Design Manual for Roads and Bridges

General Principles and Scheme Governance
Maintenance & Operation

GM 701
Asset delivery asset maintenance requirements

Revision 1

Summary
This document contains asset delivery asset maintenance requirements for motorways and all-purpose trunk roads.

Application by Overseeing Organisations
Any specific requirements for Overseeing Organisations alternative or supplementary to those given in this document are given in National Application Annexes to this document.

Feedback and Enquiries
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Release notes

Version	Date	Details of amendments
1	Mar 2020	Revision 1 (March 2020) Update to references in England National Application Annex. Revision 0 (November 2019) GM 701 document created to outline asset delivery asset maintenance requirements for motorways and all-purpose trunk roads. This full document has been written to comply with the new Highways England drafting rules.

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Foreword

Publishing information

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Contractual and legal considerations

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Introduction

Background

This document covers asset delivery asset maintenance requirements for motorways and all-purpose trunk roads.

Assumptions made in the preparation of this document

The assumptions made in GG 101 [Ref 1.N] apply to this document.

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1. Scope

Aspects covered

1.1 The national requirements for the maintenance of motorway and all-purpose trunk roads and associated assets, detailing the high-level concept and contents of the maintenance requirements set out in the National Application Annexes shall be followed.

NOTE 1 The maintenance and response requirements detail the service levels that are expected across the affected property across asset types.

NOTE 2 The effective delivery of service levels contributes to the delivery of the required outcomes, and can provide an assured level of network performance and integrity, a high level of customer satisfaction and a safe, clean, tidy network.

Implementation

1.2 This document shall be implemented forthwith for asset delivery asset maintenance requirements on the Overseeing Organisations' motorway and all-purpose trunk roads according to the implementation requirements of GG 101 [Ref 1.N].

Use of GG 101

1.3 The requirements contained in GG 101 [Ref 1.N] shall be followed in respect of activities covered by this document.

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2. Normative references

The following documents, in whole or in part, are normative references for this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Ref 1.N	Highways England. GG 101, 'Introduction to the Design Manual for Roads and Bridges'

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General Principles and Scheme Governance
Maintenance & Operation

GM 701
England National Application Annex to GM 701 Asset delivery asset maintenance requirements

Revision 1

Summary
This National Application Annex contains the Highways England specific requirements for asset delivery asset maintenance.

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Release notes

Version	Date	Details of amendments
1	Mar 2020	Revision 1 (March 2020) Update to references only. Revision 0 (November 2019) Highways England National Application Annex to GM 701.

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Introduction

Background

This National Application Annex (hereinafter referred to as asset delivery asset maintenance requirements (ADAMr)) sets out Highways England's asset delivery specific requirements in relation to the carrying out of cyclic and repair maintenance activities on the affected property.

It provides for an intelligence-led approach to cyclic and repair maintenance activities, under which network knowledge, asset information and customer insight may be used to vary the maintenance activities as appropriate. This ensures cyclic and repair maintenance interventions are undertaken at the optimum time, ensures the asset is maintained efficiently, whilst complying with all statutory duties. This approach is called intelligence-led maintenance.

Cyclic and repair maintenance is carried out to prolong asset life, deliver sustained performance and keep assets safe for customers. Highways England issues the maintenance requirements plan and Appendix E/A and Appendix E/B of this document to the maintenance contractor to enable efficient and effective planning and delivery of all cyclic and repair maintenance activities outlined within ADAMr.

Highways England has legal duties with respect to the maintenance and operation of the network. These legal duties are derived from the following enabling legislation:

1) Highways Act 1980 Highways Act 1980 [Ref 10.N];
2) Infrastructure Act 2015 Infrastructure Act 2015 [Ref 13.N].

Assumptions made in the preparation of this document

The assumptions made in GG 101 [Ref 18.N] apply to this document.

The approach set out in GG 104 [Ref 31.N] applies to this document.

