LIFECYCLE PLAN:

CARRIAGEWAYS

Version 0.2

FEBRUARY 2012

Version	Date	Signed	Checked	Status
0.1	November 2010			Draft
0.2	February 2012			Final Draft

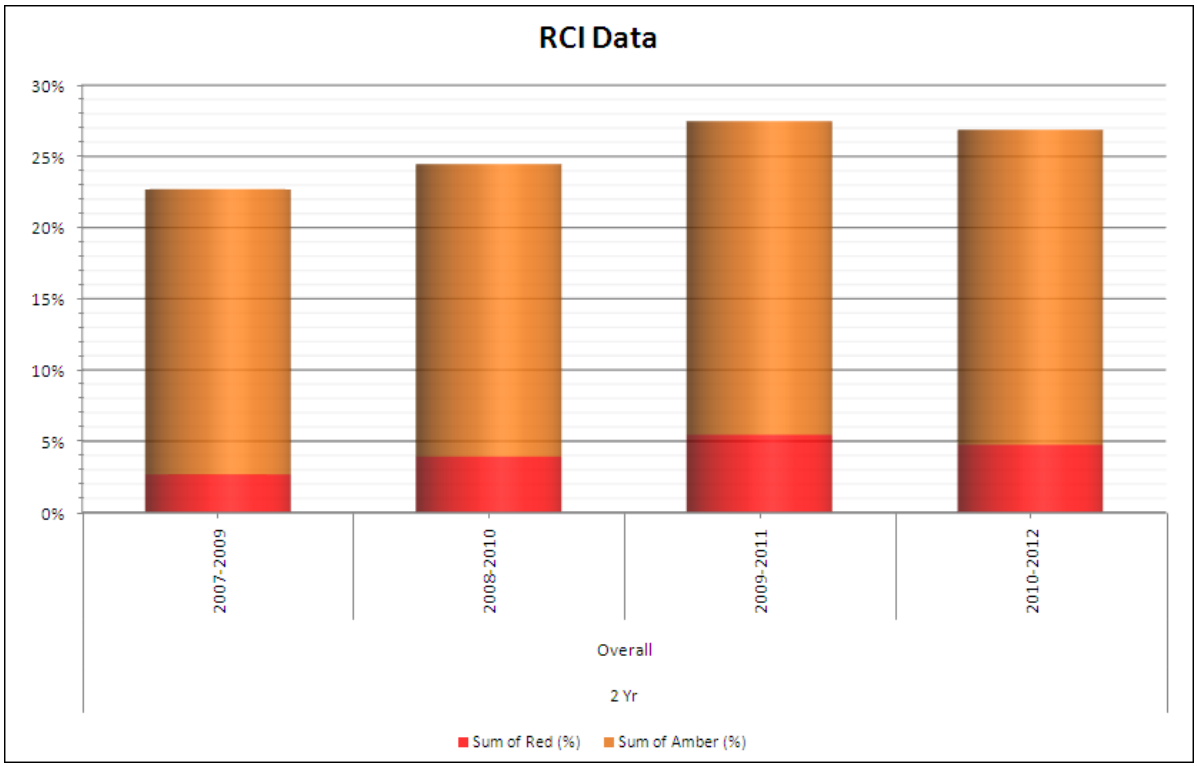
Contents

1. Summary of Current Status (February 2012)

1.1. Current Issues

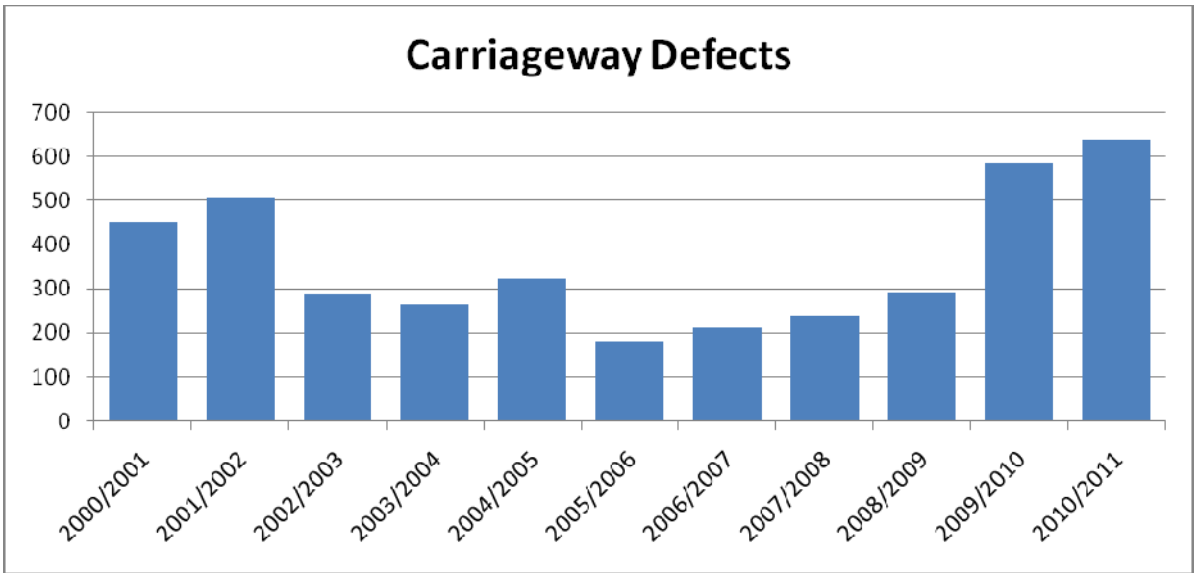
The carriageways asset is the council's most valuable road infrastructure asset. It has been estimated that it would cost £1,276m to replace with an equivalent modern road asset. In the current financial year (2011 – 2012), £3,439k is being invested on maintenance of carriageways. Expenditure on resurfacing works in the last 5 years has bought approximately 99 km of new road surface. This is equivalent to resurfacing our roads once in every 77 years. Approximately 284 km of our carriageways have been surface dressed in the last 5 years. On average our roads have been getting surface dressed once in every 27 years.

The annual Scottish Roads Maintenance Condition Survey monitors the condition of local authority carriageways and the overall trend, in Moray, had been an improving one with the areas roads being best in Scotland in 2009 relative to other local authorities. However, the last few years has seen a decline in road condition with Moray now 4th relative to other Scottish authorities.



Rolling 2 Year RCI Results

The number of telephone calls received from the public to report carriageway defects, which dropped over the period 2000 – 2006, has now started to rise again as indicated below.



Customer Requests Logged in CSS

In Scotland, between 2001 and 2009, 'A' road traffic increased by 10%.
Over the same period, traffic on Moray's roads increased by 14%. (Moray Draft Local Transport Strategy 2010)

Roads in rural areas are suffering increasing amounts of damage due to the ever growing use of wide and heavy vehicles related to agricultural and forestry activities.

Up until about 2007, there was a specific capital budget of £150,000 per year for improvements to forestry roads. This was often supplemented with E.U. grants of up to 50% to provide passing places, replace culverts, provide drainage, improve visibility splays and resurface. The bulk of this work was carried out on narrow, twisting, single, track roads with few passing places and which were often cul-de-sacs. As such, they served the forest and 1 or 2 farms, but little else and would otherwise be a low priority for improvement. There is no separate capital funding at present.

A survey is currently being undertaken, commissioned by the Forestry Commission, to update previous information of forest owner`s programmes of extraction. Details obtained include tonnage planned to be extracted per year over the next 5 years and over-all tonnages in 5 year blocks for the following 15 years. Also included is the grid reference of the point of access on to the public road network and direction of travel. When this has been received, the reserve list of road works will be updated. The last survey was about 6 years ago.

Housing Estates in many of our towns were built 30-40 years ago and are approaching the time when their roads will require extensive levels of maintenance.

Roads in Moray are subjected to relatively low volumes of Utility activity. In 2010/11 a total of 1,478 openings were recorded in the Scottish Road Works Register (SRWR), of which 991 (or 67%) were in urban areas. As would be expected, the highest number of these openings were in Elgin which had 297, followed by 124 in Forres and 108 in Buckie.

The rate of deterioration of carriageways and their surfaces is slowed down if the layers are protected from the effect of water, either flowing on the surface or permeating the layers and foundations. As many of our roads have evolved, associated drainage is not 'designed' and is viewed as insufficient. Most of the planned drainage works undertaken are a reaction to obvious drainage problems rather than an attempt to generally improve drainage of carriageways.

Drier summers, warmer but wetter and windier winters and more extremes of weather will impact on our transport infrastructure especially if that infrastructure is not in good condition.

Roads maintenance material costs are very much influenced by the price of oil. Fuel cost rises are obvious to most of the public. Bitumen is a major component of materials used to maintain carriageways and is subject to regular price increases.

1.2. Current Strategies

The objective of engineers, in planning their annual programme, has been to reduce the principal carriageway backlog of resurfacing works, to stabilize the non-principal carriageway backlog, and to protect, as far as is possible, the revenue budget allocated to reactive and necessary cyclic activities and to work that cannot be funded from capital (i.e. surface dressing). Resurfacing schemes include edge strengthening and drainage improvements as necessary to protect this investment.

The level of expenditure on surface dressing has been protected and increased. Surface dressing is both an early intervention "preventative" maintenance treatment and a holding treatment for surfaces that really need to be replaced. Surface dressing is now being carried out on over 66 km of road (2010/11) at a cost of £782k.

Revenue budgets have declined markedly to the extent that most maintenance works that are capable of being funded by capital borrowing are funded from the capital programme. Most revenue headings have been reduced to minimum budgets to protect, as much as possible, spending on patching and surface dressing as mentioned above.

A new 10 year capital programme was agreed by the Council in January 2012. The previous 5 year capital programme of resurfacing allowed for a 5% increase in expenditure per annum. Unfortunately road construction inflation has significantly overtaken this figure.

Also some of the allocation which was nominally for resurfacing was, with Committee approval, reallocated to other assets which had previously been funded from revenue budgets.

Consequently, it has not been possible to reduce carriageway backlog as shown in the attached table.

Survey	Road Class											
	A		B		C		A, B & C		Unclassified		Overall	
	RCI	Rank	RCI	Rank	RCI	Rank	RCI	Rank	RCI	Rank	RCI	Rank
2007-2009	18.6%	4th	14.8%	2nd	20.4%	5th	18.0%	3rd	28.1%	7th	**22.7%**	**2nd**
2008-2010	22.0%	4th	20.3%	2nd	21.6%	4th	21.2%	2nd	28.3%	1st	**24.4%**	**1st**
2009-2011	23.4%	5th	22.0%	3rd	23.1%	4th	22.8%	2nd	33.0%	3rd	**27.5%**	**2nd**
2010-2012	22.6%	6th	21.3%	2nd	23.5%	5th	22.6%	3rd	31.7%	7th	**26.9%**	**4th**

The new 10 year capital plan allows for a significantly increased investment in carriageway maintenance.

2. The Asset: Physical Parameters

The road network has more evolved than been developed. Those roads that were constructed to a specification were built to the design standards that were current at the time. Many of our carriageways are carrying traffic loadings and volumes that were not anticipated 40, 30 or even 20 years ago – 40 tonne artics and huge tractors.

Fortunately very few of Moray's roads are built on poor ground with the consequent increased maintenance frequency. However, most of our roads are too narrow for the size and volume of traffic that uses them with hardly any verge within which to construct drainage systems.

Many of our housing estates were built in the 1960's or 1970's. Little maintenance has been carried out on these roads since they were constructed and a growing number of them will be in need of resurfacing over the next 5 years.

