PAG Team

TRANSPORT SCOTLAND
CÒMHDHAIL ALBA

Turner & Townsend

Performance Audit Group's Annual Report 2017/18

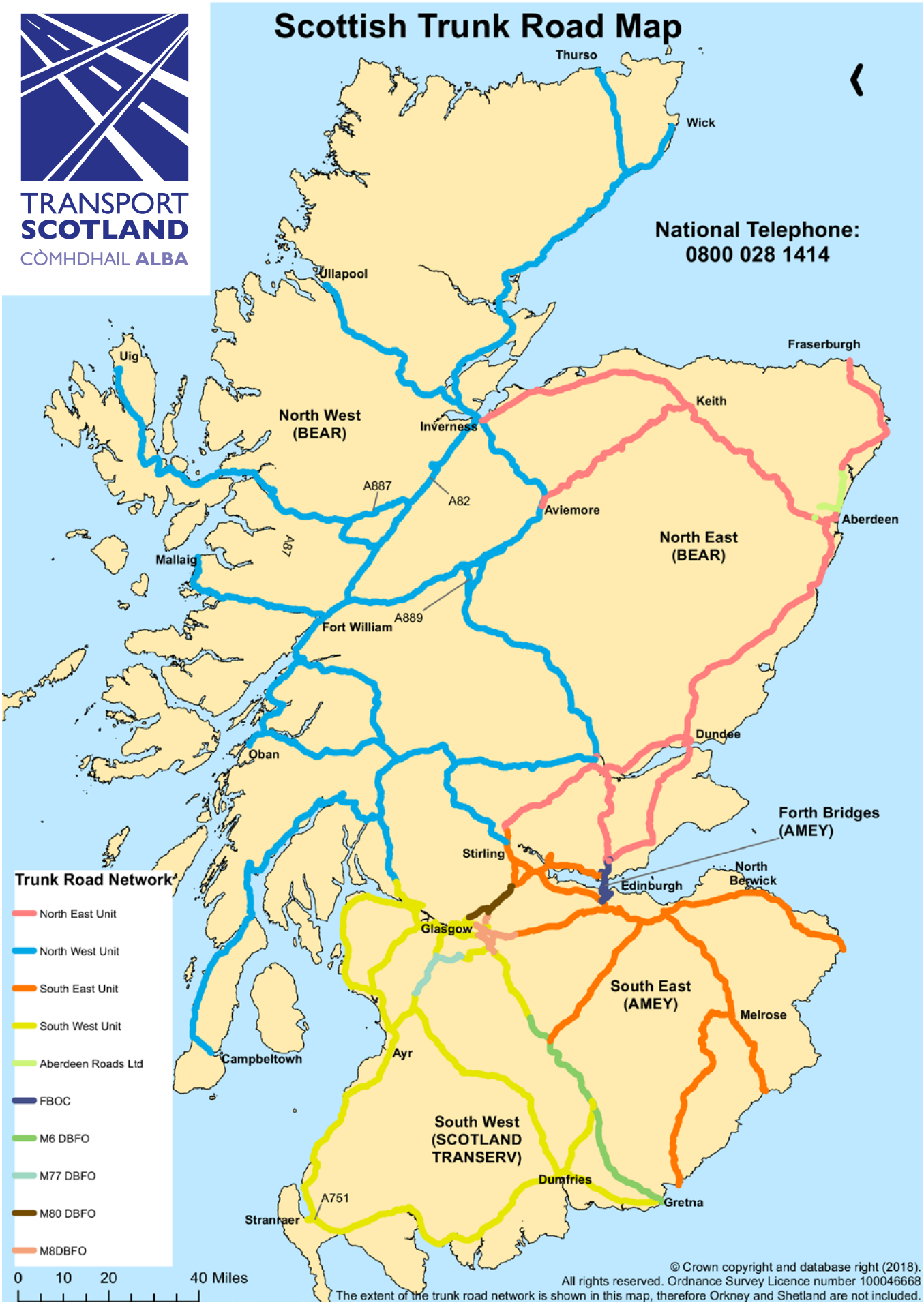
An independent public report on Scotland's trunk road maintenance

making the **difference**

amey

BEAR SCOTLAND

ScotlandTranServ
A Balfour Beatty Mouchel Joint Venture


Scottish Trunk Road Map
TRANSPORT SCOTLAND
CÒMHDHAIL ALBA
National Telephone:
0800 028 1414
Thurso
Wick
Ullapool
Uig
Fraserburgh
Keith
North West (BEAR)
Inverness
A887
A82
Aviemore
Aberdeen
North East (BEAR)
A87
Mallaig
A889
Fort William
Dundee
Oban
Forth Bridges (AMEY)
Stirling
North Berwick
Edinburgh
Glasgow
South East (AMEY)
Melrose
Campbeltown
Ayr
South West (SCOTLAND TRANSERV)
Dumfries
Gretna
A751
Stranraer
Trunk Road Network
North East Unit
North West Unit
South East Unit
South West Unit
Aberdeen Roads Ltd
FBOC
M6 DBFO
M77 DBFO
M80 DBFO
M8DBFO
0 10 20 40 Miles
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The extent of the trunk road network is shown in this map, therefore Orkney and Shetland are not included.

Foreword

Richie Hales
Director
Turner & Townsend
August 2018

This is the Performance Audit Group's (PAG) annual report on the management and maintenance of Scotland's trunk road network for 2017/18.

PAG's role is to audit, monitor and report on the performance of the Operating Companies (OCs) and this report summarises the extensive work carried out by the PAG multi-disciplinary team throughout the year.

2017/18 has seen a change in the provider of the PAG service, with CH2M's Contract ending in December 2017 and Turner & Townsend being engaged in March 2018 to carry on with delivery and as such prepare this Annual Report.

Turner & Townsend are a global, independent professional services business, offering independent advice, safeguarding the commercial interests of clients embarking on asset improvement & investment programmes across infrastructure, real estate and natural resources. Turner & Townsend are supported in the delivery of the PAG service by PWC & the Waterman Group.

To enable the preparation of this Annual Report, the PAG team have utilised the output from the monthly reports carried out within the period of April – October 2017 and combined those with findings from the start of the Turner & Townsend appointment.

As the Turner & Townsend appointment continues to mature, the 2018/19 year will see the PAG team working ever closer with Transport Scotland and the OCs to raise standards and provide a safe and reliable network. Our collective focus is to deliver:

- Quality of Service for Trunk Road Customers
- Asset Enhancement and Continuous Improvement of Service
- Value for Money and collectively deliver sustainable value to all stakeholders

The PAG team's approach to the commission is driving improvements through independent constructive challenge and continuous improvement with the focus on outcomes being at the forefront of all decisions.

We are taking great pride in playing our part in delivering a great road user experience and we trust you find our latest report clear, comprehensive and informative.

Executive summary

The 4th Generation Term Contracts for the Management and Maintenance of the Scottish Trunk Road Network have generated savings through the competitive procurement process when compared to prices under the 3G contracts for similar operations.

Savings of **£3.2m** were delivered during **2017/18**

with cumulative savings of **£27.9m** delivered to date over the life of the 4G contracts.

The budget for **2017/18** of **£196.5m** was up **£20.1m** **10.2%** from the previous year.

Performance in managing budgets and general financial management was fair to good.

Improvements in the level of service across the network were achieved in numerous areas, whereas to a lesser degree, **performance reduced in some areas.**

Performance in undertaking safety inspections was good over the year,

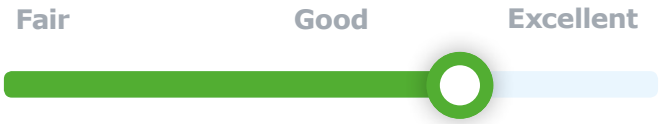
Detailed inspections and general inventory management fared less well.

All units performed well in sustainability with very few issues found by the monitoring activities undertaken by PAG.

In cyclic activities good performance was generally achieved in grass cutting, weed control and soft landscaping, however **Drainage achieved a fair performance** on the whole with a number of issues noted throughout the year for blocked gullies or broken covers.

A good performance was noted for safety barrier works. Performance in repair of Category 1 defects was fair to good. **In general incident response performance was good.**

A good to excellent performance was noted in **quality management systems** with fair to excellent performance noted in **environmental management systems.**



All units delivered a good performance in terms of **Health and Safety**.

Contents

Chapter 1:

Overview

1.1 Background

The Scottish trunk road network

The network is divided into five geographic units (NW, SW, NE, SE and FB) and five DBFO/PPP projects, each with its own contract (see Figure 1, page 1).

Each of the five units (see Figures 1-02 to 1-05) is managed and maintained by an OC. Figure 1-01 outlines the structure of these arrangements.

Figure 1-01 – Structure of arrangements between Transport Scotland, PAG and the OCs

The network is 3,138km long, excluding M6 DBFO, M77 PPP, M8/M73/M74 DBFO, AWPR DBFO and M80 DBFO. It contains a total of 4,288 structures, including 1,918 bridges and footbridges.

The OC contracts

From 1 April 2013, the 4G contract in NW and SW have been managed and maintained by BEAR Scotland Ltd (an independent company jointly owned by Jacobs Engineering, Breedon Aggregates and Eurovia) and Scotland TranServ (a joint venture between Balfour Beatty and Mouchel/WSP) respectively.

From 16 August 2014, the 4G contracts in NE and SE have been managed and maintained by BEAR Scotland Ltd and Amey LG Ltd/Amey Highways Ltd respectively.

From 1 June 2015, the contract in FB has been managed and maintained by Amey LG Ltd/Amey Highways Ltd. The current contract expiry date for this contract is May 2020.

The current contract expiry date for SW and SE contracts is August 2020, with expiry date for NW and NE contracts August 2022.

The contract's objectives

The contracts to manage and maintain the network were awarded by the Scottish Ministers, and focus on the following three objectives:

- Customer service – "to enable a 'customer oriented' approach to be further developed in the way roads are managed and maintained."
- Value for money – "to achieve the maximum efficiency in the use of the substantial sums of money expended on the maintenance of the network."
- Effective management – "to encourage innovation and skilful management to maximise trunk road capacity and achieve the best use of the network."

The contracts also aim to encourage:

- Flexibility – "to accommodate changes to the trunk road network."

Performance ratings

PAG uses a star rating system to assist in benchmarking OC performance. These performance ratings have been applied throughout the report.

★★★★ ***Excellent***

★★★☆ ***Good***

★★☆☆ ***Fair***

★☆☆☆ ***Poor***

A summary of these ratings reflect overall OC performance for the various areas reviewed. It should be noted that in the instance of a Notice of Non-conformance (NNC) or Remedial Notice being issued or a previously issued Remedial Notice remaining open, scoring of the related section reduces to no higher than 'fair' or 'poor' respectively.

Overview

North West fact file

Figure 1-02 – NW Unit

Managed and maintained by: **BEAR Scotland Ltd.**

BEAR's central office:

BEAR House

Inveralmond Road

Inveralmond Industrial Estate

Perth

PH1 3TW

Total route length of the network in NW:

1,422km

Number of structures:

1,501

Budget for maintaining trunk roads in NW this period:

£51.4m

Overview

South West fact file

Figure 1-03 – SW Unit

Managed and maintained by: **Scotland TranServ.**

ScotlandTranServ
A Balfour Beatty Mouchel Joint Venture

Scotland TranServ's central office:

Oatlands House
150 Polmadie Road
Glasgow
G5 0HD

Total route length of the network in SW:

619km

Number of structures:

1,545

Budget for maintaining trunk roads in SW this period:

£52.6m

Overview

North East fact file

Figure 1-04 – NE Unit

Managed and maintained by: **BEAR Scotland Ltd.**

BEAR's central office:

BEAR House

Inveralmond Road

Inveralmond Industrial Estate

Perth

PH1 3TW

Total route length of the network in NE:

593km

Number of structures:

485

Budget for maintaining trunk roads in NE this period:

£30.3m

Overview

South East fact file

Figure 1-05 – SE Unit

Managed and maintained by: **Amey Highways Ltd**

Amey's central office for SE:

6A Dryden Road

Bilston Glen

Loanhead

EH20 9TY

Total route length of the network in SE:

473km

Number of structures:

631

Budget for maintaining trunk roads in SE this period:

£33.4m

Overview

Forth Bridges fact file

Figure 1-06 – Forth Bridges Unit

Managed and maintained by: **Amey Highways Ltd**

Amey's central office for FB:

Forth Road Bridge

Administration Office

Ferrymuir Gait

South Queensferry

EH30 9SF

Total route length of the network in FB:

32km

Number of structures:

126

Budget for maintaining trunk roads in SE this period:

£28.7m

1.2 Network spend

The Scottish trunk road network

Reported spend figures are inclusive of contract price fluctuations (CPF) unless otherwise stated.

A comparison of spend figures for 2017/18 and 2016/17 is shown in Figure 1-07. Total spend for 2017/18 is £203.1m (2016/17: £179.3m).

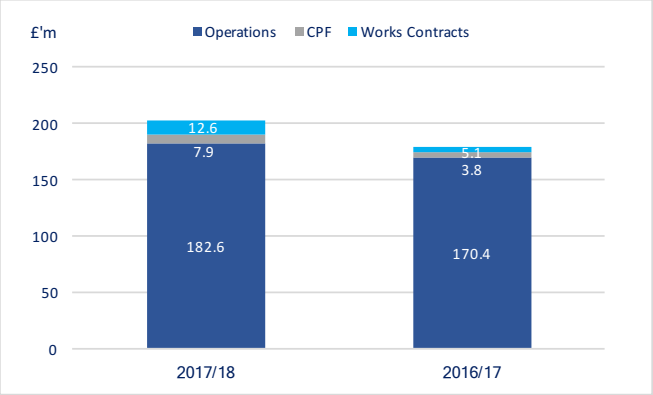


Figure 1-07 - Financial comparison – all units

A profile of spend by Unit split between OC operations and works contracts is given in Figure 1-08.

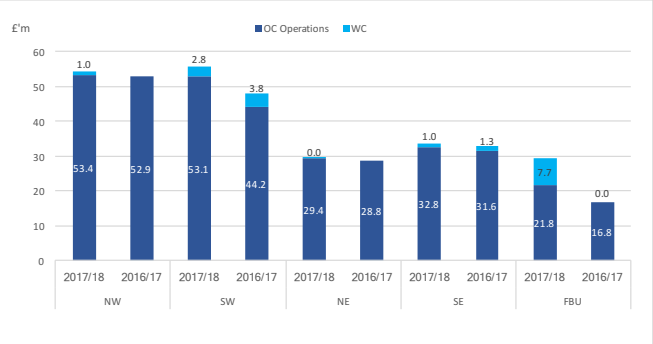


Figure 1-08 - Spend split by works and operations by Unit

The budget for 2017/18 of £196.5m (net of CPF) was up £20.1m (11.4 %) from the previous year (see Figure 1-09).

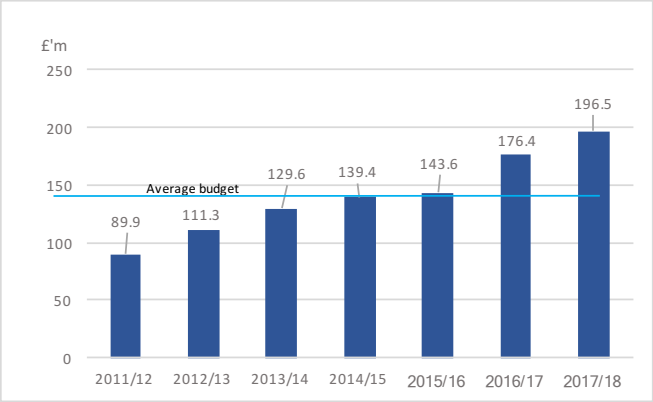


Figure 1-09 - Comparison of budgets (net of CPF) for maintenance and improvements

Spend net of CPF for 2017/18 is £195.2m (2016/17: £175.5m), which is £1.3m less than budget.

For 2017/18, CPF payments totalled £7.9m on operations priced at base rates totalling £182.3m, see Figure 1-10. The CPF figure for 2016/17 was £3.8m on operations priced at base rates totalling £170.4m.

