

Appendices Contents

Appendices 1

Appendix A. Carriageways.....	1
A.1. Overview.....	1
A.2. Asset Knowledge.....	1
A.2.1. The Carriageway Assets	1
A.2.2. Inspections and Surveys	3
A.2.3. Monitoring Performance	5
A.2.4. Customer Satisfaction	6
A.3. Maintenance	7
A.3.1. Historical Trends	8
A.3.2. Current State of Our Assets	9
A.3.3. Investment Scenarios	10
A.4. Scheme / Programme Development.....	11
Appendix B. Structures.....	13
B.1. Overview.....	13
B.2. Asset Knowledge.....	13
B.2.1. The Structures Assets	13
B.2.2. Inspections and Surveys	15
B.2.3. Monitoring Performance	17
B.3. Maintenance	20
B.4. Analysis	20
B.4.1. Historical Trends	20
B.4.2. Current State of Our Assets	21
B.4.3. Investment Scenarios	22
B.5. Scheme / Programme Development.....	23
Appendix C. Ancillary Assets	27
C.1. Overview.....	27
C.2. Asset Knowledge.....	27
C.2.1. The Ancillary Assets.....	27
C.2.2. Inspections and Surveys	37

C.2.3. Monitoring Performance	37
C.2.4. Customer Satisfaction	41
C.3. Maintenance	42
C.4. Analysis	43
C.4.1. Historical Trends	43
C.4.2. Current State of Our Assets	44
C.4.3. Investment Scenarios.....	45
C.5. Scheme / Programme Development.....	45
Appendix D. Intelligent Transport Systems (ITS)	47
D.1. Overview.....	47
D.2. Asset Knowledge.....	47
D.2.1. The ITS Assets.....	47
D.2.2. Inspections and Surveys	53
D.2.3. Monitoring Performance	54
D.2.4. Customer Satisfaction	55
D.3. Maintenance	55
D.3.1. ITS Roadside Assets.....	55
D.3.2. ITS Systems Estate.....	55
D.4. Analysis	56
D.4.1. Historical Trends	56
D.4.2. Current State of Our Assets	57
D.4.3. Investment Scenarios.....	57
D.5. Scheme / Programme Development.....	58
Appendix E. Our customers and their requirements	59
Appendix F. NMC Performance Indicators (PIs) & Monitoring Indicators (MIs)	62
Appendix G. ITS Performance Indicators (PIs) & Monitoring Indicators (MIs)	72
Appendix H. Abbreviations.....	77
Appendix I. Glossary	79
Appendix J. References	83

Appendices

Appendix A. Carriageways

A.1. Overview

The trunk road carriageway is one of the most visible community assets for which the Scottish Government is responsible. The carriageway is the core, paved asset within the trunk road network. It includes a surface course, binder course, base, and sub-base. The carriageway is used daily for hundreds of thousands of journeys and must be appropriately maintained in order to ensure the journeys we make are safe and reliable. Transport Scotland has contracts in place with Operating Companies to ensure that our trunk road carriageways are appropriately inspected, monitored, managed, maintained and repaired. This section of the RAMP describes asset-specific information that is used to develop the life cycle plan for trunk road carriageways, as detailed in Section 4.1.

A.2. Asset Knowledge

A.2.1. The Carriageway Assets

Table A-1 provides detail of the trunk road carriageway assets, their definitions and quantities. The inventory records held for the carriageway comply with the requirements set down in Transport Scotland’s Trunk Road Inventory Manual and are held within our Asset Management Performance System (AMPS).

Asset Type	Quantity
<p>Carriageway</p> <p>Road constructed for use by vehicular traffic. Carriageway includes turning lanes, bus lanes, crawler lanes and acceleration / deceleration lanes.</p> 	<p>Motorway - 444 km</p> <p>Dual Carriageway- 555 km</p> <p>Single Carriageway - 2,293 km</p> <p>Slips & Roundabouts - 453 km</p>

Asset Type	Quantity
<p>Hard Shoulder</p> <p>A surfaced strip usually of one traffic lane width adjacent to and abutting a carriageway intended for use by vehicles in the event of an emergency or during obstruction of the carriageway,</p> 	<p>606 km</p>
<p>Layby</p> <p>A part of the road set aside for vehicles to draw out of the traffic lanes and wait for short periods.</p> 	<p>203 km</p>
<p>Crossover</p> <p>A pedestrian or vehicular crossing of a footway/cycleway, verge, central island or central reserve. This includes minor junctions, driveways, field entrances and central reserve crossovers.</p> 	<p>12,324</p>
<p>Central Island</p> <p>An obstruction built in the road to split traffic into lanes and/or to provide a pedestrian refuge.</p> 	<p>386,622 m²</p>

Asset Type	Quantity
<p>Central Reserve</p> <p>An area that separates the opposing carriageways of a dual carriageway road or motorway.</p> 	<p>684 km</p>
<p>Node Marker Point</p> <p>A Node Marker Point is used to show the position of the start and end sections on the trunk road network, and is formed of 2 or 3 markers on the carriageway.</p> 	<p>3,858</p>

Table A-1: Carriageway Asset Groups and Quantities

A.2.2. Inspections and Surveys

In addition to the surveys described in Section 4.2, the following machine-based road condition surveys are carried out annually on trunk road carriageways to ensure that best value is achieved from our structural maintenance programmes (structural maintenance is the collective term for activities which maintain the integrity of the carriageway structure and are one of the scheme types listed in Section 4.5). All the road condition data is held in our Asset Management Performance System (AMPS).

Deflectograph

Transport Scotland has used the Deflectograph survey vehicle for over 20 years to provide an indication of road strength. The Deflectograph is a self-contained lorry-mounted system, where a loaded wheel passes over the road, the road deflects and the size of the deflection is related to the strength of the road layers. This provides reliable estimates of the remaining useful life of the road and identifies areas requiring strengthening. One-fifth of the network is surveyed annually, giving full network coverage every five years.



SCANNER (Surface Condition Assessment for the National Network of Roads)

This vehicle uses an electronic 'scanner' to make a number of measurements that describe the condition of the road surface, including rutting, cracking and ride quality. From this Transport Scotland can assess the lengths of road which require resurfacing or overlaying of the surface layer. Half of the network is surveyed annually, giving full network coverage every two years.

The Deflectograph and SCANNER surveys are used to calculate the condition scores discussed in Section 5.2.1.

SCRIM (Sideways Co-efficient Routine Investigation Machine)

Transport Scotland undertakes an annual condition survey to measure the wet skidding resistance of all trunk road surfaces. Each section of road is assigned a skid resistance threshold known as an Investigatory level. Sections that are at or below the Investigatory Level are investigated in accordance with UK-wide road standards (CS 228) and Transport Scotland's Skid Resistance Policy.

Griptester

The Griptester is a trailer-based device for measuring skidding resistance and gives instant readings of the skid resistance of the road surface being driven on. All four Operating Companies operate Griptesters supplied by Transport Scotland to measure the early skid resistance of road surfacing materials.

Our Operating Companies analyse the information obtained from all of the above surveys and use this, alongside other condition and inspection data, to identify sections of the network that should be considered for structural maintenance.

A.2.3. Monitoring Performance

Transport Scotland measures and monitors the performance of trunk road carriageways by undertaking and analysing annual road condition surveys and road user satisfaction surveys. This helps us to understand and prioritise the needs of our network. Our network is diverse with significant variations in traffic ranging from urban motorways to rural single carriageway roads. Hence each road type varies in the rate of deterioration, the defects that occur, when it will require maintenance, and the type of maintenance required. Consequently, we have adopted different maintenance targets for motorways, dual and single carriageways to provide a well-maintained trunk road network.

Carriageway Condition

Transport Scotland has developed a condition performance measure to identify sections of carriageway that have reached a condition where more detailed monitoring or investigation is appropriate and to establish if and when remedial measures are required. The condition of the carriageway is measured using industry standard inspections (see Appendix A.2.2). We use this data to generate a score for each section of carriageway, known as the Transport Scotland Road Condition Indicator (TS RCI¹). The three Transport Scotland RCI condition categories, descriptions and example photographs are shown in Table A-2. Further detail on current carriageway asset condition can be found in Section 5.2.1.

¹ TS RCI calculation based on several SCANNER survey condition parameters (rutting, profile variance, texture and cracking) and the remaining structural life reported by Deflectograph. It is not equivalent to the Road Condition Index reported by Scottish Local Authorities which is based on SCANNER survey data alone.

Condition Categories*	Description	Photographs
Good (TS RCI < 40)	Considered to be in a good state of repair and does not require investigation or maintenance.	
Fair (TS RCI ≥ 40 < 100)	Should be investigated to provide the optimum time for planned maintenance intervention.	
Poor (TS RCI ≥ 100)	Should be investigated to determine if structural maintenance is required.	

Table A-2: Carriageway Condition Categories

A.2.4. Customer Satisfaction

Transport Scotland undertakes an ongoing customer survey which asks road users about their satisfaction with the condition of trunk road carriageways. This allows us to gauge current levels of satisfaction and compare and trend current and past levels of satisfaction in order to identify areas for improvement

The 2024 report found that 86% of road users would prioritise the maintenance of existing roads over building new roads. In 2025, the top three priorities of customers for improving the road network were the ‘speed with which road defects are repaired’² (49%), ‘better road surface condition’ (39%) and the ‘quality of repairs’

²Where percentages do not sum to 100%, this may be due to computer rounding, the exclusion of ‘don’t know’ categories or multiple answers.

(34%). Figure A-1 below shows the more detailed response to the question of satisfaction with the condition of trunk road surfaces, with 44% either very satisfied or satisfied.

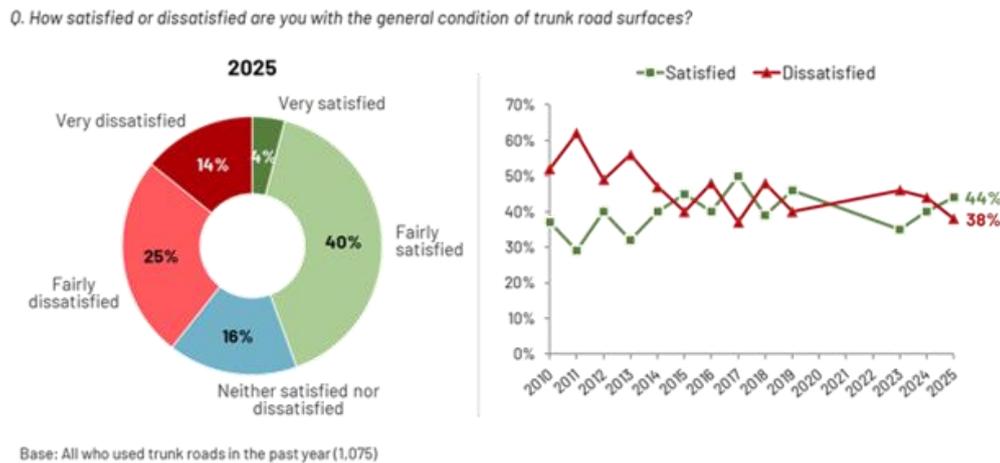


Figure A-1: Satisfaction with the Condition of Trunk Road Surfaces (2025)

A.3. Maintenance

Full details of the maintenance requirements for carriageways are provided in our Operating Company contracts, (details of which are provided in Section 1.9.1). Maintenance activities undertaken for carriageways typically include:

Reactive maintenance

A range of unplanned activities that may arise on the trunk road network, including essential maintenance to fix a defect. When a defect has been identified, normally through safety and detailed inspections, the Operating Company is required to take account of contract requirements, applicable regulations and engineering judgement in deciding when remedial action will be necessary, and to make recommendations on the type of work required.

Cyclic Maintenance

Minor work carried out on a regular or cyclic basis that helps to maintain the safety, appearance or effective operation of the carriageway. These activities include sweeping, litter picking and the clearing of debris.

Programmed Maintenance

Moderate to major work which aims to improve the condition and functionality of the asset, planned one or more years in advance. For more information, see Section A.4, Scheme / Programme Development.

Winter Service

Transport Scotland undertakes steps it considers reasonable to prevent snow and ice from endangering the safe passage of pedestrians and vehicles on the trunk road network. These services are provided by the Operating Companies in accordance with contract requirements. During severe weather conditions, we endeavour to keep the public informed in a variety of ways, including the Traffic Scotland website, our Traffic Scotland Customer Care Line, roadside electronic variable messages signs, social media and radio travel information broadcasts. Further details on winter maintenance can be found in Section 7.1.3.

A.3.1. Historical Trends

Carriageways funding since 2021 is outlined in Figure A-2 below, along with illustration of the corresponding trend in condition in Figure A-3.

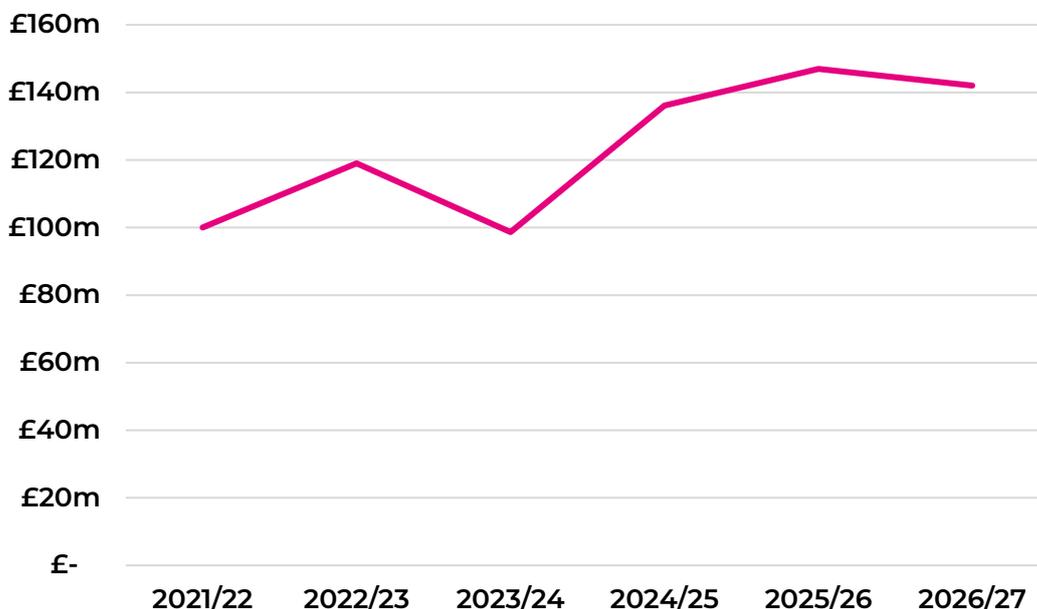


Figure A-2: Trend in Carriageway Funding

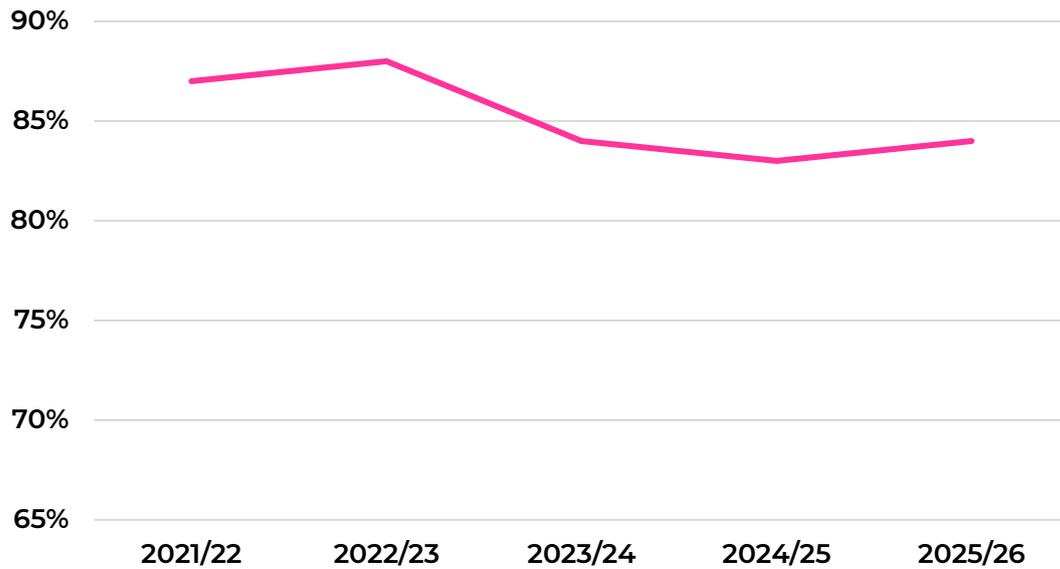


Figure A-3: Trend of Carriageway Assets in Good or Fair Condition

A.3.2. Current State of Our Assets

The condition of our carriageway assets is presented in Figure A-4, with 84% of trunk road carriageways, approximately 7,300 lane-km, currently in good or fair structural condition.