The Council funded a significant programme of road maintenance several years ago peaking in 2004/05. Road surfaces deteriorate over time. The surfaces replaced then will require intervention treatments over the next 5 to 10 years if their life is to be maximised.

Global warming will have an effect on bituminous bound carriageways with hotter summers causing more softening of surfaces and intense rainfall episodes flooding and damaging carriageways more frequently. Milder winters may be less damaging, but not if the number of freeze/thaw cycles is increased and accompanied by wetter weather.

2.1. Inventory

The carriageway asset is split into four classifications as illustrated below:

Road Class	Environment		Total Length (km)	Average Width (m)
	Urban length (km)	Rural length (km)		
A	25.5	132.0	157.5	7.0
B	36.6	255.6	292.2	6.0
C	36.8	326.5	363.3	4.9
U	299.0	428.5	727.6	5.1
Total	398.0	1142.6	1540.6	

Table 2.1 Carriageway Road Length by Classification (*June 2011*)

2.2. Hierarchy

The road network is made up of different types of road ranging from heavily trafficked urban roads to lightly trafficked narrow rural lanes. It should be noted that Moray has no dual carriageways or motorways. To enable the appropriate management of the network, individual lengths of carriageway have been

designated against a hierarchy of road types. The types reflect the roles of different roads and distinguish the following characteristics:

- Rural or Urban
- Through Routes or Access links

The Code of Practice for Maintenance Management (4) defines hierarchies as listed in table below.

CoP Category	Hierarchy Description	Type of Road General Description	Detailed Description
1 (n/a to Moray Council)	Motorway	Limited access motorway regulations apply	Routes for fast moving long distance traffic. Fully grade separated and restrictions on use.
2 (Moray Council Hierarchy 1)	Strategic Route	Principal A routes between primary destinations.	Routes for fast moving long distance traffic with little frontage access or pedestrian traffic. Speed limits are usually in excess of 40mph and there are few junctions. Normally two lane with no footway
3a (Moray Council Hierarchy 2)	Main Distributor	Major Urban Network and Inter- Primary Links. Short – medium distance traffic.	Routes between Strategic Routes and linking urban centres to the strategic network with limited frontage access. In urban areas speed limits are usually 40mph or less, parking is restricted at peak times and there are positive measures for pedestrian safety.
3b (Moray Council Hierarchy 3)	Secondary Distributor	Classified roads (B and C class) and unclassified urban bus routes carrying local traffic with frontage access and frequent junctions.	In rural areas these roads link the larger villages and HGV generators to the Strategic and main Distributor Network. In built up areas these roads have 30mph speed limits and very high levels of pedestrian activity with some crossing facilities including zebra crossings. On street parking is generally unrestricted except for safety reasons.
4a (Moray Council Hierarchy 4)	Link Road	Routes linking between the Main and Secondary Distributor network with frontage access and frequent junctions.	In rural areas these roads link the smaller villages to the distributor roads. They are of varying width and not always capable of carrying two way traffic. In urban areas they are residential or industrial inter-connecting roads with 30mph speed limits, random pedestrian movements and uncontrolled parking.

4b (Moray Council Hierarchy 5)	Local Access Roads	Roads serving limited numbers of properties carrying only access traffic.	In rural areas these roads serve small settlements and provide access to individual properties and land. They are often only single lane width and unsuitable for HGV. In Urban areas they are often residential loop roads or cul de sacs.

Table 2.2 Road Hierarchy Descriptions

Roads lengths within each of the designated hierarchies are shown in the tables below.

Hierarchy		Environment		Total Length (km)
		Urban Length (km)	Rural Length (km)	
1	Strategic Route	16.6	99.4	116.0
2	Main Distributor	60.4	138.0	198.4
3	Secondary Distributor	60.1	195.0	255.1
4	Link Road	32.5	177.3	209.8
5	Local Access Road	228.3	533.1	761.4
Totals		**397.9**	**1142.8**	**1540.7**

Table 2.3 Carriageways Road Length by Road Hierarchy and Urban/Rural Split (*August 2011*)

2.3. Other Road Categorisations

Traffic Sensitive Roads

This categorisation informs utility owners where there are restrictions as to when they can carry out works on carriageways (and footways). This data is under review [IA1].

Roads with Special Engineering Difficulty

This categorisation informs utility owners about lengths of road that have non-standard construction and require early liaison with the roads authority.

2.4. Quality of Inventory Held

The records of the carriageway asset are stored electronically within various computer applications :-

- Roads Database (in-house MS Access database)
- WDM RMS (Road Management System)
- Arcview GIS
- WDM NSG (National Street Gazetteer)

Work is ongoing to migrate as much of this data as possible into the recently installed WDM RMS system.

Data currently held within the above systems include road numbers, names and descriptions, Unique Street Reference Numbers, lengths, average widths, areas, adoption dates, maintenance hierarchies, winter priorities, inspection frequencies and histories, machine based inspection data, etc. together with spatial data within GIS showing the extent of the adopted road.

As part of the development of this plan, an assessment of the current data held was undertaken. The above information is considered to be very reliable. There are gaps in the data, relating to visual condition, carriageway construction, surface type and previous treatments. Information is available on previous treatments back to at least 1998/99 and will be transferred from paper records into the roads asset management system as resources allow [IA2].

2.5. Asset Register

The primary record of the carriageway asset is the statutory list of public roads – those roads for which the roads authority have a duty to maintain. This is held in electronic format in the List of Public Roads database held and maintained by the Transportation Section.

This, supplemented with the inventory records described above, currently provides the asset register for this asset group.

In addition, the National Street Gazetteer (NSG) lists all roads whether public or private.

Nationally it is intended that the NSG will become the primary data source, in effect the statutory list of roads.

2.6. Asset Growth

Asset growth over the last 5 years

Over the last 5 years the asset has grown by 1% (15km). This growth has occurred primarily due to the adoption of new roads built by developers.

Predicted Asset Growth

It is expect that the asset will continue to grow over the duration of this plan. This is based on the following assumptions:

- Continued adoption of roads from new development
- Construction of the Fochabers and Mosstodloch By-pass (the existing Trunk road and new link roads will become Moray Council responsibility)

3. Service Expectations

Currently Moray is 4th of all Scottish Councils in the SRMCS results.
Previously, the Council had an objective to remain in the top third of the list (no worse than 10th or 11th).

3.1. Customer Perceptions

The Moray Council Roads Maintenance section sought public feedback via an online questionnaire over a 5-year period from 2005/06 to 2009/10. Unfortunately the questionnaire was not very prominent on the website and the level of response was very low. Only 45 responses were received over the 5-year period with 14 being the highest in any single year.

Up to 2008/09 questionnaires were often sent out to properties in the vicinity of road or lighting works. Usually forms were sent out immediately prior to road works and shortly after lighting works. Typically, out of over 600 forms issued, road works would receive a return rate of about 10% whereas lighting schemes had a return rate of around 30%.

There is clearly an opportunity for more effectively capturing the perceptions of road users and this has been reflected as a specific task in the Council's "Customer Satisfaction Improvement Plan" to ascertain customer opinions and priorities to inform asset management plan during Q1/2 2012/13 and report to service committee thereafter [Ia3].

The Roads Maintenance Section has a significant amount of information on the Council's public website to advise road users of its Capital and Revenue Roads Budgets, the Winter Maintenance Policy as well as providing a facility to report faults and defects.

3.2. Goals and Objectives

The current Single Outcome Agreement has as one of it's top ten priorities; "Roads/Transport – Addressing the transport infrastructure and encouraging sustainable travel".
This follows through into the updated Local Transport Strategy (2010) which has a number of relevant objectives including "Maintain and improve the existing transport infrastructure to enable an effective and reliable transport network"

3.3. Use

Traffic volumes in Moray have grown by 14% between 2001 and 2009. This is higher than the Scottish average. HGV traffic also continues to grow throughout Scotland. Several key routes within Moray have over 10% HGV traffic.

3.4. Safety Considerations

Accident statistics for Moray are outlined in the table below. These include figures for the trunk road network within Moray.

Date	Urban				Rural				All
	Speed limit <=40mph				Speed limit >=50mph				
	Fatal	Serious	Slight	Total	Fatal	Serious	Slight	Total	Total
2005	2	11	59	72	7	13	71	91	163
2006	1	7	43	51	5	19	82	106	157
2007	0	12	46	58	6	20	86	112	170
2008	0	12	68	80	4	28	79	111	191
2009	1	8	67	76	3	20	94	117	193
2010	3	13	54	70	1	14	57	72	142

Table 3.1 Accident Statistics (*August 2011*)

Clearly the provision of safe roads is underpinned by inspections and the follow up processes. Information from safety inspections is a consideration when developing maintenance programmes.

Further, there are specific road safety related budgets that are used to provide new or replacement assets. These include Capital budgets for: Roads Safety, Safety Barriers, Cycling, Walking & Safer Streets.

3.5. Utility Activity

Coordination of utility works is undertaken by a Traffic and Transportation team in accordance with the New Roads and Street Works Act, as amended by the Transport (Scotland) Act 2005. Utility Works and Road Authority Works are required to be recorded in the Scottish Road Works Register (SRWR). The detailed coordination of utility activity is carried out by the Traffic and Transportation Team on a daily basis interfacing with the SRWR online.

The coordination of major utility projects, often looking ahead to future financial years, are undertaken at Local RAUC level where utility companies and the road authority can table their future programmes of work to enable open discussion and exploration of the opportunity for any joint working, early progression of utility work in advance of major roads maintenance projects, or, the delay of major roads projects until after utility work is completed. The frequency of these local RAUC meetings has unfortunately been allowed to slip in recent years and an improvement on frequency of meetings should be achieved as a priority. [IA4]

In the main both utility companies and the road authority in Moray are in compliance with the noticing requirements as set down in the Transport Scotland Act. One failing of Moray Council is the number of early starts (without sufficient notice) required for major projects undertaken early in the financial year, especially with Surface Dressing. The limited timescale between the Council budget setting exercise and the requirement to give 3 months advance notice of major works means that this is unlikely to be entirely resolved in the near future.

