Shetland Islands Council

Roads Asset Management Plan

Version 2A

December 2017

Foreword

This plan sets out the Council's intentions for the management of its road asset for the next 5 years and beyond. It has been produced in accordance with national guidance and recommended good practice.

In essence asset management sets out an approach to be used in acquiring, maintaining, improving and disposal of an asset. In terms of roads Asset Management can be defined as:

"A structured, long-term approach to planning optimal maintenance and eventual renewal of infrastructure."

It is widely recognised that the application of modern asset management practices can enable improved value for money. In these challenging times is it essential that the Council embraces these methods and strives to ensure that every penny spent is invested as wisely as possible. This plan forms an important part of the Council's commitment to apply good asset management to roads.

The plan has recognised the views of road users and residents and in particular the importance that is placed upon our road assets. However, the opinion of residents needs to be updated so new opinion surveys will now be undertaken on a bi-annual basis. Recent harsh winters have shown that our roads are susceptible to damage when bad weather occurs. It is essential that an appropriate level of investment is put into the road network to maintain and ultimately contribute to the main principles of the Council, that of the economic wellbeing of the locality.

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Executive Manager – Roads Service

Document Control & Council Approval

Version Number/Date	Approved by Council
v1	Progress with this document's development has been noted at various meetings of the Environment and Transport Committee and the Roads – Member Officer/Working Group.
v2 v2a	Approved by Environment & Transport Committee on 3 October 2016 and Shetland Islands Council on 2 November 2016. Annual update completed on 19 December 2017.
Next Update Due	June 2021

Responsibility for the Plan

The persons responsible for the delivery of and updating of this plan are shown below

Position	Name	Responsible for
Shetland Islands Council		To approve material changes to the RAMP, act as custodians of community assets and to set policy.
Environment & Transport Committee		Approval of the functional amendments to the RAMP.
Executive Director of Infrastructure Services	Maggie Sandison	Approval of functional amendments to be proposed to Committee.
Executive Manager of Roads Service	Dave Coupe	Champion of RAMP.
Team Leader-Asset and Network Management	Neil Hutcheson	Monitoring improvement actions, informed decision making & ensuring updates to the documents. Identifying where improvements to the service can be made.
Programme Manager	Bill Peterson	Updating RAMP document as required. Producing integrated forward work programmes, both long and short term, and ensuring their availability to all interested parties. Identifying conflicts and opportunities for rationalisation of works.
Network Engineer	Neil Robertson	Ensuring data management procedures are followed and that all information is kept up to date. Providing requested information outputs to other parties.
Team Leaders	Neil Hutcheson, George Leask, Barrie Scobie & Brian Wood	Monitoring and updating risk registers, ensuring control measures are put in place & identifying risks that need to be passed up the management tree.
Asset "Owner" Carriageways	Neil Hutcheson	Updating lifecycle plans, ensuring implementation of improvement actions. Identifying asset specific investment requirements; works programmes and changes to procedures and documentation.
Asset "Owner" Footways	Barrie Scobie	
Asset "Owner" Structures	George Leask	
Asset "Owner" Street Lighting and Traffic Signs	Mervyn Smith	
Asset "Owner" Drainage	Brian Wood	

1. Introduction

Overview

This Road Asset Management Plan (RAMP) sets out and records the plans for Shetland's road assets for the period 2016-2021. The "road asset" comprises of carriageways, footways, structures, street lighting, traffic management and street furniture (also drainage etc). The definition of asset management adopted by Shetland Islands Council is that contained within the County Surveyor's Society Framework for Highway Asset Management:

"Asset management is a strategic approach that identifies the optimal allocation of resources for the management, operation, preservation and enhancement of the highway infrastructure to meet the needs of current and future customers."

The Society of Chief Officers of Transportation for Scotland (SCOTS) guidance requires the RAMP to be produced together with a road maintenance manual (RMM) and an annual status and options report (ASOR).

Purpose

There are many reasons for implementing a RAMP that include:

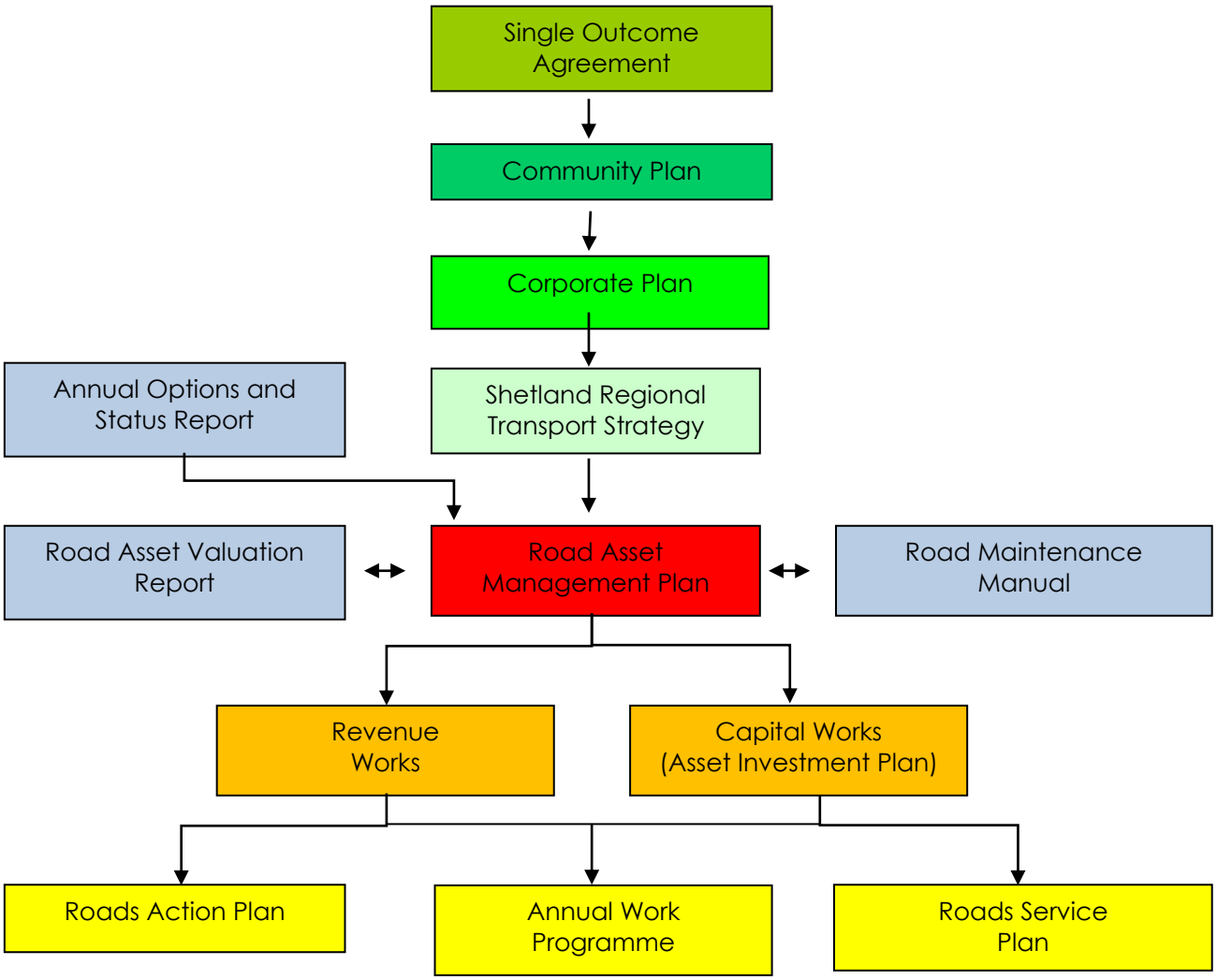
- providing evidence of strategic thinking and long term planning with regard to maintenance and management of the road infrastructure ;
- to identify and take account of the needs of road users;
- a satisfactory explanation to stakeholders of a fair and reasonable way of allocating limited operational, maintenance and improvement resources;
- the introduction of Whole of Government Accounts (WGA) and Resource Accounting and Budgeting (RAB), whereby local authorities are to be required to provide financial forecasting and valuation information to central government;
- in order to meet both national and local outcomes as specified within the single outcome agreement;
- formalising strategies for investment in road asset groups; and
- defining service standards.