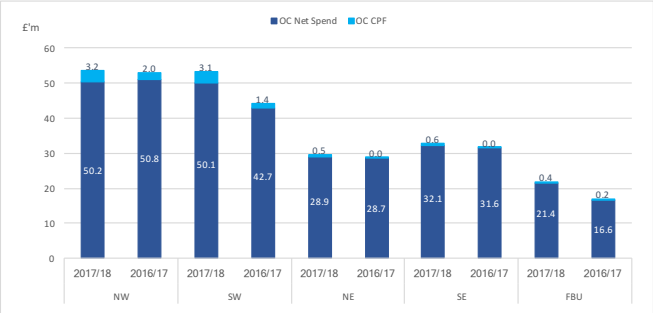


Figure 1-10 - OC spend split by base rates and CPF - all units

Transport Scotland's 4G contracts have generated savings through competitive procurement process when compared to prices under its previous contracts for like operations. Savings of £3.2m have been delivered during 2017/18, with cumulative savings of £27.9m delivered to date over the life of the 4G contracts.

1.2.2 Spend analysis

Transport Scotland reports a network asset valued at a net £13.4bn for roads and £6.0bn for structures. In maintaining its asset, Transport Scotland spent £203.1m during 2017/18 (2016/17: £179.3m). Figure 1-11 shows how this spend was allocated by asset type during the year.

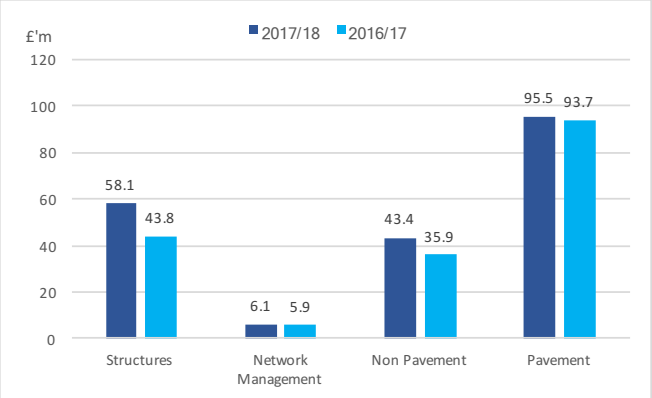


Figure 1-11 – Spend by asset type - all units

The spend categories identified in Figure 1-11 are detailed below:

- Structures includes bridges, footbridges, underpasses, culverts, retaining walls, sign gantries, high mast lighting and CCTV masts.
- Network management includes core operation activities not directly attributable to structures, non-pavement and pavement assets.
- Non-pavement includes drainage systems, vehicle restraint systems, street lighting, traffic signs and other ancillary assets.
- Pavement includes only carriageways and footways.

Figure 1-12 shows spend by maintenance activity.

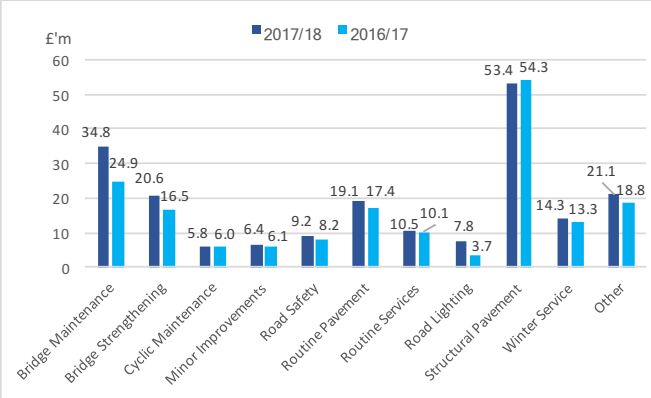


Figure 1-12 - Spend by maintenance activity - all units

Chapter 2:

Management of service

Key Points

Network reliability

- From the OC's figures, on average 95.6% of the road was available to road users throughout the year.
- The figures demonstrate that NW unit had the highest amount with 99.7% of the road available to road users throughout the year, whilst the FB unit had the lowest with 88.1% network availability, although this may be a reflection of the relatively small size of the unit.
- The SE and NW units were the most efficient with regards to unplanned roadworks, with 205,379 km hrs and 66,180 km hrs respectively of unplanned road closures on average per month. Measured across respective networks of 1,422 km and 473 km these are relatively low figures.

Network inspections

- The OCs performed well in completing Safety Inspections and Patrols on time.
- Performances from the SE, NE and NW improved on last year's performances.
- The SE performance was excellent with a 99.7% record for completing Safety Inspections on time.
- Performance in completing structures inspections was above 90% for all units with NW and SE achieving 100%.
- Performance in undertaking Detailed Inspections was fair in SW, NE and SE units, however performance was poor in NW and FB units.

Inventory management – Condition Rating

- With the exception of FB unit, Inventory management for all OCs was poor in the reporting period with condition rating completion very low in NW, NE and SW units. SE Unit did better achieving 59%, FB had 95% completion.
- The performance of NW, SW and NE deteriorated throughout the year.
- SE recorded an improvement throughout the course of the year.

Sustainability

- All units performed well in sustainability with very few issues found by the monitoring activities undertaken by PAG. In particular NE, NW and FB units had no issues observed.

Chapter 2:

Management of service

2.1 Network reliability

Network reliability

The delivery of Transport Scotland's investment by the OCs is pivotal to a safe, efficient, reliable and sustainable network.

The OCs are required to minimise the potential disruption and inconvenience to road users caused by essential maintenance by planning works, combining activities, and coordinating with all stakeholders, including statutory undertakers.

2.1.1 Traffic Management

The OC's performance in minimising the impact of roadworks is measured as a monitoring indicator (MI 02 + MI 03). These are based on the length and time of lane closures in each Unit.

For MI 02, these road occupation values are used to calculate the overall percentage of the network available to road users. This is related to budget and planned maintenance activities that require network intervention to undertake.

Unit	% Available
NW	100%
SW	96%
NE	96%
SE	98%
FB	88%
Average	95%

Figure 2-01 – MI reporting road occupations and percentage of network available to road users

MI 03 relates to unplanned roadworks. The Monitoring indicator is based on the overall length of the road which is unavailable due to unplanned roadworks, multiplied by the duration, in hours, of the road occupation (see Figure 2-02).

Unit	Unplanned Road Closure (km x hrs)	Total Length of unit in Km
NW	205,379	1,422
SW	380,696	618
NE	463,566	593
SE	66,180	473
FB	8,310	32

Figure 2-02 – MI reporting unplanned road occupations by the number of hours (average monthly total)

2.2 Network inspections

Inspections

To deliver reliable journey times, ensure safety of the network and ensure budgets are allocated to areas of most need, the OCs are required to implement inspection regimes.

Weekly safety inspections/patrols are carried out on routes to identify and repair the most serious defects quickly.

To maintain the safe condition of the trunk road assets, detailed inspections are carried out, typically annually, to identify minor defects. These defects are grouped into schemes, which are prioritised based on need.

In general, the OCs completed inspections on time.

2.2.1 Safety inspections and patrols

Figure 2-03 gives the OC's performance in completing safety inspections on time.

Unit	2016/17	2017/18
NW	98.8%	98%
SW	95.6%	98%
NE	97.8%	99%
SE	99.6%	100%
FB	99.3%	98%

Figure 2-03 – Safety inspection performance

NW – BEAR ★★★☆

Overall a good performance, 98% of Safety Inspections and patrols were recorded as being completed on time. This comprised of 99.9% of safety inspections and 94.6% of night time safety patrols.

SW – Scotland TranServ ★★★☆

Overall, 98% of safety inspections and patrols were recorded as being carried out on time providing a good performance.

This included 99.5% of safety inspections, 99.4% of safety patrols and 99% of night time safety patrols completed on time.

NE – BEAR ★★★☆

BEAR gave a good performance recording an average of 99% performance in carrying out safety inspections and patrols on time.

This comprised of 99.6% of safety inspections, 99.6% of safety patrols and 99.7% of night time safety patrols.

SE – Amey ★★★★

Amey achieved an excellent performance, 100% of safety inspections and patrols were recorded as being completed on time.

FB – Amey ★★★☆

A good performance overall, Amey recorded an average of 98% performance in carrying out safety inspections and patrols on time.

This included 99.4% of safety inspections, 99.7% of safety patrols and 90.8% of night time safety patrols completed on time.

2.2.2 Detailed inspections – roads

The performance by the OCs in completing detailed inspections in 2017/18, is as shown in Figure 2-04.

Unit	2016/17	2017/18
NW	70.7%	65%
SW	78.7%	87%
NE	80.5%	92%
SE	77.3%	87%
FB	69.7%	72%

Figure 2-04 – OC performance in completing detailed inspections (excluding electrical inspections)

NW – BEAR ★☆☆☆

A poor performance overall, BEAR's performance deteriorated during 2017/18 from 70.7% in 2016/17 to 65% of the required detailed inspections carried out on time.

Contributory factors to this were a deterioration in the number of Category A Footway inspections in May, and structural integrity of traffic control barriers in July. However, performance in inspection of arrester beds and balancing pods increased significantly in September.

Figure 2-05 – A83 Inverary Pavement Investigation

SW – Scotland TranServ ★★☆☆

Scotland TranServ's performance was fair, increasing throughout 2017/18 from 78.7% to 87% of the required detailed inspections carried out on time. This was an improvement from the previous year.

High performance was achieved in inspection of balancing ponds, traffic signals and retro-reflectivity of road markings.

NE – BEAR ★★☆☆

BEAR's performance was fair, increasing from 80.5% to 92% of the required detailed inspections recorded as being carried out.

This was a significant improvement from 2016/17 when 80.5% was achieved.

SE – Amey ★★☆☆

Overall, the performance by Amey was fair, increasing significantly from 77.3% last year to 87% of the required detailed inspections carried out on time.

In May, noteworthy improvement was made in inspections of structural integrity of traffic control barriers.

FB – Amey ★☆☆☆

A poor performance overall by Amey despite an increase from 69.7% to 72% of the required detailed inspections recorded as being carried out on time.

It was noted throughout the year that performance decreased where detailed inspection frequency is specified as 2 years or more. Amey prepared a programme to improve on this around the August - September reporting period.

2.2.3 Inspecting structures

Maintaining structures

The OCs are required to inspect structures at regular pre-determined intervals and prepare programmes to manage and maintain them. The OCs must then design, procure and carry out works either directly or through tendered works contracts.

The term 'structures' includes bridges, footbridges, underpasses, culverts, retaining walls, sign gantries, high mast lighting and CCTV masts. Regular inspections are carried out at two and six-yearly intervals.

The OCs are also required to carry out cyclic maintenance tasks to structures each year.

The OCs have an obligation to inspect all structures within their respective units. The inspection period generally runs from February to November in each calendar year.

Two types of inspections are routinely undertaken:

- General Inspection – visual inspections carried out every two years; and
- Principal Inspection – close detailed visual inspection of every structural element carried out every six years.

Other inspections may be carried out on a needs basis. These may include superficial, scour or special inspections, usually following severe weather, sudden or unknown change in condition or following an incident.

Inspections enable the current condition and any defects to be recorded in the Structures Management System (SMS). Based on inspections, each OC develops a programme of prioritised essential maintenance proposals within the available budget.

A breakdown of the inspections completed by Unit, and the overall performance of each OC is shown in Figure 2-06.

Unit	PI's 08 + 09 Average (Principal + General Inspections)
NW	100%
SW	95%
NE	97%
SE	100%
FB	91%
Average	97%

Figure 2-06 – OC performance in completing principal and general inspection programmes

Management of service

NW – BEAR ★★★★

Performance by BEAR was excellent during the reporting period completing all programmed inspections on time.

SW – Scotland TranServ ★★★☆

Performance by Scotland TranServ was good.

Scotland TranServ had planned to submit a total of 450 reports by the end of September 2017. A review of IRIS at that time showed 447 had been submitted at that time.

NE – BEAR ★★★☆

BEAR's performance was good with 97% of the principal and general inspection programmes completed on time.

SE – Amey ★★★★

Performance by Amey was excellent, similar to the previous year.

Amey completed 180 general inspections by September 2017 in comparison with the programmed 173 inspections, therefore surpassing its target.

FB – Amey ★★☆☆

Performance by Amey was fair, deteriorating significantly during the reporting period. Amey completed 91% of the principal and general inspection programme on time.

As of August 2017, of the 8 Principal Inspection reports which were programmed to be submitted, only 1 was recorded on IRIS at that time. Amey reported that this was a result of late third party inspection reports.

Case Study provided by AMEY FB: Technology & Structural Health Monitoring on the Forth Road Bridge

To provide Engineers with real-time data and structural monitoring analytics, Amey developed a sophisticated inspection and management database and retrofitted extensive Structural Health Monitoring (SHM) technology onto the Forth Road Bridge. This innovative and highly configurable system was designed to include data analytics software and machine learning to allow Engineers to interrogate and interpret significant volumes of live data received from the various SHM sources. The data is displayed in a usable format allowing Engineers to systematically monitor structural performance and make informed asset management decisions that support day-to-day inspection, maintenance work and longer term planned maintenance and improvement programmes.

Designed and developed specifically for Major Structures the system has streamlined reports generation and automated defect scoring. Recent developments include the use of handheld devices for real-time inspection reporting on site, together with integration of historic bridge records. Amey's virtual reality model of the Forth Road Bridge is planned to be incorporated into the system to assist engineering teams in managing this major asset in a way that embraces new technology with engineering excellence.

2.3 Inventory management

The RMMf is a computer-based system provided by Transport Scotland and operated by the OCs, which contains the inventory of trunk road assets. The OCs are responsible for recording all works carried out on the network and updating and archiving the inventory as necessary. The accuracy of the inventory is important as the data is used to assist and establish budgets and programmes.

NW – BEAR

BEAR's performance deteriorated in condition ratings from around 22% in May to 9.72% in September. This was already a deterioration on the 43% recorded at the end of the previous reporting period.

SW – Scotland TranServ

Scotland TranServ's performance in recording inventory condition ratings decreased, from 15.68% in June to 11.91% in September.

NE – BEAR

BEAR's performance in recording inventory condition ratings decreased, from 26% in June to 1.78% in September.

SE – Amey

Amey's performance in recording condition ratings increased overall, from 53% in June to 58.94% in September.

FB – Amey

Amey maintained a high percentage of condition ratings throughout the year, deteriorating slightly from 98% in April to 95% in August.

2.4 Sustainability

Sustainability monitoring

Transport Scotland, PAG and the OCs continue to work together to provide a more sustainable service and to assist in achieving these ambitious carbon reduction targets. The OCs prepare annual sustainability reports which are scrutinised by PAG and Transport Scotland.

The CEEQUAL based sustainability monitoring tool developed by PAG continues to be used to determine the OCs performance when planning, designing and completing approved schemes. In addition, a number of site visits and depot inspections were undertaken by PAG.

Waste generation and management and the use of reused, recycled and renewable materials continues to be monitored. The manner in which the quantities of waste and use of recycled materials is recorded and reported was reviewed by both PAG and Transport Scotland with a more consistent approach adopted.

The following table shows the average score for Monitoring Indicators 17 and 18.

MI 17 measures the percentage of materials used by OC operations that are from a recycled, reused or renewable source.

MI 18 measures the percentage of waste generated by the OC's operations that is reused or recycled.

Unit	MI 17	MI 18
NW	0%	100%
SW	10%	100%
NE	0%	100%
SE	10%	100%
FB	0%	89%

Figure 2-07 – Monitoring Indicators 17 and 18

NW – BEAR

PAG completed 24 scheme sustainability monitoring reviews during the period, with no issues observed.

During the reporting period BEAR was awarded an initial verification score of 75.3% under CEEQUAL.

SW – Scotland TranServ

PAG completed 25 scheme sustainability monitoring reviews during the period.

Only one issue was observed, in relation to a lack of pollution prevention measures on site.

NE – BEAR

PAG completed 15 scheme sustainability monitoring reviews during the period, with no issues observed.

During the reporting period BEAR was awarded an initial verification score of 73.6% under CEEQUAL.

SE – Amey

PAG completed six scheme sustainability monitoring reviews during the period.

Issues discovered during the PAG inspections included site vehicles parked on verges and a lack of bunding on fuel containers.