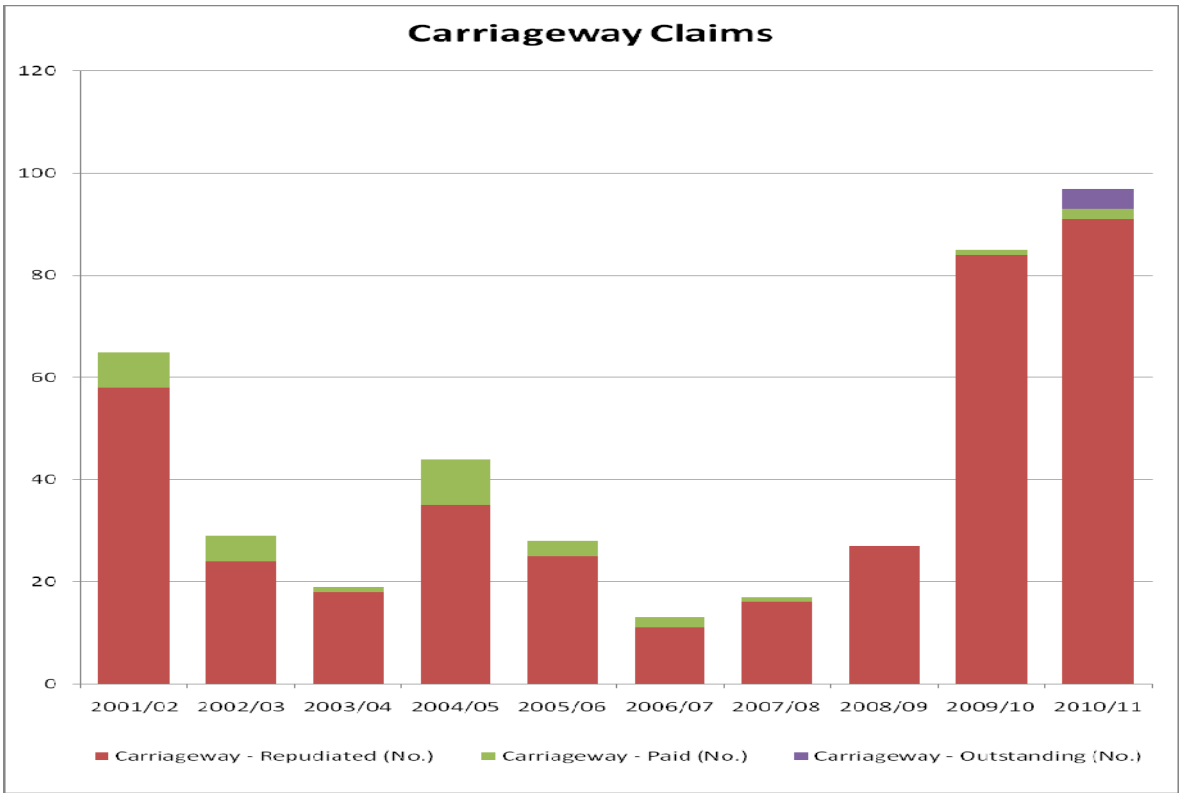
At present the Authority enforces a 2 year guarantee period on all reinstatements with 3 years for those including deep excavations.

The number of utility openings undertaken within the last five years is detailed in the following table. A breakdown of these figures for footway and carriageway is not available at present.

Count of Works Reference Notice Type	2006-07	2007-08	2008-09	2009-10	2010-11	Grand Total
URGENT	11	20	26	26	26	109
MINOR WITHOUT EXCAVATION	0	0	5	21	28	54
MINOR WITH EXCAVATION	239	343	1226	983	1317	4108
STANDARD	263	369	484	459	650	2225
MAJOR	12	25	139	175	172	523
ROAD RESTRICTION	0	0	39	40	23	102
DEFECTIVE APPARATUS	0	0	1	0	0	1
DIVERSIONARY WORKS	0	0	1	0	0	1
REMEDIAL OTHER	3	3	54	46	49	155
Grand Total	**528**	**760**	**1975**	**1750**	**2265**	**7278**

Table 3.2 Utility Openings

3.6. 3rd Party Claims



Carriageway Claims Information from Payments Section (as at 05/01/12)

Most carriageway related claims submitted to the Council's insurers are repudiated. Robust safety inspection and defect repair processes are vital to defending such claims.

3.7. Environment

When undertaking a project environmental considerations are taken into consideration, including for example Controlled Activities Regulations (CAR) and potential impact on areas such as Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI).

Tools to compare the carbon footprint of different carriageway maintenance processes are becoming more widely available, assisting with consideration of different maintenance options. Where appropriate, recycling processes are specified and the use of recycled materials especially within foundation layers is common.

3.8. Network Availability Considerations

There are a small number of carriageways within Moray which have been designated as traffic sensitive. These are detailed in Table 3.3 below

Road No.	Burgh	Road Name	Section	T.S. Times
A941	Elgin	Bishopmill Brae	From Cumming Street to North Street	Restricted on Weekdays from 07:30 to 09:15 and from 16:00 to 18:00
A941	Elgin	Cumming Street	From roundabout at A96(T) Alexandra Road to Bishopmill Brae	Restricted on Weekdays from 07:30 to 09:15 and from 16:00 to 18:00
A941	Elgin	Lossiemouth Road	From North Street to Elgin Derestriction Signs	Restricted on Weekdays from 07:30 to 09:15 and from 16:00 to 18:00
A941	Elgin	Main Street	From roundabout at Thornhill Road to New Elgin Road	Restricted on Weekdays from 07:30 to 09:15 and from 16:00 to 18:00
A941	Elgin	New Elgin Road	From Main Street to roundabout at Station Road	Restricted on Weekdays from 07:30 to 09:15 and from 16:00 to 18:00
A941	Elgin	North Street	From Bishopmill Brae to Lossiemouth Road	Restricted on Weekdays from 07:30 to 09:15 and from 16:00 to 18:00

Table 3.3 Traffic Sensitive Carriageways (*August 2011*)

Some communities and businesses are sensitive to the disruption that might arise from closure of roads for maintenance purposes. That has to be balanced against carrying out appropriate treatments at least cost in a safe environment.

3.9. Amenity Value Considerations

Within some of the larger settlements there are a limited number of conservation areas. There is a need for careful consideration of materials that may be appropriate to the heritage of the area.

4. Management Practices

4.1. Policies

The management and maintenance of the carriageway asset is governed by the following policies:

- Roads Asset Management Plan (RAMP) – Hierarchy, Inspection intervals, intervention limits, Defect Categories and Response Times
- Winter Maintenance Plan – Priority and Route Plans
- Revenue and Capital Programme
- Local Transport Strategy
- Design Guidelines and Construction Standards

4.2. Inspection Regime

Inspection Regime for Carriageways

Safety Inspections

Safety inspections are designed to identify all defects likely to create a danger to the network users. The table below details the frequency with which these inspection are undertaken. The frequency of inspection is related to the carriageway hierarchy shown in Table 2.2.

Moray Council Category	Hierarchy Description	Frequency	Method
1	Strategic Route	Monthly*	Driven
2	Main Distributor	Monthly*	Driven
3	Secondary Distributor	3 Monthly*	Driven
4	Link Road	6 Monthly (rural) Annually (urban)*	Driven
5	Local Access Roads	6 Monthly (rural) Annually (urban)*	Driven

Table 4.1 Safety Inspection Frequency

*All urban carriageways are inspected by walking along adjacent footways.
The inspection regime is based upon the recommendations of the Code of Practice for Highway Management.

Safety inspections will identify defects that are the responsibility of others to repair – e.g. defective manhole covers or poor reinstatements carried out on behalf of utility companies. Inspectors will make safe these defects and/or report them through the Scottish Road Works Register. Utility companies do not formally inspect their apparatus within the carriageway surface but rely on routine safety inspections by the roads authority.

Defect reporting procedure

Members of the public and other Council staff can report defects by several routes: in person, by telephoning roads maintenance, by use of web based reporting. All such reports are recorded in the roads management system, evaluated and inspected and/or prioritised for repair.

Service Inspections

Visual Inspections
Service inspections are designed to identify deficiencies that compromise the reliability, quality, comfort and ease of use of the network. Although not intended for identifying defects that could compromise user safety, any such defects observed during service inspections will be recorded and dealt with in the same way as safety inspections. Service inspections are not currently formally undertaken. Maintenance staff record such deficiencies as they are identified and these appear on the 'Reserve' List of desirable works.

4.3. Condition Assessment

Reserve list
The reserve list is a list of treatments to lengths of carriageway (of footway, or bridges, etc) that would need to be applied to bring that part of the asset back to an ideal condition. The reserve list has been compiled by technical staff over a number of years and forms a pool of works to be considered when compiling annual planned works programmes.

Machine based Inspections
Scottish Road Maintenance Conditions Surveys (SRMCS) are undertaken on proportions of our network each year. These results contribute to measuring the serviceability of road carriageways.

- A roads - 100%/year (in one direction; alternates direction each year)
- B & C roads – 50%/year (in one direction; alternates each time a length of road is surveyed)
- Unclassified roads- 10%/year (in one direction)

Information from SRMCS is translated into a Road Condition Index (RCI) - a measure of the whole of the Moray Council carriageway network. The RCI is reported to Audit Scotland every year as a statutory Performance Indicator and reported along with the RCI for all other Scottish Local Authorities.

Information on how the RCI is obtained is given in Appendix A.

Skid resistance
There are no routine surveys of carriageway skid resistance undertaken within Moray. Surveys are commissioned from time to time, to measure specific lengths of road where skid resistance might be a concern.

Reactive Inspections
Reactive inspections are undertaken when a defect or issues are reported by the public or another authority. Reactive inspections are recorded in the same way as safety inspections and the defects are categorised and repairs instructed as described below.

The public are able to notify the council of carriageway defect by the following means :-

- Website
- Email
- Phone
- Personal contact at council office
- Via their Community Council

Road Inspectors

Inspections are undertaken by a small team of road inspectors. Inspectors are in the process of gaining their Roads & Highways Inspectors Award (Credit rated at SCQF Level 6).

Inspection Records

Inspection results are currently recorded on paper on site, then entered into the WDM system in the office afterwards. Inspection dates are recorded in the 'Roads database' which is used to generate blank inspection forms each month and calculate the quarterly inspection performance indicators.

Inspections will soon be undertaken using hand-held devices. This will mean that defects are recorded electronically at source, then simply downloaded in the office afterwards. As well as saving time, these will have the added advantage of GPS positioning and the ability to take a digital photograph at the time of inspection which will remain with the defect record for evermore.

The inspection records provide a valuable resource in enabling maintenance works to be planned. They also form the basis of the council's defence against 3rd party liability claims.

Data Interpretation

Scottish Road Maintenance Condition Survey (SRMCS) data is loaded into the Pavement Management System where an inbuilt algorithm analyses and provides a report of all roads in terms of condition. The algorithm assesses the pavement defect type and defect area. There is capacity for the system to accept visual inspection data, traffic volumes, pavement age and type if available. The system is relatively new to Moray and staff have yet to develop expertise in using it for this purpose.

Because the machine based survey only covers 10% of unclassified and 50% of B and C class roads in any year, it is necessary for engineering staff to inspect roads prior to recommending planned maintenance. It is hoped to formalise this visual inspection process into annual 'coarse visual inspections'. [IA5]

4.4. Construction/Asset Acquisition

New carriageway assets are acquired in four ways.

- Private developers are required to obtain 'construction consent' prior to building new or extending existing roads. Any road built in accordance with construction consent must be adopted by the Council on request.
- The Council receives requests to adopt existing private roads. The condition of these roads is taken into account and, if appropriate, a report is made to Committee with a recommendation to adopt.
- Trunk roads can become local public roads following an improvement to the trunk road network, i.e. Fochabers Bypass or following a review of trunk roads. In the latter case local roads can become trunk roads.
- The Council commissions improvement works which add to the roads asset.

Every addition to the list of roads inevitably means increased liability for maintenance. It is rare for there to be a formal assessment of the long term cost of acquiring additional assets. This can lead to the addition of new assets that have onerous ongoing maintenance requirements.

It is the responsibility of the Transportation Manager to formally adopt new assets onto the List of Public Roads. The amount of detail provided in this process is currently minimal and significant improvements could be made in this area, so that the Roads Maintenance Manager is aware of the full extent of future maintenance liability.

It is the responsibility of Road Maintenance to ensure that any newly acquired assets are included in inspection and other programmes. Although no documented process exists for this process, the introduction of the Roads Asset Management system has reinforced this process although further improvement should be implemented to allow circulation of this information to both the front line workforce and other interested parties.

4.5. Routine Maintenance

Once Inspectors or other staff identify a defect, a works order is raised and the work allocated a category which determines how quickly the defect should be made safe or repaired.