The plan aims to improve how the road asset is managed and to enable the delivery of a better value for money roads service. Local authorities have a statutory duty to pursue best value. Expenditure must be prioritised to ensure corporate objectives can be effectively delivered within budgetary constraints. Asset management assists this process by enabling the allocation of resources based upon assessed need.

The use of lifecycle planning, the minimisation of whole life costs and decision making informed by an appreciation of risk and benefit are key asset management components that will help the Roads Service allocate resources to where they are likely to provide the best long-term benefits.

RAMP and Other Plans

The RAMP relates to the Council's other strategic documents and plans as illustrated below:



The RAMP is informed directly by the Shetland Regional Transport Strategy, the Annual Status and Options (Carriageway Condition) Report and the Road Maintenance Manual. Targets and strategies contained in the RAMP are used to develop annual works programmes once the Council's annual budget for roads has been agreed.

2. Road Assets

Road Assets

The Council's road assets covered by this plan are:

- Carriageways 1,054 km
- Footways 114 km
- Structures 308 Bridges, Culverts, Underpasses etc
- Street Lighting 3,995 Lighting Columns
- Traffic Management Systems 10 Pedestrian Crossings (7 Pelican and 3 Zebra)
- Road Drainage Infrastructure (extent unknown)

The asset also includes traffic signs, roadside safety barriers, pedestrian barriers, gullies, ditches, traffic calming features, road markings, car parks, verges and street furniture such as bollards.

Assets Not Covered

Some related assets that the Roads Services maintain are the responsibility of other Council departments. The Council owned road assets not covered in this RAMP are:

- footpaths managed by the Housing Service and Sport & Leisure Service;
- bus shelters managed by Estate Operations;
- amenity grassed areas which are maintained by Environmental Services;
- private roads;
- private bridges;
- public rights of way and
- water related infrastructure that does not form part of the road network.

Inventory Data

This plan is based upon currently available inventory data for road assets, i.e. carriageway, footway, structures, street lighting, traffic signals and street furniture. For some minor road assets inventory data is not currently held, however, an attempt has been made to incorporate these assets within this plan using local estimates and sample surveys. The continual improvement of the asset data will form an important part of the process of updating the road asset data management plan.

3. Customer Expectations

Customer Preferences

The expectations of road users need to be sought and understood as part of the asset management process. The Council takes part in national performance reviews through APSE and SCOTS as well as seeking the views of the local community by undertaking general "your voice" surveys regularly over a number of years. Questions related to roads were included in the autumn 2005 survey, with exactly the same questions repeated in autumn 2008. The survey allowed satisfaction to be rated at one of five levels, from very poor to excellent. By repeating exactly the same questions, it was possible to monitor changes in satisfaction levels over that three-year period. A new survey is overdue and will be undertaken this year, 2016/17. The format used will be as provided by APSE so that it is consistent with surveys undertaken by other local authorities enabling comparisons to be made for benchmarking purposes.

In addition project specific consultation is undertaken for all major works and traffic management schemes where local residents, Councillors and appropriate user groups are consulted to gauge their opinion of the scheme.

Performance and maintenance issues shall be consulted on bi-annually. A questionnaire is circulated to all Community Councils asking them to record levels of satisfaction with, and the importance of all aspects of road maintenance. The most recent survey model used was the ‘Highway Maintenance Services Customer Satisfaction Survey’ as produced by APSE. The results of this consultation will feedback into the road maintenance plan, determining the respective priorities within each Community Council area.

Additional consultation takes place with transport stakeholders on an as required basis, for example, reviewing specific issues such as winter maintenance, or parking restrictions and traffic management.

Consultation Results

Full results of the latest “Your Voice” survey can be found in the survey report itself, however some of the findings in relation to roads are:-

- 86% rated the general standard of the road surface as satisfactory or better.
- 79% rated the repair of potholes and road surface defects as satisfactory or better (70% in 2005).
- 76% rated the general standard of footway maintenance as satisfactory or better (78% in 2005)
- 60% rated the gritting and snow clearing of rural main roads as good or excellent with 93% rating it as satisfactory or better (89% in 2005).
- 75% rated the gritting or snow clearing of footways in residential areas as satisfactory or better (72% in 2005)
- 86% rated the speed of repairs of Street lights as satisfactory or better (93% in 2005).