Amey is currently working to attain CEEQUAL on the SE contract.

FB – Amey

PAG completed four scheme sustainability monitoring reviews during the period, with no issues observed.

Amey is currently working to attain CEEQUAL on the FB contract.

Case Study provided by AMEY FB:
St Margaret's Tunnel Infill Project

A disused Rail tunnel, constructed in 1864 and abandoned in 1954, was discovered below part of the Forth Road Bridge Estate and was in need of repair. The vaulted roof and brick lined tunnel was located 15m below the trunk road adjacent to the northern approach to the Forth Road Bridge, and had the potential to cause subsidence to the carriageway above in the event of collapse.

Several remediation options were assessed with the final innovative system designed by Amey involved lining and filling the tunnel with 21,342 individually placed polystyrene blocks with a compressive strength adequate to support the weight of ground above. The blocks were protected from potential hydrocarbons by using a resistant membrane liner. This solution also ensured that should the tunnel ever be re-commissioned the blocks can be easily removed.

The 420m long tunnel had single vertical access shafts at each end with an uneven ground surface that presented logistical and safety challenges during installation. To address this Amey designed and innovative sliding mono-rail system that eliminated manual handling risk and halved the installation time. Two local Primary Schools also provided time-capsules that were encased in the tunnel. Amey's social media channels shared a time-lapse video that similarly trended as the BBC's no.1 story.

2.5 Construction Design Management (CDM)

CDM

The change in the CDM regulations in 2015 put new responsibilities on all parties and in particular the Client to monitor the compliance of others in the performance of their duties. The new regulations applied to all works after October 2015 and the OCs were tasked with performing the duties of the Principal Designer/Principal Contractor.

Site sample monitoring generally found good compliance with legislative requirements.

Desktop monitoring was undertaken to check on OC's performance in complying with legislative requirements and contractual obligations to upload information to IRIS.

Inconsistencies, missing dates and documents were found in schemes from each Unit.

There were numerous instances, in each unit, of CDM documentation not being uploaded onto IRIS. This included a lack of Pre-Construction Information documentation, Construction Phase Plans and Health & Safety files.

Chapter 3:

Delivery of service

Key Points

Cyclic maintenance

- Excellent performance was achieved in grass cutting by the NE, SE and FB units.
- The NW and SW achieved a good performance in grass cutting.
- NW unit achieved an excellent performance in weed control, while the other units achieved a good performance.
- In dealing with drainage issues, the FB unit achieved a good performance, the NW unit achieved a poor performance and all other units achieved a fair performance.

Reactive maintenance

- Performance in reactive lighting maintenance was high, with all units achieving a rating of excellent, with the exception of the NE unit who maintained their good performance from last year.
- Consistent performance was also achieved across the units for reactive safety barrier, fencing and barrier maintenance. SE Unit significantly improved their performance to achieve a rating of excellent, whilst all other units achieved a rating of good.
- A fair performance was achieved by NW, NE and SW units in reacting to Category 1 defects, a good performance was noted in and SE and FB units.
- Incident response performance was good in all units with the exception of the NE unit which was issued with a Notice of Non-Conformance in April 2017 resulting in a fair rating overall.

Planned maintenance

- Good record keeping, supervision and workmanship was recorded by PAG by all OCs across the units.

3.1 Cyclic maintenance

Cyclic maintenance

The OCs carry out various cyclic maintenance activities on the network in order to keep it operational, safe and tidy. These include operations such as cleaning gullies and catchpits, cutting grass and cleaning road signs.

The OCs are required to update RMMf when they carry out these operations.

Grass cutting

Measure of performance in grass cutting changed from a frequency measure in the NW and SW Unit contracts to the performance measure used in the NE, SE and FB Unit contracts.

NW – BEAR ★★★☆

Overall, BEAR's performance remained good.

Grass cutting operations were carried out according to the agreed programme.

Three ORIs were raised throughout the year. These were addressed in a timely manner by the OCs, generally within the same monthly reporting period.

SW – Scotland TranServ ★★★☆

Overall, Scotland TranServ's performance reduced from excellent to good.

Four ORIs were raised for grass height exceeding maximum specification height.

NE – BEAR ★★★★

Overall, BEAR's performance improved from good to excellent.

One ORI was raised in the year.

Throughout the grass cutting season, the OC generally had an excellent performance.

SE – Amey ★★★★

Overall performance improved from good to excellent.

Grass cutting was completed to specification and on programme throughout the season resulting in only a few minor issues.

One ORI was issued by PAG during the reporting period.

FB – Amey ★★★★

Amey's performance remained excellent.

All visual inspections throughout the year found that grass heights met with contractual requirements.

Weed control

NW – BEAR ★★★★

BEAR's performance improved from good to excellent.

Weed treatment operations were carried out to the agreed programme. Three ORIs were raised by PAG in August but generally BEAR maintained an excellent standard in weed control.

SW – Scotland TranServ ★★★☆

Scotland TranServ's performance remained good.

Weed control operations were carried out to the agreed programme.

15 ORIs were issued by PAG during the reporting period. Defects raised by the OCs were consistently lower than the number of ORIs raised.

NE – BEAR ★★★☆

Overall performance remained good.

Weed growth observed in the central reserves of the A96 Aberdeen were monitored for dieback.

Five ORIs were raised within the period.

SE – Amey ★★★☆

Amey maintained a good performance.

Four ORIs were opened due to invasive species at the M8. Seven ORIs were raised in total throughout the period.

FB – Amey ★★★★

Amey demonstrated an excellent performance in weed control overall. One ORI was raised for invasive species.

Soft landscaping

NW – BEAR ★★★☆

Overall, BEAR's performance increased from poor to good.

A total of 43 ORIs were issued concerning soft landscaping, a significant number relate to vegetation obscuring regulatory and warning signs.

SW – Scotland TranServ ★★★☆

Scotland TranServ's performance remained good.

41 ORIs were raised in the reporting period, a number of which related to obscuration of regulatory and mandatory signs. 140 defects were raised between August and October by the OC.

NE – BEAR ★★★☆

Overall performance remained good.

14 ORIs were open during the reporting period, a number of which related to obscured signs on the A95 and A96.

SE – Amey ★★★☆

Amey maintained a good performance.

Amey generally achieved an excellent performance in the early months of the year, but this reduced to fair in July. 20 ORIs were raised throughout the period.

FB – Amey ★★★★

No major issues were noted throughout the year relating to soft landscaping activities.

Litter picking

Responsibility for litter picking on the trunk road network excluding motorways and special roads rests with the local authorities.

Each OC is required to issue its grass cutting programme to relevant local authorities. This is intended to ensure an integrated approach to cutting grass and litter picking. If litter is not removed prior to grass being cut, it is shredded by grass cutting equipment. Shredding of litter makes removing it more difficult.

If a local authority is deficient in its litter picking duties, the OCs are responsible for contacting the local authority to highlight their concerns.

Delivery of service

In April 2013, Transport Scotland established a protocol which set out the process the OCs should follow for sweeping carriageway channels where local authorities had failed to undertake their responsibilities. This entails the OC identifying any local authority failings to Transport Scotland who may then order the OC to undertake such work in place of the local authority.

Sweeping, cleansing and litter

NW – BEAR ★★★☆

Overall BEAR's performance increased from fair to good.

A total of 2 ORIs were raised for sweeping, cleansing and litter operations.

A Hazard Notice was raised in July due to a long area of detritus across the westbound lane of the A85 following an HGV over-run.

SW – Scotland TranServ ★★★☆

Overall, Scotland TranServ's performance improved from fair to good.

PAG raised 20 ORIs throughout the year relating to graffiti and litter on routes where the Scotland TranServ have responsibility. Initially, Scotland TranServ were recording litter incorrectly, however this was rectified following PAG intervention.

NE – BEAR ★★★☆

Overall performance remained good.

Six ORIs were raised throughout the year.

PAG observed litter picking on the M90 and A96 East of Elgin. Accumulations of litter were observed on the A90 North of Dundee in the May-June reporting period and subsequently reported to the local authority for action.

SE – Amey ★★★★

Amey's performance improved from fair to excellent.

No ORIs were raised until the period of September and October, when 3 were raised, with litter noted on some route tours by PAG.

FB – Amey ★★★★

Amey maintained an excellent performance throughout the year.

PAG observed Amey taking advantage of road closures set up for re-surfacing operation to carry out cleansing operations.

Drainage, gullies and ironworks

NW – BEAR ★☆☆☆

Overall, BEAR's performance remained poor.

The number of ORIs being raised in the monthly period remained consistent at around 11 - 16 being raised per month. These were for issues such as heavily silted gullies, blocked gullies and dislodged catchpit covers. 56 ORIs were raised in total throughout the year.

Hazard Notices were raised in May, August and October for issues such as a collapsed BT manhole cover and one grating which had fallen into gully pots.

Figure 3.01 – Collapsed BT Manhole A82 Achnahannet

BEAR raised 160 defects in September, closing 60 and 177 in October, closing 46. Performance in closing defects has room for improvement.

Delivery of service

SW – Scotland TranServ ★★☆☆

Scotland TranServ's performance increased from poor to fair.

71 ORIs were raised by PAG throughout the year.

There were issues early throughout the year with blocked gullies and dislodged manhole covers. Two Hazard Notices were raised in July, both of which related to occurrences of flooding on the M8.

Figure 3.02 – flooding on the M8

NE – BEAR ★★☆☆

Overall performance improved from poor to fair.

Two Hazard Notices were issued in March and one in June for an upended gully, a dislodged gully grating and a missing gully cover.

A number of ORIs were raised throughout the period. These were dealt with in a more timely manner than the previous year with the exception of August, where 10 ORIs were raised, nine of which remained open at the end of the reporting period.

SE – Amey ★★☆☆

Overall, Amey maintained a fair performance.

Four Hazard Notices were raised in July and closed in the same period. 16 ORIs were raised throughout the year.

PAG observed issues with block gullies during September and October.

Case Study provided by Amey SE:
A720 Dreghorn – Drainage Improvement

During the winter of 2017 Amey undertook a complex drainage scheme on the Edinburgh City Bypass at Dreghorn junction. The scheme was promoted due to a long history of flooding on the mainline westward carriageway during heavy and prolonged rainfall and was ranked as the number 1 risk through the Disruption Risk Management Plan.

Upon intrusive and visual inspections by Amey, it was found the main source of outfall at this area resulted in a series of drainage pipes meeting at a solitary point which could not cope with existing surcharge volumes. The inclusion of a 40m length x 2.5m width x 4m depth filtration trench within the system also created a significant blockage to the free flow of water especially in extreme conditions.

Investigation also discovered catch-pits within the existing drainage system did not contain adequate sumps, resulting in debris being trapped in chambers and within the filtration trench on a frequent basis that exacerbated the problem.

Amey identified an innovative design to remove the existing filtration trench consisting of a sustainable solution of installing Polystorm modular cells containing an integrated inlet and outlet as well as access points for maintenance cleansing should that be required in the future. The cells used were manufactured from over 90% recycled materials and provided a compressive strength of 61 tonnes/m2.

In addition to cell installation, concrete catch-pits with improved maintenance sumps were constructed along with filter media, geotextile membrane and the insertion of further positive drainage. SEPA were consulted before development and afterwards and approved the solution. To date, there have been no occurrences of flooding during heavy precipitation proving the solution has benefitted the reliability of journey delay times in this particularly traffic sensitive route.

Delivery of service

FB – Amey ★★★★

Amey's performance in the year remained excellent.

Only one ORI was raised in June 2017 for a damaged gully cover on the M90.

Signing, signals, road markings and studs

NW – BEAR ★★☆☆

Overall, BEAR's performance increased from poor to fair.

88 ORIs were raised throughout the reporting period for issues including damaged, obscured and missing signs, badly worn road markings and missing road studs.

SW – Scotland TranServ ★★★☆

Overall, Scotland TranServ's performance increased from poor to good.

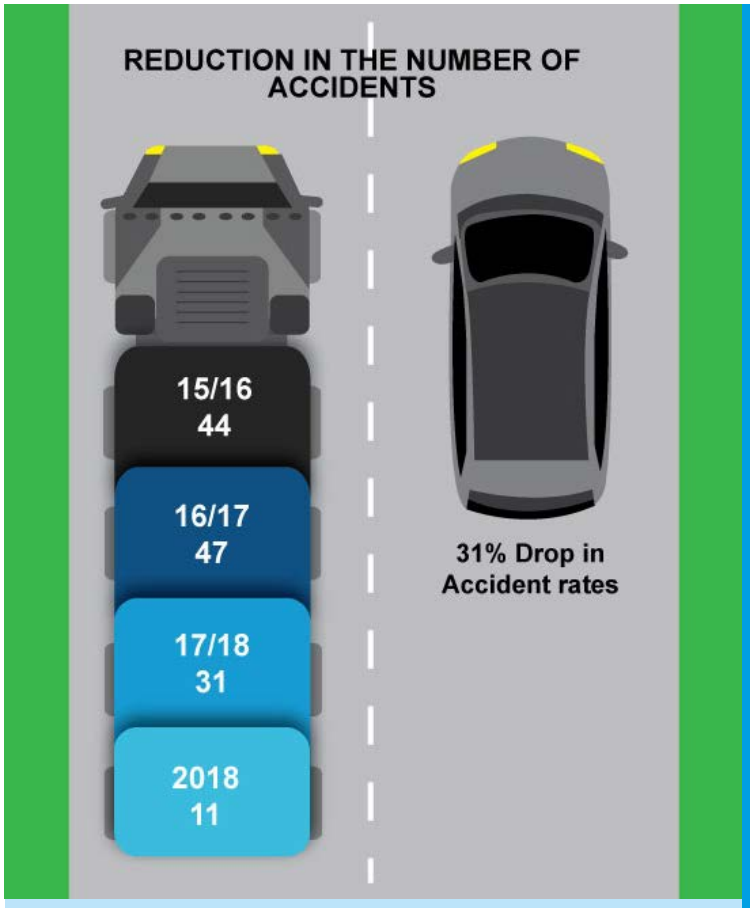
38 ORIs were raised throughout the reporting period. Many of these were due to obscured or damaged signs on the A77.

Case Study provided by Scotland TranServ SW:
A75 Vehicle Activated Signage

Scotland TranServ's innovative Vehicle Activated Signage solution is helping to reduce injuries and saving lives on the busy A75. Working in unison with Transport Scotland, our Road Safety team identified an alarming trend in Killed and Serious Injured (KSI) accident stats.

The A75 was identified to have a KSI accident rate 1.5 times higher (21%) than the trunk road average for SW Scotland (14%). On further investigation prevalence for accidents involving HGVs was identified. The route is the main link for inbound freight from Ireland into Scotland and Northern England and subsequently has higher than average heavy goods traffic.

Evidence suggests that HGV related accidents on the A75 are six times the national average for this road-type.

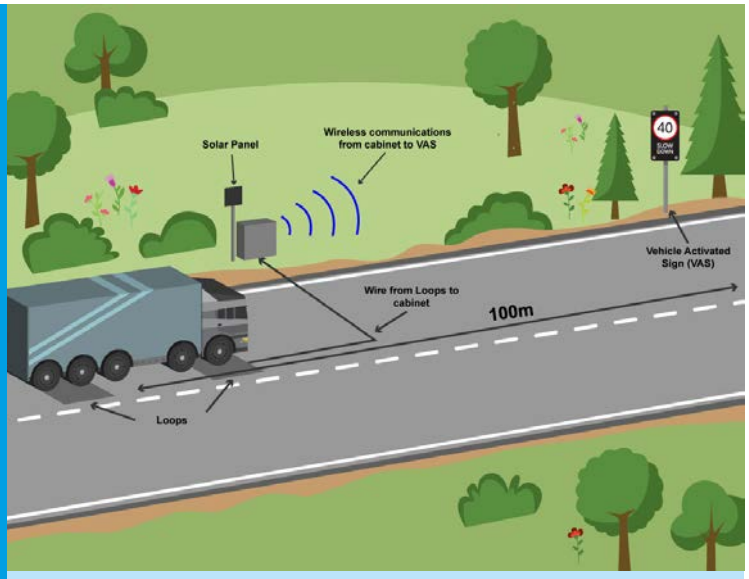


While this analysis indicates HGVs are over-represented, it was necessary to analyse a decade of data to most clearly identify contributing factors. From the 2006-2015 study it was identified that in over half of accidents involving an HGV, the HGV was found to be blameworthy, with final 2015 stats showing the HGV was the blameworthy vehicle in 7 out of 10 accidents.