Service Standard

The service standards applied to safety defects identified within the carriageway are:

Emergency	Make safe at the time of inspection by coning or signing. If it is not practicable to do this then repair within 2 hrs and carry out a permanent repair within 28 days should this be considered necessary.
Priority 1	Temporary repair within 3 days, permanent within 28 days, if considered necessary.
Priority 2	Permanent repair within 28 days
Priority 3	Permanent repair within 6 months

Category 1 defects are, for example, potholes in carriageways in excess of 100 mm deep.

Potholes > 150 Dia. Or sunken tracks or subsidence	**C/way category 1**	**C/way category 2**	**C/way category 3**	**C/way category 4**	**C/way category 5**
> 100mm deep	Emergency	Emergency	Emergency	Emergency	Emergency
40-100mm deep	Emergency	P1	P1	P2	P2
20-40mm deep	P1	P2	P2	P2	P2
< 20mm deep	P2	P2	P3	P3	P3
Minor non Safety Defects	P3	P3	P3	P3	P3

Other CarriagewayDefects	**C/way Category 1**	**C/way Category 2**	**C/way Category 3**	**C/way Category 4**	**C/way Category 5**
Missing ironwork > 150mm across or Diameter	Emergency	Emergency	Emergency	Emergency	Emergency
Missing ironwork < 150mm across or Diameter	Priority 1	Priority 1	Priority 1	Priority 1	Priority 1
Flooding if endangering property or standing water affecting full width of running lane	Emergency	Emergency	Emergency but only if >100mm depth	Emergency but only if >100mm depth	Emergency but only if >100mm depth
Safety fence or pedestrian barrier if creating a danger	Emergency	Emergency	Emergency	Emergency	Emergency

Other defects are categorised based on an assessment of their severity, location and anticipated rate of deterioration.

Some defects are linked to utility apparatus and works within the carriageway and these are notified to the appropriate utility where they are the responsible authority.

The authority's performance in relation to defect repair targets is regularly reported to committee. Performance indicators over the last few periods are:

			Performance Indicator				
PI Ref.	**Defect Category**	**Target**	**2006/7**	**2007/8**	**2008/9**	**2009/10**	**2010/11**
ENVDR136a	Emergency	90%	86.2%	90.3%	88.4%	95.3%	97.2%
ENVDR136b	P1	85%	65.9%	91.6%	88.7%	79.6%	94.2%
ENVDR136c	P2	70%	43.7%	61.7%	79.5%	77.7%	86.3%
ENVDR136d	P3	70%	66.4%	76.2%	85.6%	91.7%	96.3%

Table 4.1 Performance Indicators (*2006 - 2011*)

4.6. Planned Maintenance: Renewals

Currently, the Council has not been asked to agree any defined serviceability standards for carriageways. In future these might specify minimum standards related to surface properties and ride quality (texture, standing water, bumpiness) for different hierarchies of road.

The Design Manual for Roads and Bridges specifies standards for skid resistance and these are used to determine work required at locations where skid resistance has been investigated.

Most of the planned maintenance of carriageways can be considered as preventative maintenance to arrest or recover from deterioration of the carriageway rather than to maintain a service standard i.e. the application of the preventative measure prevents larger future costs having to be incurred to achieve the same outcome. Ultimately, if no maintenance was carried out, the whole of the road would disintegrate. It is very rare for that to happen, with some intervention to replace some of the carriageway layers occurring before then. That is not to say that all our actions are truly economically preventative since the planned maintenance could be to recover from a situation that might have been avoided with an earlier (and probably less costly) intervention. To better evaluate least whole life cost options requires the application of lifecycle cost analysis (LCA), a process which is just becoming available in Moray as in many authorities in Scotland.

In Moray, the approach in recent years has been to analyse trends from detailed analysis of the Scottish Road Maintenance Condition Survey (SRMCS) and to bid for funding from the capital plan to either continue the improving condition of principal roads or to maintain the condition of non principal roads.

Technical staff then allocate planned works up to the budget allocation based on a detailed analysis of the SRMCS results, a detailed knowledge of their respective areas and information contained within the reserve list.

The type of criteria that are considered are:

- Measured Condition / Engineers Assessment – will a treatment applied now stop the need for a more expensive treatment in a few years, or, is the pavement going to deteriorate significantly in the next year?
- Safety Inspections – does this site have a history of safety defects that can be linked to poor condition?
- Hierarchy – more important roads get a higher priority
- Accessibility / Land Use – services utilised by a high proportion of the public get a higher priority than a residential street
- Customer Complaint Levels – customers generally only complain when there is a real problem.
- Cost – the financial outcome always needs to be assessed.

4.7. Disposal

The disposal of carriageway assets is relatively rare from the perspective of a council disposing of an entire section of road. This section is therefore included for completeness and to enable documentation of the practices used for those occasions when an asset is disposed of.

The main reason to consider disposing of a carriageway would be in association with an adjacent upgrade; a new road construction, or other change that results in very little traffic on the affected asset. The important consideration is what other use the road has. Most often, the old road would remain a public road but downgraded to an appropriate category commensurate with its new function. The change would lead to a change in the maintenance strategy.

Carriageways that are no longer considered to act as roads can be ‘stopped up’ in which case the old road reverts to the owner of the solum on which the road was built. However, consideration has to be given to utilities that may be in or adjacent to the road, including street lighting.

5. Investment

5.1. Historical Investment

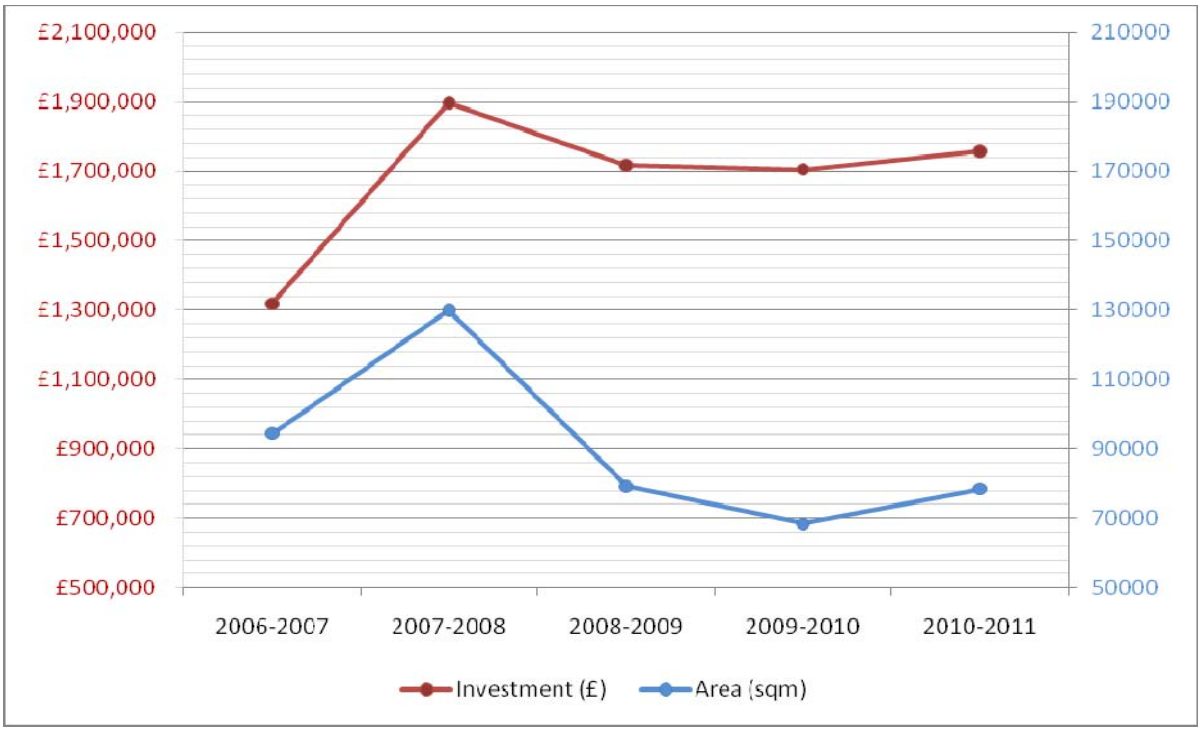
Over the last several years, the total budget allocated to planned maintenance of carriageways has remained broadly static. However, the effect of construction inflation means that budgets have reduced in real terms. In Scotland, during 2009/10, the overall expenditure on road maintenance saw an increase of 5% over that in 2004/05. In purchasing terms however councils spent 13% less than they did in 2004/05. (Audit Scotland, Feb 2011).

Financial Year	Sub-Category	Budget		Grand Total
		Capital	Revenue	
2003-2004	Resurfacing	£ 690,326.45	£ 1,054,489.77	£ 1,744,816.22
	Surface Treatment	£ 44,538.85	£ 563,239.78	£ 607,778.63
	Total :-	**£ 734,865.30**	**£ 1,617,729.55**	**£ 2,352,594.85**
2004-2005	Resurfacing	£ 757,753.36	£ 1,422,368.95	£ 2,180,122.31
	Surface Treatment		£ 429,256.28	£ 429,256.28
	Total :-	**£ 757,753.36**	**£ 1,851,625.23**	**£ 2,609,378.59**
2005-2006	Reconstruction		£ 21,504.89	£ 21,504.89
	Resurfacing	£ 1,010,526.22	£ 1,003,671.52	£ 2,014,197.74
	Surface Treatment		£ 484,194.37	£ 484,194.37
	Total :-	**£ 1,010,526.22**	**£ 1,509,370.78**	**£ 2,519,897.00**
2006-2007	Resurfacing	£ 640,766.35	£ 678,295.48	£ 1,319,061.83
	Surface Treatment		£ 636,933.14	£ 636,933.14
	Total :-	**£ 640,766.35**	**£ 1,315,228.62**	**£ 1,955,994.97**
2007-2008	Resurfacing	£ 1,877,809.52		£ 1,877,809.52
	Surface Treatment	£ 528,941.84		£ 528,941.84
	Total :-	**£ 2,406,751.36**		**£ 2,406,751.36**
2008-2009	Reconstruction	£ 173,887.75		£ 173,887.75
	Resurfacing	£ 1,358,122.68		£ 1,358,122.68
	Surface Treatment	£ 261,762.38	£ 540,227.35	£ 801,989.73
	Total :-	**£ 1,793,772.81**	**£ 540,227.35**	**£ 2,334,000.16**
2009-2010	Reconstruction	£ 221,893.41		£ 221,893.41
	Resurfacing	£ 1,278,508.82		£ 1,278,508.82
	Surface Treatment	£ 392,438.85	£ 517,404.29	£ 909,843.14
	Total :-	**£ 1,892,841.08**	**£ 517,404.29**	**£ 2,410,245.37**
2010-2011	Reconstruction	£ 39,139.35		£ 39,139.35
	Resurfacing	£ 1,396,524.95		£ 1,396,524.95
	Surface Treatment	£ 542,774.09	£ 634,691.18	£ 1,177,465.27
	Total :-	**£ 1,978,438.39**	**£ 634,691.18**	**£ 2,613,129.57**