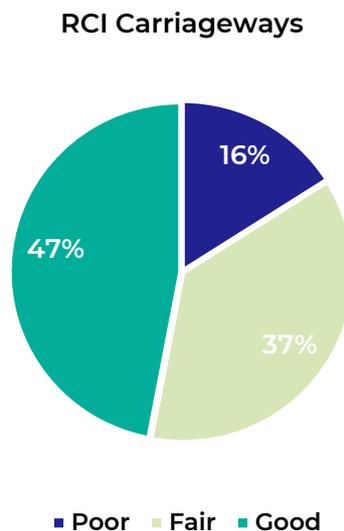


Figure A-4: Structural Condition of Carriageways

An annual SCRIM survey of the network also measures the skid resistance of road surfaces, with 87% of trunk road carriageways reporting skid resistance above the required investigatory level. Where the recorded value is lower than the investigatory level, this does not in itself mean that the road surface is deficient, sub-standard or unsafe. It is merely a trigger for a more detailed investigation.

A.3.3. Investment Scenarios

Further detail to the investment scenarios outlined in Section 5.4 is provided below, with a focus on carriageway assets. Figure A-5 visually compares the different investment options and is supported by additional commentary on the removal of backlog and maintenance of condition scenarios.



Figure A-5: Summary of Annual Carriageway Investment Scenarios

Budget Required to Remove Backlog

To remove the £958 million carriageway maintenance backlog (see Figure 5-7 in the RAMP for more information on the backlog) and achieve condition targets comparable with other similar countries (93% of carriageways in good or fair condition) within ten years, an average investment of £223 million per annum, excluding contract price fluctuation (CPF) is required.

Budget Required to Maintain Current Condition

The investment required to maintain trunk road carriageways at their current condition is estimated at £142 million per annum (excluding CPF), which is in line with the 2026/27 indicative budget.

Baseline Budget Required to Meet Core Commitments

The minimum funding necessary to ensure road safety for users, in line with statutory obligations and national standards.

A.4. Scheme / Programme Development

Structural maintenance is the collective term for activities which maintain the integrity of the carriageway structure. There are several types of structural maintenance treatment options and consideration of best value and sustainability are undertaken at the start of any proposed design.

Identifying Carriageway Structural Maintenance Schemes

Structural maintenance of carriageways rejuvenates the pavement by treating either the surface layers (for example, surface dressing) or the surface and sub layers (for example, strengthening or reconstruction). Table A-3 presents the main structural maintenance activities and their typical renewal frequency on the trunk road network. Typically, up to 500 lane-km receive structural maintenance each year.

Treatment Type	Treatment Description	Typical Renewal Frequency*
Surface Dressing	Application of a bituminous emulsion to the carriageway upon which one or more layers of stone chippings are applied.	Up to 10 years
Strengthening	Addition of new surfacing materials on top of existing construction, or removal of existing surfacing materials and replacement with new.	10 to 20 years
Reconstruction	Removal of existing carriageway construction, full or partial depth, and replacement of new.	20 to 40 years

*Frequencies vary for roads of different traffic loadings and construction form

Table A-3: Carriageway Maintenance Activities

The identification of structural maintenance schemes is largely informed by the Deflectograph and SCANNER condition surveys described in Section A.2.2, supplemented by a programme of visual inspections. The actual need for

maintenance is assessed through further site inspections and appropriate testing which are used to validate initial findings and refine appropriate treatment options. The outcome of this is a one-year implementation programme and a further two-year planning programme which is updated annually.

Sections that are at or below the SCRIM Investigatory Level are investigated in accordance with UK-wide road standards (CD 228 – Skidding Resistance) and Transport Scotland's Skid Resistance Policy. A section of road with skid resistance values below the Investigatory Level does not in itself mean that the road surface is deficient, sub-standard or unsafe. It is merely a trigger for a more detailed investigation. Following a detailed investigation, sections that are considered in need of treatment are added to the structural maintenance programme.

For roads structural maintenance schemes, each Operating Company has a contractual obligation to maintain an approved forward works programme that satisfies the requirements of Transport Scotland. This is managed by a Performance Indicator measuring the percentage of programmed work that is approved and in place.

Operating Companies are required to submit both one and three-year programmes for Patching, Strengthening and Resurfacing schemes, so that there is a plan for short and medium-term work.

Detailed visual condition surveys are carried out for all schemes within the one-year programme. The development of the one and three-year programmes is a continuous, cyclical process, with ongoing review throughout the year to capture changes in asset condition or revised budget allocations.

All schemes are reviewed and prioritised using our value management process and approved by Transport Scotland before their delivery.

Appendix B. Structures

B.1. Overview

Transport Scotland is responsible for the management, maintenance and operation of trunk road bridges and structures on the trunk road network. Public safety and the availability of the network are paramount. Structures that are part of the road asset are managed and maintained by our Operating Companies who are contracted by Transport Scotland on behalf of the Scottish Government. They carry out day-to-day inspection, planned and reactive structural inspections, monitoring, management, maintenance and repairs to trunk road structures in accordance with the Operating Company contracts, the Design Manual for Roads and Bridges and best practice. This section of the RAMP describes asset-specific information that is used to develop the life cycle plan for trunk road structures, as detailed in Section 4.1.

B.2. Asset Knowledge

B.2.1. The Structures Assets

Table B-1 details the trunk road structures assets, their definitions and quantities. The inventory records held for structures comply with the requirements set down in CG 302: As Built, Operation and Maintenance Records for Highway Structures, and are held within our Asset Management Performance System (AMPS).

Asset Type	Quantity
<p>Bridge</p> <p>A structure supporting the trunk road as it crosses an obstacle (e.g. river, valley or flood plain) or a service (e.g. local road, railway or canal), OR</p> <p>A structure supporting the passage of a local road over the trunk road.</p> 	<p>1,745</p>

Asset Type	Quantity
<p>Culvert</p> <p>A structure supporting the trunk road as it crosses an obstacle (e.g. river, valley, flood plain, agricultural access).</p>  <p>Culverts are classified as structures where it spans 2m to 3m, or multi-cell culverts with the cumulative spanning 5m or more, or corrugated metal culverts spanning 0.9m or more.</p>	557
<p>Retaining Wall >1.5m</p> <p>A structure associated with the trunk road where the dominant function is to retain earth either above the trunk road or supports the trunk road. The retained fill height must be above 1.5 meters to qualify as a structure.</p> 	938
<p>Sign / Signal Gantry</p> <p>Portal and cantilever gantries that support signs and/or signals over or adjacent to the trunk road.</p> 	357
<p>Large Road Sign</p> <p>Large signs (over 7m high) which are classified as structures.</p> 	195
<p>High Mast Light</p> <p>High mast column for lighting 20 meters tall or over.</p> 	300

Asset Type	Quantity
<p>CCTV Mast</p> <p>Mast for camera, radio, speed camera and telecommunication transmission equipment adjacent to the trunk road.</p> 	<p>249</p>
<p>Footbridge</p> <p>A structure supporting a footway or cycleway as it crosses the trunk road.</p> 	<p>147</p>

Table B-1: Structures Asset Groups and Quantities

B.2.2. Inspections and Surveys

To ensure structures are maintained to the necessary standards, and to check they are safe for use and fit for purpose, it is essential that their visual and structural condition and integrity are reviewed and monitored on a regular basis. The types of planned inspections, assessments, monitoring and surveys our Operating Companies are required to undertake can be found in the Schedule 2: Appendix 4 of the Scottish Trunk Road Network Management Contracts and the Transport Scotland Structures Manual (TSSM). A summary of the inspections is outlined below:

General Inspection

Undertaken at intervals not exceeding two years to provide information on the physical condition of all visible elements of the structure without the need for special access equipment or traffic management arrangements.

Principal Inspection

The inspection of all elements from within touching distance, and utilising access equipment as appropriate, carried out on a maximum six-year cycle. The General and Principal Inspections identify and prioritise defects, and the outcomes are used to calculate the condition scores discussed in Section B.2.3.

Special Inspection

Undertaken to investigate particular concerns identified during a General or Principal Inspection rather than at programmed intervals. A number of Special Inspections are undertaken to provide more detailed information on the condition and structural integrity of specific parts or components of a structure, including those outlined below. There is an ongoing programme of Special Inspections to review structures identified with 'hidden defects' or 'hidden elements' that cannot readily be inspected during planned Principal and General Inspections.

Scour Inspection

Undertaken alongside Principal Inspections on structures over or carrying watercourses in order to check for erosion of sediment such as sand and rocks from around bridge abutments or piers. Also, as part of the Level 2 Scour Assessment Programme to CS 469 – Management of scour and other hydraulic actions at highway structures, currently under way to structures over and adjacent to watercourses.

Inspection for Assessment

Undertaken because of increases in vehicle loadings due to changes in carriageway layout or to assess a structure that has deteriorated or been subject to accidental damage.

Assessment

Determination of the load carrying capacity of a structure in accordance with CS 454 – Assessment of highway bridges and structures and/or CS 458 – The assessment of highway bridges and structures for the effects of special type general order (STGO) and special order (SO) vehicles.

A comprehensive programme of assessment has been undertaken to ensure structures can safely carry Authorised Weight (AW) vehicles. This can occasionally relate to the stability of a structure that may be subject to ground movement.

Structural Review

Undertaken in accordance with CS 451 – Structural review and assessment of highway structures, to determine whether a structure has to undergo further assessment. This would be required where there is change in condition, operational load carrying requirements or changes to assessment standards. All sub-standard structures (those with load capacities of less than 40/44 tonnes) are subject to an

annual review of their CS 470 management plans including monitoring regimes, outputs, condition and interim measures in place.

Assessment of Vehicle Parapets

Undertaken in accordance with CS 461 - Assessment and upgrading of in-service parapets to identify substandard parapets, safety fences around parapets and their connections (a wall/rail/fence that runs along the outside edges of the bridge deck, or retaining wall, parallel to the direction of traffic flow to prevent users from accidentally falling off the bridge).

Identification of 'Particularly at Risk' Supports and Subsequent Assessment

Undertaken in accordance with CS 453 – The assessment of highway bridge supports which are vulnerable under vehicle impact.

B.2.3. Monitoring Performance

The condition of our structures is categorised using a five-point condition banding that ranges from 'excellent' to 'very poor'. Based on the defects recorded in the condition inspection surveys, a work bank of treatments is created for structures and the maintenance target for these structures is to be defect free. Our investment scenarios use this information, and the outcomes of the planned inspections, with works being prioritised based on condition and importance.

Structures Condition

Transport Scotland has adopted the Bridge Condition Index (BCI) inspection standard, which is used by the majority of road bridge owners in the UK. The index is calculated from General and Principal Inspection data (see Appendix B.2.2) enabling analysis and trending of condition information. Two condition indicators are calculated for each structure, which are defined as:

- **BCI_{av}**: The average BCI for a structure taking into account the condition of all structural elements on the structure. This score provides an overview of the average structure condition.
- **BCI_{crit}**: The condition score of the load bearing element which is in worst condition. This score provides an indication of the criticality of the structure with regards to the load bearing capacity

A further two condition indicators are evaluated for the stock of structures:

- Structures Stock Condition Indicator ($SSCI_{av}$): the weighted average of the individual BCI_{av} scores, this score provides an overview of the average stock condition.
- Structures Stock Critical Indicator ($SSCI_{crit}$) – the weighted average of the BCI_{crit} scores, this score provides an indication of the criticality of the stock with regards to load carrying capacity

Table B-2 outlines the different condition categories. Further detail on current structures asset condition can be found in Section 5.2.2.

Condition Categories*	Description
<p>Excellent (BCI 90-100)</p>	<p>No functional or structural defects.</p> 
<p>Good (BCI 80-89)</p>	<p>Some minor defects that have limited impact on the structure. Examples include localised flaking of paintwork and weathered or stained concrete.</p> 
<p>Fair (BCI 65-79)</p>	<p>Minor to moderate defects that may impact on the durability of the structure and may impact function. Examples include small areas of exposed reinforcement and failed paint.</p> 
<p>Poor (BCI 40-64)</p>	<p>Moderate to major defects that are likely to impact on the function of the structure. Examples include large areas of exposed reinforcement and exposed and rusting metal.</p> 
<p>Very Poor (BCI 0-39)</p>	<p>Major structural defects and some components on the bridge may be failed, requires attention.</p> 

Table B-2: Bridge and Structure Condition Categories

B.3. Maintenance

Full details of the maintenance requirements for structures are provided in our Operating Company contracts, (details of which are provided in Section 1.9.1). Maintenance activities undertaken for structures typically include:

Cyclic Maintenance

Minor work carried out typically twice a year during Spring and Autumn that helps to maintain the appearance, condition and functionality of a structure and reduce the need for other, normally more expensive, maintenance works. Examples include cleaning of bridge deck and abutment drains and expansion joints on bridges, removal of vegetation, checking and tightening holding down bolts to parapets, maintenance of services, and lighting.

Reactive Maintenance

Normally identified through the inspections described in Appendix B.2.2 and Section 4.2 but may also arise from reports received from the police or public. The causes of reactive maintenance vary considerably, but typically include vandalism, vehicle impacts, flooding, fire, fly tipping and ongoing deterioration of the structures.

Programmed Maintenance

Moderate to major work which aims to improve the condition and functionality of the asset, planned one or more years in advance. For more information, see Section B.5, Scheme / Programme Development.

B.4. Analysis

B.4.1. Historical Trends

Structures funding since 2021 is outlined in Figure B-1 below, along with an illustration showing the corresponding trend in condition in Figure B-2.