The results of the surveys can be used by the Roads Service to identify areas of the service that may require revised strategies to be implemented.

Customer Contacts

Customers or road users make contact with the Roads Service in the traditional way via letters, personally visiting the office and through the local Community Council or their Council member. A more common method in recent times has been to e-mail the Roads Service at our address which is available on the Council's website. The Council also has a Twitter address and the Roads Service has occasionally received messages for our attention over this newer form of social media. In addition to these methods Roads also has a link from its webpage to our Pavement Management System. A member of the public can "create" a defect on the system if they wish to report a fault such as a damaged kerb or blocked gully. The Area Maintenance Engineers can then access this defect and, when necessary, create a works order for the necessary repairs.

4. Demands

Asset Growth

The road asset has increased by approximately 0.8 kilometres per year over the last 5 years, mainly due to a number of small housing developments complete with attendant footways and lighting columns. This low rate of growth, equating to only 0.1 % p.a., was in part due to the Council's Housing debt and a reduction in funding to Housing Associations. However, this rate is expected to increase in the next 5 years with a number of developments being planned by the Council, Hjaltland Housing Association and private developers. There may be as many as 300 houses built requiring approximately 8 construction consents for the associated roads. Currently the largest of these will be by Hjaltland at the Staney Hill on the north-west outskirts of central Lerwick. This development will account for almost 200 of these houses with a considerable increase in our road network required to service these properties.

Recent additions in the use of traffic calming features and high friction surfacing have increased the maintenance budget requirements due to additional maintenance costs for their repair but again the increase in their use is likely to recede in the near future as most problem areas have now been addressed.

New or additional assets create the need for maintenance, management and associated funding in future years as these assets age. This is particularly relevant to street lighting as energy cost increases immediately result in an increase in the budget required. However, as we are now in the process of replacing conventional streetlighting lanterns with LED equivalents on existing public roads we now require developers to provide this energy efficient form of lighting on any roads that they construct.

Traffic Growth and Composition

The SIC traffic section keeps records of traffic volumes from a number of permanent and temporary counter sites throughout the Isles. As would be expected the majority of HGV traffic occurs on the principal roads. However, largely due to the aquaculture industry, there are a number of unclassified routes where significant volumes of HGV vehicles are present and this is undoubtedly causing significant damage to single track roads which were never intended to be subjected to this level of traffic loading. This has created a growing need for investment in the maintenance of these single track roads.

Environmental Conditions

Pressure has also been placed upon the asset as a result of environmental conditions, most notably the harsh winters experienced in 2009/10 and 2010/11. These caused significant damage to carriageways with a freeze/thaw action resulting in cracking of the road surface, throughout Shetland. There is also a notable increase in the occurrence of landslips on hillsides where peat overlies a rock substrate. These are usually as a result of high intensity rainfall events which now appear to be more common, possibly as a result of climate change. These have the potential to damage roads and/or disrupt travel. The most notable incidents in the past were the landslides across the A970 at Channerwick and the Maywick Road in the South Mainland.

Utility Activity (For Example:- Scottish Water, BT, SSEB, District Heating)

Utility activity can have a major effect on the maintenance and management of the road assets. There is undoubtedly a significant increase in the number of defects found following the disturbance of the carriageway or footway surface due to utilities. This is apparent even when the utility has reinstated the surface to the required standard. In the recent past the renewals of water mains within Lerwick and the installation of district heating scheme infrastructure has increased maintenance costs. Fortunately Scottish Water has recently been making use of “pipe bursting” technology to replace or line existing pipework without the need for excavations in the carriageway. We also understand that the district heating scheme is now operating at capacity so there is unlikely to be any significant increase in new connections in the immediate future.

Statutory undertakers are responsible for carrying out their own reinstatements although these may be contracted and/or sub-contracted to others. This can cause programming problems where different contractors are responsible for different aspects of the reinstatement. The Roads Service enforces a 2-year guarantee period on all re-instatements and 3 years for those entailing deep excavations.

Where statutory undertakers have caused damage to Council assets it is SIC practice to endeavour to reclaim the costs of repair or replacement from the responsible party. This is not always possible but recently we have had more success with the most notable repair being the inlay resurfacing of a half lane width of Commercial road along a failed water main reinstatement.

It is difficult to predict the amount of utility activity in any one year although the recent rise in activity related to a large capital investment by Scottish Water is likely to tail off over the next three years. Work is in progress on upgrading broadband in Shetland with fibre optic cables being installed in existing ducts between exchanges and newly installed service cabinets. This has required some work in the carriageway and roadside verges. While this work may be ongoing over the next five years it is not expected to require a large number of excavations in the carriageway.

5. Service Standards

This plan is based upon delivering the service standards listed below. The standards reflect the funding levels in section 6. They are the standards that road users can expect from Shetland's road assets during the plan period. This plan targets delivery of service standards shown below. Details of how the specific measures shown below are calculated are included in the road maintenance manual.

SCOTS CORE PERFORMANCE INDICATORS

Service	Measured By	Target	Standard
		2017	2021
Carriageways			
Safety	Percentage of Cat 1 defects made safe within response times.	100%	100%
	Percentage of safety inspections completed on time	96.9%	96.9%
Condition	Percentage of all roads to be considered for maintenance treatment	37.7%	38.9%
	Percentage of "A" Class roads to be considered for maintenance treatment	19.8%	20.7%
	Percentage of "B" Class roads to be considered for maintenance treatment	33.5%	34.4%
	Percentage of "C" Class roads to be considered for maintenance treatment	31.5%	35.0%
	Percentage of unclassified, non-principal roads network where maintenance should be considered	50.5%	51.1%
	Percentage of carriageway length treated	6.68%	4.35%

Footways			
Safety	Percentage of Cat 1 defects made safe within response times.	Not applicable	TBA
	Percentage of safety inspections completed on time	100%	100%
Condition	Percentage of footway area to be considered for maintenance treatment	Not formally inspected	TBA
	% of footway area treated	2.21%	1%

Street Lighting – Core Indicators			
Safety	Percentage of repairs within 7 days	not available	70%
	Percentage of street lights not working as planned on any one evening	6.4%	5%
Environment	Average annual electricity consumption per street light (kwHrs)	525.7	320

Structures			
Condition	Percentage of primary inspections carried out on time	Not available	TBA
	Percentage of general inspections carried out on time	100%	100%
	Bridge Stock Condition Indicator - Average	98.38	TBA
	Bridge Stock Condition Index - Critical	95.83	TBA

An action for the Engineers with responsibility for bridges, over the next two years, is to re-assess them and update their entries in the data inventory. The above table will be populated at that time. It is likely that during this plan, period inspections will identify additional structures that have deteriorated to the point of requiring attention. Priorities may need to be adjusted to accommodate this.