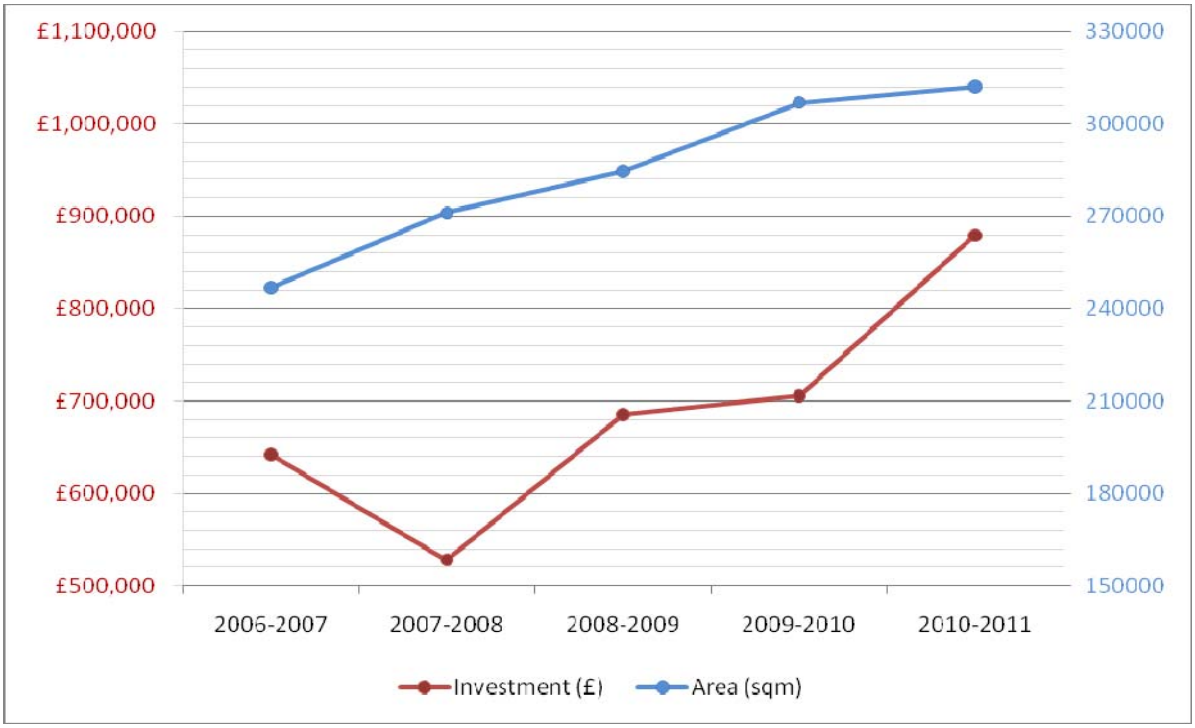
Table 5.1 Breakdown of Resurfacing & Surface Dressing Budgets

5.2. Output from Investment

The investment level above has been able to purchase the following outputs:



Resurfacing Output (sqm) from Investment (£)



Surface Dressing Output (sqm) from Investment (£)

5.3. Forecasting Financial Needs

In Moray a 'reserve list' of desirable works has been maintained since 1991.

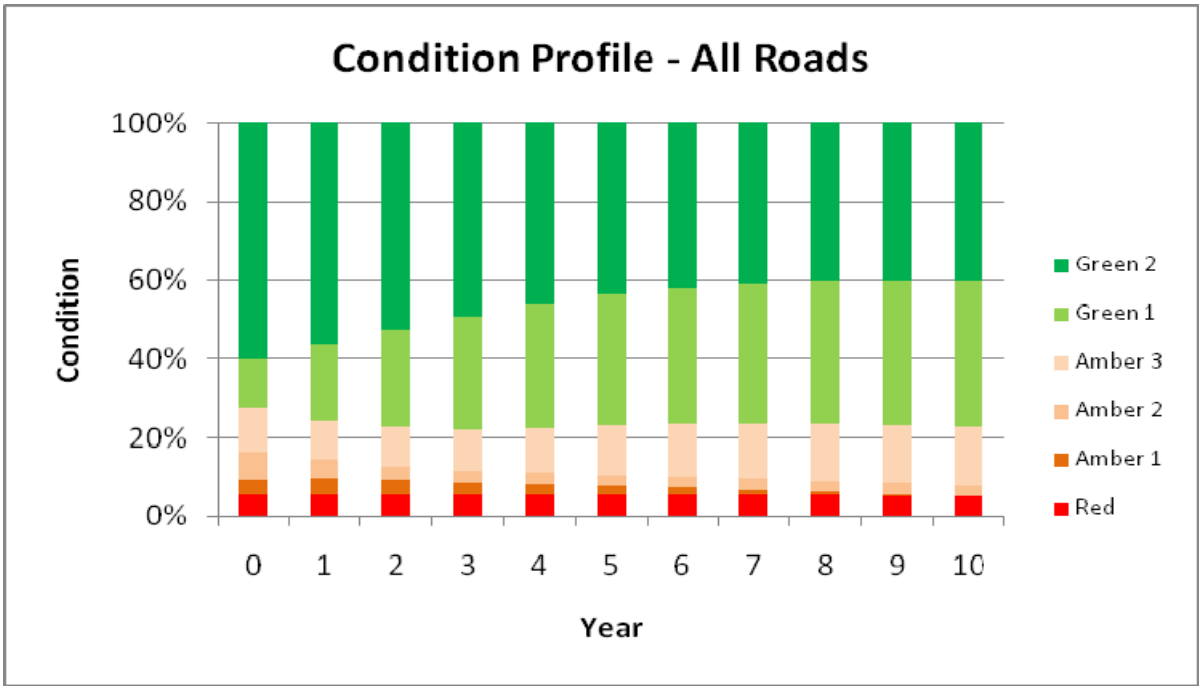
More recently, output from the Scottish Road Maintenance Condition Survey has allowed a backlog figure for carriageway maintenance to be calculated. The backlog figure is the estimated amount to eliminate all carriageway defects. In 2009 this figure was reported as £33.7 million increasing to £41.2 million in 2011.

Improved 'Best Value' Analysis

The SCOTS led 'Roads Asset Management Planning' project has recently produced a tool to help evaluate the effect of different maintenance strategies across a network over a number of years. This was used to inform input into the 2012 – 2022 capital plan recently approved by the Council.

The graph below illustrates the projected impact of the approved Capital Plan on Moray's overall road condition. The RCI (red + amber) shows a slight improvement over years 0 to 3, followed by an almost steady state from thereon. Despite the steady RCI, you can see below that the 'Green 1' category (the worst of the 'greens') increases during the first 7 years of the plan.

Whilst the SCOTS tool provides a valuable prediction of future road condition, it does this based on certain assumptions regarding treatment lives, deterioration rates, inflation at 8% per annum, etc. This inflation figure is that reported in the recent Audit Scotland report. The results therefore cannot be taken as wholly accurate however they are the best indication we have of how road condition is likely to change under different budget scenarios.



Moray Overall RCI 2012-2022 (based on approved Capital Plan)

Further graphs, showing the projected 10 year RCI for each road classification, are included in Appendix B.

Industry inflation

Roads maintenance material costs are very much influenced by the price of oil. Fuel is obvious but at least the price of fuel does occasionally come down. Bitumen prices regularly rise and don't, to my knowledge, come down.

The rise in cost of key products is:

Product	2009 to 2010 % rise	2010 to 2011 % rise
Diesel	18.3%	18.5%
Gas Oil	37.8%	27.4%
Surface dressing chips	13%	7.9%
Surface dressing K1-70 binder	32.5%	22.9%
Surface dressing intermediate binder	40%	15.3%
Hot rolled asphalt surfacing	6%	17%
Bitumen macadam surfacing	15%	15%

In 2010/11, Roads Maintenance purchased some £2,277,000 of materials and paid £316,000 for transport fuel. These price rises are significant.

5.4. Valuation

An exercise to calculate the value of the carriageway asset has been undertaken as required by new Whole Government Accounting procedures.

The Gross Replacement Cost (GRC) of the carriageway asset (1540km) has been calculated at approximately £1.2 billion at 2011 prices. This is based on the actual road lengths, assessed road widths and uses unit replacement cost based on recent rates for carriageway construction. It represents the cost of replacing the entire asset with new.

The 2009/10 level of investment at £2.6 million per annum was less than 0.3% of the GRC and the resultant average return period for carriageway strengthening of 75 years is unreasonable.

The Depreciated Replacement Cost (DRC) of the carriageway asset has been calculated at £1.1 billion. This represents the value of the asset in its current condition.

6. Forward Works Programme

6.1. Existing Programme

The allocation of budget to both Revenue and Capital Budgets is decided by the Council in February each year. Recently, the Council approved a 10 year capital plan (2012 – 2022).

Once budgets are known, a report is made to the Economic Development and Infrastructure Services Committee covering a review of the previous year and more detailed expenditure proposals for the coming year.

Subsequently, engineering staff develop their annual Works Programme and update the Reserve List.

The reserve list and works programme is collated using an in-house database known as Futures. This is published annually, in early spring, and is made available to members and the general public on the Council website. “Futures” is updated throughout the year, reflecting progress against planned work.

The Futures database should at least identify all resurfacing schemes at least 5 years into the future and all surface dressing schemes at least 3 years into the future (or longer for first dressing of recently surfaced roads).
There is good correlation between the value of carriageway work in the ‘reserve list’ and backlog figures calculated using Scottish Road Maintenance Condition Survey (SRMCS) data reinforcing staff confidence in the Futures database
There is currently no documented method to prioritise schemes that move from the reserve list to the annual works programme. Engineering judgement is applied taking the following into consideration: [IA7];

- SRMCS information
- Road hierarchy
- Traffic volumes
- Proximity to public facilities
- Levels of public service requests
- Previous maintenance history and cost
- Sensible packages of work
- Reasonable coordination with others
- Accident statistics
- Cost/Benefit assessment

For roads maintenance purposes, Moray is split into two areas – east and west of the River Spey. Typically, the allocation of budget for the carriageway asset is split 50/50 between these two areas on the basis that road length is virtually equally between the two. Consideration of SRMCS survey results has demonstrated that this is currently a fair reflection of engineering need.

There is some flexibility within the Annual Works Programme to vary the programme to reflect outturn prices, reprioritisation, utility involvement or other unforeseen obstacles. The objective of the Area Engineer is to spend as close as possible to the budget allocation figure without exceeding the bottom line budget for both Capital and Revenue works.

6.2. Programme Co-ordination

The Annual Works Programme and the reserve Futures works programme are made available internally to Consultancy, Traffic and Transportation and Street Lighting Teams. This provides an opportunity to identify potential conflict across sections or opportunity for coordination of works at an early stage.

Coordination works reasonably well between some sections, but less so between other sections where less use is made of the Futures database. There is room for improvement perhaps using the roads asset management system which provides a map based interface. [IA8]

A section of road may need drainage works in advance of resurfacing, footway and kerbing works in advance of resurfacing and patching or edge strengthening works in advance of surface dressing and resurfacing works. This more holistic approach to road maintenance is desirable, but can be limited if budgets are restricted. Sometimes it has been necessary to fund such works over a number of years with budgets being drawn from different capital headings.
Planned works for road purposes should be coordinated with utility organisation plans through locally organised meetings. Those meetings have not been held for a number of years. The extension of the Scottish Road Works Register (SRWR) by requiring road works to be registered in advance (as well as utility works) has improved information flow, but there is little evidence in Moray that utility organisations have an appetite for joint working and any coordination has simply been agreement that major works for Roads Maintenance are delayed until utility works have been completed or delay of non emergency utility work until restrictions placed on planned utility work has been concluded.

6.3. Option Appraisal

There are no formal documented option appraisal processes. The identification of the appropriate treatment required is at present based on the experience and knowledge of engineering staff. This engineering judgement is applied to consider possible treatment options, associated costs, anticipated life of the treatment and available budgets. Tools are being developed, through the SCOTS asset management programme for example, to assist with option appraisal.