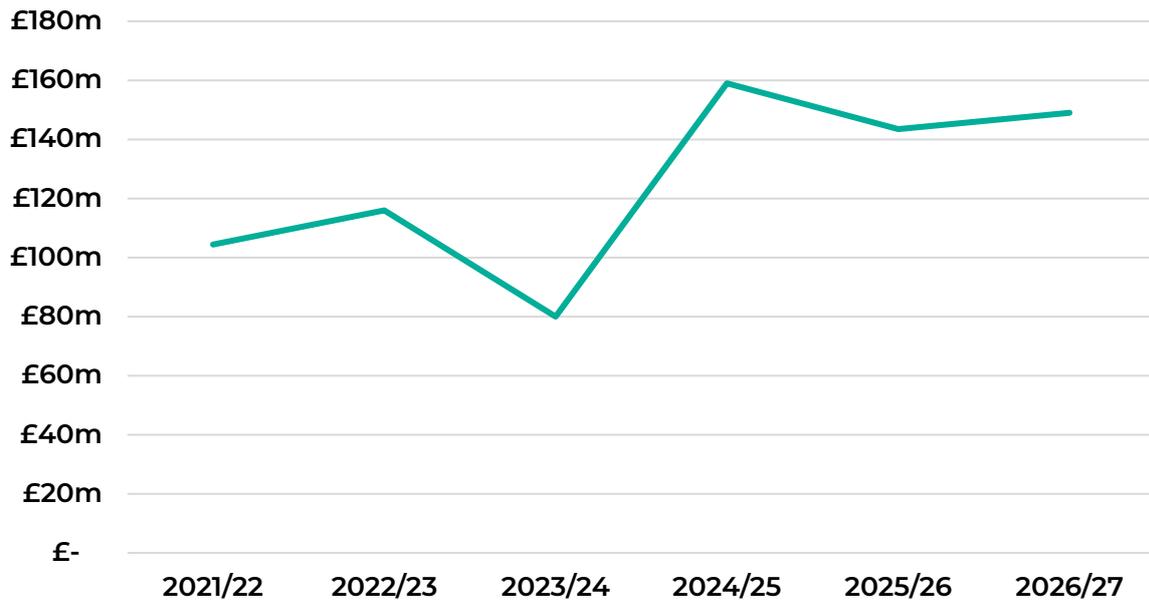


Figure B-1: Trend in Structures Funding since 2021

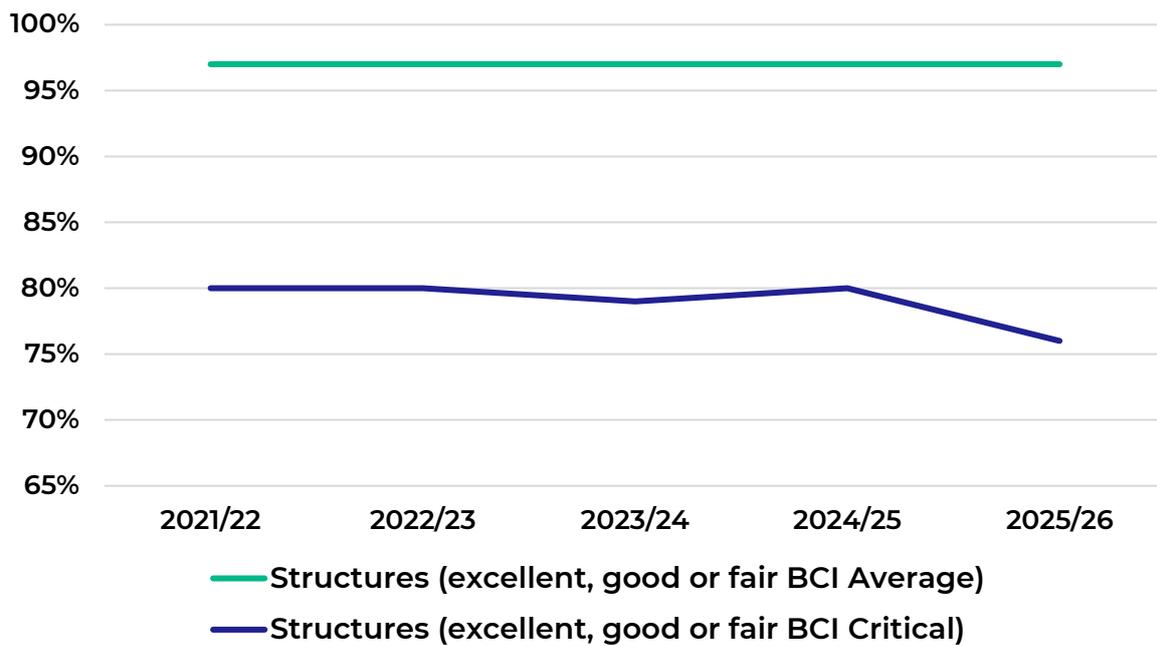


Figure B-2: Trend of Structures Assets with Excellent or Good BCI Condition since 2021

B.4.2. Current State of Our Assets

Current indicators for structures assets are presented in Figure B-3, with 97% of trunk road structures having a BCI Average rating of ‘excellent’, ‘good’ or ‘fair’. Also,

the majority of trunk road structures (76%) have a BCI Critical rating of ‘excellent’, ‘good’ or ‘fair’.

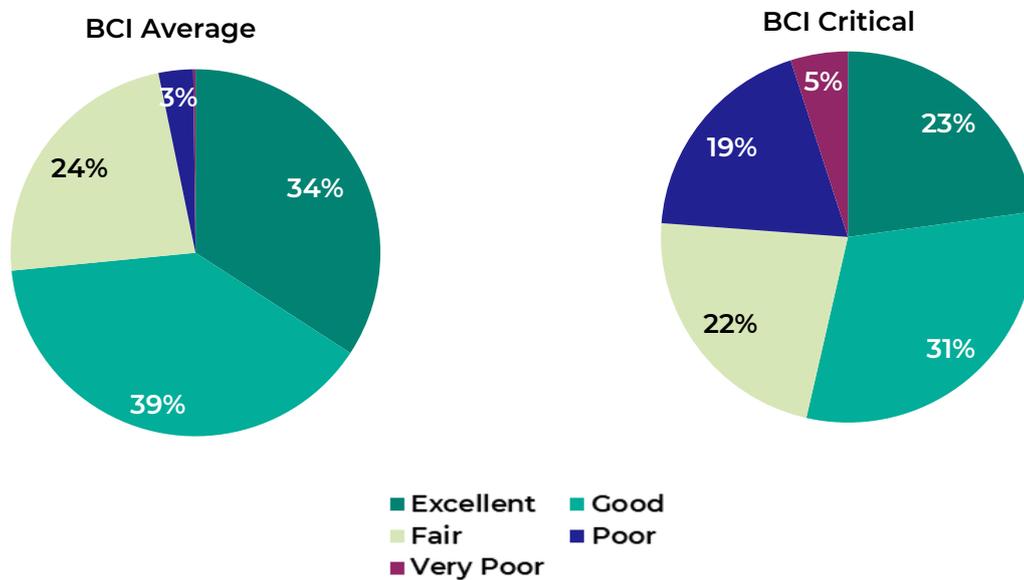


Figure B-3: Structures BCI Indicators

B.4.3. Investment Scenarios

Further detail to the investment scenarios outlined in Section 5.4 is provided below, with a focus on structures assets. Figure B-4 visually compares the different investment options and is supported by additional commentary on the removal of backlog and maintenance of condition scenarios.

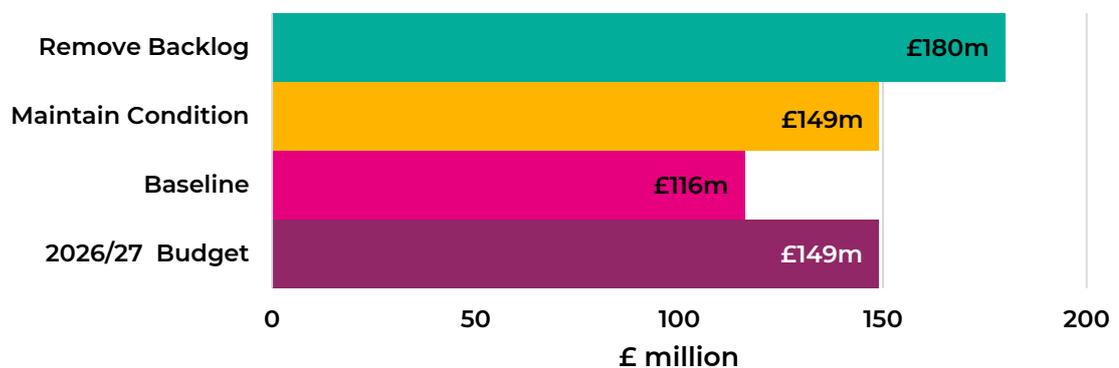


Figure B-4: Summary of Annual Structures Investment Scenarios

Budget Required to Remove Backlog

This scenario seeks to deliver all required maintenance currently in the £1.79 billion structures work bank within 13 years. An average investment of £180 million per annum is required (excluding CPF). (See Figure 5-7 in the RAMP for more information on the backlog).

Budget Required to Maintain Current Condition

This scenario aims to fund essential and unavoidable maintenance, ensure public safety, address network deterioration and avoid future restrictions. It minimises the whole life cost of assets and starts to reduce the backlog of repairs. An average investment of £149 million per annum is required (excluding CPF), which is in line with the 2026/27 indicative budget.

Baseline Budget Required to Meet Core Commitments

The minimum funding necessary to ensure road safety for users, in line with statutory obligations and national standards.

B.5. Scheme / Programme Development

An annual process of developing works programmes is applied, with draft programmes developed for the following:

- Ten-year programme for Major Bridges
- Five-year programme for Major Bridges
- Three-year programme
- One-year programme

The Operating Companies then meet with Transport Scotland to review the draft programmes and estimates, and indicative budgets are allocated. Detailed estimates can then be developed for each scheme within the one-year programmes, enabling costs and works orders to be agreed and issued before work commences.

Remedial Works

All trunk road structures deteriorate over time due to usage, exposure and other factors, some arising from past design and construction practices. Work aimed at counteracting these mechanisms and maintaining the public safety and the durability and safe use of structures is referred to as structural maintenance. Structural

maintenance includes repairs due to deterioration or damage and bringing sub-standard and non-standard components up to current standards. Also, strengthening or replacement of structures that are life expired or unsuitable for current usage or those with substandard load carrying capacity or road alignment. Current specific programmes of work include strengthening and replacement of structures, upgrading of vehicle parapets, strengthening of supports, and scour protection to structures. Table B-3 presents some indicative maintenance activities and their typical renewal frequency for trunk road structures.

Element	Treatment Description	Typical Renewal Frequency*
Bearings	Replacement of bearings which transfer loads and movements from the deck to the substructure and foundations.	15 to 40 years
Plug joints & Buried Joints	Replacement of an in-situ joint in the pavement comprising a band of specially formulated flexible material which may also form the surfacing.	5 to 15 years
Elastomeric in metal rails	Replacement of a prefabricated joint comprising an elastomeric seal fixed between metal rails or runners.	11 to 20 years
Parapets (metal)	Replacement of a safety barrier that is installed on the edge of a structure where there is a vertical drop.	20 to 40 years
Parapets (masonry)		Up to 100 years
Waterproofing	Application of a material to form an impervious membrane on a bridge deck to protect it from the ingress of water and de-icing salts.	20 to 40 years

* *Dependent on traffic loadings and whether maintenance is carried out at optimum intervention point*

Table B-3: Indicative Maintenance Activities for Key Elements

Strengthening and Replacement

Strengthening work is required to bring a number of trunk road structures up to current load carrying capacity requirements. Under EC Directive, all Member States are required to accept articulated vehicles and drawbar-trailer combinations with six or more axles weighing up to 44 tonnes on international journeys. This directive came into effect in the UK on the 1 Jan 1999 and was enshrined in Statutory Instrument No. 3224, see Table B-4.

Year	Regulation	Gross Vehicle Weight and number of axles
1986	Statutory Instrument 1986 No. 1078 The road vehicles (construction and use) regulations 1986	38 tonne, 5 axles
1998	Statutory Instrument 1998 No. 3111 The road vehicles (authorised weight) regulations 1998	40 tonne, 5 axles
2000	Statutory Instrument 2000 No. 3224 The road vehicles (authorised weight) (amendment) regulations 2000	44 tonne, 6 axles

Table B-4: Summary of Loading Regulations

Transport Scotland is progressing a bridge strengthening and replacement programme with a number of structures programmed for strengthening over the RAMP period. Works have been ongoing delivering the bridge strengthening and replacement programme since 2000, indicating the scale of the impact of increasing vehicle and axle loads on the network.

Future spend will be targeted on bridges with sub-standard decks. The majority of sub-standard bridges are short to medium span structures on the traditional routes. At the present time Transport Scotland's policy is to operate all of its structures without weight restrictions, subject to review and monitoring in accordance with CS 470 – Management of sub-standard highway structures to maximise network availability. However, as public safety is paramount, should ongoing deterioration or traffic volumes and flows alter the load carrying capacity of a structure, this will be reviewed in accordance with CS 451. If funding for the necessary remedial or

upgrading works is not available, then in future it may be necessary to impose traffic restrictions or closures to ensure safety and prevent structural collapse.

Identifying and Prioritising Maintenance Schemes

Structures maintenance needs are identified through the regular Principal and General Inspection programmes described in Appendix B.2.2, where defects are identified, scoped and allocated an indicative cost for remedial works and risk programmes. This schedule of works is known as the Structures Workbank. The Operating Companies review all available information (including all inspection reports, risk programmes monitoring requirements, test results, known strengthening and replacement requirements) and identify:

- Maintenance operations required for structures and any associated access systems.
- Strengthening and replacement schemes required for structures and any associated access systems.
- Special Inspections and investigations
- Assessments and any resulting interim and formal measures for sub-standard structures, including monitoring, traffic restrictions, propping, or closure.
- Monitoring requirements for structures with known defects

Transport Scotland prioritises maintenance for road structures using our Structures Risk Prioritisation tool, which is based on the Value Management of the Structures Renewals Programme. This provides a robust, repeatable and documented process for prioritising needs on the basis of risk.

Appendix C. Ancillary Assets

C.1. Overview

The trunk road network includes not just carriageways and structures, but also footways, lighting, traffic signs, drainage networks and much else besides. Ancillary assets cover all trunk road asset types with the exception of the carriageway, road structures and Intelligent Transport Systems (ITS). This section of the RAMP describes asset-specific information that is used to develop the life cycle plan for trunk road ancillary assets, as detailed in Section 4.1.

C.2. Asset Knowledge

C.2.1. The Ancillary Assets

Tables C-1 and C-2 detail the trunk road ancillary assets, their definitions and quantities. The inventory records held for ancillary assets comply with the requirements set down in Transport Scotland's Trunk Road Inventory Manual and are held within our Asset Management Performance System (AMPS).

Asset Type	Quantity	Lifespan
Fences & Barriers		
<p>Fences and Barriers</p> <p>A barrier which runs alongside the carriageway for screening noise, glare or to prevent access.</p> 	748 km	20 yrs
<p>Traffic Control Barriers</p> <p>A moveable barrier or gate which can control the flow of traffic or close sections of the road.</p> 	43	15 yrs
<p>Pedestrian Guardrail</p> <p>A protective fence usually on the edge of a footway intended to prevent pedestrians from stepping on to the carriageway.</p> 	42 km	20 yrs

Asset Type	Quantity	Lifespan
Drainage		
<p>Balancing Pond</p> <p>A catchment area to collect surface run-off following heavy rain and control its discharge into a drainage system to prevent flooding. Some ponds hold water permanently, some are largely dry.</p> 	67,307 m ²	20 yrs
<p>Catchpit</p> <p>A chamber with a sump or pit to collect silt or solid material and prevent it from blocking the drains. It may have an access cover or metal grating cover, similar, but larger in size than a gully.</p> 	9,984	30 yrs
<p>Channel</p> <p>A narrow longitudinal strip, generally near the edge of the carriageway, constructed to carry and lead away surface water.</p> 	66 km	30 yrs
<p>Combined Kerb Drainage</p> <p>A kerbline that contains a drainage channel inside the block.</p> 	66 km	30 yrs
<p>Counterfort Drain</p> <p>A field drain filled with granular material, which may be laid over a porous or perforated pipe.</p> 	90,713 m ²	30 yrs
<p>Ditch</p> <p>A trench adjacent to a carriageway for drainage, generally running parallel to the carriageway.</p> 	755 km	15 yrs

Asset Type	Quantity	Lifespan
<p>Filter Drain</p> <p>A drain surrounded by granular material which remains visible (such as gravel), within which may be laid a porous or perforated pipe.</p> 	1,614 km	27.5 yrs
<p>Gully</p> <p>A chamber at the side of the road to collect surface water and trap debris.</p> 	91,506	25 yrs
<p>Grip</p> <p>A shallow trench across the verge of a road to lead surface water away from the carriageway.</p> 	33,846	5 yrs
<p>Piped Grip</p> <p>A chamber constructed to give access to a drain, sewer or other underground service.</p> 	15,466	20 yrs
<p>Manhole</p> <p>A chamber constructed to give access to a drain, sewer or other underground service.</p> 	32,600	30 yrs
<p>Small Culvert</p> <p>An enclosed channel or large pipe for water to flow under or alongside the road.</p> 	135 km	40 yrs
<p>Drainage Ancillary Item</p> <p>Any other drainage asset such as soakaways, headwalls, spillways, sluices and pumps.</p> 	11,152	20-30 yrs

Asset Type	Quantity	Lifespan
Geotechnical		
<p>Slopes</p> <p>Slopes above or below the road; are one of the following:</p> <ul style="list-style-type: none"> • Earthwork – an artificial slope often described as an embankment or cutting • Land – a natural slope assessed by the Scottish Road Network Landslide Study as posing a risk • Rock – an artificial slope, normally a cutting, where the face is rock 	 <p>187 km²</p>	<p>50 yrs</p>
<p>Protection/Rigid Support</p> <p>Covers a range of constructions including:</p> <ul style="list-style-type: none"> • Retaining walls <1.5m • Buttresses, • Beams, columns, props, • Dentition, • Revetments, • Sprayed concrete facings • Riprap and armourstone as toe ballast or erosion protection. 	 <p>17,704 m²</p>	<p>30 yrs</p>
<p>Other Geotechnical Assets</p> <p>Covers a range of geotechnical measures such as:</p> <ul style="list-style-type: none"> • Anchors/Bolts/Dowels • Barrier Fencing • Debris Traps • Granular Replacement • Reinforced Soil • Rock Netting • Soil Nailing 	 <p>1,464 m²</p>	<p>20-50 yrs</p>