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Abbreviations

Abbreviation

Abbreviation	Definition
ADAMr	Asset Delivery Asset Maintenance Requirements
ADMM	Asset Data Management Manual
APTR	All Purpose Trunk Roads
CCTV	Closed Circuit Television
DAS	Departures Approval Systems
DLOA	Detailed Local Operating Agreement
DMRB	Design Manual for Roads and Bridges
DNO	Distribution Network Operator
EMP	Environmental Management Plan
EqIA	Equality Impact Assessment
GeoAMP	Geotechnical Asset Management Plan
ILM	Intelligence-Led Maintenance
MCHW	Manual of Contract Documents for Highways Works
MRP	Maintenance Requirement Plan
NRSWA	New Roads and Street Works Act
NRTS	National Roads Telecommunications Service
NTOC	National Traffic Operations Centre
O&MM	Operation and Maintenance Manual
RDD	Regional Divisional Director
ROC	Regional Operations Centre
SCADA	Supervisory Control And Data Acquisition
TCB	Tension Corrugated Beam
TOC	Technology Operations Capability
T-TOC	Tools for Technology Operations Capability
WEEE	Waste Electrical and Electronic Equipment

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Terms and definitions

Terms and definitions

Term	Definition
Affected property	The lengths of all-purpose trunk road and/or motorway (including carriageways, hard shoulders, slip roads, roundabouts and access roads) and the associated premises, infrastructure and other amenities to be maintained and operated.
Asset delivery	Asset delivery is where Highways England is directly responsible for managing all aspects of the operation of the network. This includes determining and managing what routine maintenance activities are undertaken and capital renewal and improvement schemes.
Collaborative custodian	Activities to monitor, provide data, analyse intelligence across all aspect of the maintenance and response contract requirements, relevant to the safety and performance of the affected property.
Departures approval system	The web-based system for submitting and seeking approval for departures from performance-based requirement or method requirement.
Defect	A defect to the asset is that it: 1) causes an unintended hazard, nuisance or danger to the users of the highway; 2) represents a deterioration from the normal condition; 3) prevents an asset from acting in the intended manner; 4) is damaged; 5) is likely to increase the rate of deterioration of another asset.
Deliverable	An output delivered by the processes that contributes to the achievement of the outcomes.
Departure	Any variation or waiving of a performance-based requirement or method requirement contained within the asset delivery asset maintenance requirement (ADAMr) documents.

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Terms and definitions (continued)

Term	Definition
Designated sites	Nationally-designated sites comprise: 1) sites of special scientific interest; 2) local sites; 3) nature reserves; 4) areas of outstanding natural beauty. Internationally-designated sites cover those with European designations including: 1) special areas of conservation and special protection areas; and 2) those with international designations, such as Ramsar sites of wetland importance.
Distribution network operator	The relevant operator of the power supply to the affected property.
Drainage liaison engineer	A nominated person in the Overseeing Organisation who is responsible for all drainage surveys, maintenance and renewals, and is the key point of contact for all drainage related matters.
Environmental management plan	An environmental management plan is a document (or set of documents), which set out agreed procedures and standards for the implementation of identified environmental management actions. It is developed to address the adverse and beneficial environmental impacts arising from planning and design, construction and maintenance and operation of the affected property.
Flood champion	The person in the Overseeing Organisation responsible for integration and coordination of flood risk management.
Flood event	The accumulation or passage of water at the ground surface where it is not normally experienced.
Flood hotspot	A location at high risk of repeated flooding.
Geotechnical asset management plan	As defined in CS 641 [Ref 25.N].
Head of Planning and Development	As per the operational structure.
Head of Service Delivery	As per the operational structure.
Injurious weeds	As defined by the Weeds Act 1959 [Ref 47.N].
Intelligence-led maintenance	The use of data and knowledge to design the optimum maintenance intervention for individual assets.
Invasive species	As defined by the Wildlife and Countryside Act 1981 (as amended), Part I, Clause 14: Introduction of New Species etc., and Schedule 9 W&C Act 1981 [Ref 48.N]
Maintenance requirement	A requirement relating to maintenance service delivery.

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Terms and definitions (continued)

Term	Definition
Maintenance requirements plan	Highways England document that details the requirements necessary to deliver the maintenance activities.
Network	Highways England's motorway and all-purpose trunk roads network.
Operation and maintenance manual	For tunnels: the manual, specific to each tunnel, which sets out operation, maintenance and emergency response procedures.
Outcome	An outcome required to be achieved in relation to a specific maintenance requirement.
Preventative maintenance	Planned recurrent intervention designed to maintain or improve the condition of an asset.
Priority drainage asset	Those assets which, if poorly managed or inadequate, pose a risk to either the safety or journey time reliability of road users, or to adjacent property, or to the water environment (or any combination of these).
Regional Director	As per the operational structure.
Regional operations centre	The regional operations centre provides a regional focus for the management and operation of the motorway and all purpose trunk road network.
Scope	The extent of the work encompassed by a maintenance requirement.
Technology operations capability centre	A Highways England service that provides first and second line support for all operational technology services, acting as a single point of contact and interfacing with regional operations to resolve technology incidents.