6. Financial Summary

Sources of Funding and Budget Allocation

Revenue

Revenue funding within roads is based on historical precedence and identified need and is split between a number of service headings which are broadly in line with Asset Management elements. Currently within the service individual budget holders are encouraged to make a case for any additional funds that are required to enable the ongoing maintenance and management of the assets such that the funding split can be adjusted to reflect current priorities. Each of the budget holders is then responsible for determining how the funding is used within their service area. Revenue funding for roads maintenance has been reduced in recent years due to pressure on the funding of the Council's overall revenue budgets.

A large part of the budget is dictated by the cost of running the Council's Roads Maintenance Section which is predicated upon the labour required to deliver the winter service. All routine and reactive works are carried out by the Maintenance Section. Therefore there is little scope to vary the total Roads budget unless there is a corresponding reduction or increase to the extents of the road network gritted/ploughed during the winter months. However there is scope for improving the use of the current budget via the exploration of different ways of directing the resources to the most productive work and that which has the greatest benefit to the asset. From 2017-18 the method of optimising this "direction of resources" will be the "carriageway cost projection model" produced by SCOTS. This spreadsheet has been developed and refined over the duration of the SCOTS RAMP project. Many authorities already use it for this purpose and this will ensure that our budget method is consistent and can be compared to other Scottish Councils.

It should be noted that the opportunity to vary budgets may also be constrained by resource considerations. As the majority of the works is carried out by "in house" resources it may be that a need to provide work that the resources are most able to do is, in some part, a stronger consideration than doing the work that is most beneficial to the asset. This can be offset to a certain extent by reallocating a proportion of, for example, the surface dressing budget to slurry sealing which requires a specialist contractor. The same process can be applied with the budgets for our traffic signs, safety barriers and cattle grids maintenance which is undertaken by a private contractor.

Capital

Roads capital projects are included as part of the Council's Asset Investment Plan. The plan is co-ordinated by the Capital Programme Service. Currently funding is allocated to Roads projects through a Business Justification Case or "Gateway" process where each proposal is assessed and prioritised by the Council's Asset Investment Group. This ensures that only the proposals, which will yield the most benefit for the Shetland public, are added to the Asset Investment Plan. The Council's capital budget

allocation has been reduced in recent years and the allocation for Capital road schemes has followed suit. The schemes “promoted” by Roads through the Business Justification Case process are generally carriageways needing reconstruction, streetlighting that needs replacement and structures such as bridges or retaining walls that need significant maintenance. These are issues that require immediate investment to maintain the value of the asset.

Where a capital roads scheme is being undertaken largely for maintenance purposes the required funding is to be related to an “asset investment plan” derived from a carriageway cost model. A capital investment project was undertaken in 2014 using a model from the Highways Maintenance Efficiency Programme (HMEP) project. In future the model used will, in common with the revenue funding, be the “carriageway cost projection spreadsheet” produced by SCOTS.

Further sources of funding for works on the public road include the following:

Income

The Roads Service operated a trading account until 2014-15. Since then works have been done on an “at cost” basis. However, the service shall still tender for external contracts when it has sufficient available resources (labour and plant). These works, which vary from resurfacing to harbour works, generate an income for the Council as well as ensuring resources are fully utilised thereby reducing their unit cost. The income generated varies greatly from year to year but has increased recently due to works associated with the construction of the TOTAL Gas Plant at Sullom Voe. This has mainly been due to the supply of asphalt from the batching plant at the Scord Quarry.

Grants

Individual grants may be available for specific types of improvement work from Government or specialist interest groups. Budget holders produce applications for external grants which are used for the specific projects identified. Recent examples of this are the new Clickimin Foot/Cyclepath, Lerwick and the Millbrae Footway Improvements, Scalloway that were part funded by SUSTRANS and the Scottish Government’s Cycling, Walking and Safer Streets funding.

Other

The Council seeks to obtain costs from developers, or works done by them, as contributions towards improvements to the road infrastructure that are required in the local vicinity due to their development. The most notable example of this was the contribution made towards the construction of the A970 South Road/South Lochside Roundabout by Safeway Ltd when they built their nearby supermarket. Developers of housing estates are on occasion required to make smaller contributions such as meeting the costs of a new footpath to link the development with a nearby settlement.

Asset Valuation

As at April 2017 the Road asset is valued as follows:

Asset Type	Gross Replacement Cost (GRC) (£000k)	Depreciated Replacement Cost (DRC) (£000k)	Annualised Depreciation Charge (ADC) (£000k)	Comments
Carriageways	954,872	847,547	9,302	
Footways & Cycleways	30,574	21,962	302	
Structures	45,171	43,927	160	
Street Lighting	30,184	17,398	747	Condition survey in progress to facilitate column replacement and lantern upgrade to LED
Traffic Management	200	139	10	Only 10 Sets of Pedestrian Crossing Lights
Street Furniture	21,015	10,457	992	
Land	6,639	6,639	-	
Total	**1,088,655**	**948,069**	**11,514**	

The valuation figures above illustrate the very high financial value of the road asset which is calculated on the basis of a depreciated replacement cost. This method of valuation provides the current cost of replacing an asset with its modern equivalent less deductions for all physical deterioration and obsolescence.