Asset Type		Quantity	Lifespan
Lighting and Electricals			
<p>Lighting Point</p> <p>A lighting installation usually consisting of a column, lantern housing and lamp.</p>		22,598	20 yrs
<p>Electrical component of Traffic Signs or Bollard</p> <p>The electrical part of a lit sign or bollard.</p>		3,549	15 yrs
<p>Electrical component of Cabinet/Pillar</p> <p>The electronic, communications or similar equipment contained within a cabinet</p>		2,440	15 yrs
<p>Electrical Ducting and Cable</p> <p>An underground ducting system to carry electrical cables to electrically powered apparatus</p>		31 km	20 yrs
<p>Navigation Aids and Lights</p> <p>Electrically energised marine navigation radar beacons and lights for Sea and Aircraft</p>		63	20 yrs
<p>Cable Chamber</p> <p>A chamber associated with road lighting, traffic signals, detector loops and other apparatus.</p>		2,351	30 yrs

Asset Type	Quantity	Lifespan
Miscellaneous		
<p>Equipment Storage Location</p> <p>A location other than a depot where equipment and/or materials are stored.</p> 	17	15 yrs
<p>Salt Bin</p> <p>A bin containing salt or grit for use during winter conditions.</p> 	13	15 yrs
Pedestrian & Cycle Facilities		
<p>Footway</p> <p>A part of the road exclusively for the use of pedestrians or pedal cycles.</p> 	890 km	20 yrs
<p>Cycle Facility</p> <p>A part of the road specifically for the use of pedal cycles.</p> 	26 km	20 yrs
Road Markings, Studs & Kerbs		
<p>Road Markings</p> <p>Markings on the carriageway, split into:</p> <ul style="list-style-type: none"> • Hatched • Longitudinal • Transverse 	11,803 km	3-5 yrs
<p>Road Studs</p> <p>Studs placed on the carriageway to guide traffic.</p> 	8,677 km	5 yrs

Asset Type		Quantity	Lifespan
<p>Kerbs</p> <p>A border, usually upstanding at the edge of a carriageway or hard shoulder.</p>		3,526 km	30 yrs
Technology Equipment			
<p>Cabinet/Pillar</p> <p>A cabinet or pillar, usually containing electronic and/or communications, traffic signal equipment or similar equipment.</p>		2,602	15 yrs
<p>Detector Loop</p> <p>A wire loop embedded in the road surface to detect the presence or speed of a vehicle.</p>		2,322	10 yrs
<p>Weather Station</p> <p>A remote electronic monitoring device to detect road surface and atmospheric conditions to give early warning of ice and frost.</p>		159	12 yrs
Traffic Signs & Signals			
<p>Bollard</p> <p>A device placed on a refuge, traffic island or verge to warn drivers of obstructions or to prevent the passage of vehicles.</p>		68,624	10 yrs
<p>Traffic Sign</p> <p>Any object or device for conveying to traffic or any specified class of traffic; warnings, information, requirements, restrictions, or prohibitions of any description.</p>		59,133	10 yrs

Asset Type	Quantity	Lifespan
<p>Reference Marker Post</p> <p>Physical markers, typically located on the hard shoulder or central reserve, showing the direction to the nearest emergency telephone every 100m on motorway sections.</p> 	4,340	7 yrs
<p>Snow Pole</p> <p>Poles mounted at the side of the road to aid snow clearing operations.</p> 	5,397	10 yrs
<p>Traffic Signals</p> <p>A system of coloured lights for stopping traffic and permitting them to move. Consists of:</p> <ul style="list-style-type: none"> • Signal Heads • Detectors • Pedestrian Push Button • Controller 	2,075	20 yrs
Vehicle Restraint Systems		
<p>Safety Fence</p> <p>A continuous barrier erected alongside a carriageway or bridge.</p> 	1,945 km	20 yrs
<p>Crash Cushion</p> <p>A crash cushion absorbs energy at a controlled rate; found installed in front of a structure or mounted on the end of a safety fence/barrier.</p> 	217	30 yrs

Asset Type	Quantity	Lifespan
<p>Arrester Bed</p> <p>Area adjacent to the road filled with a material to decelerate and arrest errant vehicles.</p> 	313 m	20 yrs

Table C-1: Ancillary Asset Groups, Quantities and Lifespan

Asset Type	Quantity
Landscaping	
<p>Bulb Area</p> <p>An area of naturalised or planted bulbs.</p> 	129,056 m ²
<p>Grassed Area</p> <p>A defined area of predominantly grass cover ranging from highly maintained road verges or feature areas to unimproved, low maintenance grasslands which are often more remote from the carriageway or covering embankments or cuttings.</p> 	29 km ²
<p>Hedge/Hedgerow</p> <p>Linear planting, may include trees.</p> <ul style="list-style-type: none"> • Hedge - intended to be formally shaped and maintained. • Hedgerow - not intended to be formally maintained. 	276 km
<p>Scrub</p> <p>An area of self-seeded vegetation, often comprising gorse, broom, birch, alder and/or bramble up to a height of approximately 3m.</p> 	6 km ²

Asset Type	Quantity
<p>Shrub</p> <p>An area of small to medium-sized woody plants that are generally smaller than trees.</p> 	215,965 m ²
<p>Tree</p> <p>A perennial plant with a woody self-supported trunk and branches.</p> 	2,171
<p>Wetland</p> <p>An area of permanent or semipermanent water from open water bodies to boggy ground.</p> 	45,105 m ²
<p>Wildflower Area</p> <p>An area of sown, naturalised or naturally occurring herbaceous and/or flowering ground cover species.</p> 	116,172 m ²
<p>Wildlife Mitigation Area</p> <p>Intended to mitigate the potential impact of the road or traffic on wildlife.</p> 	66,345 m ²
<p>Woodland</p> <p>Grouping of predominantly tree species. Can include a shrub and/or a ground cover layer.</p> 	16 km ²
<p>Invasive and Injurious Species</p> <p>An area where there is evidence of Invasive or Injurious species.</p> 	1 km ²

Table C-2: Ancillary Asset Landscape Group and Quantities

C.2.2. Inspections and Surveys

In addition to the surveys described in Section 4.2, our Operating Companies are required to undertake the following inspections:

Specialist Road Markings Surveys

Includes retro-reflectivity testing to ensure that markings of the line can reflect light from the vehicle back to the driver during the hours of darkness and skid resistance testing to ensure that markings are providing a specified level of surface grip.

Specialist Road Stud Testing

Undertaken to ensure that road studs (often referred to as cats' eyes), are reflecting light from vehicle headlights during the hours of darkness.

Specialist Drainage Inspections

Generally undertaken using specialist surveying techniques to investigate a potential problem identified through safety or detailed inspections, such as flooding or blockages.

Landscape Opportunities inspections

Undertaken by the Landscape Architect at intervals not exceeding 12 months in order to identify potential opportunities to improve the landscape associated with the trunk road network.

Specialist Woodland inspections

Inspections of woodland and trees are also required at set intervals.

C.2.3. Monitoring Performance

The performance of ancillary assets is monitored by undertaking regular inspections and surveys. The collection of condition data for ancillary assets will enable us to compare the performance of assets across the trunk road network and assess how they are performing over time.

This information is used to inform maintenance strategies and assess how these assets are performing over time, for any defined scenario.

Ancillary Asset Condition

Ancillary assets are categorised by the severity of their defects according to five levels of service or condition categories. These condition categories are 'excellent', 'good', 'fair', 'poor' and 'very poor'. The condition categories developed for footway and cycle facilities and road markings are shown as examples in Tables C-3 and C-4 below. Further detail on current ancillary asset condition can be found in Section 5.2.3.

Condition Categories	Description
Excellent	<p>New or nearly new condition with no obvious visual defects. May have obvious signs of disturbance in the surrounding grassed areas indicating recent works.</p> 
Good	<p>An even and comfortable surface, free from defects and with few visible signs of surface deterioration. Showing no signs of the original construction works and all surrounding grassed areas returned to vegetation.</p> 
Fair	<p>Free from safety defects but poor visual aesthetics. Evidence of initial deterioration, minor cracking, crazing and fretting. Minor isolated spot defects. Poor quality reinstatements including minor differences in level with original surface. Minor settlement/ unevenness or filler loss on block paved areas.</p> 
Poor	<p>Extensive cracking, failed patching, potholes, standing water (>10mm deep), small areas of depression (>25mm) or slab trips (>20mm). Extensive missing filler and/or loose blocks. Extensive wearing of screed for cycle facilities.</p> 
Very Poor	<p>Requires replacement/ rehabilitation, life expired. Effects include extensive and severe surface failure, cracking, distortion or slab trips. Complete loss of screed for cycle facilities.</p> 

Table C-3: Footway and Cycleway Condition Categories

Condition Categories	Description	
Excellent (E)	New or nearly new. May show obvious signs of new construction and differences in the condition and colour of the surrounding carriageway surface.	
Good (G)	No visual defects with few visible signs of surface deterioration. Very minor signs of weathering.	
Fair (F)	Minor rocking and projections. Level different with carriageway not exceeding 10mm. Relative movement under load not exceeding 10mm. Minor differential between component levels. Minor corrosion of ironwork. Minor deterioration of the surface around the cover.	
Poor (P)	Projections greater than specified maximum (20mm). Level difference with carriageway exceeding 10mm. Rocking under load, worn covers, major differential in component levels. Moderate corrosion of ironwork. Longitudinal gaps greater than 20mm that may cause danger to cyclists or pedestrians.	
Very Poor (VP)	Missing, cracked or broken covers. Rocking grating/cover causing intrusive noise in urban areas. Major corrosion of ironwork. Collapse of chamber, gully frame and /or major deterioration of the surface around the cover.	

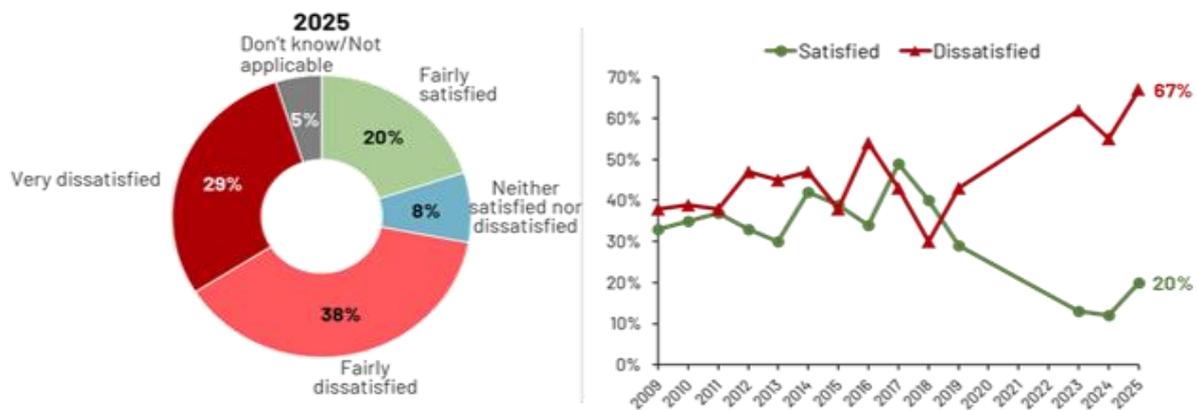
Table C-4: Gully Condition Categories

C.2.4. Customer Satisfaction

Transport Scotland conduct an annual customer survey of users of the trunk road network. Findings include customer satisfaction regarding visibility of road signage (62% either 'very satisfied' or 'fairly satisfied'), provision of lighting along roads (60% either 'very satisfied' or 'fairly satisfied'), provision of signs at decision-making points (60% either 'very satisfied' or 'fairly satisfied'), visibility of road markings (51% either 'very satisfied' or 'fairly satisfied') and provision of laybys and parking facilities (49% either 'very satisfied' or 'fairly satisfied').

There are also specific questions covering satisfaction with the general condition of cycle lane surfaces (20% 'fairly satisfied') and footway surfaces (18% either 'very satisfied' or 'fairly satisfied'), with more detail in Figure C-1 and C-2 below.

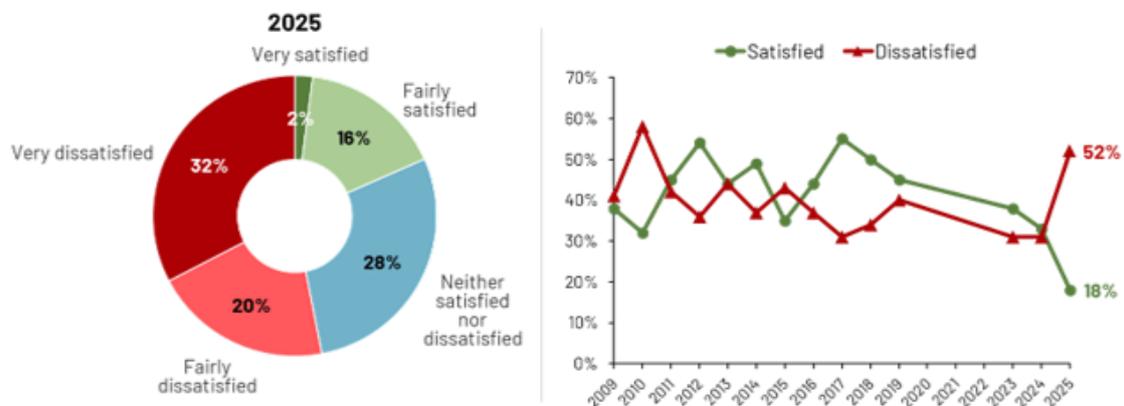
Q. How satisfied or dissatisfied are you with the general condition of cycle lane surfaces?



Base: All who had used a cycle lane on trunk roads in the last year (47)

Figure C-1: Satisfaction with general condition of cycle lane surfaces (2025)

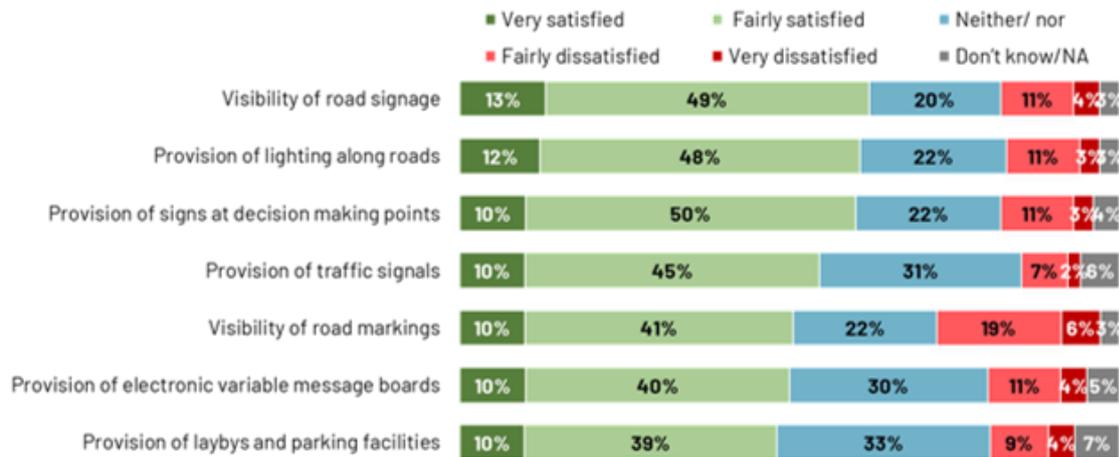
Q. How satisfied or dissatisfied are you with the general condition of footway surfaces?



Base: All who had used a footway on trunk roads in the last year (61)

Figure C-2: Satisfaction with general condition of footway surfaces (2025)

0. How satisfied or dissatisfied are you with the following aspects of trunk roads?



Base: All who had used trunk roads in the past year (1,075)

Figure C-3: Satisfaction with lighting, marking, signage, laybys and parking (2025)³

C.3. Maintenance

Full details of the maintenance requirements for ancillary assets are provided in our Operating Company contracts, (details of which are provided in Section 1.9.1).