Using data from STATS 19 on Transport Scotland's IRIS programme, Scotland TranServ's Strategic Road Safety Team identified HGV speed as the predominant accident causation factor.

A bespoke solution traffic classifier device was developed, identifying relevant class of vehicles by axle length, evolving the Vehicle Activated Sign (VAS). The system receives information via inductive traffic loops sunken into the carriageway approximately 100m from VAS on both approaches.

Delivery of service



Accidents are down. Since installation, the VAS solution is delivering an impact on speed reduction and accident rates. Against findings of the previous two years it showed a marked decline in accidents, from 32 prior to installation in 2015 to 22 post-implementation. That marks a 31% drop in HGV accident rates since the implementation of our Vehicle Activated Signage solution.

There has been a marked reduction in HGV speeds on the A75, with an overall drop of 5%. A further positive from the implementation of the VAS system is the reduction of 'All Vehicle' average speeds of 6.3mph, a 12.5% reduction.

NE – BEAR ★★☆☆

Performance remained fair.

33 ORIs were raised over the course of the reporting period.

A Hazard Notice was raised in March for a void left unfilled when a sign post was removed on the southbound verge of the A9 near the River Earn Bridge.

SE – Amey ★★☆☆

Amey's performance remained fair.

13 ORIs were issued in the period between August and October, 9 of which were closed out in the period with four remaining open. 42 ORIs were raised in total throughout the reporting period.

FB - Amey ★★★★

Amey maintained an excellent performance.

No major issues were noted throughout the year.

Structures

Maintenance of Structures

OCs are required to carry out cyclic maintenance to structures. These activities include clearing vegetation, cleaning movement joints and construction gaps, checking and cleaning bearings and bearing shelves, checking parapets and their mesh infills and connections to safety fences. Cyclic maintenance of structures is required to be carried out twice each year as a minimum.

NW – BEAR

PAG carried out site inspections at a sample of structures where BEAR had recorded work as complete and noted that debris had built up, and silt was blocking channels, partially restricting the flow of water. An inspection report was prepared and BEAR agreed to address the issues, but no photographic evidence was provided within the period to confirm this.

SW – Scotland TranServ

PAG carried out inspections at a number of structures at which Scotland TranServ had recorded work as complete. PAG noted detritus at expansion joints, bearing shelves and drainage channels. Vegetation had not been cut back at most of the sites visited.

PAG provided an inspection report in July which highlighted that work had not been completed in accordance with the 4G contract, which resulted in a financial deduction. PAG reconfirmed the requirements of the 4G contract to the OC.

NE – BEAR

PAG carried out inspections at a number of structures at which BEAR had recorded work as complete. PAG noted detritus at expansion joints, bearing shelves and drainage channels. Some joints were corroded and three of four safety barriers to parapet transition connections had failed at M90, between junctions 4 and 5.

The level of vegetation clearance completed varied from structure to structure with most inspected requiring further subsequent work by BEAR.

PAG provided an inspection report in June which highlighted that work had not been completed at various sites. BEAR provided a response in July with photographic evidence stating this had subsequently been addressed.

SE – Amey

PAG recorded in May that Amey did not carry out all cyclic work to a high quality, with bearing shelves and drainage channels covered in silt and rail joints full of debris.

However, this was improved upon in the subsequent reporting period.

FB – Amey

PAG carried out site inspections at a sample of structures which Amey had recorded as complete in both June and July 2017.

Both inspections confirmed that the cyclic maintenance work was generally completed to a good standard, with only a small number of minor issues noted.

3.2 Reactive maintenance

Lighting

Lighting in general is measured via MI 01, Well lit network, which measures the percentage of lighting points remaining lit across the network.

NW – BEAR ★★★★

BEAR performance has improved from fair to excellent.

Two ORIs were raised in the reporting period.

SW – Scotland TranServ ★★★★

Overall, Scotland TranServ's performance improved from poor to excellent.

However, during the month of August, PAG carried out a night inspection of the M8 and 34 ORIs were raised as a result. 44 ORIs were raised in total over the annual period.

Case Study provided by Scotland TranServ SW:
M8 High mast LED Replacement Programme

On commencing the contract in 2013, Scotland TranServ began an audit of structures across the South West Scotland network. An extensive review of these assets concluded in the findings of a 2015 report identifying 47% of M8 high masts were reaching the end of their maintainable life, with many units over 50 years old.

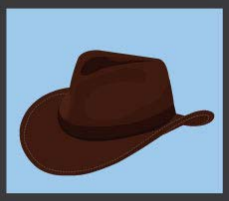
It was important to Scotland TranServ to deliver long-term change in lighting our motorways, delivering an energy-efficient corridor that will benefit the long-term environment, improve safety and deliver extensive cost benefits.

Scotland TranServ has so far replaced more than 1,800 lanterns on the M8. A further 700 are due for completion in the year ahead. To date this is delivering an annual energy saving of around 2,349,010(kWh). Based on an annual average household energy usage that's enough of a saving to power approximately 500 homes.

Delivery of service

Once completed this will deliver an annual saving of 2,349,010kwh, enough to power...

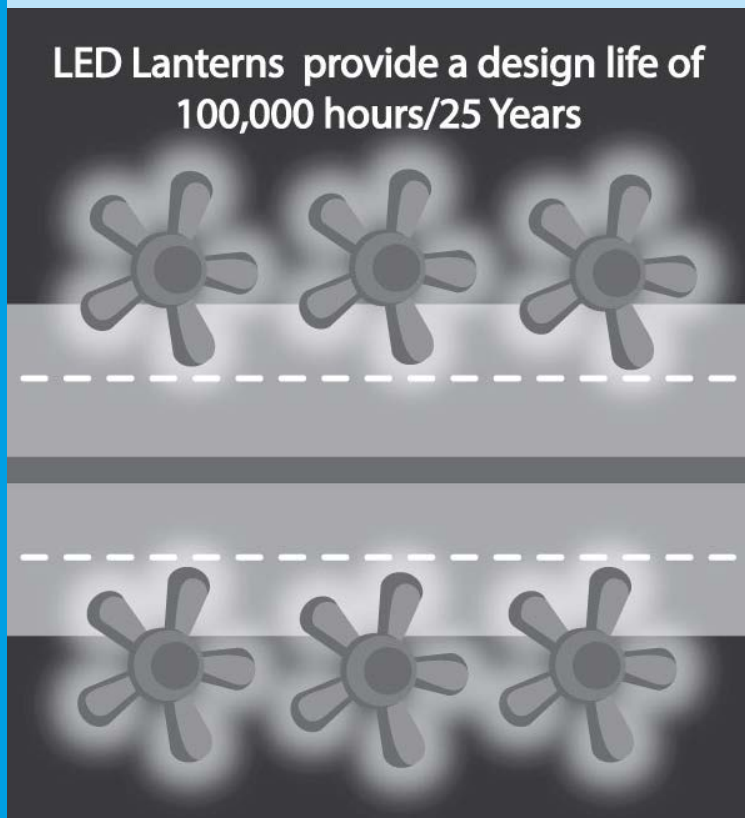
For 1 year, California (near Falkirk)



For 6 years, Dallas (Morayshire)

For 10 years, Moscow (Ayrshire)

In replacing 61 ageing high mast towers with new units, our contractors have recycled around 64 tonnes of steel. While the LED lanterns are perceptibly brighter, a further benefit is the reduction in light pollution, with a more downward directional illumination from the LED units, compared to the off-light from the HPS lanterns leading to 'sky glow'.



There is a significant reduction in maintenance burden, and when coupled with the energy saving in costs, this is understood to be around £25 million over the lifetime of the lanterns. Reduced maintenance also means improved health and safety, with engineers requiring fewer visits onto the busy motorway to replace or repair lanterns. This is also less of a burden for motorists with fewer traffic management occasions required.

Accident statistics are also encouraging with 23 'Dark' accidents in 2016 falling 26% to 17 in 2017. Scotland TranServ will carry out a longer term study to establish more concrete trends.

With the implementation of a further innovation in a Central Management System attached to MORLICS artificial intelligence control, TranServ predicts additional long-term savings could dramatically increase from around 60% to over 70% further to implementation.

NE – BEAR ★★★☆

BEAR's performance remained good.

An ORI was raised in May for a section of lighting points which were lit during daylight hours. This was closed in the same reporting period. Three ORIs were raised in total throughout the annual period.

SE – Amey ★★★★

Amey's performance improved from good to excellent.

Only one ORI was issued during the period.

FB – Amey ★★★★

Amey's performance continued to be excellent.

Vehicle restraint systems, barriers and fencing

NW – BEAR ★★★☆

Overall, BEAR's performance increased from fair to good.

Despite this there were issues; 3 sections of vehicle restraint system (VRS) were observed with overdue Category 1 defect repairs. Overdue repairs were also observed on VRS systems which had been noted on IRIS as having been permanently repaired.

11 ORIs were raised in total throughout the period.

SW – Scotland TranServ ★★★☆

Overall, Scotland TranServ's performance improved from fair to good.

A number of VRS defects resulting from vehicle strikes were observed in March / April and recorded in the IRIS system.

19 ORIs were raised throughout the reporting period.

NE – BEAR ★★★☆

BEAR's performance improved from fair to good.

Installation of a new VRS on the A96 west of Keith was observed by PAG in the reporting period of March-April.

VRS improvement works were also observed by PAG on the A90 Forfar to Brechin in the May-June reporting period.

Six ORIs were raised by PAG throughout the reporting period.

Case Study provided by BEAR NE:
A90 Forfar to Brechin Vehicle Restraint System Upgrades

A roadside safety study covering the A90 trunk road between Dundee and Aberdeen was undertaken during financial year 2015/16. This assessment analysed data from injury collisions involving vehicles striking roadside features with the objective of identifying areas that would see safety benefits from restraint system improvements.

A section of trunk road between Forfar and Brechin was identified where 15 collisions involving VRS strikes (six serious and nine slight in injury severity). This equated to an accident rate of 1 collision / km and a severity ratio of 40%. Further analysis of the data also revealed that all the collisions involved vehicles striking the central reserve safety barrier.

An inspection of the VRS within this area found that it was in generally good condition and appropriately positioned. An issue with the high number of ramped terminal ends however was identified. To reduce the risk these terminals pose to errant vehicles it was considered appropriate to replace these with full height terminals.

A four-phase replacement programme was put in place which saw 57no. ramped terminals replaced. Terminals were located near at-grade junctions in the central reservation between Quilko Junction (Forfar) and St Ann's Junction (Brechin). Budgets dictated that this replacement programme spanned multiple financial years.

The design identified the use of a Quest CEN 110 system as an approach terminal. This system was preferred to the traditional double-sided Trend terminals as a disadvantage of the Trend system is that it "coils" upon impact, rendering the terminal obsolete post collision. The Quest system, as proven by increased testing in accordance with BS EN 1317-3, is a more effective system in withstanding impacts and depending on the severity of a collision, individual parts can be replaced providing improved maintenance benefits.

The development and implementation of this road safety package has provided a cost-effective outcome to collision severity reduction in the area. The number of ramped P1 terminals located near at-grade junctions has been reduced along the route resulting in a safer environment to the travelling public.

SE – Amey ★★★★

Amey's performance increased from poor to excellent.

PAG observed some issues in October 2017 and raised two ORIs.

Seven ORIs were raised throughout the reporting period.

Case Study provided by AMEY SE:
Vehicle Restraint Systems re-galvanising.

Amey began to scope out the practicality and potential cost savings with re-galvanizing VRS's in 2017. Re-galvanization is the process of re-applying a protective zinc coating to steel, to prevent rusting.

The re-galvanizing proposal by Amey included research by Strathclyde University and the Advanced Forming and Research Centre (Inchinnan) to demonstrate that the process does not compromise the mechanical integrity of the steel.

During September 2017, a trial was conducted of re-galvanizing older VRS beams currently located on the network. The trial was successful in proving that re-galvanizing is a cost beneficial option. This innovative method of reusing steel positively demonstrated financial savings, circular economy benefits, and efficient resource management without comprising on the safety and structure of the VRS. This trial allows Transport Scotland (as well as Amey and the wider industry) to significantly contribute to the Scottish Government's declared objectives of reducing carbon reliance.

The trial successfully demonstrated that there are no significant issues in replacing re-galvanized VRS components compared to removal and disposal of old and replacement with new and even provides an opportunity to install in accordance with current guidelines.

Amey are continuing further investigations into technical performance of VRS components and are taking the next steps to using this technology further on the network, delivering cost savings, being efficient with resources without comprising on safety.

FB – Amey ★★★☆

Amey's performance continued to be good.

An ORI was raised in the May-June reporting period for a damaged bridge parapet on the M90.

One ORI was raised throughout the reporting period.

3.2.1 Category 1 defects

Category 1 defects

Category 1 defects are the most serious defects, generally safety related which, once identified by the OC, should be made safe within 24 hours or quicker for certain defects, and permanently repaired within 28 days. Details of all Category 1 defects are recorded in RMMf along with details and dates of all temporary and permanent repairs.

Damaged bridge parapets identified as Category 1 defects are made safe using temporary safety barriers. However, these repairs can take longer due to the need to obtain or fabricate parts and use sector scheme trained and registered contractors. The contract permits 56 days.

Unit	2016/17	2017/18
NW	97%	94%
SW	92%	91%
NE	94%	92%
SE	95%	95%
FB	98%	97%

Figure 3-03 – OC performance in repairing Category 1 defects

NW – BEAR ★★☆☆

Overall performance by BEAR reduced from good to fair, achieving an average figure of 94%.

The number of Category 1 defects in the unrepaired backlog increased significantly from the start of the period at 26 in March to 165 in October.

Hazard Notices were raised in relation to deep potholes and failed reinstatement of a footway.

Case Study provided by BEAR NW:
A83 Emergency Resurfacing

Winter 17/18 was particularly harsh in the North West, with a greater number of freeze thaw events than any other year since the beginning of the contract. The frequency of these events led to significant carriageway failures across the unit, most notably on the A83.

Transport Scotland's additional investment of £1.9m alongside a re-prioritisation of funds from other work codes allowed a £4m programme of urgent repairs to progress across the unit with the A83 urgent repairs totalling an estimated £650k. The schemes were designed using an accelerated Statement of Intent process to allow BEAR to affect the repairs as soon as possible.

Consultation: In advance of the first scheme commencing on site a web page was launched where the proposed programme of repairs was uploaded. A83 stakeholders were then issued a consultation letter advising that daily updates would be uploaded to this web page.

Throughout construction, both Twitter and the BEAR website were updated daily providing vital information to keep the travelling public up to date with the ongoing repairs.

Delivery: Prior to construction it was agreed that some sections of carriageway would benefit from advanced milling to allow traffic to run on a smoother temporary surface until resurfacing operations could take place.

Delivery of service

Following discussions with surfacing contractor, the programme for repairs commenced to address the most urgent locations on the route. Works were carried out between 7am and 7pm each working day, mainly under convoy traffic management, however, due to restricted road widths at certain locations some periods of 'STOP/STOP' working was required.

Work on thirteen sites was completed before the end of the financial year with the remaining sites completed by the end of April.

Final spend on the A83 emergency works was in excess of £1m.

Surfacing repairs to a significant number of sites was carried out in a relatively short period of time providing a safer and smoother road surface for the travelling public.

SW – Scotland TranServ ★★☆☆

Overall, performance remained fair, achieving an average PI of 91%.

The year began with 334 defects in the unrepaired Category 1 backlog. Scotland TranServ worked to reduce the number of road marking defects, which represented the main cause of the backlog. This resulted in the backlog defects numbers reducing to 167 by October.

Figure 3.04 – Pothole on the M8

NE – BEAR ★★☆☆

Overall performance by BEAR remained fair achieving an average figure of 92% (see Figure 3-03).

The number of defects in the unrepaired backlog increased from 21 in April to 71 in October.

SE – Amey ★★★☆

Overall, performance improved from fair to good, achieving an average PI of 95%.