Historical Expenditure

Historical expenditure invested in works on the Road asset is shown below:

Asset	Works	Historical Expenditure £ 000				
		12/13	13/14	14/15	15/16	16/17
Carriageways	Capital	832	342	303	1,125	474
	Revenue	2,799	2,835	2,719	2,446	3,093
Footways	Capital	87	82	103	325	170
	Revenue	46	41	50	58	78
Structures	Routine & Reactive	9	2	2	3	0.7
	Planned	381	287	628	552	350
Street Lighting	Energy Costs	212	189	224	228	258
	Routine & Reactive	0	0	0	0	0
	Planned	276	344	452	395	392
Traffic Signals	Energy Costs	Energy Costs included in Street Lighting				
	Routine, Planned & Reactive	Included in Street Lighting				
Totals:		**4,642**	**4,122**	**4,481**	**5,132**	**4,816**

Investment in carriageways, especially revenue spending, has significantly reduced since 2011/12. The increase in 2016/17 was largely due to “one-off” additional funding for the micro surfacing of urban roads. The effect of this reduction was initially exacerbated by construction inflation which, due to the increased costs of bitumen and fuel, impacted on the area of carriageway that could be treated. This was reflected in the data gathered during the annual condition survey and the resulting statutory performance indicator. The Road Condition Indicator (RCI) for all of Shetland’s roads initially increased from 40.7 to 43.7 in 2011/12 and then reduced slightly to 42.5 in 2012/13. This figure is the percentage of “the road network that should be considered for maintenance treatment.” However, in the past 4 years the RCI has reduced to 37.7% as a result of better use of the SCANNER survey data to target the most appropriate roads for preventative maintenance.

Footway spending has also had a significant reduction. The main impact being that no new footpaths have been constructed recently until 2015/16 when the grant assisted Millbrae footpath began construction. This situation is likely to continue for the immediate future. However, the slurry sealing of footways has been increased to treat footway surfaces as this will prevent more costly repairs being required in the long term.

There has also been a general reduction in planned spending on structures/bridges down from £380,000 to approximately £150,000 if only the smaller schemes undertaken on an annual basis are considered. This reduction has been met by undertaking repairs to existing bridges rather than replacing them with culverts. While this work extends the life of the bridge there will inevitably come a time when

the only option is their replacement with a large diameter culvert. In recent years the spend on planned works increased due to essential maintenance to the bearings of the Burra and Trondra bridges. This is reflected in the increase in expenditure on planned structural maintenance in the financial years 14/15 and 15/16.

Planned Funding

The service standard targets shown in section 5 are based upon the following funding levels. The funding for years 17/18 to 19/20 is based upon the budget for the 2016/17 financial year as confirmed by the full Council at their meeting on 10 February 2016. This decision was based on previous budgets, the length of the network this allowed to be treated and an estimated improvement in road condition.

Funding beyond 19/20 shown below is an estimate included solely to allow the prediction of long term condition. It has been assumed that a level of funding similar to current funding levels (the average of the last 3 years) will be provided. Any changes to these funding predictions in the future will require an update of this RAMP.

Asset	**Works**	**Funding Required £k**			**Long Term Funding Assumed £k**
		17/18	**18/19**	**19/20**	**Y3-Y20 pa**
Carriageways	Reactive	62	62	62	62
	Routine	883	883	883	883
	Planned	1,866	1,866	1,866	1,866
Footways	Reactive	35	35	35	35
	Routine	5	5	5	5
	Planned	0	0	0	0
Structures	Reactive	40	40	40	40
	Planned	80	80	80	80
Street Lighting	Energy Costs	230	230	230	350
	Reactive	25	25	25	25
	Planned	145	145	145	145
Traffic Signals	Energy Costs	Included in Street Lighting Energy Costs			
	Reactive	Included in Street Lighting Reactive Costs			
	Planned	20	20	20	20
Totals:		**3,391**	**3,391**	**3,391**	**3,391**

Energy cost are shown at 2014/15 value although it is very likely that these will escalate significantly if recent trends in prices continue as they are predicted (12.5% annual increase).

Asset Investment Strategies

The strategies in this section have been determined using predictions of future condition over a 3-year period. In future the predictions will be made over a 20 year period by making use of the "carriageway cost projection model" produced by SCOTS. This will enable strategies to be created to look at the whole life cost of maintaining the asset. Using long term predictions means that decisions about funding levels can be taken with due consideration of the future maintenance funding liabilities that are being created.

Investment strategies for the major asset types are summarised below. These strategies are designed to enable the service standards in section 5 to be delivered.

Investment between Asset Types

In comparison to historical investment, future investment, for the main asset types, is planned to be:

- Carriageways: level of investment maintained at similar levels
- Footways: level of investment maintained at similar levels
- Structures: level of investment maintained at similar levels
- Street lighting; level of investment maintained at similar levels, but this is only made possible by the approved "savings" policy that will see streetlights being removed in some areas. This reduction in the asset will allow our rapidly deteriorating streetlighting to be maintained/replaced providing the budget is not further reduced. The aim in the medium term is also to replace our existing conventional lanterns with their LED equivalent. The cost of these replacements, and the replacement of a substantial number of "failed" lighting columns, would be met from the energy savings accrued by the use of these energy efficient lanterns. Therefore, until the lights are replaced the investment will be maintained at similar levels. When this replacement scheme is completed the streetlighting energy expenditure will be almost halved. The reactive maintenance expenditure would also be reduced to approximately 60% of the current figure. The completion of the replacement scheme could initially result in the planned maintenance being reduced to less than 50% of the current figure. However, in time this would need an increase to allow for planned replacements of columns in order to avoid the current situation where a significant proportion of our columns have reached the end of their useful life at the same time.
- Traffic signals; level of investment maintained at similar levels