Full option appraisal needs to be developed as part of the outcomes to asset management for carriageways [IA9]

7. Risk

7.1. Risk Identification

Details of the major risks associated with this asset group are included within the RAMP Risk Register, which is still under development. Risks relate to H&S, finance, reputation, environmental, etc and are based on the corporate Moray Council risk management guidelines.

7.2. Risk Evaluation and Control

The evaluation and control of risk follows the guidelines produced by Moray Council.
Details of these guidelines are given in the RAMP document.

8. Works Delivery and Procurement

The majority of reactive maintenance works on the carriageway asset are carried out in house by the Roads Maintenance workforce. Reactive maintenance is responding to defects that need relatively urgent intervention. Use of sub contractors particularly during periods of peak demand for the internal workforce is sometimes required. In general, reactive works are paid for at actual cost although a Schedule of Rates is adopted for patching type works. Actual cost works require a pre-works estimate of cost. An explanation is required where out-turn cost significantly exceed estimate and this is required to be approved by either the Technician or Area Engineer dependant upon the severity of any overspend.

The vast majority of planned works on the carriageway asset are also carried out in house by the Roads Maintenance workforce. Planned Works are normally subject to the preparation and acceptance of a priced Bill of Quantities, which allows benchmarking opportunities, and the work is subject to re-measurement on completion.

The in house road maintenance workforce resource is the minimum necessary to deliver the Council's Winter Service policy. In recent years (up to 2011/12) the whole of the roads maintenance revenue and capital budgets has only just been sufficient to provide the work needed to sustain the workforce out-with winter, so utilisation of external contractors to maintain the carriageway asset have been limited to specialist works eg Carriageway recycling, which was procured through the Public Contracts Scotland portal.

Larger realignment schemes, although rare, tend to be designed by the Consultancy section and are usually tendered through the Public Contracts Scotland portal. In these cases following pre-qualification most works contracts are currently awarded on the basis of cost only. This is being reviewed by the Consultancy section in an attempt to incorporate some element of quality assessment.

Procurement of external suppliers for any works is governed by the Council's Procurement Regulations. These currently require the following:

- Works up to £5,000 – a written quotation.
- Between £5,000 and £30,000 – 3 quotes.
- Over £30,000 – formal tender.

These limits apply to both main contracts and sub-contracts.

9. Performance Measurement

9.1. Performance Measurement

Performance is measured via a combination of national and local performance indicators.

9.2. Performance Indicators: National

Road condition is measured annually across Scotland by the Scottish Road Maintenance Condition Survey (SRMCS).

Each year 100% of A class, 50% of B class, 50% of C class and 10% of Unclassified roads are surveyed in one direction. The current year and previous year's results are combined to calculate a rolling 2-year Road Condition Indicator (RCI).

The table below shows the RCI results for each road class over the past 5 years (4 no. 2-year RCI's). The rank shown is Moray Council's position when results are compared against all 31 other Scottish Councils.

Survey	Road Class											
	A		B		C		A, B & C		Unclassified		Overall	
	RCI	Rank	RCI	Rank	RCI	Rank	RCI	Rank	RCI	Rank	RCI	Rank
2007-2009	18.6%	4th	14.8%	2nd	20.4%	5th	18.0%	3rd	28.1%	7th	**22.7%**	**2nd**
2008-2010	22.0%	4th	20.3%	2nd	21.6%	4th	21.2%	2nd	28.3%	1st	**24.4%**	**1st**
2009-2011	23.4%	5th	22.0%	3rd	23.1%	4th	22.8%	2nd	33.0%	3rd	**27.5%**	**2nd**
2010-2012	22.6%	6th	21.3%	2nd	23.5%	5th	22.6%	3rd	31.7%	7th	**26.9%**	**4th**

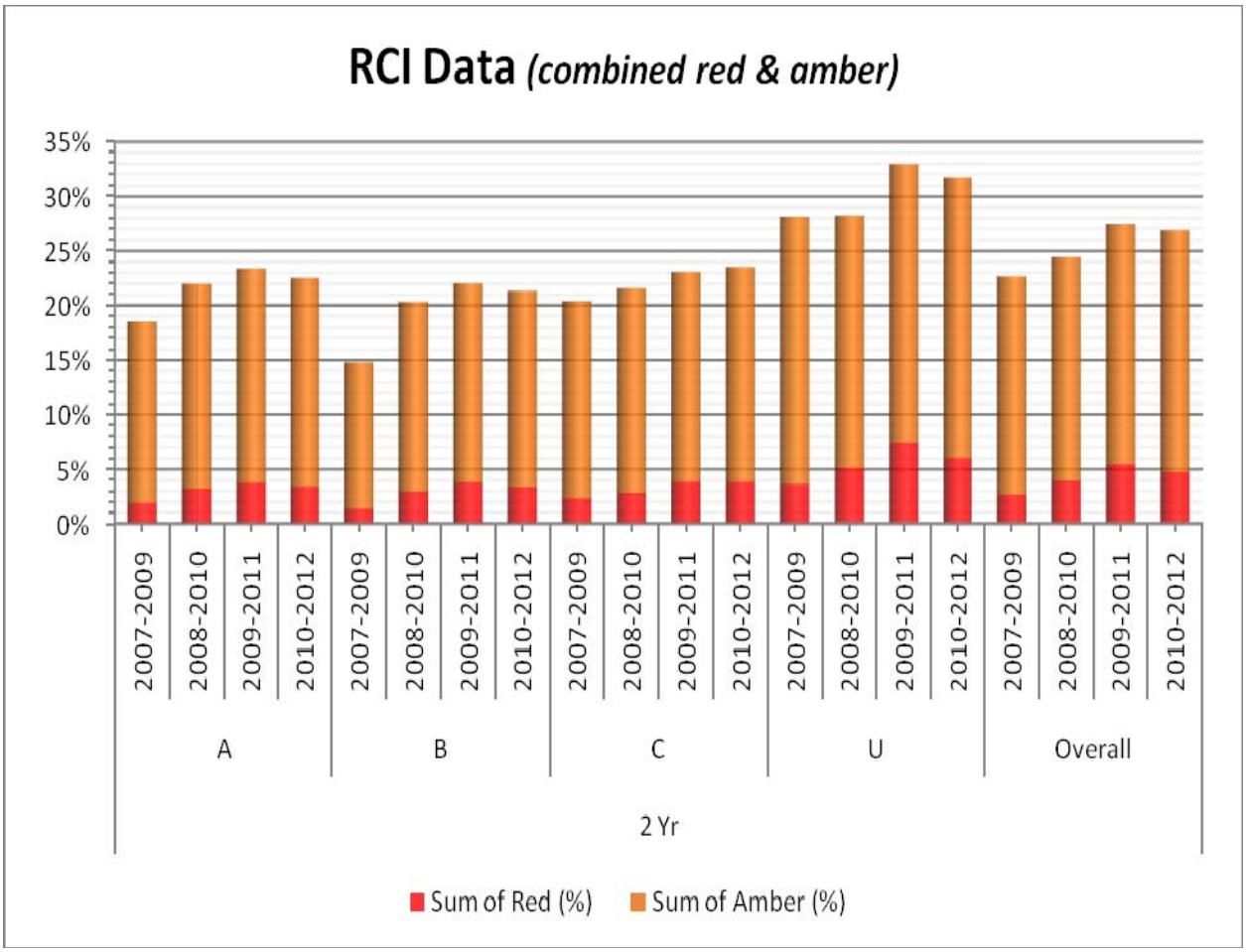


Table 9.1 Road Condition Indicator (RCI) 2007/09 – 2010/12

The SRMCS RCI is the only national carriageway performance indicator which compares Moray against all other Scottish Councils.

Moray Council also participates in APSE (Association for Public Service Excellence) 'Performance Networks for Highways and Winter Maintenance'. A range of performance indicators are reported to APSE each year for comparison with other participating Councils.

9.3. Performance Indicators: Local

A number of local performance indicators are calculated quarterly and annually. Only two of these indicators (ENVDR135a & ENVDR 131d) are specific to carriageways – the remainder are calculated using data which includes other road assets.
Local performance indicators, their targets, and results for the past 3 years are as follows.

P.I. Ref No.	P.I. Description	Target	2008/2009	2009/2010	2010/2011
			Annual	Annual	Annual
ENVDR061	% Planned works completed as programmed	90	92.1	79.7	86.7
ENVDR062	% Reactive works against planned	25	22.6	22.1	30.2
ENVDR063	Roads - No. of insurance claims received	n/a	33	98	86
ENVDR063b	% Successful insurance claims	8	0	1.2	5
ENVDR063c	Amount paid in settlements	n/a	0	£ 155.00	£ 250.00
ENVDR131d	% of Priority 1 carriageway routes treated within 2.5hrs of start	95	-	94.9	96.5
ENVDR135a	% inspection completed as scheduled - Carriageways	95	94.5	97.8	95.8
ENVDR135b	% inspection completed as scheduled - Footways & Cycleways	95	92.7	98.6	97.7
ENVDR136a	% Emergency repairs - made safe within 2 hrs	90	88.4	95.3	97.2
ENVDR136b	% Priority 1 repairs completed within 3 working days	85	88.7	79.6	94.2
ENVDR136c	% Priority 2 repairs completed within 28 days	70	79.5	77.7	86.3
ENVDR136d	% Priority 3 repairs completed within 6 months (subject to resources)	70	85.6	91.7	96.3

Table 9.2 Local Performance Indicators

The winters of 2009/10 and 2010/11 had a marked effect on some of these indicators.

9.4. Performance Reporting:

Performance information and supporting evidence are input into the 'Covalent' (the Council's current performance management system). Research and Information Officers from the Council's Chief Executive's Department then collate these results and submit a report to the Council's Audit & Performance Committee quarterly.
In addition, carriageway condition (the RCI, broken down by road classification) is included in the Statutory Performance Indicators reported to the Audit Commission each year.

10. Future Strategies

The 2012-22 Capital Plan sets the future strategy to tackle the problem of deterioration. Refer to the table in section 5.3 above.