Defects in the backlog have remained at a consistent level throughout the year, from 23 in March to around 28 in October.

FB – Amey ★★★☆

Amey's performance remained good.

The number of defects in the backlog remained at a similar low level throughout the year, from 5 in April to 6 at the end of October.

3.2.2 Incident response

Incident response

The OCs must provide resources to deal with incidents on the network or to assist the emergency services.

Incidents include:

- Debris removal
- Overturned lorries
- Road traffic accidents/breakdowns
- Landslips
- Flooding
- Serious carriageway defects
- Bridge/gantry strikes
- Spillages
- Severe weather.

The OCs are required to respond to incidents as quickly as possible and within specific timescales depending on the type of road.

Trunk road incident support service (TRISS)

TRISS operates on trunk road network routes where the potential for major delays due to breakdowns or other incidents have been identified.

The overall aims of TRISS are to:

- Clear up incidents quickly
- Offer assistance to broken down vehicles
- Reduce congestion
- Free up police time.

TRISS vehicles are specially adapted and equipped high-roofed vans. They are operated by trained staff working for the OCs. The target time for TRISS to get to an incident is 20 minutes.

Incident response

In addition to TRISS, each OC is responsible for responding to incidents across the entire Unit. Specific contractual timescales are set for the OCs to respond, and a monthly PI is used to measure whether response times are achieved. This PI figure ignores incidents recorded against sections requiring TRISS attendance occurring within the periods which require TRISS response times. Figure 3-05 shows each OCs performance in dealing with incidents.

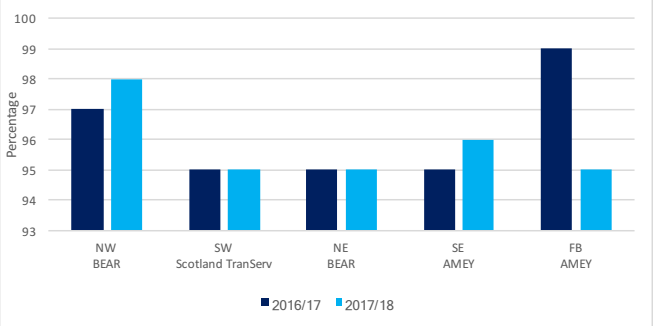


Figure 3-05 – OC performance in dealing with incidents

NW – BEAR ★★★☆

Overall performance was good with the PI figure increasing from 97% to 98%.

7 ORIs were raised during July, most of which were closed within the same reporting period.

SW – Scotland TranServ ★☆☆☆

Scotland TranServ performance was poor with a Remedial Notice issued in November 2017.

Overall Scotland Transerv maintained as PI figure of 95%.

NE – BEAR ★★☆☆

BEAR's performance was fair due to a Notice of Non-Conformance raised in April 2017 for having no reference in its Incident Response Plan relating to boundaries with the Aberdeen Western Peripheral Route. This was promptly closed in June 2017.

Across the year a PI figure was achieved of 95%.

SE – Amey ★★★☆

Amey's performance remained at good, an increase was noted in the reported PI figures from 95% to 96%.

FB – Amey ★★★☆

Amey's performance remained at good, however deteriorated in the year from 99% to 95%.

Hazard Notices

Hazardous situations identified by PAG are immediately raised with OCs and later followed by a formal Hazard Notice, regardless of whether these are the responsibility of OCs or third parties.

It should be noted that Hazard Notices do not always indicate a failure of delivery by an Operating Company. For example, some hazards observed by PAG, such as collapsed manhole/gully ironwork or debris on the carriageway, may have occurred between scheduled Operating Company safety inspections.

Hazardous situations which can occur on the network can include:

- Poor traffic management
- Faulty traffic signals
- Exposed electrical wiring
- Missing/broken ironwork and gullies (within trunk road boundary)
- Dangerous carriageway defects (potholes)
- Debris on the carriageway.

A total of 21 Hazard Notices were issued by PAG during 2017/18 (see Figure 3-06).

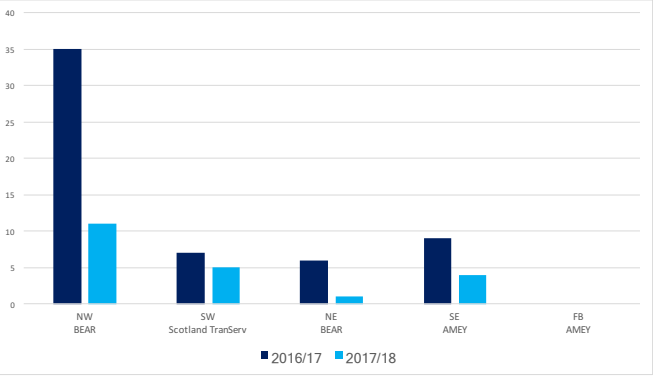


Figure 3-06 – Number of Hazard Notices issued

3.3 Planned maintenance

Planned maintenance

Work flowing from inspections together with other priority remedial works already identified feed into the one and three year programmes of planned maintenance needs, which are updated annually.
This maintenance work is programmed based on the budgets available to each OC.

Planned maintenance schemes are vital to maintain assets in good serviceable condition and require careful planning, prioritisation and coordination.

Planned maintenance is carried out to maintain the asset value of the network.

These operations are generally for schemes with a value up to £350k. Schemes of greater value are considered for procurement by works contracts (see section 3.4).

Maintaining roads

This typically includes:

- Reconstruction and resurfacing of carriageways
- Application of surface dressing and anti-skid surfacing
- Upgrading safety fencing
- Replacing road markings and studs.

Maintaining Structures

This typically includes:

- Parapet and barrier upgrades
- Waterproofing
- Concrete repairs
- Joint replacement

NW – BEAR

The main works undertaken included carriageway resurfacing, patch repairs, footpath repairs, drainage improvement, kerbing and gully renewal.

Structures work included bridge and parapet barrier upgrades at the A82 Ballachulish and bridge replacement at A830 Criche.

Site inspections by PAG observed supervision, workmanship and record keeping were satisfactory.

Case Study provided by BEAR NW:
A9 1360 Cromarty Bridge Phase 2 Refurbishment

Principal and Special Inspections carried out on the structure since 2001 have identified several defects including; chloride ingress, resulting in steel reinforcement corrosion, crosshead beams and piers resulting in cracking and spalling of concrete in these areas.

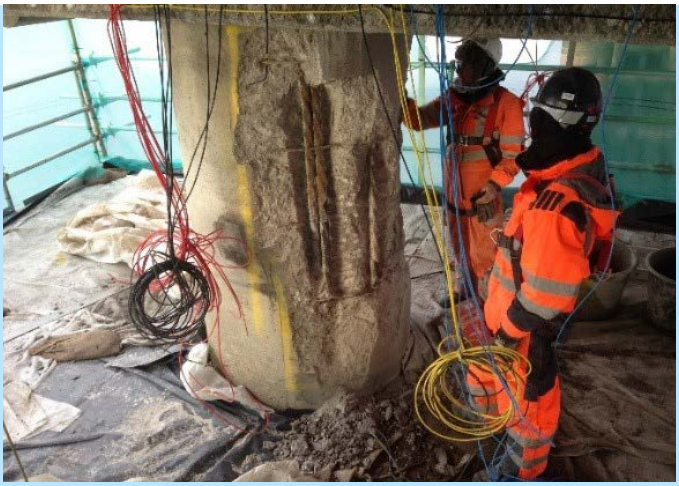
Alkali Silica Reaction causing map cracking in the precast stringer beams supporting the deck.

Surfacing and joint defects which were determined to be age related with the possibility of the failure of deck waterproofing in some areas.

Following a Phase 1 refurbishment of spans 1 to 4 of the structure in 2010/2011, which identified a number of issues it was recommended that a further trial was carried out to refine the strategy to refurbish all 67 spans of the structure.

The Phase 2 refurbishment was carried out on spans 5, 6 and 7 of the structure included:

- Stitching of the concrete deck at Piers 5 and 6.
- Full deck refurbishment of spans 5, 6 & 7, including concrete repairs, waterproofing and surfacing.
- Bearings were replaced on Piers 5 to 7 as were the expansion joints at pier 7.
- Concrete repairs were carried out on the crosshead beams, diaphragm and piers.
- An impressed current cathodic protection system was installed to provide protection to the reinforced concrete elements of the structure including deck, crosshead beam diaphragm and piers.



Concrete being prepped for repair

Deck joint following hydro-dem

- Access, which had been one of the main issues under Phase 1, was provided by a bespoke platform which was suspended on winches around the piers. This allowed lowering and raising to adjust the work front above the tide levels.
- It has been agreed that the future strategy should look to minimise traffic management and associated disruption. This may involve concentrating on areas above piers for deck refurbishment, with possible jack up barges being used below deck, for welfare and access.

SW – Scotland TranServ

Works undertaken included carriageway surfacing, Category 1 defects repairs, lining renewals and pedestrian guard rail replacement.

Structures work included bridge deck waterproofing at A78 Warrix Interchange.

Site inspections by PAG observed supervision, workmanship and record keeping was satisfactory.

Figure 3.07 – Carriageway surfacing operation at Inverkip on A78

NE – BEAR

Works undertaken include resurfacing, water layby improvements, expansion joint replacement, patch repairs and junction sign replacement.

Structures work included expansion joint replacement at M90 Necessity Brae bridge and resurfacing at the M90 Junction 8 slip northbound bridge.

Figure 3.08 – M90 Necessity Brae joint replacement

Site inspections by PAG observed supervision, workmanship and record keeping was generally satisfactory. A good standard of on-site safety was also observed by PAG during site visits.

Case Study provided by BEAR NE
A95 80F Cromdale Footbridge Replacement

The existing A95 Cromdale Footbridge was built in 1970 and provided a continuous footway link over the Burn of Cromdale, a tributary of the River Spey.

The footbridge was located to the east of the masonry arch road bridge at a low level from the south approach. At the north end of the footbridge there was steep and narrow elbowed ramp to reconnect to the footway at road level.

Coupled with the severe deterioration of the old footbridge a scheme was developed to provide a new DDA compliant crossing.

A new embankment was built on the south approach to provide a higher bridge crossing level with the bridge set on a gentle gradient The new abutments are now set clear of the water course and flood levels.

Delivery of service

The installation of the prefabricated footbridge was undertaken overnight under full closure of the A95. This ensured minimum disruption to the public with diversions.

The design undertook to provide an aesthetically pleasing structure, and remove all obstructions to meet current Standards and provide accessibility for all. The newly installed footbridge is a prefabricated 18m single span structure with timber parapets and deck on steel beams.

The new structure and approach footpaths now provide a safe route for all non-motorised users through the village of Cromdale.

SE – Amey

Works undertaken included carriageway resurfacing, footpath repairs, kerbing and gully renewal, Category 1 defects repairs and drainage improvements.

Structures work included bridge surfacing and bridge joint replacement at the A7 260 Ettickfoot Bridge and waterproofing at the A985 Kincardine Bridge.

Site inspections by PAG observed supervision, workmanship and record keeping was satisfactory. A good standard of on-site safety was also observed by PAG during site visits.

Figure 3.09 - A985 Kincardine Bridge waterproofing

FB – Amey

Works undertaken included carriageway resurfacing and concrete repairs. PAG observed that the works area was kept tidy with all materials and waste stockpiled away from the direct works area. PAG also observed that Amey employed two squads for the works which increased productivity.

PAG observed structural maintenance works which were of a good standard of workmanship and safety. At one site, due to gantries being located in the work area, Amey's sub-contractor employed the use of banksmen to help direct and manoeuvre delivery wagons safely.

Chapter 4:

Quality of service

Key Points

Quality management

- All units were meeting contractual obligations operating under approved QM certification. Operating Companies were also working towards achieving either recertification or certification for the first time to the revised BS EN ISO 9001:2015 and BS EN ISO 14001:2015.
- The QMS performance of NW and NE remained excellent and SE improved to excellent. SW was noted as good and FB performance improved to good.

Health and safety management

- All units delivered a good performance in terms of Health and Safety.
- All OCs maintained accreditation to BS OHSAS 18001:2007.

Environmental management

- NE delivered excellent performance regarding its EMS, NW and SE delivered good performance and SW and FB delivered fair performance.
- Environmental audits of all OCs demonstrated a high level of compliance, however, two findings were raised in SW.

Continuous improvement

- The number of remedial notices raised in 2017/18 was reduced when compared to the number raised in 2016/17.
- The number of NNCs raised in 2017/18 was also reduced when compared to the number raised in 2016/17.

Quality of service

4.1 Management systems

OC Management systems

The OCs are required to maintain management systems that comply with:

- BS EN ISO 9001 – Quality management systems
- BS EN ISO 14001 – Environmental management systems
- BS OHSAS 18001 – Occupational health and safety systems

Management systems refer to a framework of processes and procedures used to ensure that an organisation can fulfil all tasks required to achieve its objectives (see Figure 4-01).

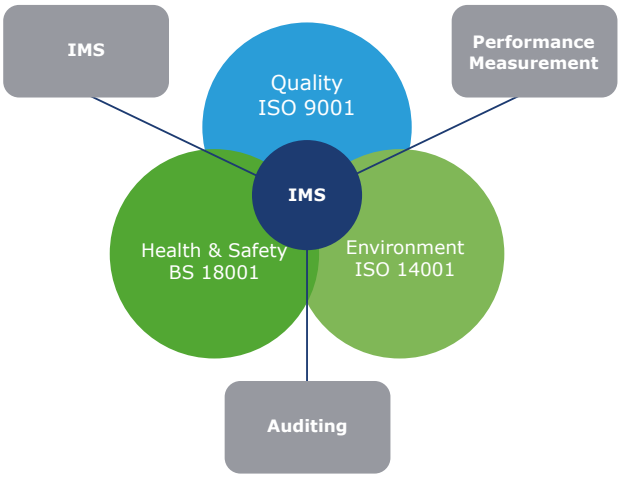


Figure 4-01 – Processes influencing an Integrated Management System (IMS)

Quality management – achieving and maintaining compliance

NW and NE achieved certification for BS EN ISO 9001:2015 in March 2018. SW, SE and FB are working towards completion of certification for BS EN ISO 9001:2015.

Quality management systems - processes

NW – BEAR & NE - BEAR

In 2015/16 an improvement plan was put forward by BEAR to address QMS process failures identified in NW and NE by PAG in NW and NE. In 2017/18 PAG conducted a second set of audits in both units that focussed on the improvement plan. PAG noted that BEAR made good progress in both units and that improvements could still be made in NW on the use of tablets and carrying out coring.

Quality management - rectifying non-compliance – (PAG and internal)

The OC performance in closing out non-conformance is measured by PI 15 for NW, SW, NE and SE and PI 17 for FB (see Figure 4-02).

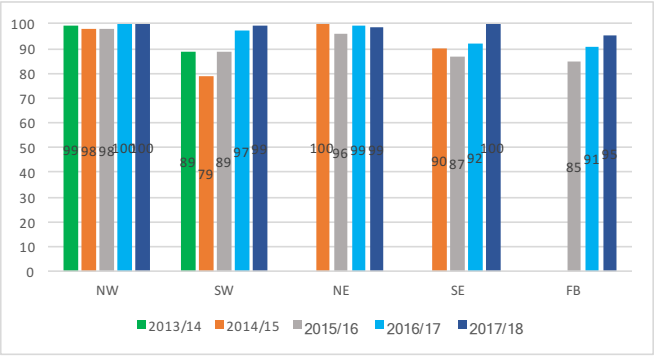


Figure 4-02 – PI 15/PI17: OC performance in closing out non-conformances

NW – BEAR

BEAR's achieved 100% performance for PI 15 closure of non-conformances within required timescales was 100% achieved.

PAG monitored the OCs internal audit programme for 2017/18; the programme was completed on time.

A PAG QMS audit focussed on performance indicators (PIs) and monitoring indicators (MIs) and found that in general, BEAR is complying with the methods of measurement for the PIs and MIs reviewed. A number of IRIS related issues affected the reporting of three PIs in particular and are being discussed with Transport Scotland.

SW – Scotland TranServ

Scotland TranServ's performance in closing non-conformances within required time-scales resulted in a figure of 99% for PI 15.