Carriageways

Category	Description	Basis of Strategy
Routine and Reactive Repair	Repair of defect to current intervention standards and response times.	The strategy requires the deployment of roadworker squads on seasonal repairs such as patching prior to surface dressing. To a lesser extent they are also deployed to undertake urgent and/or emergency repairs.
Planned Maintenance Preventative	A programme of preventative treatment or roads in the initial stages of deterioration.	The strategy is predicted to require approximately – A roads: Surface dressing 12.0 km pa on average – B & C Roads: surface dressing 12.0 km pa – U Roads: Surface dressing 11.0 km pa This split reflects the respective area of each road classification. Priority has been given to "A class" roads in the past at the expense of other classifications. This is shown by comparing the RCI for each classification. The aim is that this split will result in a greater improvement in the overall RCI for the given budget. This approach is supported by the "Financial Reporting Tools for Carriageways" produced by SCOTS. This totals 35 km so it would take 30 years for the entire 1054 km carriageway network to be surface dressed.
Planned Maintenance Corrective	Programme of resurfacing where a preventative treatment cannot be applied due to rutting or poor longitudinal profile.	The strategy is predicted to require: – A roads 3.4 km resurfacing pa – B & C roads 3.1 km of resurfacing pa – U roads 3.0 km of resurfacing pa. This split reflects the respective area of each road classification. Priority has been given to "A class" roads in the past at the expense of other classifications. This is shown by comparing the RCI for each classification. The aim is that this split will result in a greater improvement in the overall RCI for the given budget. This approach is supported by the "Financial Reporting Tools for Carriageways" produced by SCOTS. This totals 9.5 km so it would take 166 years for the entire carriageway network to be resurfaced. (Please note that there are significant lengths of unclassified road in Shetland where the surface construction consists of layers of surface dressing. They have never been surfaced with bitmac/asphalt and are unlikely to be in the future as their running surface is adequate for roads of this nature with low traffic volumes).

The strategy will apply a low cost preventative treatment, such as surface dressing, before carriageways deteriorate to a condition where more expensive treatments are required. The level of investment is predicted to be insufficient to allow any long-term improvement to be made in the condition of Shetland's carriageways. However, it may be possible to maintain the current condition if the proposed preventative maintenance funding is approved. This will require full use of the condition surveys to target the lengths of road that should be repaired and the most appropriate treatment method.

Footways

Category	Description	Basis of Strategy
Routine and Reactive Repair	Repair of defect to current intervention standards and response times.	The majority of Shetland's footways have been maintained to a high standard and there is only occasionally a need for a roadworker squad to repair or undertake urgent or emergency repairs.
Planned Maintenance Preventative	A programme of preventative treatment of bituminous footways in the initial stages of deterioration.	The strategy is predicted to require: – Footway Surface Treatment (slurry sealing) 4.0 km pa on average Coverage at this rate means that it would take 28.5 years to treat the entire 114 km footway network.
Planned Maintenance Corrective	Programme of resurfacing/renewal of footways.	The strategy is predicted to require approximately: – Renewal of flagged footways 100 sqm pa – Resurfacing of bituminous footways 800sqm pa This is a relatively low figure because as stated above our footways have been maintained to a high standard and slurry sealing will be targeted to prevent further deterioration.

The strategy will apply a low cost preventative treatment, such as slurry sealing, before the footways deteriorate to a condition where more expensive treatments are required. The level of investment should be sufficient to maintain the generally good condition of the footways. There are some footpaths in adopted housing estates that are deteriorating and may need resurfacing in the near future. However, they are not significant lengths and the proposed preventative maintenance funding should allow the worst of these to be resurfaced.

Structures

Category	Description	Basis of Strategy
Routine and Reactive Repair	Repair of defect to current intervention standards and response times.	The strategy requires the deployment of roadworker squads on minor repairs to parapets, movement joints, patching of the bridge deck surfacing and the pointing of stonework walls or abutments.
Replacement	Replacement of deteriorated bridges or those assessed as being weak.	The strategy involves the replacement of “traditional” bridge types with large diameter twinwall culverts. The older bridges are generally short span reinforced concrete slabs with concrete or stonework abutments. It is generally more cost effective to replace these with culverts than to strengthen the existing structure. Consideration to be given to the use of pre-fabricated concrete headwalls.
Refurbishment	Refurbishment of structures that show signs of deterioration	The strategy involves the annual inspection of Trondra, Burra and Muckle Roe bridges with any defects being rectified shortly thereafter. The bearings on both the Burra and Trondra have recently been replaced by a private contractor.
Parapet works	Strengthening or replacement of weak parapets	Existing parapets on older bridges are generally of sub-standard height so unsuitable for pedestrians. They are usually constructed from in-situ concrete so are a hazard to vehicles. They are replaced with galvanised pedestrian barrier panels on bridge parapets for safety reasons. Consultants inspect the parapets at Burra, Trondra and Muckle Roe bridges regularly.
Scour Protection	Scour protection works on structures susceptible to scour	As appropriate from surveys but this type of work is reducing as large diameter twinwall culverts replace “traditional” bridge types.

The structures strategy will see the inspection and reassessment of all of our bridges over a two-year period. The proposed funding for replacements is £80,000 per year that would allow 2 to 3 new culverts to be installed. The maintenance budget of £40,000 in addition to some minor repairs monies would perhaps be sufficient to allow the repair or refurbishment of a further large diameter culvert. The Trondra Bridge was painted last financial year (2016/17) and bolts on its parapet rail are to be replaced. The Muckle Roe Bridge is to be painted this financial year (2017/18).

Street Lighting

Category	Description	Basis of Strategy
Routine and Reactive Repair	Repair of defect to current intervention standards and response times.	The strategy requires the deployment of a single two-man squad to undertake the routine inspections of the streetlighting asset. The same squad will repair any defects that are identified during the inspections.
Planned Maintenance Preventative	There are no plans to undertake any significant level of preventative maintenance.	A number of local authorities have a programme of re-painting lighting columns to prevent corrosion. We have shown that this is not cost effective in Shetland. The majority of our columns are approaching 25 to 30 years old so are nearing the end of their design life. It is more cost effective to replace these with new hot dipped galvanised columns.
Planned Maintenance Corrective	Programme of structural renewal	The strategy is predicted to require approximately 140 columns replaced pa. Replacement at this rate means that it would take 28 years to renew every streetlight.
Invest to save		A savings review was undertaken in 2012/13 and its recommendations approved by the Environment and Transport Committee. This has seen part-night lighting introduced in some areas and the complete removal of columns where lighting is not considered necessary. Capital money has been required to remove columns but the long-term benefits are reduced spending on capital renewals, energy and inspections. The aim in the medium term is also to replace our existing conventional lanterns with their LED equivalent. The cost of these replacements, and the replacement of a substantial number of “failed” lighting columns, would be met from the energy savings accrued by the use of these energy efficient lanterns. The necessary funds would be borrowed with the repayments met from the resulting energy savings.