Maintenance activities undertaken for ancillary assets typically include:

Cyclic Maintenance

Day-to-day servicing, rather than repair, of assets to keep them operating. Examples include weed control (on footways, cycle lanes, kerbs etc.), pressure jetting of combined kerb drainage, checking tensioning devices on relevant road restraint systems and litter picking.

Reactive Maintenance

Unplanned work normally identified through the inspections described in Section C.2.2 or reports from members of the public. The requirements for defect repairs for all categories of defects are described in the Trunk Road Inventory Manual (TRIM).

³ Where percentages do not sum to 100%, this may be due to computer rounding, the exclusion of 'don't know' categories or multiple answers.

Programmed Maintenance

Moderate to major work which aims to improve the condition and functionality of the asset, planned one or more years in advance. For more information, see Section C.5, Scheme / Programme development.

Winter Service

Transport Scotland undertakes steps it considers reasonable to prevent snow and ice endangering the safe passage of customers utilising the trunk road network. This includes gritting of footways and cycleways.

C.4. Analysis

C.4.1. Historical Trends

Funding since 2021 is outlined in Figure C-4 below, along with illustration of the corresponding trend in condition in Figure C-5.

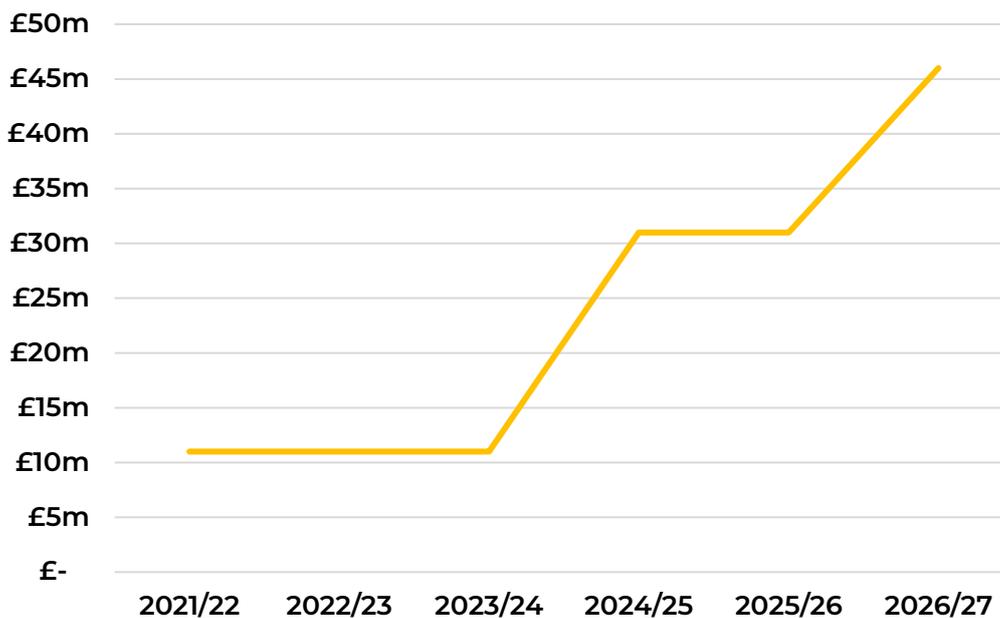


Figure C-4: Trend in Ancillary Asset Funding since 2021

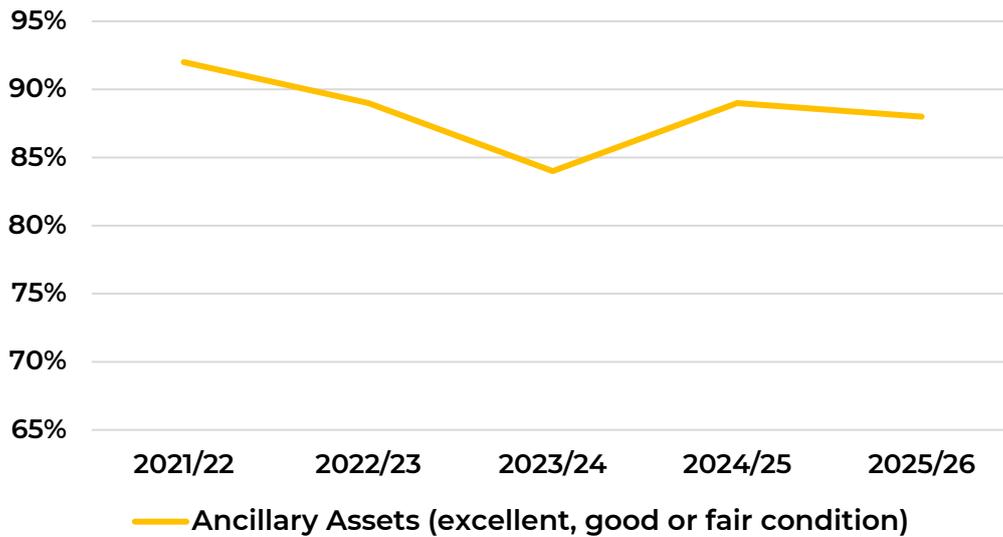


Figure C-5: Trend of Ancillary Assets with ‘excellent’, ‘good’ or ‘fair’ Condition since 2021

C.4.2. Current State of Our Assets

The condition of trunk road ancillary assets, aggregated under eight asset groups is presented in Figure C-6. Currently 98% of lighting assets, 95% of technology assets, 90% of footways, and 90% of road markings are in ‘excellent’, ‘good’, or ‘fair’ condition.

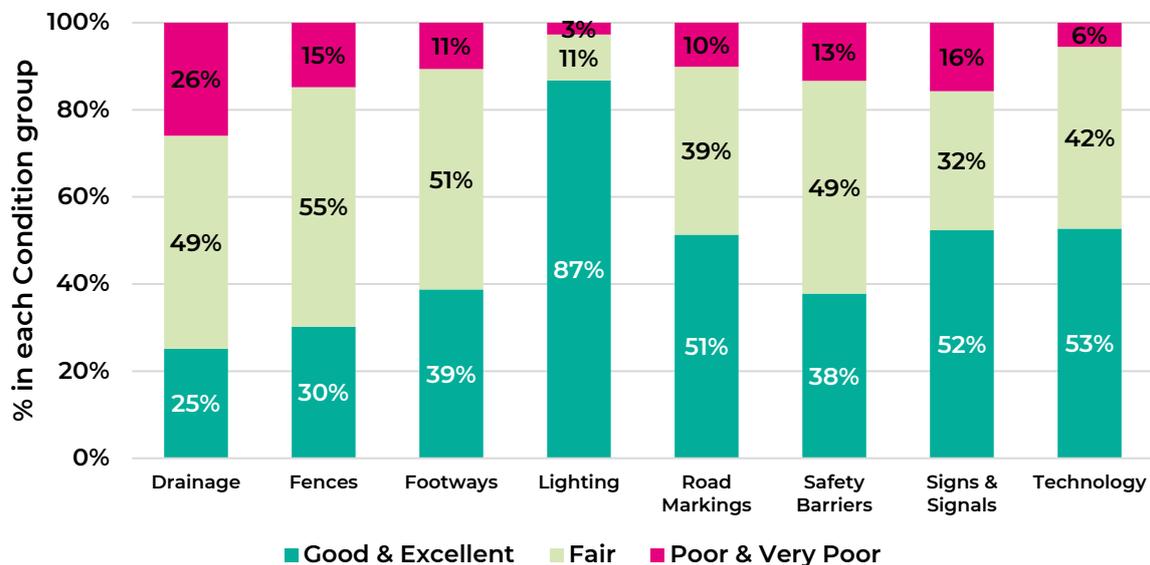


Figure C-6: Current Condition of Ancillary Assets

C.4.3. Investment Scenarios

Further detail to the investment scenarios outlined in Section 5.4 is provided below, with a focus on ancillary assets. Figure C-7 visually compares the different investment options and is supported by additional commentary on the removal of backlog and maintenance of condition scenarios.

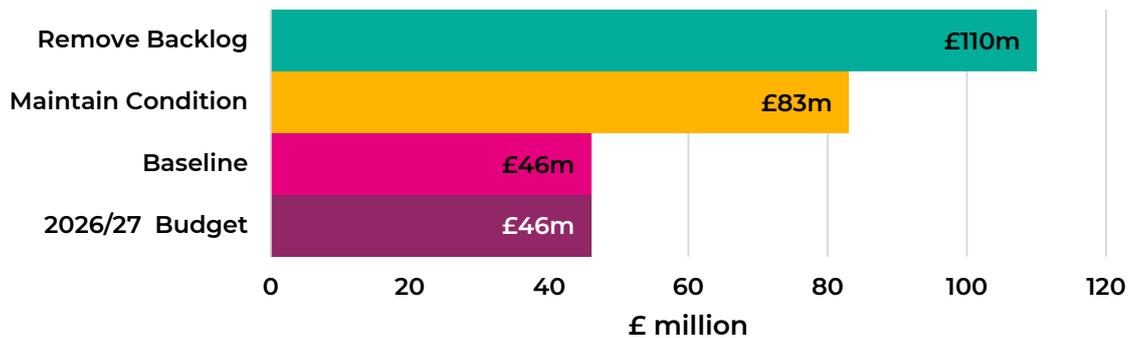


Figure C-7: Summary of Annual Ancillary Assets Investment Scenarios

Budget Required to Remove Backlog

To remove the £256 million ancillary asset maintenance backlog within ten years, an average investment of £110 million per annum is required (excluding CPF). (See Figure 5-7 in the RAMP for more information on the backlog).

Budget Required to Maintain Current Condition

The investment required to maintain trunk road ancillary assets at current condition levels is £83 million per annum (excluding CPF).

Baseline Budget Required to Meet Core Commitments

The minimum funding necessary to ensure road safety for users, in line with statutory obligations and national standards.

C.5. Scheme / Programme Development

An annual process of developing works programmes is applied, with draft programmes developed for one and three years ahead. This allows for short and medium-term planning on a rolling basis.

The Operating Companies then meet with Transport Scotland to review the draft programmes and estimates, and indicative budgets are allocated. Detailed estimates can then be developed for each scheme within the one-year programmes and ultimately finances and works orders are agreed and issued before work commences.

The purpose of an ancillary asset scheme is to deliver appropriately designed planned maintenance to improve or renew the asset, based upon its current condition. The treatment undertaken should enable the asset to be reset to a condition that removes the need for further maintenance (besides routine maintenance) during the expected serviceable life of the asset.

Where appropriate, renewals of ancillary assets are undertaken as part of programmed carriageway or structure maintenance schemes as this will reduce disruption to the road user and provide good value for money.

Renewals

Programmed maintenance on ancillary assets is typically of a lesser nature than those undertaken on carriageways and structures, for example:

- Patching and maintenance of footways and cycle lanes
- Replacing roadside kerbs
- Road lighting and electrical work
- Repair and/or replacement of safety fences
- Repainting of road markings and replacement of road studs
- Repair and remedial works to earthworks, embankments and cuttings

Our Operating Companies are required to log all Category 2 defects found during Detailed Inspections in our Asset Management Performance System (AMPS). They are then required to produce short to medium-term work programmes by prioritising, preparing and submitting programmes and bids for the repair of these defects while at the same time taking account of service life and life cycle requirements. Where appropriate, renewals of ancillary assets are undertaken as part of programmed carriageway or structure maintenance schemes as this will reduce disruption to the road user and provide good value for money.

Appendix D. Intelligent Transport Systems (ITS)

D.1. Overview

The Traffic Scotland Service (TSS) is underpinned by our Intelligent Transport Systems (ITS) assets, encompassing physical roadside assets and underlying software and hardware IT solutions. These assets proactively monitor, capture and communicate traffic and travel information to enhance safety, minimise disruption and support resilience of the transport network.

Transport Scotland has contracts in place with an ITS infrastructure contractor to ensure that our roadside assets are appropriately inspected, monitored, managed, maintained and repaired, and with a specialist systems contractor to provide the appropriate regime is in place to maintain the software and hardware estate. Where our roadside assets are gantry or structure mounted these are the responsibility of the relevant operating company for the area and our supply chain work closely to ensure coordination of maintenance activities.

This section of the RAMP describes asset-specific information that is used to develop the life cycle plan for trunk road ITS assets, as detailed in Section 4.1.

D.2. Asset Knowledge

D.2.1. The ITS Assets

Table D-1 details the physical roadside ITS assets, their definitions and quantities. The inventory records held for the ITS assets comply with the requirements set down in Traffic Scotland Infrastructure Contract (TSIC).

ITS asset information management is well-developed but is at an earlier stage than the other asset classes included in the RAMP. This means that less data is available for analysis. Improving data availability for these assets is one of our priorities.

Asset Type	Quantity	Lifespan
<p>Aircraft Warning Light</p> <p>Gantry-mounted warning lights used to alert aircraft pilots of the presence of a tall structure.</p> 	3	15 yrs
<p>Cabinet & Pillar</p> <p>A cabinet or pillar, usually containing electronic and/or communications, traffic signal equipment or similar equipment.</p> 	5,124	15 yrs
<p>Cables</p> <p>Multi-pair copper and fibre optic cabling, power cables and composite CCTV cables.</p> 	1,474 km	25 yrs
<p>CCTV Cameras</p> <p>CCTV camera, speed camera, or other camera.</p> 	468	15 yrs
<p>CCTV Cameras – Mobile</p> <p>A trailer-based CCTV camera or post mountable camera for occasional use.</p> 	12	15 yrs
<p>Communication Device</p> <p>Various communications devices</p> 	2,892	15 yrs

Asset Type	Quantity	Lifespan
<p>Electric Vehicle Charger Electric vehicle charging equipment.</p> 	2	10 yrs
<p>Emergency Roadside Telephones SOS telephone located on motorway class and other special roads for use in an emergency.</p> 	917	15 yrs
<p>Fuel Cell Hydrogen based electrical energy source for off-grid applications.</p> 	1	10 yrs
<p>Gantry – Electrical Installation Electrical control equipment supplying energy to motorway gantries.</p> 	269	25 yrs
<p>Generator Electrical back-up power supply for various ITS installations on the Trunk Road Network and Control Rooms.</p> 	6	15 yrs

Asset Type	Quantity	Lifespan
<p>Masts & Posts</p> <p>Mast or Post for mounting closed-circuit television camera, speed camera or other camera and other ancillary equipment.</p> 	621	25 yrs
<p>Meteorological Installation</p> <p>Equipment, consisting of sensors, and controllers reporting on meteorological conditions.</p> 	6	15 yrs
<p>Motorway Electronic Signs</p> <p>Electronic signs located on the motorway network providing lane specific information.</p> 	1,092	15 yrs
<p>Multi-Purpose Controller</p> <p>Communications device used to control multiple roadside devices.</p> 	456	15 yrs
<p>NTDS Traffic Counters</p> <p>Traffic counting and classification equipment</p> 	704	15 yrs
<p>Ramp Metering – Infrastructure</p> 	6	15 yrs

Asset Type	Quantity	Lifespan	
Motorway slip road control equipment providing traffic signal controlled entry.			
<p>Solar Panel Installation</p> <p>Solar panel installations to provide alternative power source.</p>		674	15 yrs
<p>Traffic Detection Infrastructure</p> <p>Equipment used to detect the presence of traffic.</p>		2,472	15 yrs
<p>Traffic Scotland Monitoring Unit</p> <p>Equipment used to monitor traffic flow, speed and direction and incident detection.</p>		518	15 yrs
<p>Transmission Building – Other Electrical</p> <p>Specialised roadside building used to house communications and control equipment.</p>		10	25 yrs
<p>Uninterruptible Power Supply</p> <p>Battery based equipment to maintain power in the event of electrical supply loss.</p>		79	10 yrs

Asset Type		Quantity	Lifespan
<p>Variable Message Signs</p> <p>Electronic variable message sign used to disseminate traffic and travel information directly to the roadside.</p>		326	15 yrs
<p>Variable Message Signs – Mobile</p> <p>A trailer-based variable message sign for occasional use i.e. during events or temporary situations where no permanent installation exists.</p>		8	15 yrs
<p>Voice Gateway</p> <p>Equipment used to manage and route roadside telephony from SOS telephones.</p>		70	10 yrs
<p>Weigh In Motion – Infrastructure</p> <p>Equipment used to dynamically measure the weight of passing traffic.</p>		36	15 yrs
<p>Wind Turbines</p> <p>Wind turbine used to generate power at off-grid locations.</p>		10	10 yrs

Table D-1: ITS Asset Groups and Quantities (Roadside)

The following Table D-2 details the equipment that comprises the systems estate. The inventory records (2734 assets) held for the ITS assets comply with the requirements set down in the second Traffic Scotland Systems Contract (TSSC2).