PAG monitored progress on the Scotland TranServ's internal audit programme. At the end of November 2017 it had fallen behind schedule, with nine audits completed of the 18 audits programmed to that date. By the end of March 2018 two audits were outstanding and carried forward into 2018/19.

A PAG QMS audit focussed on PIs. Scotland TranServ demonstrated documented evidence that trend analysis for PIs was collated and maintained with its monthly management reviews ensuring that actions were taken on PIs falling below threshold levels.

NE - BEAR

BEAR's performance in closing non-conformances within required time-scales resulted in 99% achieved for PI 15.

A PAG QMS audit on PIs demonstrated that BEAR is complying with the methods of measurement. Trend analysis for PIs was analysed and discussed at BEAR monthly management reviews and with senior managers. It was noted that BEAR takes action to rectify PIs where there are failures in meeting thresholds, including ad-hoc audits.

PAG monitored BEAR's 2017/18 internal audit programme which was completed satisfactorily at the end of March 2018. BEAR had programmed an additional six ad-hoc audits in response to issues identified internally, these audits focussed on cyclic maintenance gully cleaning, removal of dead animals, third party claims, Category 1 defect reporting, bridges (cyclic maintenance, IRIS, performance measurement) and abnormal load routeing.

SE - Amey

Amey's performance in closing non-conformances within required time-scales improved to excellent with an overall average of 100% achieved for PI 15. PAG monitored Amey's 2017-18 internal audit programme which was completed on time.

PAG carried out a QMS audit on performance indicators which demonstrated that Amey is adopting the methods of measurement detailed in the contract, carries out trend analysis at monthly OC PI review meetings and takes actions to rectify PIs where there are failures in meeting thresholds, including the consideration of raising internal non-conformances.

FB – Amey

Amey's performance in closing non-conformances within required timescales improved. Performance deteriorated at the start of the year but improved to achieve an overall PI 15 figure of 95%. During 2017/18 PAG monitored the OCs internal audit programme which was completed on time.

A PAG QMS audit on PIs verified that, in general, Amey is adopting the methods of measurement detailed in the Contract. Amey demonstrated that trend analysis for PIs is analysed at monthly PI review meetings and at Management Reviews. Action is being taken to rectify PIs where there are failures in meeting thresholds, including the consideration of raising internal non-conformances.

Health and safety management

Health and safety

OCs are required to report to the Health and Safety Executive (HSE) any incidents involving deaths and injuries, occupational diseases and dangerous occurrences under the legislation requirements of The Reporting of Injuries, Diseases and Dangerous Occurrences 2013 Regulations (RIDDOR).

Reported RIDDORs to the HSE are shown in Figure 4-03.

Unit	Number of RIDDORS 2016/17	Number of RIDDORS 2017/18
NW	1	0
SW	2	1
NE	2	0
SE	4	1
FB	0	0

Figure 4-03 – OC's RIDDOR performance

NW - BEAR

No RIDDORs were reported for the period April to October 2017.

SW - Scotland TranServ

One RIDDOR was reported to the HSE in April 2017 when a sub-contractor operative dropped a section of parapet railing. He caught his hand between the falling railing and the fixed railing already in place, causing fractures to his fingers with treatment in hospital.

NE - BEAR

No RIDDORs were reported for the period April to October 2017.

SE - Amey

There was 1 RIDDOR within this period on 15th June 2017. An IPV (crash cushion) was struck on the M8 by an errant vehicle when undertaking traffic management for gully works. The injured party was absent from work for greater than 7 consecutive days resulting in RIDDOR reportable.

FB – Amey

No RIDDORs were reported for the period April to October 2017.

Health and Safety / Construction Design Management (CDM) Audits

NW – BEAR

A health and safety site audit on A9 Ballinluig 'crack and seat' resurfacing scheme demonstrated that BEAR is committed to operating in a safe manner. There was evidence of risks being assessed, controls being put in place and these were being followed on site. The site operatives interviewed were aware of their health and safety responsibilities and the various hazards within the area. BEAR's management of health and safety provisions remains good.

A CDM audit at A9 Cromarty Bridge refurbishment Phase 2 scheme confirmed that BEAR was undertaking its CDM duties on site.

SW - Scotland TranServ

PAG undertook a health and safety audit at A8 Port Glasgow on an overnight patching and resurfacing scheme. The processes operating on-site were satisfactory and comprehensive.

CDM audits at A77 Kirkoswald LED upgrade scheme and A77 North of Cairnryan landslide action confirmed that the OC were complying with CDM regulations. One finding was raised at A77 Kirkoswald regarding documentation control. The audits established the necessary verification of Transport Scotland's CDM Client obligations.

NE - BEAR

A health and safety audit reviewed BEAR's health and safety documentation at its Inveralmond office which was to a good standard. A site visit to the M90 J6 concrete carriageway repair and surfacing scheme was undertaken as part of the audit. The health and safety processes operating were comprehensive.

A CDM audit included a visit to the A92 140 Station Road Bridge parapet replacement scheme and confirmed BEAR is undertaking its duties successfully on site with respect to its monitoring and verifying of the CDM regulation requirements. One finding was raised during the document review regarding the lack of completed health and safety files which had been uploaded to IRIS/SMS. BEAR was already addressing issues regarding document records through an open internal non-conformance.

SE – Amey

A health and safety audit was undertaken consisting of a review of Amey's health and safety documentation at its Bilston Glen office and a site visit to the A68 Pathhead gully patching scheme. The processes operating on site were good and Amey's management of health and safety arrangements including processes operating on site remains comprehensive.

The CDM audit included site visits to A7 Old Tweed Bridge restoration site and to M8 J3a Starlaw Road Bridge waterproofing scheme. The audit confirmed that Amey is undertaking its duties on site in line with CDM regulation requirements 2015. No non-conformances were raised, however at the Old Tweed Bridge site a number of issues were noted in relation to house-keeping and safe working practices.

FB – Amey

A health and safety audit reviewed the OCs relevant health and safety documentation at Amey's South Queensferry office and included a site visit to M90 litter picking operations. The OCs management of health and safety arrangements remains good. The health and safety processes operating for the M90 litter picking works were satisfactory, with some minor areas for improvement noted.

CDM audits included reviews of the OCs associated documentation at Amey's South Queensferry office and site visits to the Forth Road Bridge Truss End Link strengthening works and to the Suspended Span Under Deck Access scheme. The audits confirmed that Amey is undertaking its duties on site in line with CDM regulation requirements.

Environmental management

Environmental management systems (EMS)

A well-implemented and managed EMS demonstrates a commitment to improving environmental performance and protection. It should fulfil the requirements of wide-reaching environmental legislation, and meet stakeholders' expectations for sustainable development.

NW – BEAR

Overall BEAR's EMS requires some improvements in its implementation on site.

Two issues were identified on site during the PAG audit concerning mitigation measures which had not been implemented by the sub-contractor. Site vehicles and equipment were found to be on grassed verges and gullies had not been covered during the tack-coat application.

BEAR subsequently raised an internal non-conformance to address the issues relating to the management of its subcontractor.

SW – Scotland TranServ

Overall Scotland TranServ's EMS was operating effectively on site.

Two findings were identified during the PAG audit; the first concerned a lack of emergency response drills undertaken at Ayr depot and the second related to the Annual Sustainability report, which was not submitted to the required contractual timescale.

NE – BEAR

Overall BEAR's EMS was operating effectively. No issues were identified at the PAG audit.

SE – Amey

Overall Amey's EMS was operating effectively.

One issue was identified at the PAG audit in relation to a cement mixing area which was not sited 10 metres away from a watercourse.

At the time of audit, it was noted, that the Amey's environmental team were not carrying out the site inspection programme to ensure that mitigation measures identified through the Environmental Scoping Assessment (ESA) process were being successfully implemented.

FB – Amey

In general, Amey's environmental review process is well established with mitigation measures implemented on site.

The PAG audit of South Queensferry depot indicated that some improvement to the way the environmental aspects are managed is required including the management and storage of materials and waste.

At the time of audit, it was noted, that Amey's Environmental team were not carrying out the site inspection programme to ensure that mitigation measures identified through the Environmental Scoping Assessment (ESA) process were being successfully implemented.

PAG will continue to monitor this activity closely to establish how performance will be improved in 2018/19.

4.2 Continuous improvement Management Systems

Resolving problems and improving performance

Management systems are required to continually improve the effectiveness and efficiency of an organisation. This is achieved by identifying areas for improvement to the organisation's processes.

The OCs are, therefore, required to regularly monitor and verify their activities through testing, inspecting and auditing. They should then action where necessary to prevent use and recurrence where deficiencies are uncovered.

PAG monitors the OC's systems and uses an escalation process to ensure issues are resolved (see Figure 4-04).

Where an issue is escalated to either NNC or Remedial Notice the OC is required to manage the default in accordance with its QMS within the specific timescale.

The OCs should respond positively to these notices, rectify the immediate problems and improve their overall effectiveness.

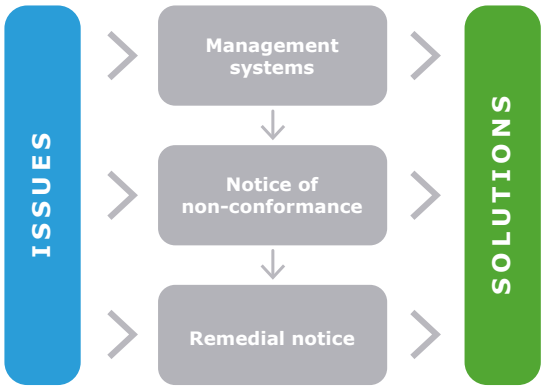


Figure 4-04 – Escalation process

OC performance

In total three Remedial Notices were issued by Transport Scotland, two in NW and one in SW between Apr 2017 and Oct 2017 (Figure 4-05). As a measure of improvement it is noted that a total of six were raised between Apr 2016 to Mar 2017.

A total of five NNCs were issued between April 2017 and October 2017 compared to six between Apr 2016 and Mar 2017 (Figure 4-06).

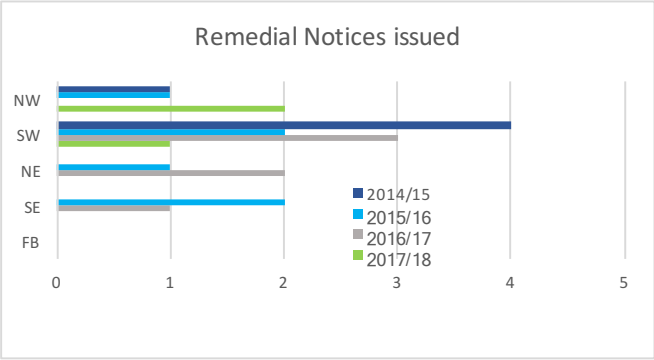


Figure 4-05 – Number of remedial notices issued

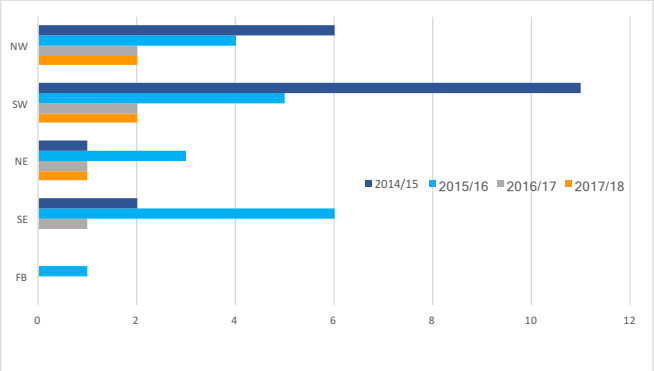


Figure 4-06 – Number of NNCs issued

Performance measurement

Performance measurement

The OC's performance in the management and maintenance of the network is measured by a set of 20 PIs in the West, 22 PIs in the East, 36 PIs in FB and 20 MIs in all units except for FB which has 22 MIs.

The performance measurement indicators agreed with the Scottish Ministers are calculated using standard methods of measurement developed by PAG.

Summary of performance measurement

PAG monitors all performance indicators throughout the year and works with the OCs to address any poor performance.

Transport Scotland and PAG set thresholds for the performance indicators, which are reviewed annually to help drive continuous improvement.

Descriptions of the PIs can be found in the contract. These are summarised in Figure 04-07 and are cross-referenced within this report where appropriate.

PI Number	Unit			PI Name
	NW/SW	NE/SE	FB	
	0	0	0	Overall Performance Indicator
	1	1	1	RIDDOR (Reporting of Injuries, Diseases and Dangerous Occurrences Regulations)
	2	2	2	Accident Frequency Rate
	3	3	3a	Repair of Category 1 Defects
			3b	Repair of Category 1 Defects Forth Road Bridge
	4	4	4	Incident Response
	5	5	5	Safety Inspections and Patrols
	6	6	6	Detailed Inspections
	7	7	7	Maintenance
	8	8	8	Structures Principal Inspections
	9	9	9	Structures General Inspections
			10	Forth Road Bridge Inspections
			11	Queensferry Crossing Inspections
	10	10	12a	Structures Maintenance
			12b	Structures Maintenance Forth Bridge
	11	11	13	Winter Service Treatments
	12	12	14	Actual Spend Against Profile
	13	13	15	Works Contracts Cost Estimates
	14	14	16	Works Contracts Out Turn Cost
	15	15	17	Closure of Non-Conformances
	16	16	18	Submission of Reports
	17	17	19	Planning Applications
	18	18	20	Communications Response
	19	19	21	Carbon Emissions
		20	22	Grassed Area
		21	23a	Recording Inventory Condition Rating
			23b	Recording Inventory Condition Rating Forth Bridge
			23c	Recording Inventory Condition Rating Queensferry Crossing

PI Number			24	Community Engagements and Community Benefits
			25	Queensferry Crossing Structural Health Monitoring System Report
			26	Queensferry Crossing Supervisory Control and Data Acquisition System Maintenance
			27a	Access Systems Inspection - Forth Bridge
			27b	Access Systems Maintenance and Testing - Forth Bridge
			28a	Access Systems Inspection - Queensferry Crossing
			28b	Access Systems Maintenance and Testing - Queensferry Crossing
			29	Programmed Special Inspections - Forth Bridge

Figure 4-07– List of PIs

Performance measurement – continual improvement

The following Figures 04-08 to 04-17 summarise performance against each benchmark PI along with results for 2016/17 inset.

NW – BEAR

In comparison to 2016/17, the performance of BEAR remained fairly consistent. However BEAR require improvement in two more PIs this year in comparison to 2016/17.

SW – Scotland TranServ

In comparison to 2016/17, the performance of Scotland TranServ deteriorated in 2017/18. This year, they failed to meet their target in two more PIs in comparison to last year.

NE – BEAR

In comparison to 2016/17, the performance of BEAR's performance deteriorated. They require improvement in three more PIs.

SE – Amey

In comparison to 2016/17, the performance of Amey improved slightly in 2016/17, as they met their target in two more PIs than last year.

FB – Amey

Amey's performance in 2017/18 improved in comparison with their performance in 2016/17, with three fewer PIs requiring improvement.