The level of investment may not be sufficient to maintain the streetlighting asset in its current condition. This is mainly due to the age of the columns. The majority were installed more than 30 years ago in the developments that were provided during the oil “boom”. Therefore, they are now all approaching the end of their useful life, at the same time. The proposed investment would allow “failed” columns on main roads to be replaced. However, individual columns on low speed/low traffic volume roads that have

become unsafe may have to be removed without any prospect of being replaced in the immediate future. The reduction in the asset resulting from the streetlighting “savings” policy means that this can be managed to some extent but it is likely that the removal of specific columns, without their immediate replacement will remain an issue unless the budget is increased.

Traffic Signals (“Pelican” Controlled Pedestrian Crossings)

Category	Description	Basis of Strategy
Routine and Reactive Repair	Repair of defect to current intervention standards and response times.	The strategy requires the deployment of Electrician and assistant from the Council’s Estate Operations on emergency repairs and on other non-emergency repairs. Occasionally assistance may be required from the supplier.
Refurbishment of signalised crossings	Refurbishment of controlled crossings that have deteriorated or the equipment has become obsolete/unreliable	When possible pedestrian crossings are refurbished with parts that are taken from crossings that are being replaced. The type of crossing currently in place is now obsolete so the supply of parts is limited and difficult to obtain.
Replacement of signalised crossings	Replacement of controlled crossings that have deteriorated or the equipment has become obsolete/unreliable	The strategy involves the renewal of 2 pedestrian crossings per year until all 10 are replaced. 5 had been replaced prior to 2016/17. There is now only one Pelican, on the A970 South Road, that requires upgrading and this will be done when the preferred route for pedestrians to the new AHS is determined.

The ten Pelican crossings in Lerwick were in a poor condition due to their age. They were first “generation” LED technology so it is difficult to source spare parts. This meant that when the lights were faulty they often remained out of service for some time. Three of these have now been replaced with Zebra crossings, with LED beacons, which should be more reliable and easier to maintain. Six of the remaining seven have also been upgraded to the latest version so the expectation is that maintenance requirements will be greatly reduced. A “spare” Pelican crossing signal head is to be purchased and installed at the Gremista depot. This will be a source of spare parts should any of the signal heads on the network fail due to a faulty part. This will significantly reduce the “downtime” of the signal head as there will no longer be a delay while waiting for the part to be delivered from the mainland.

7. Risks to the Plan

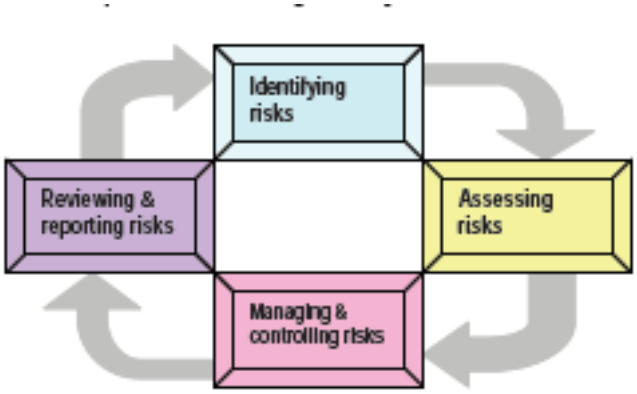
Risk Management

Risk management is a systematic approach to identifying and dealing with the risks that threaten our plans and projects and impact upon the continuation of service delivery.

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

The Council has a four-step framework for identifying, assessing, managing and controlling and reviewing risk (See Figure 8.1). This is a continuous process and can easily be integrated with performance management. The Council has agreed criteria by which to judge the likelihood and impact of risks, effectiveness of control measures and required levels of management of residual risks.

Figure 8.1: Four-step risk management framework



Risk Identification

Risk to the Council's business can take a variety of forms; for example, financial risk, risks to project and service delivery, its reputation, partnerships, employees and Councillors and risks from missed opportunities. Those risks could affect the council's performance, its assets, stakeholders, customers or members of the public. They can also affect the Council's viability.

Risk Evaluation

The next step is to assess those risks in terms of the likelihood that they will occur and the impact if they do. The criteria for the levels of likelihood and impact for risks are shown in tables 8.1 and 8.2 below.

Table 8.1: Description and definitions of LIKELIHOOD of the RISK occurring

Descriptor	Description
Almost certain	I would not be at all surprised if this happened within the next few months
Likely	I think this could occur sometime in the coming year or so
Possible	I think this could maybe occur at some point, but not necessarily in the immediate future
Unlikely	I would be mildly surprised if this occurred, but cannot entirely rule out the possibility
Rare	I would be very surprised to see this happen, but cannot entirely rule out the possibility

Table 8.2: Description and definitions of IMPACT of the RISK should it occur

HAZARD IMPACT	Personal Safety	Property loss or damage	Failure to provide Statutory Service or breach of legal requirements	Financial Loss or Increased cost of Working	Disruption in Service (Days) (This may vary with the criticality of the service)	Personal Privacy Infringement	Environmental	Community	Embarrassment
Insignificant	Minor injury or discomfort to an individual	Negligible property damage	Litigation, claim or fine <£2k	<£10k	None	Isolated personal detail revealed	Minor localised - damage to plants	Inconvenience to an individual or small group	Contained within Service Unit
Minor	Minor injury or discomfort to several people	Minor damage to one property	Litigation, claim or fine £2k to £50k	£10k to £100k	1	Isolated personal detail comprised	Death of invertebrates	Impact on an individual or small group	Contained within Service
Significant	Major injury to an individual	Significant damage to small building or minor damage to several properties from one source	Litigation, claim or fine £50k to £250k	£100k to £500k	2-3	Several persons details revealed	Death of fish	Impact on a local community	Local public or press interested
Major	Major injury to several people or death of an individual	Major damage to critical building or serious damage to several properties from one source	Litigation, claim or fine £250k to £1m or custodial sentence imposed	£500k to £1m	4-14	Several persons details comprised	Death of animals	Impact on several communities	National public or press interest
Catastrophic	Death of several people	Total loss of critical building	Multiple civil or criminal actions. Litigation, claim or fine above £1m	>£1m	>14	All personal details revealed/comprised	Permanent damage to site of special interest	Impact on the whole of Shetland	Officer(s) and/or members forced to resign

Multiplying the likelihood score by the impact score gives the uncontrolled risk score. The next stage identifies controls (strategy, policies, practices that exist currently) and their efficacy (ineffective, partially effective, effective, and very effective).