Asset Type	Quantity	Lifespan
Modem Hardware	87	10 yrs
IP Router	275	10 yrs
Server	84	7 yrs
IP Switch	1017	10 yrs
IP Server	28	7 yrs
Network Gear	180	10 yrs
IP Firewall	24	10 yrs
Hardware	142	10 yrs
Computer	609	7 yrs
Windows Server	62	7 yrs
Miscellaneous IP Equipment	226	10 yrs

Table D-2: ITS Asset Groups and Quantities (Systems Estate)

D.2.2. Inspections and Surveys

Condition Assessment

Condition rating of the present condition of Traffic Scotland ITS for the purposes of making decisions for planned maintenance or replacement are undertaken in accordance with Table D-3.

Condition Categories	Description
A	Installed or refurbished within last six (6) months.
B	Functioning in accordance with the Manufacturer's Documentation, shows slight wear, or minor damage and unlikely to result in disruption to the Traffic Scotland Service.
C	Functioning in accordance with Manufacturer's Documentation, shows increased wear or damage and has the potential to result in disruption to the Traffic Scotland Service.
D	Not functioning in accordance with Manufacturer's Documentation or is subject to Repeat Faults and likely to result in disruption to the Traffic Scotland Service at any time.
X	Added to Condition Ratings C or D above to indicate it is impossible to function in accordance with the Manufacturer's Documentation, or Spares are unavailable or obsolete, or Records confirm less than two (2) years Economic Life Expectancy.

Table D-3: Intelligent Transport Systems condition categories

A Condition Rating shall be performed in accordance with the frequencies set out in the Planned Maintenance Task Schedules. See the Traffic Scotland Operations and Infrastructure Services Contract for more information.

D.2.3. Monitoring Performance

The state of the ITS asset base is not calculated solely from its condition. As many assets are related to technology, it is not always possible to get a condition score and they typically will have a relatively shorter life expectancy compared to other assets found on the road network such as pavements, which can be operable for decades. Renewal strategies to improve the asset include the identification and phased renewal of obsolete technology, sites past economic life expectancy, under-performing technology and substandard or hazardous infrastructure.

Obsolescence of technology assets is a major factor which we monitor, to ensure that our systems will be able to communicate with one another and interact with our hardware. Unlike condition, obsolescence is more difficult to track as assets may become unsupported by a provider at relatively short notice.

The Traffic Scotland Infrastructure Contractor (TSIC) provides the management and maintenance of the ITS assets and for the provision of traffic information to the public. Our contracted supplier provides us with an annual summary report with key asset information and analysis which is used during our asset management planning processes.

Further detail on current ITS asset condition can be found in Section 5.2.4.

D.2.4. Customer Satisfaction

Transport Scotland's ongoing customer survey of users of the trunk road network has a question covering satisfaction with the provision of electronic message boards, with 50% either 'very satisfied' or 'fairly satisfied' as per the 2025 results. User survey results indicate that 34% of users have used the Traffic Scotland website for the provision of information.

D.3. Maintenance

Full details of the maintenance requirements for ITS assets are provided in our ITS contracts, (details of which are provided in Section 1.9.2). Maintenance activities cover the following:

D.3.1. ITS Roadside Assets

Routine maintenance activities typically include electrical testing, structural testing, cleaning of CCTV Cameras and Emergency Roadside Telephones.

Reactive maintenance is typically identified through self-reporting or inspections but may also arise from reports from the Police or public. Faults are categorised dependent on severity and responded to in accordance with contractual requirements.

D.3.2. ITS Systems Estate

Routine maintenance activities typically include server maintenance, software patching of IT equipment, licence renewals and other duties required to ensure the system is operating as expected.

Reactive maintenance is typically identified through systems user reporting on observed performance levels or routine / regular inspections and monitoring.

D.4. Analysis

D.4.1. Historical Trends

Funding since 2021 is outlined in Figure D-1 below.

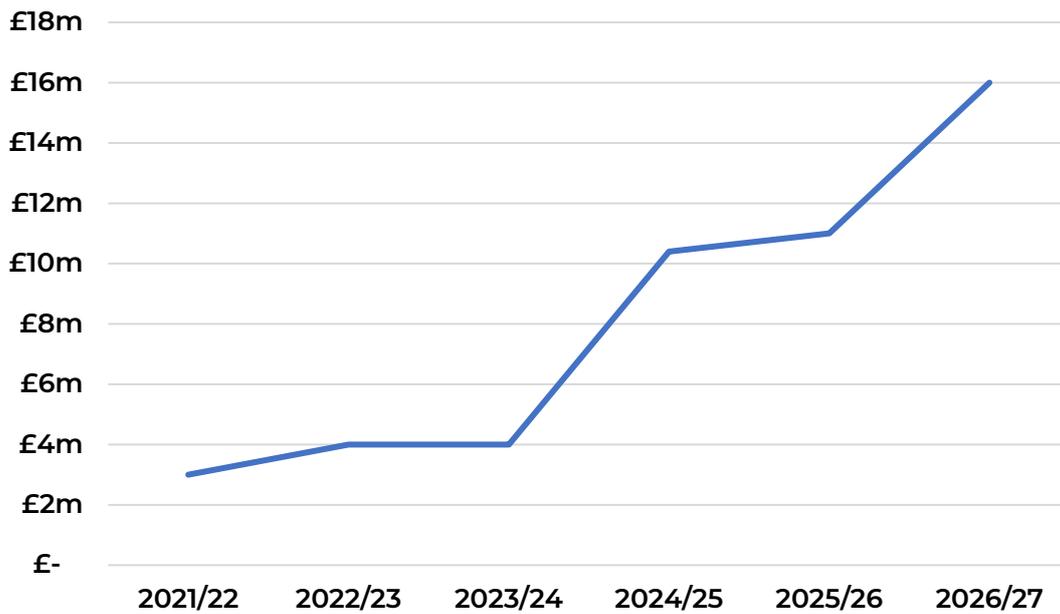


Figure D-1: Trend in ITS Asset Funding since 2021

D.4.2. Current State of Our Assets

The condition of our ITS assets, aggregated under eight asset groups, is presented in Figure D-2. Currently 81% of comms assets, 77% of power supplies, 73% of data collection assets, and 66% of cables are in 'excellent', 'good', or 'fair' condition.

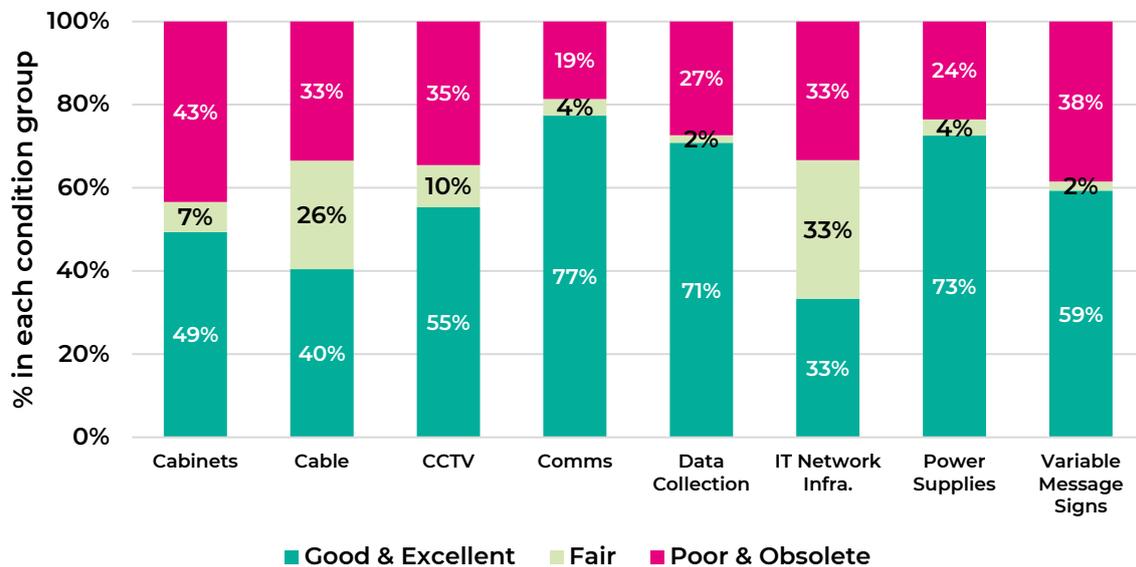


Figure D-2 Current Condition of ITS Assets

D.4.3. Investment Scenarios

Further detail to the investment scenarios outlined in Section 5.4 is provided below, with a focus on ITS assets. Figure D-3 visually compares the different investment options and is supported by additional commentary on the removal of backlog and maintenance of condition scenarios.

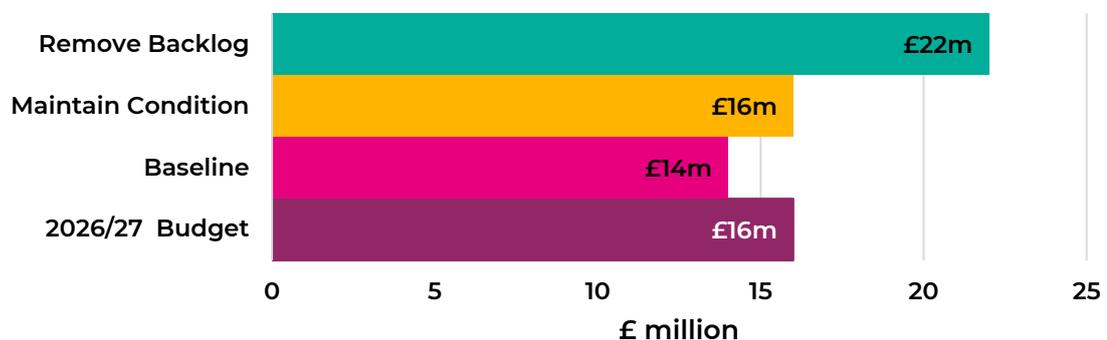


Figure D-3: Summary of annual ITS Assets Investment Scenarios

Budget Required to Remove Backlog

This scenario seeks to remove the £91 million maintenance backlog within ten years. An average investment of £22 million per annum is required (excluding CPF). (See Figure 5-7 in the RAMP for more information on the backlog).

Budget Required to Maintain Current Condition

The investment required to maintain Traffic Scotland assets at current condition levels is £16 million per annum (excluding CPF), which is in line with the 2026/27 indicative budget.

Baseline Budget Required to Meet Core Commitments

The minimum funding necessary to ensure road safety for users, in line with statutory obligations and national standards.

D.5. Scheme / Programme Development

An annual process of developing works programmes is applied, with draft programmes developed on a rolling one year and three-year basis.

Transport Scotland then review the draft programme with both the TSIC and TSSC2 and indicative budgets are allocated on an annual basis. Both contracts have an element of lump sum works and separate works that are agreed on a task-by-task basis.

Transport Scotland are undertaking a significant upgrade of roadside assets, particularly motorway signal units and variable message signs. Similarly, an investigation into the future of the TSS will necessitate a specific programme of investment to be developed. This investigation offers the opportunity to deliver a step change in the efficiency and effectiveness of the TSS and enhance its importance.

Appendix E. Our customers and their requirements

Customer group Example customers included	What they want	How we engage
<p>Road users</p> <ul style="list-style-type: none"> • Public • Bus companies • Haulage organisations • Tourists 	<ul style="list-style-type: none"> • A safe, accessible trunk road network that supports economic growth. • Consistent, responsive, flexible customer service. • Information about the network to make choices. • Consultation about issues and changes. 	<ul style="list-style-type: none"> • Social media, Traffic Scotland, and more conventional means. • Through our Operating Companies, which manage day-to-day customer interactions. • Formally through our road user surveys. • Through community engagement and consultations and industry groups.
<p>Scottish Government</p> <ul style="list-style-type: none"> • Ministers • Members of Scottish Parliament (MSPs) 	<ul style="list-style-type: none"> • Delivery of the current Transport Scotland Corporate Plan and the National Transport Strategy. • Support in delivering the Scottish Government's priorities and National Outcomes. • Information to support policy making and decisions. 	<ul style="list-style-type: none"> • Through our formal governance structures. • Via the Scottish Parliament. • Directly in response to questions from MSPs.

Customer group Example customers included	What they want	How we engage
<p>Road authorities</p> <ul style="list-style-type: none"> • Local roads authorities (such as councils) • National Highways • Welsh Government <ul style="list-style-type: none"> • Northern Ireland Government • Road action groups 	<ul style="list-style-type: none"> • Collaboration to achieve joint outcomes such as improved road safety. • Information to support decisions about local transport. • Consultation about issues and changes which affect them. • Knowledge sharing on best practice. • Collaboration on developing standards for roads construction (such as the Design Manual for Roads and Bridges). 	<ul style="list-style-type: none"> • Through Regional Transport Partnerships. • Via the Inter-Ministerial Group for Transport. • Through the partnerships established to deliver the Road Safety Framework.
<p>Supply chain</p> <ul style="list-style-type: none"> • Operating Companies • Construction companies <ul style="list-style-type: none"> • Consultants • Other suppliers 	<ul style="list-style-type: none"> • Clear requirements on services provided to deliver effective asset management as part of the AM framework. • Information to perform the required services effectively. • Fair contracts and payment terms • Certainty of work and budget to allow effective planning and delivery. 	<ul style="list-style-type: none"> • Via our Operating Company governance structures. • Through supplier awareness days. • Through the management of specific projects. • Through the Supplier Development Programme.

Customer group Example customers included	What they want	How we engage
<p>Emergency services</p> <ul style="list-style-type: none"> • Police Scotland • Scottish Fire and Rescue • Scottish Ambulance • Motor recovery organisations 	<ul style="list-style-type: none"> • Collaboration to manage public and national safety and security and to ensure the accessibility and free movement of traffic on the trunk road network. 	<ul style="list-style-type: none"> • Daily, via our Operating Companies to manage incidents and incident strategy. • Through the partnerships established to deliver the Road Safety Framework.
<p>Transport Scotland staff</p> <ul style="list-style-type: none"> • Staff 	<ul style="list-style-type: none"> • Understanding of their role on delivering effective asset management. • Information, policies, procedures and guidance to perform their role. 	<ul style="list-style-type: none"> • Through our internal governance structures and operational planning/ delivery meetings. • With training on systems, policies and procedures.
<p>Partners</p> <ul style="list-style-type: none"> • Sustainable transport groups • Environmental partners • Disability Assistance • Development organisations 	<ul style="list-style-type: none"> • Collaboration to achieve joint outcomes such as reduced carbon emissions, increased active travel and an accessible trunk road network. • Information about Transport Scotland activities. • Consultation about issues and changes which affect them and their stakeholders. 	<ul style="list-style-type: none"> • Through Regional Transport Partnerships. • Through community engagement and consultations relating to specific projects and schemes.

Table E-1: Our customers, their requirements and our delivery

Appendix F. NMC Performance Indicators (PIs) & Monitoring Indicators (MIs)

Performance Indicators (PIs)

Ref No.	PI	Description	Aim
1	RIDDOR (Reporting of Injuries, Diseases and Dangerous Occurrences Regulations)	The incident rate based on the number of RIDDOR 'reportable' accidents, incidents injuries and diseases reported within working sites under control or supervision of the Operating Company.	To measure the effectiveness of the Operating Company's safety processes by monitoring the incident rate per 100,000 hours worked.
2	Repair of Structures Category 1 Safety Defects	Percentage of Category 1 Structures Parapet defects repaired within contractual timescales.	To measure the Operating Company's performance in carrying out safety critical maintenance in a timely manner.
3	Repair of Category 1 Safety Defects	Percentage of Category 1 defects repaired within contractual timescales (excluding Structures Parapet defects).	To determine the extent to which the Operating Company repairs Category 1 defects within the required timescales.
4	Asset Data Quality Audit	An outcome-based measure of the quality of asset data of the road network based on the Trunk Road Information Manual (TRIM), by process of Audit.	To measure the quality of Mandatory and Desirable Inventory Data fields by the Operating Company.