North West

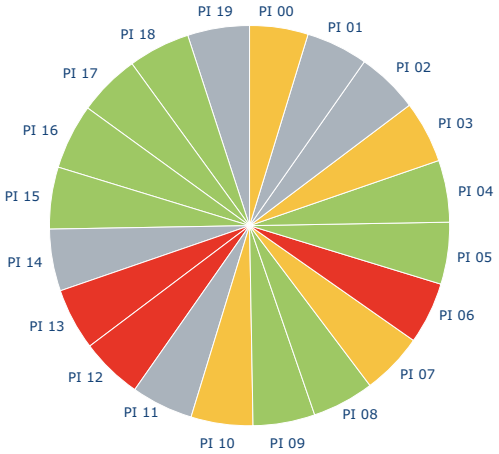


Figure 4-08 - PI summary for NW 2017/18

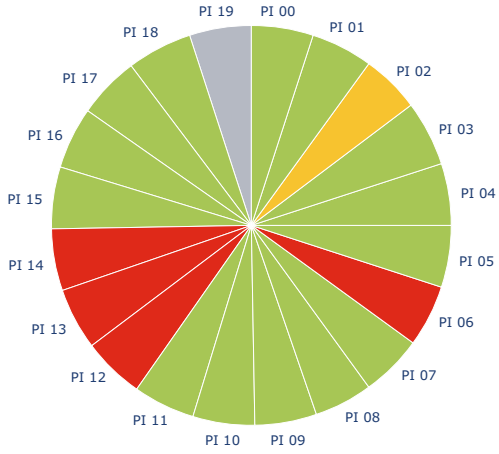


Figure 4-09 - PI summary for NW 2016/17

South West

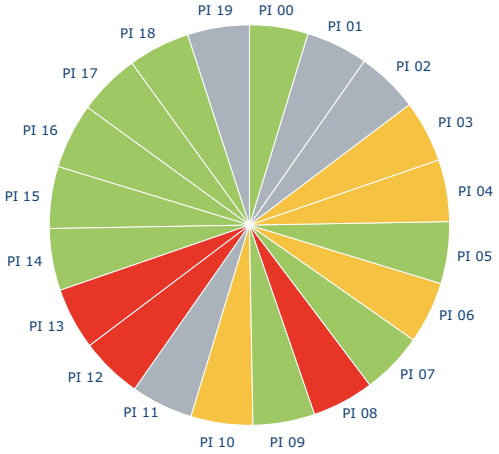


Figure 4-10 - PI summary for SW 2017/18

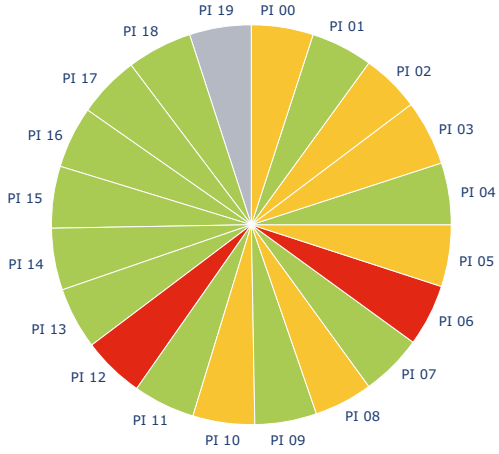


Figure 4-11 - PI summary for SW 2016/17

North East

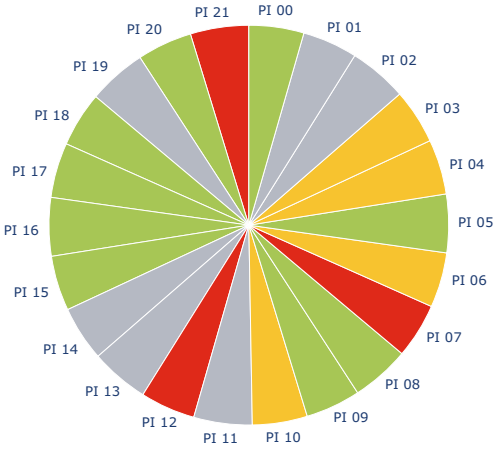


Figure 4-12 - PI summary for NE 2017/18

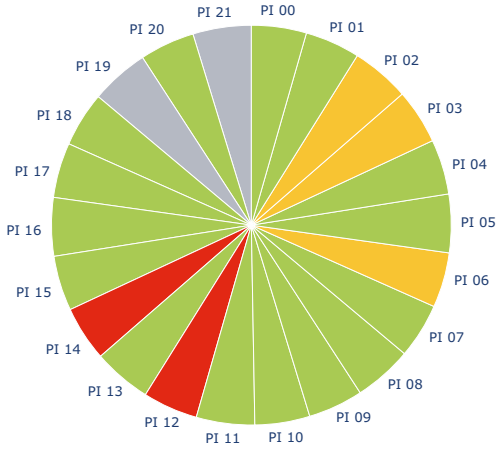


Figure 4-13 - PI summary for NE 2016/17

South East

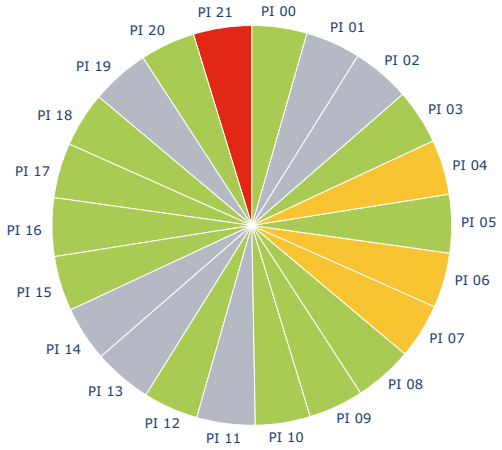


Figure 4-14 - PI summary for SE 2017/18

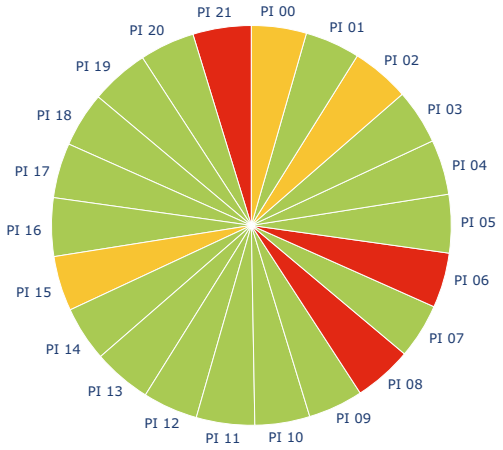


Figure 4-15 - PI summary for SE 2016/17

Forth Bridge

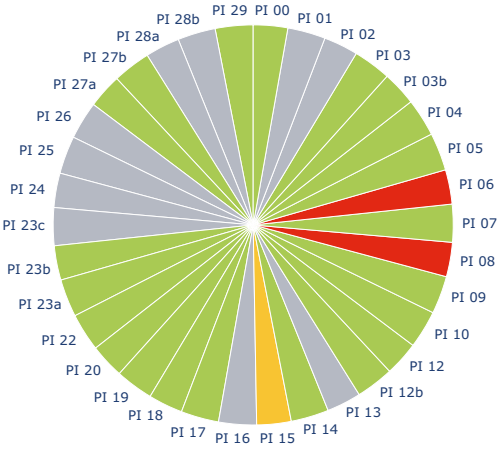


Figure 4-16 - PI summary for FB 2017/18

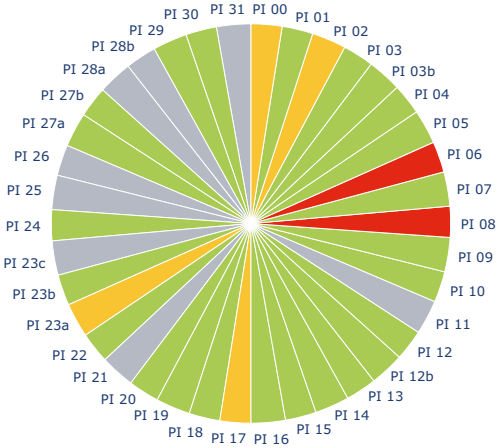


Figure 4-17 - PI summary for FB 2016/17

Key

- Target met
- Target not met and some improvement required
- Target not met and improvement required
- Not measured

Chapter 5:

Value of service

Key Points

Financial spend

- Overall spend across all OCs was under budget by £1.3m.
- NE accounted for £1.4m, SE £226k and NW £186k. FB spend exceeded budget by £305k and SW by £225k.
- There were differences between spend and budget at work category across all units.
- OC performance in managing the budget was good except in NE where performance was fair. All OCs had performance issues with monthly profiling of spend.
- The OC's performance in managing the bid/order process was good except in NE and FB where performance was fair.

Financial management

- OC performance in submitting financial information, such as works contractor invoices and expenditure profiles, was excellent in all units except SE and FB where performance was good.
- OC performance with general financial management was fair in all units except NW where performance was good.

Commercial matters

- OC performance in managing the measurement process was good in NW, fair in NE, SE, SW and FB. There were issues with provision of records, method of measurement and OC review comments.
- Performance in dealing with claims was good in FB and SE. Performance was fair in NW, SW and NE with the OCs failing to fully comply with the claim notification process.

Value of service

5.1 Financial Spend

5.1.1 Budget, orders and spend

PAG monitors and reports on the inter-relationship of budget, orders and spend to assist Transport Scotland in its financial management. How this fits into the overall process is shown in Figure 5-01.

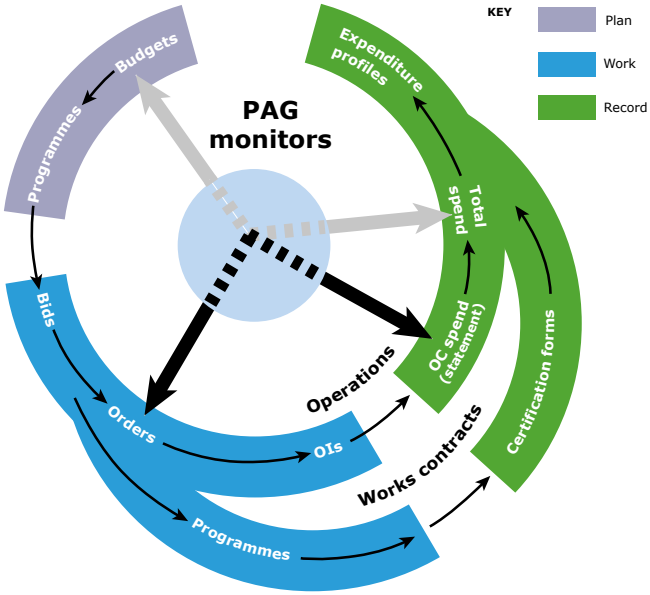


Figure 5-01 – Financial monitoring process

Budgetary control

Budgetary control by the OCs is an important management responsibility. It is important that the OCs exercise good budgetary control regardless of funding levels, as there may be little scope to revise programmes if there are any significant increases in scheme costs, particularly towards year end. This risk has been recognised by Transport Scotland and is included within the PAG audit and monitoring programme.

The OCs have responsibility for delivering a programme of maintenance covering five budget categories, these are routine maintenance (RM), structural maintenance (SM), structures (STR), minor improvements (MI) and strategic road safety (SRS).

A comparison of spend against budget for 2017/18 is shown in Figure 5-02.

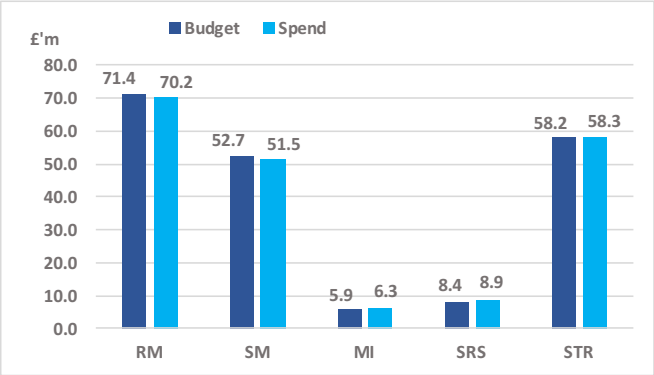


Figure 5-02 - Spend v Budget (excluding CPF) - all units

Total spend across all OCs was less than budget by £1.3m with an under spend against RM of £1.2m (2%) and £1.2m (2%) against SM. This however was offset by over spends against SRS of £473k (6%), MI of £453k (8%) and STR of £114k (0.2%) (Figure 5-02).

NW – BEAR ★★★☆

Overall performance was good with budget under spent by £186k (0.4%). Figure 5-03 shows how BEAR managed its budget at budget category level.

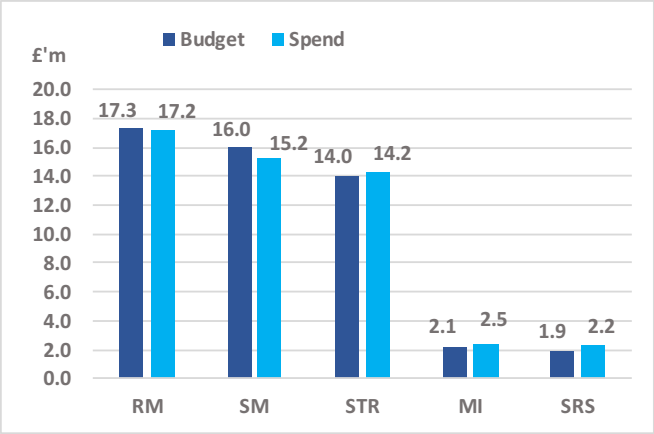


Figure 5-03 - NW Budget v Spend (excluding CPF)

Figure 5-03 highlights a budget under spend against SM at £847k (5%) and RM at £166k (1%) offset by over spends against MI of £312k (15%), SRS of £308k (16%) and STR of £207k (1%).

SW – Scotland TranServ ★★★☆

Overall performance was good with budget over spent by £225k. Figure 5-04 shows how Scotland TranServ managed its budget at budget category level.

Value of service

Whilst spend was overall in line with budget there were differences at budget category level. RM was under spent by £348k (2%) with over spends against the other budget categories. STR at £221k (2%), SM at £155k (1%), MI at £142k (4%) and SRS at £55k (3%).

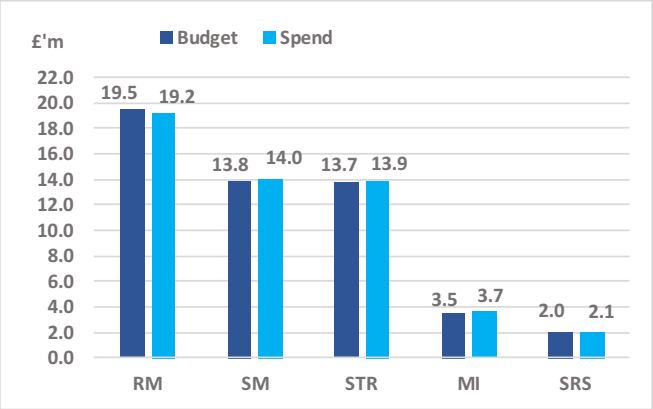


Figure 5-04 - SW Budget v Spend (excluding CPF)

One area where Scotland TranServ requires to improve is in the provision of accurate expenditure profiles.

NE – BEAR ★★☆☆

Overall performance was fair with budget under spent by £1.4m (5%). Figure 5-05 shows how BEAR managed its budget at budget category level.

This highlights the under spend relates to RM at £660k (5%), SM at £633k (6%) and STR at £112k (4%).

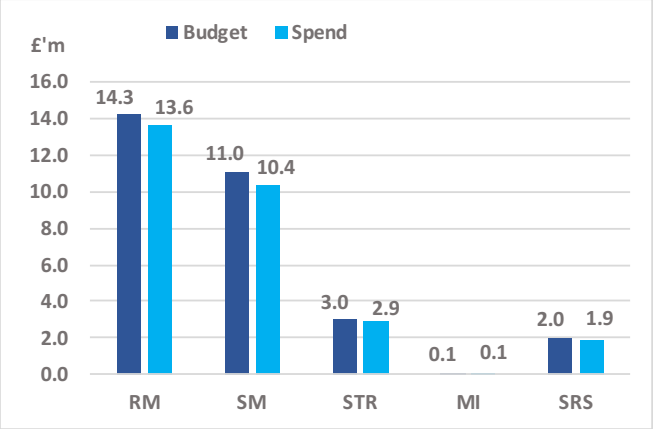


Figure 5-05 - NE Budget v Spend (excluding CPF)

One area where BEAR requires to improve is in the provision of accurate expenditure profiles.

SE – Amey ★★★☆

Overall performance was good with budget under spent by £226k (1%). Figure 5-06 shows how Amey managed its budget at budget category level.