The risk is then re-assessed for likelihood and impact. The new score is the current risk score that exists after controls have been applied and so the real level of risk. That information is then recorded in the risk register. The risks are then prioritised to enable decisions to be made about the significance of those risks to the Council, and how they will be managed.

Table 8.3: Residual Risk Rating Matrix

F R E Q U E N C Y

S E V E R I T Y

	Rare	Unlikely	Possible	Likely	Almost Certain
Insignificant	1	2	3	4	5
Minor	2	4	6	8	10
Significant	3	6	9	12	15
Major	4	8	12	16	20
Catastrophic	5	10	15	20	25

Risk Control

When the risks and opportunities have been identified and assessed for likelihood and impact, there needs to be agreement on who will “own” the risk and how it will be managed, controlled or exploited. When the existing controls and action plans have been identified, the risks are re-assessed for likelihood and impact. This gives a forecasted controlled score of the Risk Profile as a result of the mitigation action plans. That information is then recorded in the risk register.

Risk Register

A risk register has been developed for the Roads Service (See Table 8.4 below). These are risks that could prevent achievement of the standards specified in this plan (section 6). Further detail on the major risks identified within the Road Asset Risk Register is given in Table 8.5 below.

Table 8.4: Roads Service Risk Register

SIC Transportation Services Roads & Fleet Risk Register					
No.	Risk	Gross Risk Profile	Uncontrolled Rating	Residual Risk Profile	Controlled Rating
FR0128	Staff number/skills shortage	High	12	High	12
FR0126	Plant/Equipment - breakdown/failure disruption	Medium	6	Low	3
FR0059	Contaminated land, air, water, structure	Medium	9	Low	3
FR0053	Budget control failure	Medium	9	Low	3
FR0054	Bad debts	Medium	9	Low	3
FR0130	Fire, lightning, aircraft, explosion	Medium	8	Low	3
FR0084	Storm, Flood, other weather related, burst pipes etc	Medium	8	Medium	8
FR0131	After Hours/ Lone working	Medium	6	Low	4
FR0135	Staff number/skills shortage	High	12	Low	4
FR0113	Late delivery	Medium	6	Low	4
FR0125	Records/Research data/systems/security/confidentiality/ back-up.	Medium	6	Low	3
FR0122	Failure of Key supplier	Medium	6	Low	3
FR0104	Public/products liabilities to third parties	Medium	6	Low	3
FR0096	Professional Errors and Omissions	Medium	6	Low	2
FR0061	Breach of Patent, copyright, trademark, Design Rights etc.	Medium	6	Low	2
FR0069	Communications poor	Medium	6	Low	2
FR0112	Noise	Low	4	Low	2
FR0119	Procurement policy - failure to observe	Low	4	Low	2
FR0016	Labour relations/disgruntled staff	Low	4	Low	2
FR0015	Other bodies - relations with	Low	4	Low	2
FR0093	Denial of Access	Low	4	Low	2
FR0056	Industrial action	Low	4	Low	2

Table 8.5: Road Asset Major Risks

Road Asset Major Risks							
Risk	**Likelihood Score**	**Impact Score**	**Uncontrolled Risk Score**	**Current Controls In Place**	**Revised Likelihood Score**	**Revised Impact Score**	**Controlled Risk Score**
Structures							
Inability to complete maintenance work due to lack of funding may lead to substantial failure of the structure causing injury and increased costs due to emergency works, or diversions due to bridge closure	3	3	12	Regular bridge inspections and allocating more of the budget to preventative/early repairs prior to the onset of structural damage.	1	3	3
Street Lighting							
Lack of funding may lead to reduction in the condition of the asset, may be unable to replace columns that are taken up for safety reasons leaving dark areas	4	4	16	Scheme to upgrade lanterns to LEDs and replace columns will be underway before the rate of column failures reaches a point where safety critical repairs cannot be done.	2	4	8
Carriageways							
Lack of funding for maintenance works may lead to a backlog of required works, the continued deterioration of the network and the need for higher cost remedial works in the future	4	4	16	Careful use of SCANNER survey data to target surface dressing may delay the deterioration in the short to mid-term but structural defects such as rutting will eventually require more expensive repairs.	3	4	12
Footways							
Lack of funding for maintenance works may lead to a backlog of required works, the continued deterioration of the network and the need for higher cost remedial works in the future	3	3	9		2	3	6
Drainage							
Standing water causing skid accidents due to reduced carriageway budgets	3	3	9	As per carriageways.	2	3	6

Further more general risks that could have a significant impact on the delivery of the service are considered in Table 8.6 below.

Table 8.6: General Risks - Impact on Service Delivery

Plan Assumption	Risk	Action If Risk Occurs
The plan is based upon winters with an average number of frost days.	Adverse weather will create higher levels of defects and deterioration than have been considered.	Budgets and predictions will be revised and this plan updated if abnormally harsh winters occur.
Available budgets have been assumed as shown in section 7.	Pressures on budgets mean that the Council may reduce the funding available for Roads.	Target service standards will be revised to affordable levels.
Construction inflation will remain at level similar to the last 5 years.	Construction inflation will increase the cost of works (particularly oil costs as they affect the cost of road surfacing materials)	Target service standards will be revised to affordable levels.
Levels of defect and deterioration are based on current data which is limited for some assets (e.g. footways)	Assets deteriorate more rapidly than predicted and the investment required to meet targets is insufficient.	Split between planned and reactive maintenance budgets will be revised.
Resources are available to deliver the improvement actions	Pressures on resources mean that staff are not allocated to service improvement tasks, predicted benefits may not be fully achieved	Target dates will be revised and reported.

The risks have been evaluated in accordance with Council policy. The risks are reviewed regularly throughout the year.

References

1) Shetland Transport Strategy
2) Asset Management Policy
3) Network Management Plan
4) Road Asset Management Manual
5) Annual Status and Options Report
6) Road Asset Data Management Plan
7) Service Improvement Action Plan