Ref No.	PI	Description	Aim
5	Routine Monitoring Inspections	Percentage of days on which link/sections of the Unit are within the required inspection interval for Routine Monitoring Inspections.	To measure the Operating Company's performance in carrying out Routine Monitoring Inspections.
6	Comprehensive Inspections	Percentage of Comprehensive Inspections carried out within the required intervals.	To measure the Operating Company's performance in carrying out Comprehensive Inspections.
7	Cyclic Maintenance	Percentage of asset (excluding maintenance of grassed areas) maintained within the required timescales.	To measure the Operating Company's performance in carrying out maintenance.
8	Structures Principal Inspections	Percentage of Structures Principal Inspections and reports carried out to agreed programme.	To measure the Operating Company's performance in carrying out Structures Principal Inspections on programme.
9	Structures General Inspections	Percentage of Structures General Inspections and reports carried out to agreed programme.	To measure the Operating Company's performance in carrying out Structures General Inspections on programme.
10	Structures Maintenance Programme	Percentage of Structures Cyclic Maintenance completed to agreed programme.	To measure the Operating Company's performance in carrying out Spring and Autumn Cyclic Maintenance Activities on programme.
11	Well-lit Network	Percentage of LED Luminaires and Lighting points operational on the Unit.	To monitor the number of operational LED road lighting points on the network.
12	Winter Treatments Efficiency	Call-out treatments carried out during the Winter Service Period compared to 1,000 precautionary treatments.	To measure the efficiency of the Operating Company when performing planned treatments and the suitability of the precautionary treatment routes.

Ref No.	PI	Description	Aim
13	Weather Forecast Accuracy	Miss rate when forecasting the frost or no frost surface condition during the Winter Service Period.	To measure the accuracy of frost reporting, which should be used as a basis for preventative treatments.
14	Remedial Notices	Number of Remedial Notices remaining open beyond agreed timescales.	To measure the performance of the Operating Company in closing out Remedial Notices.
15	Closure of Non-Conformances	Number of Performance Audit Group Non-Conformances outstanding beyond agreed timescales.	To measure the Operating Company's performance in the closure of Performance Audit Group-raised Non-Conformances.
16	Complaints Response Time Compliance	Percentage of complaints responded to within required timescales.	To measure the Operating Company's performance in responding to complaints from any channel.
17	Planning Applications	Percentage of planning applications processed within the required timescales and to the required quality.	To measure the Operating Company's performance in processing planning applications effectively and within the required timescale.
18	OC Correspondence and Call Response Time Compliance	Percentage of requests and correspondence (excluding complaints) responded to in compliance with required timescales.	To measure the Operating Company's performance in responding to customer requests and correspondence.
19	Carbon Emissions	Measurement of annual carbon emissions in comparison to the second Annual Period benchmark.	To measure the Operating Company's performance in reducing its carbon emissions.
20	Grassed Area Maintenance	Percentage of grassed area maintained in accordance with the Scottish Minister's Requirements.	To measure the Operating Company's performance in maintaining grassed areas.

Ref No.	PI	Description	Aim
21	Salt Spread	The percentage of compliant treatments using salt with the Precautionary Treatments Matrix and in accordance with the Winter Service Plan.	To measure the compliance of the treatments with the Precautionary Treatments Matrix.
22	Litter and Refuse	The percentage of litter and refuse cleaning activities achieved to schedule.	To ensure that the Unit is being kept clear of litter and refuse in compliance with the Code of Practice on Litter and Refuse (Scotland) 2018.
23	Review and Inspection of Structures Assets with Known Defects	Percentage of Structures with known defects inspected and reviewed within the required timescales.	To measure the response to the Operating Company's performance for structures where there is a known defect.
24	Inventory Data Completion	An outcome-based measure of the inventory data of the road network based on the Trunk Road Inventory Manual (TRIM).	To measure the completion of Mandatory and Desirable Inventory Data fields by the Operating Company.
25	Approvals for Structural Maintenance (Series 0100 Schemes)	An outcome-based measure of the Series 0100 Structural Maintenance works programme scheme approvals as a percentage of the Required works programme value.	To measure the percentage of the Statements of Intent (SOIs) or Scheme Approvals (SAs) in place for planned Series 0100 Structural Maintenance schemes for the forward year.
26	Submission of Planned Maintenance Works (Series 0300 Schemes)	An outcome-based measure of Series 0300 Patching schemes submitted by the contractual deadline.	To measure the percentage of Series 0300 Scheme Statement of Intent (SOI) submissions for Patching schemes that were received by TS a minimum of 25 working days prior to the Commencement of the scheme build.
27	Incident Response	Percentage of Incident Responses within the required timescales.	To measure the Operating Company's performance in providing Incident Response.

Ref No.	PI	Description	Aim
28	Sustainability - Waste Generation and Management	Percentage of waste materials re-used or recycled.	To measure the amount of waste generated by the Operating Company's Operations.
29	Timely Upload of Construction Phase Plans	Percentage of Construction Phase Plans uploaded to AMPS at least 7 days in advance of the construction start date.	To measure the Operating Company's performance in providing a sufficient review period for TS and PAG of Construction Phase Plans.
30	Timely Upload of Final Health and Safety Files	Percentage of Final Health and Safety Files uploaded to AMPS within 30 days of Scheme Completion date.	To measure the Operating Company's performance in uploading Final Health and Safety Files to AMPS in a timely manner.
31	Asbestos Action Plans	Percentage of Asbestos Action Plans in place.	To measure the Operating Company's performance in producing Asbestos Action Plans to cover the whole trunk road network by April 2025 in accordance with GD5/16 of the DMRB.

Table F-1: NMC Performance Indicators

Monitoring Indicators (MIs)

Ref No.	PI	Description	Aim
1	Operations Instructions completed on Target	Percentage of Operations Instructions completed by the proposed finish date.	To measure the Operating Company's performance in completing Operations Instructions.

Ref No.	PI	Description	Aim
2	Network Availability	The Lane length availability on the Unit.	To measure Lane availability over the existing network.
3	Traffic Disruption caused by Un-programmed Work	The Lane length and duration unavailable on the Unit due to un-programmed work.	To measure disruption caused by un-programmed work in terms of Lane/km/hours.
4	Orders against Expenditure Profile	Percentage of ordered work against budget.	To measure value of work ordered for the current Financial Year at the end of each reporting period against the accumulated profiled spend as set at the end of the reporting period.
5	Programme Completion	Percentage of the annual forward programme delivered within 7 days of initial programme completion date.	To measure the percentage accuracy of the completion dates of works outlined in the expenditure profile.
6	Accuracy of Operations Cost Estimates	Accuracy of cost estimates for Operations on site.	Measure the accuracy of the Operating Company's estimates for Operations.
7	Forward Planning Spend	Percentage of the spend for works delivered against original allocation.	To measure the percentage accuracy of the spend for works against original allocation, with breakdown for each cost code.
8	Staff Turnover	Percentage staff turnover during last 12 months.	To measure staff turnover.
9	Working Hours	Average hours worked per employee in the reporting period.	To measure the average number of hours worked per employee.

Ref No.	PI	Description	Aim
10	Training	Average number of training hours per employee provided in last 12 months.	To measure the Operating Company's performance in providing training and development to all direct employees.
11	KSI Accident Frequency Rate	Counting incidents of Killed or Seriously Injured across the Unit.	Incentivise the OC to reduce KSI incidents through own initiatives, safety schemes and innovations.
12	Observations Resulting from Inspections and Hazard Notices	Percentage of Observations Resulting from Inspections and Hazard Notices responded to within the required timescale.	To measure the number of Observations resulting from Inspections and Hazard Notices responded to within the required timescale.
13	Innovation	Financial value of innovations introduced by the Operating Company.	To measure the Operating Company's performance in delivering an efficient and effective service whilst minimising costs.
14	Collaboration	Value of collaborative services provided by Operating Company.	To measure the Operating Company's performance in providing efficiency savings in the provision of public sector services through collaborative agreements.
15	Submission of Reports	Percentage of monthly reports and submissions that are submitted within the required timescales.	To measure the Operating Company's performance in the submission of the reports and submissions.
16	(Ultra) Low Emission Vehicles (ULEV)	Percentage of the car and van fleet (up to 3.5 tonnes) classified as ultra-low emission vehicles.	To measure the amount of ULEV in the Operating Company's fleet.
17	ULEV Usage	Percentage of the total distance travelled in the car and van fleet (up to 3.5 tonnes) using electric mode, classified as ultra-low emission vehicles.	To measure the usage of ULEV in the Operating Company's fleet.

Ref No.	PI	Description	Aim
18	Salt Usage	Total amount of salt used in each Annual Period as a percentage of the amount used in the first Annual Period following Commencement of Service Date (used as a benchmark).	To monitor the amount of salt used during the Winter Service Period.
19	Potassium Acetate Usage	Total amount of potassium acetate used in each Annual Period as a percentage of the amount used in the first Annual Period following Commencement of Service Date (used as a benchmark).	To monitor the amount of potassium acetate used during the Winter Service Period.
20	Community Engagements and Community Benefits	The percentage of all opportunities created, visits and tours undertaken, and meetings attended during the reporting period.	To measure the Operating Company's performance in engaging with communities.
21	Injurious Weeds	Percentage reduction in injurious weed extents on the network.	To measure the performance of the operating companies in relation to management of injurious weeds within the unit with a target (to be agreed with the director) to increasingly reduce the amount each year.
22	Winter Treatments Time Compliance	Percentage of Winter Service treatments carried out in compliance with the required timescales.	To measure the Operating Company's performance in carrying out Winter Service activities.
23	Ice Alarms	Total number of activations from road sensors and mobile road sensors due to the presence of ice on the surface.	To measure the Operating Company's performance in carrying out Winter Service activities.

Ref No.	PI	Description	Aim
24	Electronic Data Capture of Pavement Maintenance Schemes	Percentage of schemes >£250k where electronic data has been captured during the delivery of the works.	To measure the performance of the Operating Company's performance in the collection of electronic data during pavement maintenance works.
25	User's Perception of the Quality of Maintenance	The perceived quality of the maintenance of the roads based on the annual Survey of trunk road users in Scotland.	To measure the satisfaction of the Operating Company's quality delivery to road users.
26	Satisfaction Level with OC Responses to Enquiries	Percentage of customers declaring satisfied with the Operating Company-related enquiries response on the satisfaction questionnaire.	To measure the satisfaction of the Operating Company's quality delivery to customers in its responses.
27	Works Contracts Cost Estimates	Accuracy of Works Contracts cost estimates.	To measure the accuracy of the Operating Company's estimates for Works Contracts.
28	Works Contracts Out Turn Costs	Success in delivering Schemes at the awarded tender value.	To measure the Operating Company's success in delivering Schemes at the awarded tender value.
29	Structures Condition Management (BCI AVE)	Target percentage of Structures listed within the Structures Programme exhibiting poor or very poor Bridge Condition Indices (BCIAVE) scores.	To measure the Operating Company's performance in maintaining or improving asset condition for all assets within its programme remit.
30	Structures Condition Management (BCI CRIT)	Target percentage of Structures not exhibiting poor or very poor Bridge Condition Indices (BCICRIT) scores.	To measure the Operating Company's performance in maintaining or improving asset condition.
31	Bids against Expenditure Profile	Percentage of ordered work against expenditure profile.	To measure value of work ordered for the current Financial Year at the end of each reporting period

Ref No.	PI	Description	Aim
			against the accumulated profiled spend as set at the end of the reporting period.
32	Accessibility Barriers	Percentage yearly reduction in the number of barriers to access on the trunk road network.	To measure the Operating Company's success in providing a Unit that is accessible to all road users.
33	Use of Reused, Recycled, Renewable Materials	Percentage of raw materials used sourced from reused, recycled or renewable sources.	To encourage sustainability and the use of reused, recycled, renewables materials.
34	Well Lit Network	Percentage of days on which link/sections of the Unit are within the required inspection interval for Routine Monitoring Inspections.	To monitor the proportion of lit assets to lighting defects on the network.

Table F-2: NMC Monitoring Indicators

Appendix G. ITS Performance Indicators (PIs) & Monitoring Indicators (MIs)

Performance Indicators (PIs)

Ref No.	KPI	Description	Aim
1	RIDDOR	The incident rate based on the number of RIDDOR 'reportable' accidents, incidents, injuries and diseases reported within working areas under control or supervision of the Contractor.	To measure the effectiveness of the Contractor's safety processes by monitoring the Incident Rate per 100,000 hours worked, according to the standard reporting practice of the Health and Safety Executive.
2	Repair to Class 1 Faults	The percentage of repair to Class 1 Faults carried out within the required timescales.	To measure the Contractor's performance in undertaking repair to Class 1 Faults.
3	Repair to Class 2 Faults	The percentage of repair to Class 2 Faults carried out within the required timescales.	To measure the Contractor's performance in undertaking repair to Class 2 Faults.
4	Repair to Class 3 Faults	The percentage of repair to Class 3 Faults carried out within the required timescales.	To measure the Contractor's performance in undertaking repair to Class 3 Faults.
5	Repair to Class 4 Faults	The percentage of repair to Class 4 Faults carried out within the required timescales.	To measure the Contractor's performance in undertaking repair to Class 4 Faults in line with their proposed programme.
6	Planned Maintenance	Percentage of Planned Maintenance visits carried out on the asset (Traffic Scotland Equipment) within the required timescales, all in accordance with Schedule 2, Scope.	To measure the Contractor's performance in carrying out Planned Maintenance.

Ref No.	KPI	Description	Aim
7	Data Service Equipment Availability	Percentage of Traffic Scotland Equipment that records Traffic Data available/operational on the Road Network. The item total shall be taken as the sum of all Data Services Counter Sites as listed within the National Traffic Data System (NTDS).	To measure the number of operational Traffic Scotland Equipment that records Traffic Data on the Road Network supporting the Data Service.
8	Asset Data Completion	An outcome-based measure of the quality of asset data for Traffic Scotland Equipment based on the data fields within the Asset Management Performance System (AMPS).	To measure the completion and quality of Inventory data fields within AMPS by the Contractor.
9	Carbon Emissions Reduction	Measurement of annual carbon emissions in comparison to first Annual Period benchmark based on the Contractor's direct emissions from owned or controlled sources (including buildings and vehicle fleet).	To measure the Contractor's performance in reducing its carbon emissions reduction with year-on-year improvements following the baseline year, required year on year % reduction expectations for the contract are to be agreed with the TS Environment team (and be between 1% and 20%).
10	Asbestos Management Plan	The Contractor is required to complete the outstanding Traffic Scotland Equipment site assessments (60%) within an Asbestos Management Plan provided by the Director at Commencement of Service and provide a programme (for agreement) for completion of the required works by 2025. The Contractor will then be assessed on delivery against the proposed programme on a quarterly basis.	The Contractor will deliver the assessments of Traffic Scotland Equipment sites programmed on a quarterly basis in line their proposed programme which will ensure delivery of the entire Asbestos Management Plan requirements prior to the proposed end date of 2025.

Ref No.	KPI	Description	Aim
11	Closure of Non-Conformances Reports (NCR)	Percentage of Non-Conformances closed out within required timescale.	To measure the Contractor's performance in the closure of Non-Conformances.
12	Submission of reports	Percentage of monthly reports and submissions listed in Schedule 3, Attachment 1.1 Reports and Submissions that are submitted within the required timescales.	To measure the Contractor's performance in the submission of accurate and acceptable quality monthly reports and submissions, including, but not limited to minutes of meetings.
13	Innovation	Assess the Contractors performance in identifying, developing and delivering innovation through service delivery.	To measure innovation from ideas generation through to implementation, and the monitoring and reporting of the improvements gained whether it be financial or qualitative.