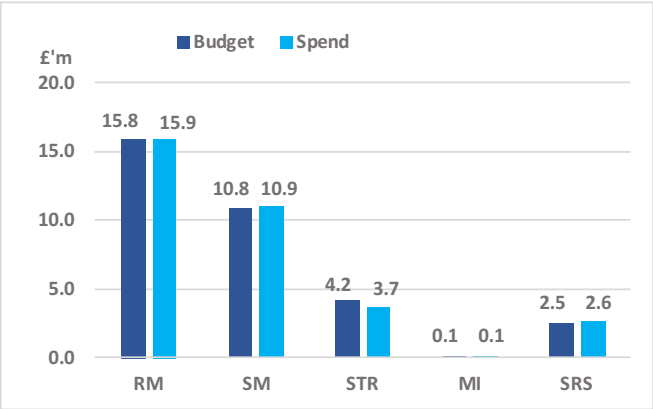


Figure 5-06 - SE Budget v Spend (excluding CPF)

Figure 5-06 highlights that the under spend was against STR at £519k (12%) partly offset by over spends against SRS of £149k (6%) and SM of £131k (1%).

One area where Amey requires to improve is in the provision of accurate expenditure profiles.

FB – Amey ★★★☆

Performance overall was good with budget over spent by £305k (1%). Figure 5-07 shows how Amey managed its budget at budget category level.

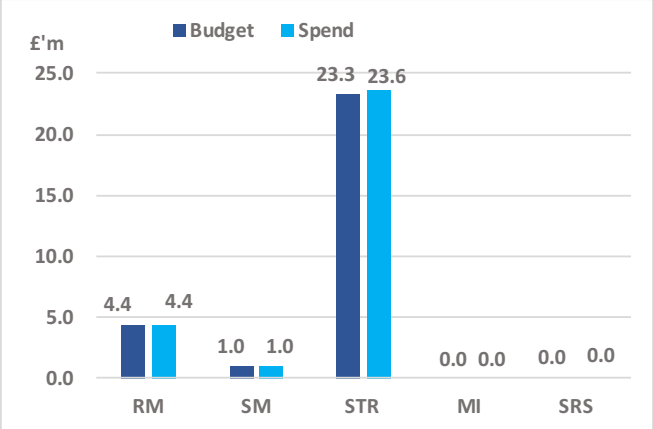


Figure 5-07 - FB Budget v Spend (excluding CPF)

Figure 5-07 highlights that the over spend was against STR at £317k (1%)

One area where the OC requires to improve is in the provision of accurate expenditure profiles.

Orders v spend

The responsibility to ensure that the value of orders issued by Transport Scotland matches its annual budgets and subsequent spend rests with the OCs.

Pressures on this process are inevitable due to operational demands changing and work already bid and ordered not proceeding. These changes may have a significant impact on the financial outturn if not managed through the contractual requirements for submitting revised bids. This process should ensure ordered work does not exceed budget.

PAG monitored the OC's financial management performance throughout the year to review whether spend for each scheme exceeded order value. PAG also reported on the relationship between budget, order value and spend for operations.

NW – BEAR ★★★☆

BEAR's performance was good. However, performance dipped in the last month of the financial year with a number of schemes having spend exceeding orders.

SW – Scotland TranServ ★★★☆

Overall performance was good. There were issues with some bids not having sufficient information to allow approval or covering operations included under monthly core activities.

NE – BEAR ★★☆☆

Overall performance was fair, with spend exceeding orders on a regular basis.

SE – Amey ★★★☆

Overall performance was good, with bids not being submitted for changes in scheme costs, particularly in the last quarter of the financial year.

FB – Amey ★★☆☆

Overall performance was fair. There were issues with spend exceeding orders throughout the year.

5.2 Financial management

5.2.1 Submission of financial information

NW – BEAR ★★★★

Overall performance was excellent with all financial submissions being received within contractual timescales.

SW – Scotland TranServ ★★★★

Overall performance was excellent with all financial submissions being received within contractual timescales.

NE – BEAR ★★★★

Overall performance was excellent with all financial submissions being received within contractual timescales.

SE – Amey ★★★☆

Overall performance was good. There were issues with the quality of information contained within the expenditure profiles during the first part of the year and issues with late submission of works contractor invoices.

FB – Amey ★★★☆

Performance was good. There were issues with the quality of information contained within the expenditure profiles during the first part of the year.

5.2.2 General financial management

NW – BEAR ★★★☆

BEAR's performance was good, although there was slow progress in closing out schemes during the first quarter of the year.

SW – Scotland TranServ ★★☆☆

Scotland TranServ's performance was fair. There was slow progress in closing out schemes throughout the year.

NE – BEAR ★★☆☆

Overall BEAR's performance was fair with slow progress in closing out schemes throughout the year.

SE – Amey ★★☆☆

Overall performance was fair. There was slow progress in closing out schemes throughout the year with performance at times poor.

FB – Amey ★★☆☆

Performance was fair. There was slow progress in closing out schemes throughout the year with performance at times poor.

5.3 Commercial matters

PAG continued to monitor the OC's measurement processes. Issues raised were discussed and resolved through regular meetings. Where appropriate, monies were deducted from the OCs for failure to substantiate values claimed.

5.3.1 Measurement issues

Measurement process

PAG carries out detailed reviews on OC spend through a process of site visits and reviews of measurement records held at the OC's central offices. Given the volume of work undertaken by the OCs, PAG work is carried out on a sample basis with typically 10% (by value) of operations reviewed. The aim of these reviews is to ensure the OC's measurement processes are robust and accurately record amounts due through their monthly statements.

NW – BEAR ★★★☆

Overall performance was good. There were some issues noted with both measurement records and BEAR review comments.

SW – Scotland TranServ ★★☆☆

Overall performance was fair. Issues were noted with measurement records, method of measurement and Scotland TranServ review comments.

NE – BEAR ★★☆☆

Overall performance was fair. There were issues noted with both measurement records, method of measurement and BEAR review comments.

SE – Amey ★★☆☆

Amey's performance was fair. There were issues noted with both measurement records and method of measurement.

FB – Amey ★★☆☆

Amey's performance overall was fair. There were issues noted with measurement records and Amey review comments.

Frequently asked questions

What is the Performance Audit Group (PAG)?

PAG is appointed by Transport Scotland to audit and monitor the performance of the Operating Companies (OC) contracted to manage and maintain the Scottish Trunk Road network. In the period covered by this report CH2M worked in association with PricewaterhouseCoopers to deliver the PAG contract.

What is PAG's role?

PAG audits, monitors and reports on the financial, technical and performance aspects of the OCs to a plan agreed with Transport Scotland. PAG also reviews payment requests from the OCs and carries out inter-unit comparisons and value for money investigations at the request of Transport Scotland. PAG can escalate the auditing and monitoring of the OCs if performance issues are identified.

What is a trunk road?

The primary transport functions for the national strategic transport network are defined as

- Linking major urban centres and areas of population change
- Providing links to international gateways, airports, ports and borders
- Linking remoter communities
- Linking key tourist areas
- Facilitating freight routes
- Linking areas of economic activity and regeneration areas of national significance.

All motorways and some A-roads are designated as trunk roads.

Are trunk roads managed and maintained in a different way to other roads?

Yes. Trunk roads are the responsibility of and funded by the Scottish Ministers. As such they are managed by Transport Scotland, maintained by the OCs and monitored by PAG. Local authorities are responsible for managing, maintaining and monitoring the local non-trunk road network.

What is Transport Scotland?

Transport Scotland is the Scottish Government's national transport agency responsible for helping to deliver the Government's capital investment programme and overseeing the safe and efficient running of Scotland's trunk roads.

What are Transport Scotland's responsibilities for trunk roads?

Transport Scotland is responsible to the Scottish Ministers for overseeing the management, maintenance and improvement of the trunk road network. To assist with this, it employs OCs, works contractors, concession companies and PAG.

What are OCs?

The OCs are responsible for delivering the management and maintenance of the trunk road network in each unit, working under contract to Transport Scotland.

What are the OC's main tasks?

The OCs oversee, coordinate and undertake cyclic and routine maintenance, winter service and emergency response. In addition, they undertake bridges and structural road maintenance, bridge strengthening and replacement, safety and condition inspections, road safety and minor improvement schemes.

What else do the OCs do?

The OCs also oversee and coordinate maintenance works carried out by contractors, and coordinate works by utility companies (statutory undertakers).

The OCs

- Undertake day-to-day management of the Unit
- Provide professional and design services, including scheme preparation
- Carry out surveys, inspections and investigations
- Manage and supervise operations and works contracts
- Manage their allocated budgets
- Report to Transport Scotland.

Frequently asked questions

What work is not done by the OCs?

There are certain maintenance and information management services carried out on the network that are not the OC's responsibility.

These include:

- Maintenance of M74/A74(M) from J12 to the English border, which is the responsibility of Autolink under the terms of the M6 DBFO project.
- Maintenance of M77 PPP project, which is the responsibility of Connect.
- Maintenance of M80 DBFO project is the responsibility of Highway Management (Scotland) Ltd.
- Maintenance of M8 M73 M74 Motorway Improvements Project DBFO is the responsibility of the Scottish Roads Partnership (SRP) consortium.
- Maintenance of AWPR – Balmeddie-Tipperty NPD Project is the responsibility of the Aberdeen Roads Partnership.
- Maintenance of Traffic Scotland electrical equipment such as variable message signs, emergency telephones, permanent speed cameras and associated cabling.
- Collection of traffic data and maintenance of counting equipment.
- Major trunk road improvements built by contractors appointed by Transport Scotland. Maintenance responsibility for these improvements is split between the contractor and the OC for a set period, up to five years, prior to full responsibility passing to the OCs.

This report does not include an assessment of these other maintenance organisations.

Where can I find out more about the management and maintenance of the M6 DBFO, M77 DBFO, M8 M73 M74, AWPR – B-T and M80 DBFO projects?

For M6, contact:
Autolink Concessionaires (M6) plc
M6 DBFO Project Office
Nethercleugh
Lockerbie
Dumfriesshire
DG11 2SQ

For M77, contact:
Connect M77/GSO plc
Connect Roads Operations Centre
Maidenhill Interchange
Ayr Road
Glasgow
G77 6RT

For M8/M73/M74, contact:
Scottish Roads Partnership
Hermiston House, Unit B
M8 Central Business Park
Greenhouse Road
Newhouse
Motherwell
ML1 5FL

For M80, contact:
Highways Management (Scotland) Ltd
c/o Bilfinger Project Investments Europe
Pavilion 2
Buchanan Park
Stepps
Glasgow
G33 6HZ

For AWPR, contact:
AWPR Project Office
New Mains of Ury
Stonehaven
Aberdeen
AB39 3QA

Glossary of main terms

4G contracts

Fourth generation contracts which were tendered in two phases. NW and SW were tendered first and commenced on 1 April 2013. NE and SE commenced on 16 August 2014. Subsequently FB was also introduced on 1 June 2015.

Automated diary facility

The Automated Diary Facility (ADF) is a web-based roadworks diary provided by Traffic Scotland as part of the Scottish Minister's Term Contract for Management and Maintenance of the Scottish Trunk Road Network. The ADF provides the ability for the OC to input and edit planned roadworks traffic management, lane closures, lane occupations and events likely to cause traffic delays.

Abnormal load

An item which, when loaded on the carrying vehicle, exceeds critical weight or size parameters given in legislation and cannot be broken down into smaller components (also referred to as Abnormal Indivisible Load).

Budget

Money allocated by Transport Scotland to manage and maintain the network during a financial year. This includes operations and works contracts.

Category 1 defects

Serious asset faults, such as potholes, that should be repaired within set timescales.

Category 2 defects

Category 2 Defects are those which, following a risk assessment, are deemed not to represent an immediate or imminent hazard or risk of short term structural deterioration.

CEEQUAL

An evidence-based sustainability assessment, rating and awards scheme for civil engineering, infrastructure, landscaping and the public realm, indicating the achievement of high environmental and social performance.

Contract control and management function (CCMf)

A computer-based financial management system supplied by Transport Scotland and operated by the OCs. The system gives everyone working on the OC contracts, including Transport Scotland and PAG, relevant access to information about how operations and works contracts are being managed and where money is being spent.

Contract price fluctuation factor (CPF)

Inflation adjustments to the OC's tendered rates and prices.

Financial year

The period between 1 April 2017 and 31 March 2018.

Integrated road information system (IRIS)

The road information system provided by Transport Scotland and used by the OCs in 4G, which includes the functionality of CCMf, RMMf, SMS and data on the physical characteristics, condition of the trunk road network and accidents.

Monitoring indicators and Performance indicators

The contracts state that a list of indicators must be provided by the OCs to show how they are performing and to allow comparisons between units.

Network

The system of motorways and trunk roads in Scotland. The network is 3,135km long and varies from urban motorways to rural single carriageways (see Figure 1). In addition, a total of 198km of motorway is covered by the M6 DBFO, M77 DBFO, M8/M73/M74 DBFO, M80 DBFO and AWPR projects.

Notice of non-conformance (NNC)

The process used in the contract to flag up where the OCs are not complying with the contract. This is issued by PAG.

Operations

Work carried out by the OCs.

Glossary of main terms

Orders

Instructions issued by Transport Scotland to the OCs. These give details of operations (not works contracts) to be carried out under the contract by the OCs. The OCs should not start operations until an order has been issued.

Quality management system (QMS)

Quality management is fundamental to the contracts. A QMS is drawn up by each OC to show how it will carry out every function required of it under the contract.

Remedial notice

A procedure used under the contract where Transport Scotland can issue a notice when an OC commits a default. This is part of the performance management procedures and may lead to withholding amounts from payment.

Routine maintenance management function (RMMf)

A computer-based system supplied by Transport Scotland and operated by the OCs, to record and report on details of the network, including where it has been inspected and routinely maintained.

Sector scheme

Sector scheme certification is given to suppliers and installers of materials by United Kingdom Accreditation Service (UKAS) accredited certification bodies. This certifies that the holder operates a QMS in line with the international standard, BS EN ISO 9001:2008 and the sector scheme document.

Spend

The amount paid for work done, including OC operations and works contracts, excluding CPF.

Structures management system (SMS)

A computer-based management system containing an inventory of information on all trunk road structures.

Sustainability

Sustainability in trunk road maintenance and improvement allows for an enhanced network consistent with social needs, permitting environmental stewardship, improving safety, promoting efficiency and meeting the mobility requirements of current and future generations.

Traffic Scotland

Traffic Scotland enables the collection and distribution of real-time traffic information relating to incidents and events currently taking place on the Scottish trunk road network.

TS2010

A specification for a new quieter and more durable road surfacing material.

Unit

The network is divided into five separate geographic units. These are: NW, SW, NE, SE and FB.

Works contracts

Schemes usually with a value of more than £350k and below £5m, which the OCs design, procure through competitive tender and supervise on site.

Abbreviations

4G	Fourth Generation Term Contract for the Management and Maintenance of the Scottish Trunk Road Network
ADF	Automated diary facility
BS	British Standard
CCMF	Contract control and management function
CDM	Construction design management
CEEQUAL	Civil engineering environmental quality assessment and award scheme
CPF	Contract price fluctuation
DBFO	Design, build, finance and operate contract
EMS	Environmental management system
EN	European standard of the CEN
FB	Forth Bridges
H&S	Health and safety
HSE	Health and safety executive
IRIS	Integrated road information system
ISO	International Standards Organisation
LED	Light emitting diode
MI	Monitoring indicators
MoI	Management of Incident database
NE	North East
NNC	Notice of non-conformance
NW	North West
OC	Operating Company
OHSAS	Occupational health and safety assessment series
ORI	Observation resulting from inspection
PAG	Performance Audit Group
PI	Performance indicators
QMS	Quality management system
RIDDOR	Reporting of injuries, diseases and angerous occurrences regulations
RMMf	Routine maintenance management function
SE	South East
SEPA	Scottish Environment Protection Agency
SMS	Structures management system
SRWR	Scottish Road Works Register
SW	South West
TRISS	Trunk road incident support service
WTN	Waste transfer note

Useful Websites

Turner & Townsend

www.turnerandtownsend.com

PAG

www.performanceauditgroup.co.uk

CH2M

www.ch2m.com

PricewaterhouseCoopers

www.pwc.co.uk

Transport Scotland

www.transportscotland.gov.uk

Traffic Scotland

www.trafficscotland.org

Scottish Road Works Commissioner

www.roadworksscotland.gov.uk

Scottish Government

www.scotland.gov.uk

Scottish Parliament

www.scottish.parliament.uk

Amey

www.amey.co.uk

BEAR

www.bearscot.com

Scotland TranServ

www.scotlandtranserv.co.uk