11. Service Improvement Actions

Improvement Actions - Carriageways			
Number	**Action**	**Proposed Implementation Date**	**Responsibility**
IA1	Review list of Traffic Sensitive Roads, etc (Para 2.1)	Take forward	Senior Engineer (Traffic)
IA2	Consider transfer of historical paper records into roads asset management system. (Para 2.1)	Not this year. (discuss the process with WDM)	
IA3	Customer perception and satisfaction questionnaire. (Para 3.1)	Q1/2: 2012/13	Roads Maintenance Manager
IA4	Increase frequency of RAUC meetings. (Para 3.5)	Take forward	Transportation Manager
IA5	Formalise visual inspections or consider additional SRMCS data. (Para 4.3)	Take forward to consider options.	Roads Maintenance Manager

IA7	Scheme prioritisation process (Para 6.1)	Work with national RAMP development programme.	Roads Maintenance Manager
IA8	Improve co-ordination and co-operation between the Roads sections. (Para 6.2)	Take forward	Roads Maintenance Manager
IA9	Review and formalise option appraisal process. (Para 6.3)	Work with national RAMP development programme.	Roads Maintenance Manager
IA10	Create a single list of roads.	Take forward	Refer to DSMT

Table 11.1 Improvement Actions

SOCIETY OF CHIEF OFFICERS OF TRANSPORTATION IN SCOTLAND

LOCAL AUTHORITY ROAD NETWORK CONDITION

Road Condition Indicator

The Statutory Performance Indicator for the condition of the Scottish local authority road network, is defined as:

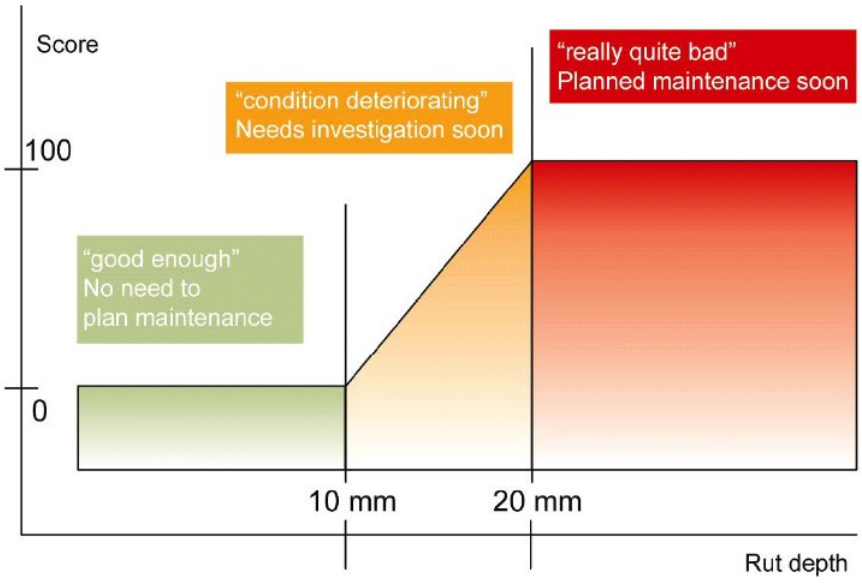
> *"the percentage of the road network which should be considered for maintenance treatment",*

'Considered for maintenance treatment' means that there is likely to be some defect in the condition of the road, but councils will need to carry out further detailed investigation and plan their programme having considered other factors including the impact on spending provision, user delays and safety concerns.

In 2007-08, the Statutory Performance Indicator changed from one which included data on longitudinal profile, rutting and texture, to a new UK. standard Road Condition Indicator (RCI), which also includes data on carriageway cracking and takes account of the severity of each defect and their relative importance for road users.

The RCI works in three stages:

1. The first step is the scoring of key survey parameters, over each 10metre section, in relation to a lower and upper threshold, with a linear weighting applied to values between the thresholds.
2. The second step is to total the parameter scores for each sub section, applying further weighting factors to reflect the importance (or relevance) of the parameter and the reliability of the measurement.
3. The third step is to allocate each sub-section to a condition band which reflects the extent to which maintenance is required:
   - 'Red' lengths (scoring over 100 points) indicating that maintenance operations are likely to be required;
   - 'Amber' lengths (scoring between 40 and 100 points) requiring further investigation and/or monitoring;
   - 'Green' lengths (scoring less than 40 points), likely to be in a satisfactory condition although isolate defects may still exist.



SOCIETY OF CHIEF OFFICERS OF TRANSPORTATION IN SCOTLAND

LOCAL AUTHORITY ROAD NETWORK CONDITION

The Scottish Road Maintenance Condition Survey

Data to calculate the RCI is collected as part of a Scotland –wide contract organised by SCOTS and covering all 32 Councils. The survey is machine-based (SCANNER[1]), and is subject to independent audit and quality assurance with the survey vehicles being subjected to rigorous annual validation checks.

Survey Coverage

A class roads are surveyed in both directions every two years, that is in one direction in one year and the opposite direction in the next year.

B and C class roads in both direction over a four year period; that is 50% of the B and C class network is surveyed in one direction in year one; 50% in one direction in year two; then the first 50% in the opposite direction in year three and so on.

A random 10% sample of the unclassified network is undertaken in one direction each year.

The survey is restricted to public roads with a bituminous surface, but excludes urban cul-de-sacs less than 150m in length and rural cul-de-sacs less than 500m in length.

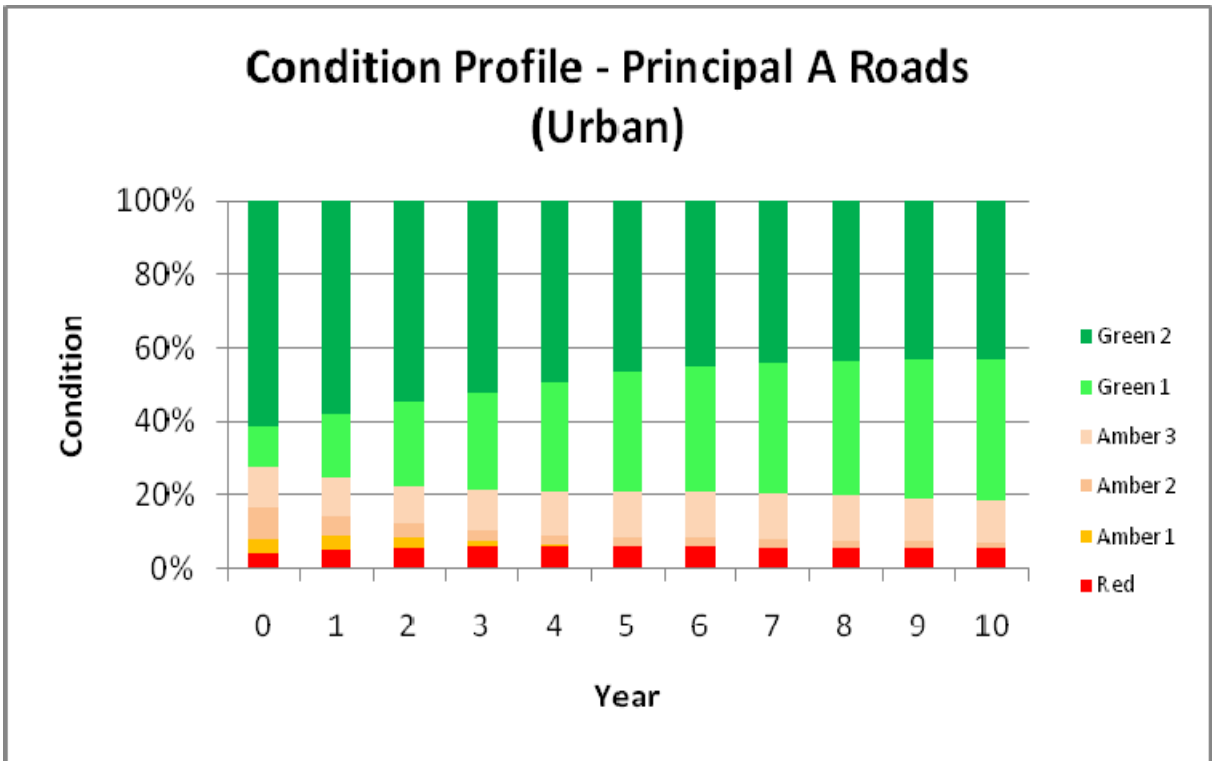
While the surveys is undertaken on an annual basis, the RCI is derived from the survey data collected over the previous two years to minimise the effect of sampling errors on the results.

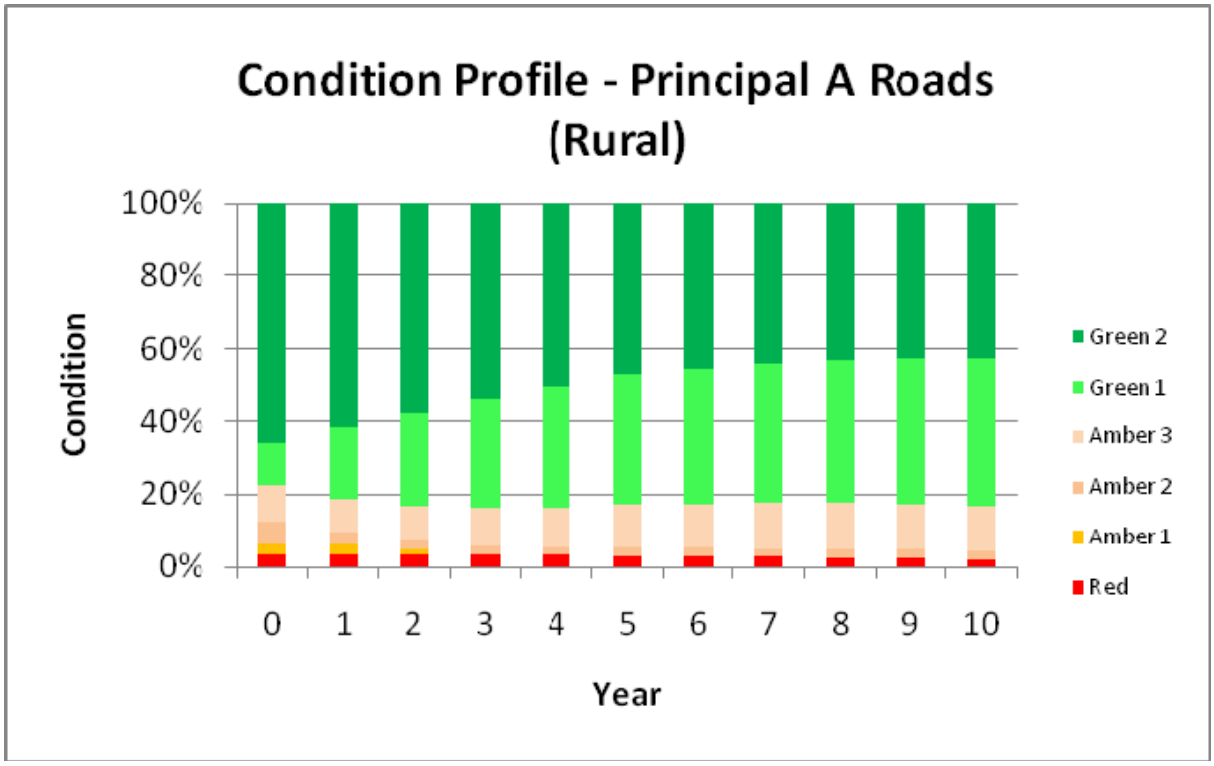
Reporting

The Scottish RCI figure includes both the “Red” and “Amber“ categories whereas in England, only the “Red” category is reported. An increase in the figure indicates deterioration, and a decrease indicates improvement.

