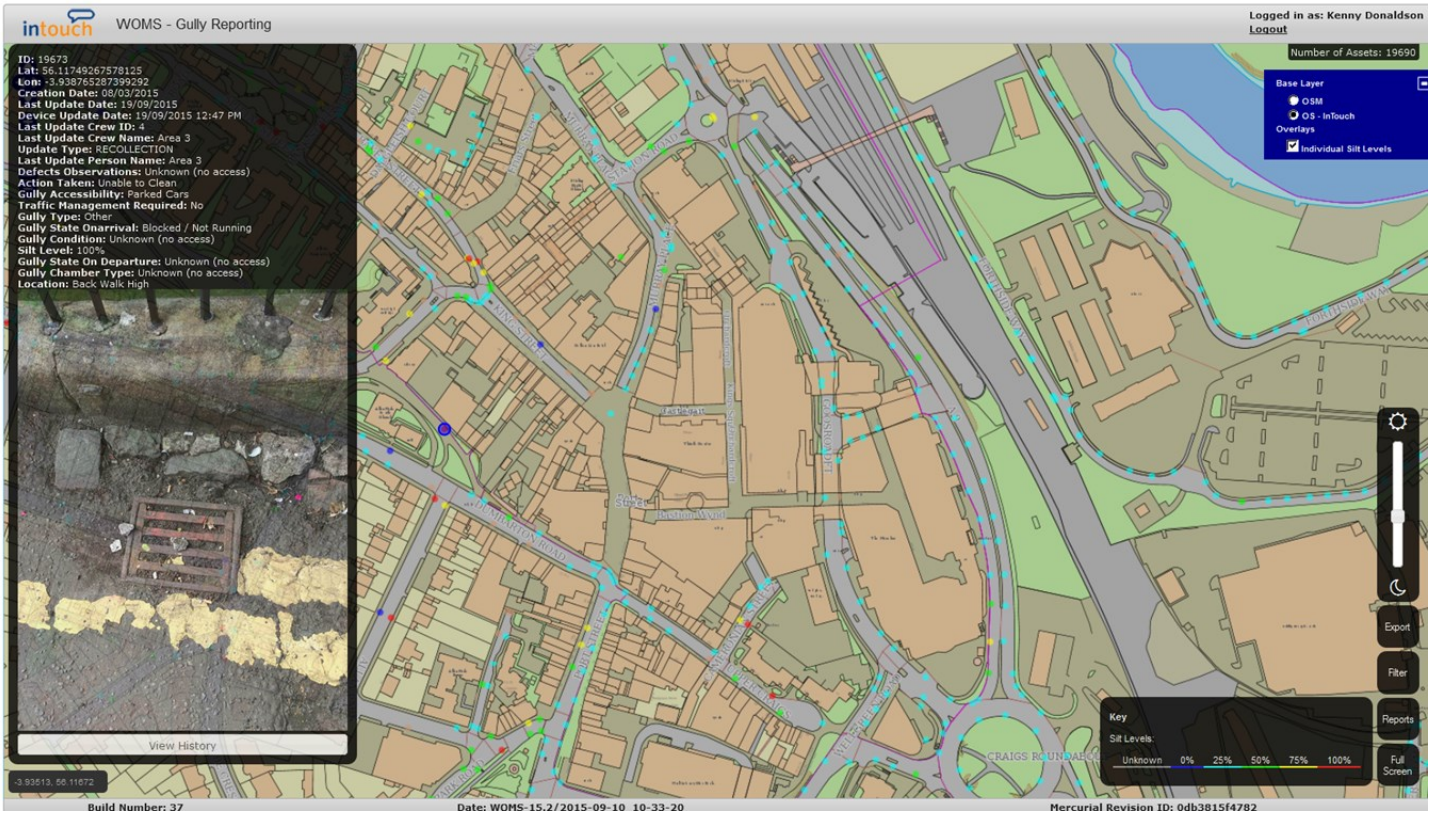
Solution

- Gully Management Software
- Contractor captured; Gully type, Location, Condition, Construction, Faults, Silt level and Photograph.