Table G-1: ITS Performance Indicators

Monitoring Indicators (MIs)

Ref No	Monitoring Indicator	Measure Description	Measure Aim
1	Equipment Availability	Percentage of Traffic Scotland Equipment available/operational on the road network. The item total shall be taken as the sum of all equipment as listed within the FMS under all Equipment Type headings.	To monitor the number of operational items of equipment on the network.
2	Staff turnover	Percentage staff turnover during last 12 months.	To measure staff turnover.

Ref No	Monitoring Indicator	Measure Description	Measure Aim
3	Training	Average number of training hours per employee provided in last 12 months.	To measure the Contractor performance in providing training and development to all direct employees.
4	Remedial Notices	Number of Remedial Notices.	To measure the performance of the Contractor in dealing with Remedial Notices.
5	Collaboration and Partnering	Value of collaborative services provided by the Contractor	To measure the Contractor's performance in providing Improvement Opportunities in the provision of public sector services through collaborative agreements.
6	Community Engagements and Benefits	Development and delivery of an Employment Skills Plan which records the number of opportunities delivered and developed during the reporting period.	To measure the Contractor's performance and compliance with the requirements of this Schedule 3 Contract Management, Section 1 Introduction, 1.4 Community benefits through delivery and compliance with their Employment Skills Plan and Employment Skills Plan method statement.
7	Attendance to Class 1 Faults	The percentage of attendance to Class 1 Faults carried out within the required timescales.	To measure the Contractor's performance in undertaking attendance to Class 1 Faults.
8	Attendance to Class 2 Faults	The percentage of attendance to Class 2 Faults carried out within the required timescales.	To measure the Contractor's performance in undertaking attendance to Class 2 Faults.
9	Attendance to Class 3 Faults	The percentage of attendance to Class 3 Faults carried out within the required timescales.	To measure the Contractor's performance in undertaking attendance to Class 3 Faults.
10	Actual Spend versus Forecast	Measure of the actual spend for the quarter against the forecast spend for the quarter for additional works for each Work Code.	To measure the Contractor's performance in forecasting spend for the year split per quarter when

Ref No	Monitoring Indicator	Measure Description	Measure Aim
			provided with available budget per Work Codes against actual spend each quarter.
11	Accuracy of Operations Cost Estimates	Measure the accuracy of cost estimates for Operations on site for schemes more than £10,000.	To measure the Contractor's performance in forecasting the cost of Operations on site for schemes more than £10,000.
12	Upload of Construction Phase Plans	Percentage of Construction Phase Plans uploaded to AMPS at least 7 days in advance of the construction start date.	To measure the Contractor's performance in providing a sufficient review period for TS and PAG for Construction Phase Plans.
13	Upload of Health and Safety Files	Percentage of final Health and Safety Files uploaded to the Asset Management Performance System (AMPS) within 30 days of Scheme Completion date.	Measure the Contractors performance in uploading final Health and Safety Files to AMPS in a timely manner.

Table G-2: ITS Monitoring Indicators

Appendix H. Abbreviations

ABR	Autumn Budget Revision
ACCAR	Approach to Climate Change Adaptation & Resilience
AM	Asset Management
AMIP	Asset Management Improvement Programme
AMPS	Asset Management Performance System
AW	Authorised Weight
BCI	Bridge Condition Indicator
CCAP	Climate Change Adaptation Programme
CCARP	Climate Change Adaptation and Resilience Plan
CCPU	Climate Change Plan Update
CMP	Carbon Management Plan
CPF	Contract Price Fluctuation
DBFO	Design, Build, Finance and Operate
DMRB	Design Manual for Roads and Bridges
GVA	Gross Value Added
GDP	Gross Domestic Product
ISO	International Organisation of Standardisation
ITS	Intelligent Transport Systems
KPI	Key Performance Indicator
MART	Multi-Agency Response Team
MI	Monitoring Indicator
NMC	Network Management Contract
NTDS	National Traffic Data System
NTS2	National Transport Strategy 2
OC	Operating Company
PAF	Payment Adjustment Factor
PAG	Performance Audit Group
PI	Performance Indicator
RAMP	Road Asset Management Plan
RCI	Road Condition Index
SBR	Spring Budget Revision
SCANNER	Surface Condition Assessment of the National Network of Roads
SCCAP	Scottish Climate Change Adaptation Programme
SCRIM	Sideways Force Coefficient Routine Investigation Machine
SEPA	Scottish Environment Protection Agency
SNAP	Scottish National Adaptation Plan
SSCI	Structures Stock Condition Indicator
STPR2	Strategic Transport Projects Review
TRIM	Trunk Road Information Manual
TRISS	Trunk Road Incident Support Service

TS	Transport Scotland
TSOC	Traffic Scotland Operations Contract
TSIC	Traffic Scotland Infrastructure Contract
TSOISC	Traffic Scotland Operations and Infrastructure Services Contract
TSSM	Transport Scotland Structures Manual
ULEV	Ultra-Low Emission Vehicle
VLOG	Vulnerable Locations Operational Group
VM	Value Management
VMS	Variable Message Sign
VRS	Vehicle Restraint System

Appendix I. Glossary

Asset – Physical road infrastructure and other items that have a distinct value to the organisation. Assets owned include carriageway, footway, structures, lighting and drainage.

Asset Management – The coordinated activities we deliver to manage our assets to maximise customer satisfaction, maintain high levels of safety, improve journey time reliability, manage risks, and enable delivery of our outcomes and priorities in the most efficient and sustainable manner.

Asset Management Framework – A structured approach that organisations use to manage their assets effectively and efficiently.

Asset Management Improvement Programme – A formal programme of activities that seeks to make positive improvements to management practices.

Asset Management Objectives – High level objectives that reflect our business responsibilities and are aligned with our strategic objectives and priorities.

Asset Management Policy – Demonstrates commitment to asset management and summarises the principles adopted in applying asset management to achieve strategic objectives.

Asset Management Strategy – Long-term approach to management of the assets, derived from, and consistent with, the asset management policy.

Backlog – The monetary value of work required to close the gap between the current performance provided by an asset and the required performance.

Carriageway – The part of a road used by vehicular traffic.

Contract Price Fluctuation – An adjustment to the contract price to reflect changes in the cost of materials or labour during the contract period.

Decision Support Tool – Integrates data, models, and analytical tools to help solve complex problems and improve decision-making processes.

Defect – Represents a deterioration from the normal condition and causes an unintended hazard, nuisance, or danger to the users.

Deflectograph – A self-contained lorry-mounted system, where a loaded wheel passes over the pavement, the pavement deflects and the size of the deflection is related to the strength (residual life) of the pavement layers and subgrade.

Direct Emissions – Emissions that originate from activities owned or controlled by Transport Scotland.

Directorate – A section of Transport Scotland in charge of a particular activity.

Griptester – A trailer-based device for measuring skidding resistance and gives instant readings of the skid resistance of the road surface being driven on.

Indirect Emissions – Emissions that do not originate from Transport Scotland but are related to our activities.

Information Management – A formal approach to the identification of information needs and the associated collection, storage, usage and maintenance of the information.

Intelligent Transport System – facilitate the monitoring, capturing and communication of traffic and travel information to road users 24 hours a day.

Investigatory Level – The point at which more detailed monitoring or investigation is appropriate, and to establish if and when remedial measures are required.

Life Cycle Plan – A considered strategy for managing an asset, or group of similar assets, from construction to disposal.

Machine Surveys – The use of specialised equipment and technology to collect data about physical environments, structures, or systems

Maintenance – Collective term used to describe all the activities and operations undertaken to manage and maintain road assets, for example, inspection, assessment, renewal, upgrade etc.

Monitoring Indicator – A numerical measure of service provision which does not have an associated Payment Adjustment Factor.

National Transport Strategy – Sets out a long-term ambitious vision for transport nationally to deliver our priorities of protecting our climate and improving the lives of people in Scotland.

Operating Company – Private sector company who is contracted by Transport Scotland on behalf of the Scottish Government to manage and maintain the trunk road network.

Patching – A maintenance process used to repair and restore the surface of a road that has been damaged or deteriorated.

Payment Adjustment Factor – Payments to Operating Companies may be reduced through PAFs in the event of underperformance against PIs, creating additional incentive to deliver work effectively. Higher adjustment factors are applied to PIs which reflect the most critical areas of the contract.

Performance Measure – A generic term used to describe a measure or indicator that reflects the condition and/or performance of an asset.

Retro-reflectivity – The property of a surface or material to reflect light back to its source, regardless of the angle at which the light hits it.

Risk Register – A central repository for all identified risks, detailing their nature, likelihood, impact, and the strategies for mitigating them.

Road Asset Management Plan – This document specifying activities and resources for implementing the asset management strategy and delivering the Asset Management Objectives.

Road User Satisfaction Measures – Road user surveys undertaken annually to identify priority areas for improvement and determine levels of satisfaction with the service.

Rutting – Surface depression in the wheel path of pavements

SCANNER – A machine-based survey that employs the use of an electronic 'scanner' to make a number of measurements that describe the condition of the road surface.

Scottish Government – The devolved government for Scotland, responsible for most of the issues of day-to-day concern to the people of Scotland, including health, education, justice, rural affairs and transport.

Scour - Sediment such as sand and rocks from around bridge abutments or piers

Scour Management Strategy – A comprehensive plan designed to address and mitigate the effects of scour.

SCRIM – The SCRIM vehicle measures the friction between a tyre and the road under controlled slip conditions.

Stakeholder – An individual, group, body or organisation with a vested interest in the management of the transport network, for example, authority, owner, public, users, community, customers, shareholders and businesses.

Structural Maintenance (Carriageways) – Structural maintenance of carriageways rejuvenates the pavement by treating either the surface layers (for example, 150mm inlay) or the surface and sub layers (for example, strengthening or reconstruction).

Structural Maintenance (Structures) – Structural maintenance of structures is defined as schemes that include the repair, renewal and replacement of structural elements or components that have become unserviceable through wear and tear or deteriorated with time and usage, or which have been damaged. Also the upgrading or replacement of structures to bring them up to current requirements.

Structures Work bank – A schedule of works and programmes that require action, having reached or close to their intervention point.

Transport Scotland – An agency of the Scottish Government with responsibility for the operation and management of the trunk road network.

Trunk Roads – The main strategic routes, including motorways.

Trunk Road Network – The system of motorways and trunk roads in Scotland.

Value Management – A formalised process for assessing the benefits of undertaking work and the associated risks of not undertaking work, allowing competing needs to be objectively prioritised.

Vehicle Restraint System – Safety devices designed to prevent vehicles from leaving the carriageway.

Visual Condition Inspection – A method used to assess the state of an asset or structure by examining it with the naked eye or using basic visual aids.

Whole Life Cost – The total cost of the asset over the term of its life including planning, design, construction, acquisition, operation, maintenance, rehabilitation and disposal.

Winter Service – a 24-hour dedicated winter maintenance service that runs from October to May.

Appendix J. References

Introduction

Transport Scotland: [Home | Transport Scotland](#)

Scottish Government: [The Scottish Government - gov.scot](#)

National Transport Strategy: [National Transport Strategy 2 | Transport Scotland](#)

The Value of the Trunk Road Network to Society and the Economy in Scotland: [TRL Report](#)

Roads Delivery and Operations Directorate: [The Trunk Road Network in Scotland](#)

Our Organisation

Infrastructure Investment Plan: [Infrastructure Investment Plan](#)

Scottish Government Values: [SG In the Service of Scotland](#)

2025-2026 Budget: [Chapter 8 Transport - Scottish Budget 2025 to 2026](#)

Customer Care Strategy: [Introduction | Transport Scotland](#)

Scotland's Road Safety Framework to 2030: [Scotland's Road Safety Framework to 2030 - Scotlands Road Safety Framework](#)

Traffic Scotland: [Traffic Scotland | Trunk road traffic updates & route planner](#)

Official List of Trunk Roads: [Official list of trunk roads | Transport Scotland](#)

Operating Company Contracts, North East: [North east trunk roads operating company contract | Transport Scotland](#)

Operating Company Contracts, North West: [North west trunk roads operating company contract | Transport Scotland](#)

Operating Company Contracts, South East: [South east trunk roads operating company contract | Transport Scotland](#)

Operating Company Contracts, South West: [South west trunk roads operating company contract | Transport Scotland](#)

Design, Build, Finance and Operate Contracts: [Trunk road network | Traffic Scotland](#)

Operating Companies: [The Trunk Road Network | Operating Companies | Transport Scotland](#)

Performance Audit Group: [Performance Audit Group](#)

Roads (Scotland) Act 1984: [Roads \(Scotland\) Act 1984](#)

2024-2025 Annual Report: [Transport Scotland Annual Report and Accounts 2024-25 | Transport Scotland](#)

Second Strategic Transport Projects Review: [Final summary report - December 2022 - STPR2 | Transport Scotland](#)

Our Approach to Asset Management

[National Transport Strategy 2 | Transport Scotland](#)

Second Strategic Transport Projects Review (STPR2): [Final summary report - December 2022 - STPR2 | Transport Scotland](#)

Programme for Government: [2025-2026](#)

Risk Management

Transport Scotland's Carbon Management Plan 2022-2027: [Transport Scotland's Carbon Management Plan Fourth Edition \(2022 - 2027\) | Transport Scotland](#)

Customer Care Strategy: [Introduction | Transport Scotland](#)

Maintenance

Equality Act 2010: [Equality Act 2010](#)

Transport Scotland's Roads for All:
<https://www.transport.gov.scot/media/43830/roads-for-all-good-practice-guide-for-roads-july-2013.pdf>

Investing in our Network

Office for National Statistics: [Construction output price indices - Office for National Statistics](#)

Data

Data Protection Act 2018: [Data Protection Act 2018](#)

Freedom of Information (Scotland) Act 2002: [Freedom of Information \(Scotland\) Act 2002](#)

Operating Our Network

Gritter Tracker: [Trunk Road Gritter Tracker](#)

Multi-agency Collaboration: [Multi-agency collaboration | Ready Scotland](#)

The Trunk Road Network: [The Trunk Road Network | Transport Scotland](#)

Traffic Scotland, Facebook: [Traffic Scotland](#)

Traffic Scotland, X: [Profile / X](#)

Climate Change, Carbon Emissions and Biodiversity

Scottish Climate Change Adaptation Programme (SCCAP): [Climate Ready Scotland: climate change adaptation programme 2019-2024 - gov.scot](#)

Scottish National Adaptation Plan (SNAP) [Scottish National Adaptation Plan \(2024-2029\)](#)

Climate Change Plan Update: [Securing a green recovery on a path to net zero: climate change plan 2018–2032 - update - gov.scot](#)

Reducing Car Use for a Healthier, Fairer and Greener Scotland: [A route map to achieve a 20 per cent reduction in car kilometres by 2030](#)

Scottish Biodiversity Strategy: [Biodiversity strategy to 2045: tackling the nature emergency - draft - gov.scot](#)

Climate Change Risk Assessment (CCRA3): [UK Climate Change Risk Assessment 2022](#)

Transport Scotland's Approach to Climate Change Adaptation and Resilience (ACCAR): [Transport Scotland's Approach to Climate Change Adaptation and Resilience | Transport Scotland](#)

Transport Scotland's Carbon Management Plan 2022-2027: [Transport Scotland's Carbon Management Plan Fourth Edition \(2022 - 2027\) | Transport Scotland](#)

[Transport Scotland's Active Travel Framework](#)

Trunk Road Adaptation Plan: [Trunk Road Adaptation Plan](#)

Managing Performance

Performance Audit Group: [Performance Audit Group](#)

National Transport Strategy: [National Transport Strategy 2 | Transport Scotland](#)
[The Trunk Road Network | Transport Scotland](#)

Appendix B – Road Structures

[The Trunk Road Network | Operating Companies and DBFO Companies | Transport Scotland](#)

Appendix D – Intelligent Transport Systems

[Traffic Scotland Operations and Infrastructure Services Contract - Lot 2 Infrastructure](#)

Appendix E – Our Customers and their Requirements

Transport Scotland Consultations: [Consultations | Transport Scotland](#)

Regional Transport Partnerships: [Regional Transport Partnerships | Transport Scotland](#)

Inter-Ministerial Group for Transport: [Inter-Ministerial Group for Transport | Transport Scotland](#)

Scotland's Road Safety Framework: [Scotland's Road Safety Framework to 2030](#)

Supplier Development Programme: [Supplier Development Programme | Helping you bid better](#)