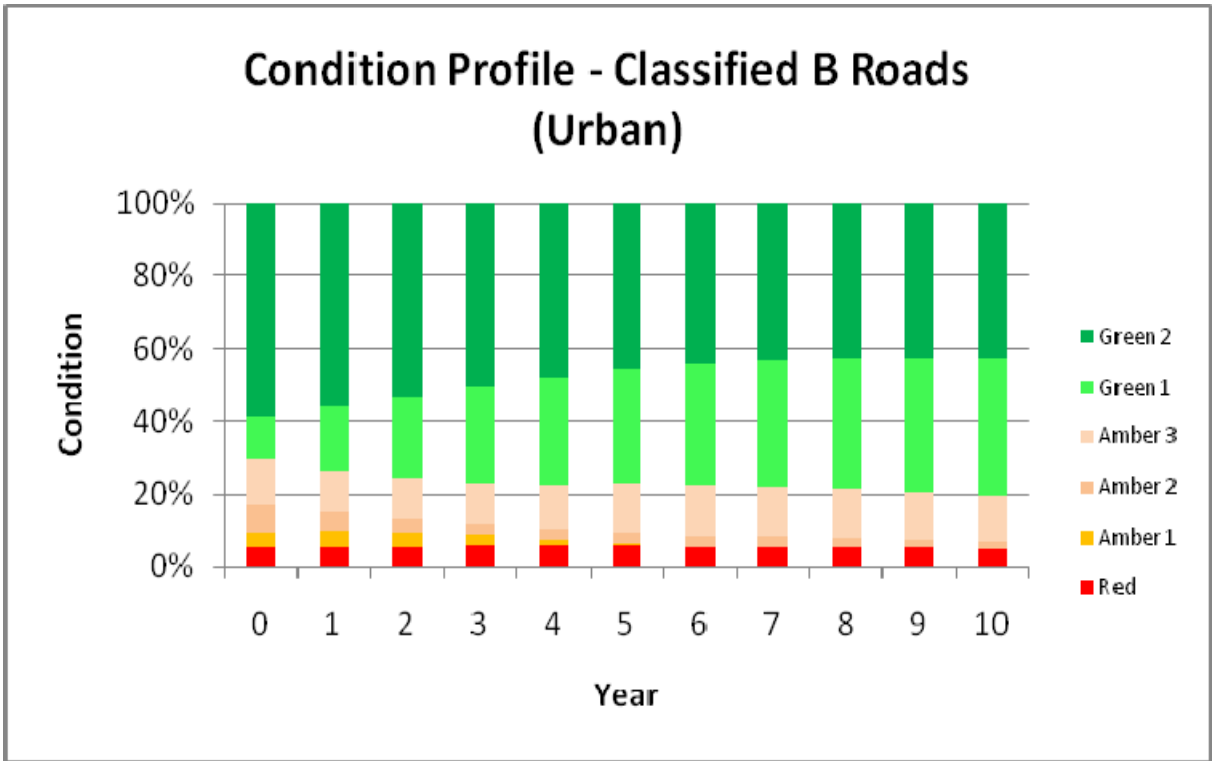
Caution is required in interpreting the results, as minor changes may not be statistically significant and undue emphasis should not be placed on a single year’s data, with greater reliance being placed on the longer term trends in the data. Variations in the survey (position on road, variations between survey vehicles etc) can cause variation in the results which can be more apparent on smaller networks.

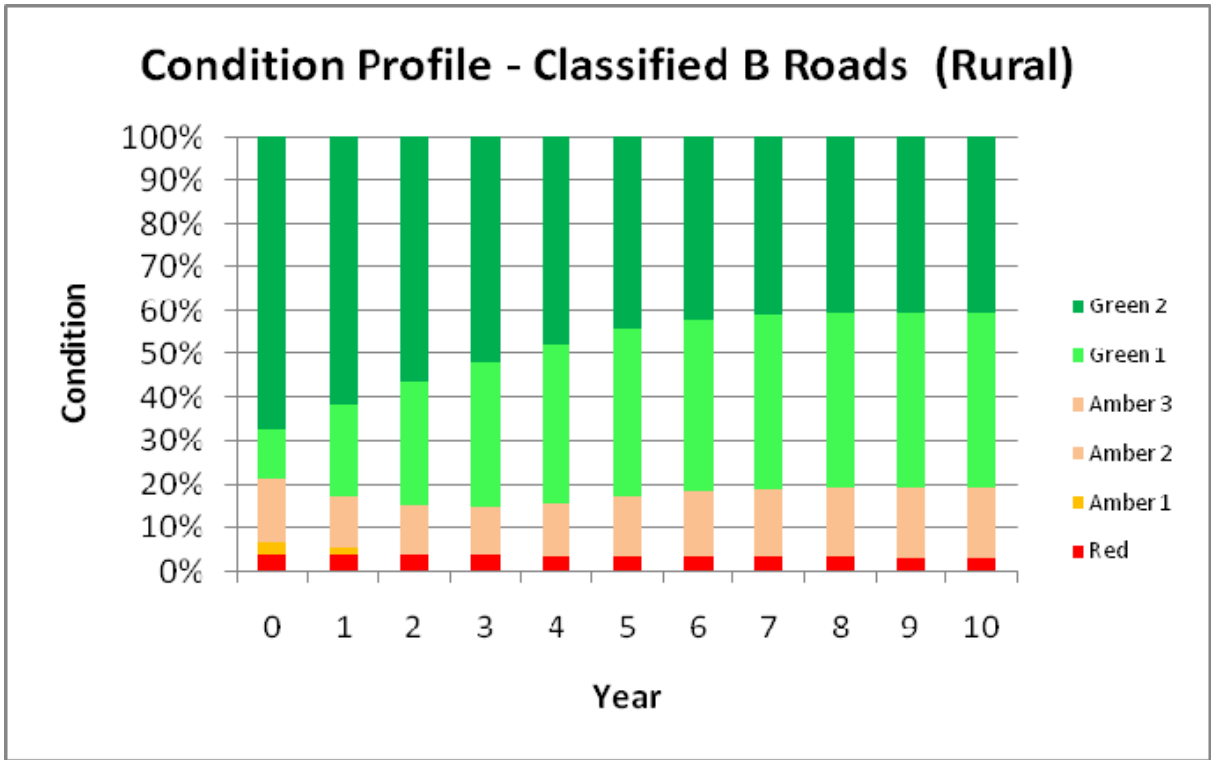
Forecast Carriageway Condition
(Based on 2012-22 Capital Plan and Road Construction Inflation at 8%)



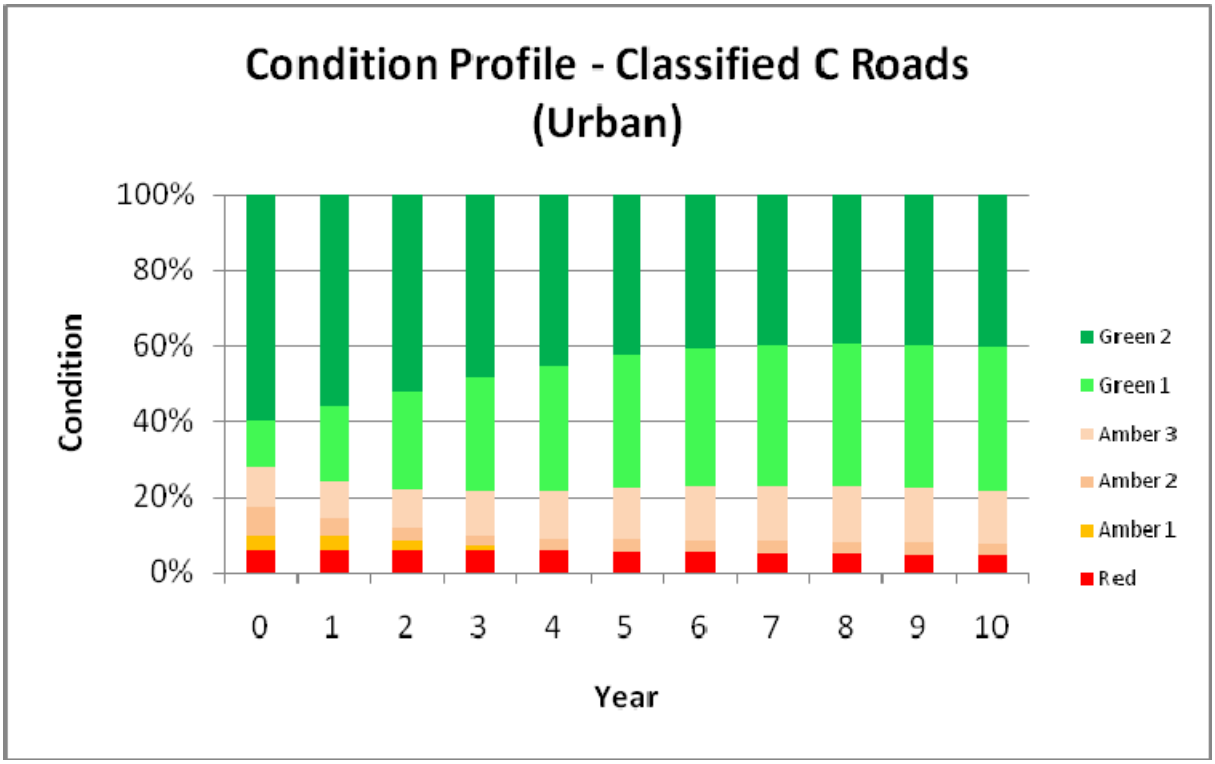


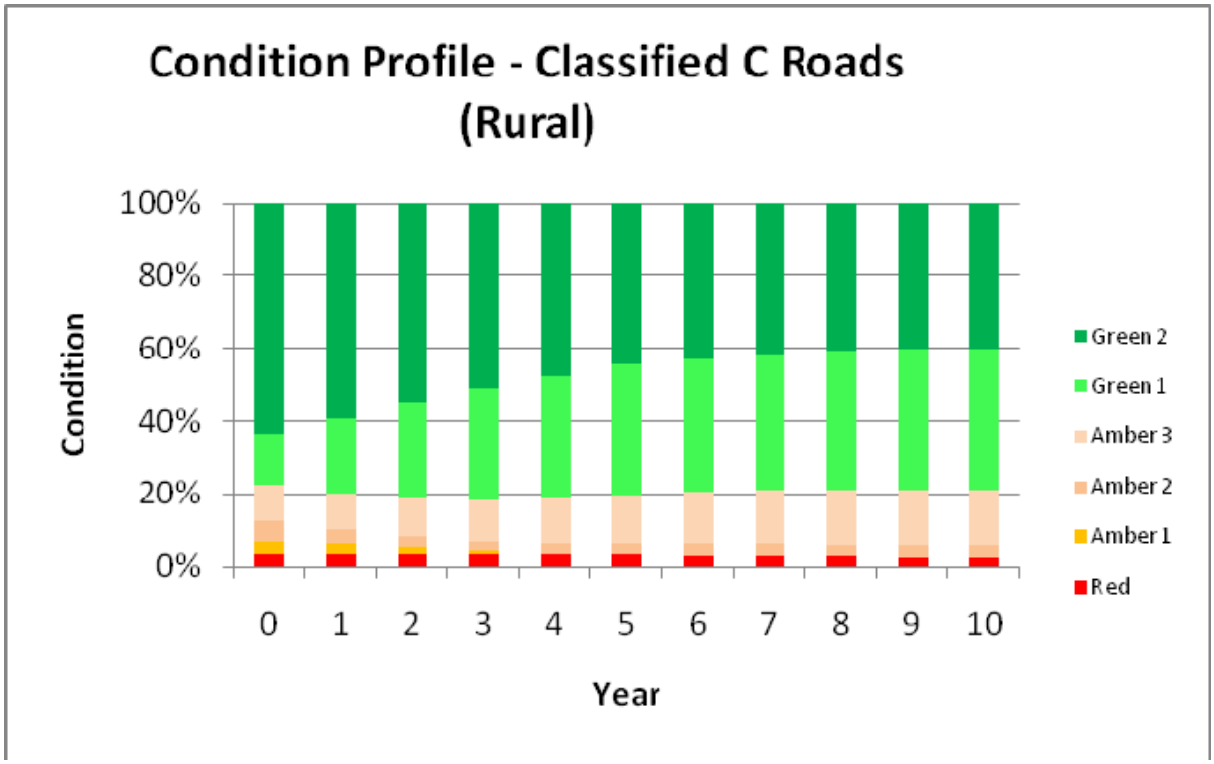
Forecast Carriageway Condition
(Based on 2012-22 Capital Plan and Road Construction Inflation at 8%)





Forecast Carriageway Condition
(Based on 2012-22 Capital Plan and Road Construction Inflation at 8%)





Forecast Carriageway Condition
(Based on 2012-22 Capital Plan and Road Construction Inflation at 8%)