Implementation

Stirling Council utilised existing external gully cleaning contract to implement the new approach.

- An additional charge was levied for each gully for the contractor to capture the required data using supplied tablets.
- It highlighted that gullies had not previously been effectively cleaned
- Tipping volumes increased dramatically
- Previously gullies were being missed as register showed less gullies than actual.



Outcomes from Data Driven Approach

- Inventory quality improved with 100% gully locations now known.
- Condition and maintenance history data captured.
- Updated cleaning cycles (Winter November– March all gullies cleaned, Summer gullies cleaned in line with silt record from wnter clean)
- Reduction in complaints
- Improvement in contractor confidence and trust
- Better value rates when contract re tendered.

Future Development

- Fitting of gully sensors to detect silt and water levels
- Full implementation of asset management system.

The Stirling example clearly illustrates the benefits of investing in a data driven asset management and maintenance approach. It has supported continuous learning and grown extensive knowledge which can be utilised effectively to gain the most from available resources. Implementation of this data driven approach has facilitated a much more effective and improved service delivery.

7.5 Investment Options

Below are a number of initial revenue budget investment options for consideration. These will all require further investigation, research and development to progress more detailed information on which option is best suited to support council objectives within the confines of available resources. Investment options should be linked to development of a long term maintenance strategy for the asset.

Option 1 Reduce existing budget allocation for drainage maintenance

Benefits	Drawbacks	Considerations
Provides budget savings	Increase risk to assets from storm events	Improved data capture to inform decision making
	Reduction in expected service life of road asset	Review of existing drainage maintenance
	Does not support Flood Prevention Act Scotland (2009)	Explore options for implementing a more data driven approach
	Increased reactive flooding costs and complaints	

Option 2 Maintain existing budget allocation for drainage maintenance

Benefits	Drawbacks	Considerations
Protects drainage budget allocation	Does not provide adequate protection for assets	Improved data capture to inform decision making
Continues to offer same level of asset protection	Lack of data to make informed choices	Review of existing drainage maintenance regime
mitigates some risk from weather events	Existing maintenance is generally driven by reactive needs rather pre-planned programmes	Explore options for implementing a more data driven approach
Contributes to Flood prevention Act	Unable to clearly demonstrate prudent stewardship of assets or delivery of value	Focus on improved record keeping to provide demonstrable service standards and identify areas for improvement

Option 3 Moderately **i**ncreased investment in drainage maintenance based on measurable outputs aimed at improved service delivery

Benefits	Drawbacks	Considerations
Provides welcome investment	Resources to develop work programmes and measurable outputs from captured data.	Investment in mobile data capture devices
reduces risk from weather events	Potential technical difficulties for data capture	Development of 3 - 5 year work programmes
supports the Flood Prevention Act	Requires leadership focus on achieving goals	Review of existing drainage maintenance regime
commences a data driven approach	Breaking vicious reactive maintenance cycle	Development of a data management plan

Option 4 Substantial investment in drainage maintenance based on implementing data driven approach through improved data capture in terms of inventory, condition, maintenance records Etc.

Benefits	Drawbacks	Considerations
Enables improved service delivery	Requires leadership commitment to deliver	Exploring mobile technology options
Enables informed decision making	Procurement of mobile technology devices	Review options for a progressive staged implementation
Mitigates risks and delivers objectives in Flood Prevention Act	Initial resource to focus on revised delivery model and achieving change.	Development of data management plan
Enables a fully optimised drainage maintenance regime to achieve best value	Requires additional finance and resource	Development of target service standards
Drainage improvements would contribute substantially to improving network resilience and arresting deterioration whilst extending asset service life.	Likely to require initial capital investment over 3 years to bring assets up to standard and develop an asset management approach to drive continuous improvement.	Review of existing verge maintenance regime to enable support for delivery of improved drainage maintenance.