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E/1. Maintenance requirements - general principles

Objectives

E/1.1 The requirements of this document shall be applied for asset delivery only.

E/1.2 The asset delivery asset maintenance requirements (ADAMr) shall be delivered to support a number of key objectives:

1) improve safety risk for all exposed populations who are either using, working on or affected by motorways and all-purpose trunk roads;
2) improve customer experience;
3) stabilise maintenance and renewal costs through the use of emerging methods;
4) inform delivery of capital improvements to the affected property.

NOTE Effective maintenance and operation of the affected property is essential in achieving the key ADAMr objectives.

E/1.3 The affected property shall be maintained to reasonable standards.

NOTE The current provisions for maintaining the affected property to a reasonable standard are incorporated in the Highways Act 1980, Section 41 (duty to maintain) and Section 58 (special defence in actions for damages for non-repair) Highways Act 1980 [Ref 10.N]. The importance of Section 58 is that it provides the defence "that the authority had taken such care as in all the circumstances was reasonably required to secure that the part of the highway to which the action relates was not dangerous for traffic".

E/1.4 All actions shall be taken to ensure that the affected property is maintained and operated to no lesser standard than is appropriate for a highway of the character of the affected property.

Framework

E/1.5 The outcomes described in ADAMr shall be achieved.

E/1.6 When maintenance works are identified, the method utilised to meet the required deliverable shall support compliance with the requirements of this document and the maintenance requirements plan (MRP).

E/1.6.1 Maintenance activities of highway assets should be planned to complement each other, and carried out in conjunction with each other when safe to do so.

E/1.6.2 Innovation should be encouraged in establishing the method by which the outcomes are achieved.

E/1.6.3 Innovation should be reinforced by the implementation of ongoing continual improvement.

Preventative maintenance

E/1.7 The outcome of a programme of preventative maintenance shall be to eliminate the cause of a potential defect or mitigating a potential risk impacting on safety, customers or the performance of the asset.

E/1.8 The schedule of preventative maintenance interventions shall meet asset and customer needs by sustaining the availability, safety, performance, operation, reliability and longevity of highway assets.

NOTE Appropriate preventative maintenance brings benefits of reduced whole of life costs, and improved customer service through lower network occupancy requirements HE NOR [Ref 27.N].

Intelligence-led maintenance

E/1.9 Intelligence-led maintenance (ILM) shall use data and knowledge to design the optimum maintenance intervention for individual assets, improve asset quality and customer satisfaction, and offer greater value for money.

E/1.10 The application of ILM shall deliver cyclic and repair maintenance activities on all assets, while ensuring compliance with statutory duties.

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E/1.11 Baseline cyclic maintenance frequencies have been set out in this document for all sub-asset cyclic maintenance activities and shall be the default requirement for each sub asset.

NOTE *The baseline cyclic maintenance frequencies for each sub-asset activity are set out in Appendix E/A.*

E/1.12 Intelligence shall be applied to identify and demonstrate if an alternative frequency is more appropriate to deliver required outcomes.

NOTE *The application of intelligence can result in a maintenance intervention changing from a cyclic activity to a repair activity.*

E/1.13 Where intelligence determines that a different frequency to the baseline is required, the exception and justification for the variance shall be recorded in the MRP.

Intelligence-led approach to defect prioritisation

E/1.14 Inspections of the asset shall be undertaken as detailed in the asset delivery asset inspection requirements GS 801 [Ref 2.N].

E/1.15 The intervention and timescale applied to rectify or manage defects shall be appropriate to the risk that the defect poses.

NOTE *Defects that require prompt attention are those identified because there is an immediate or imminent risk of either one or more of the following occurring:*

1) *injury to any party using or repairing the network;*
2) *failure of an asset to fulfil its intended function where such an asset protects the road user and or facilitates the safe use of the network;*
3) *failure of an asset necessary to effectively enforce the compliance with a mandatory or prohibitory requirement;*
4) *liable to leave the Secretary of State in breach of one or more of his statutory duties; and*
5) *graffiti likely to cause offence.*

E/1.15.1 Defects may be identified from inspections, incidents, third party reports or those identified through the collaborative custodianship of the affected property (see figure E/1.15.1).

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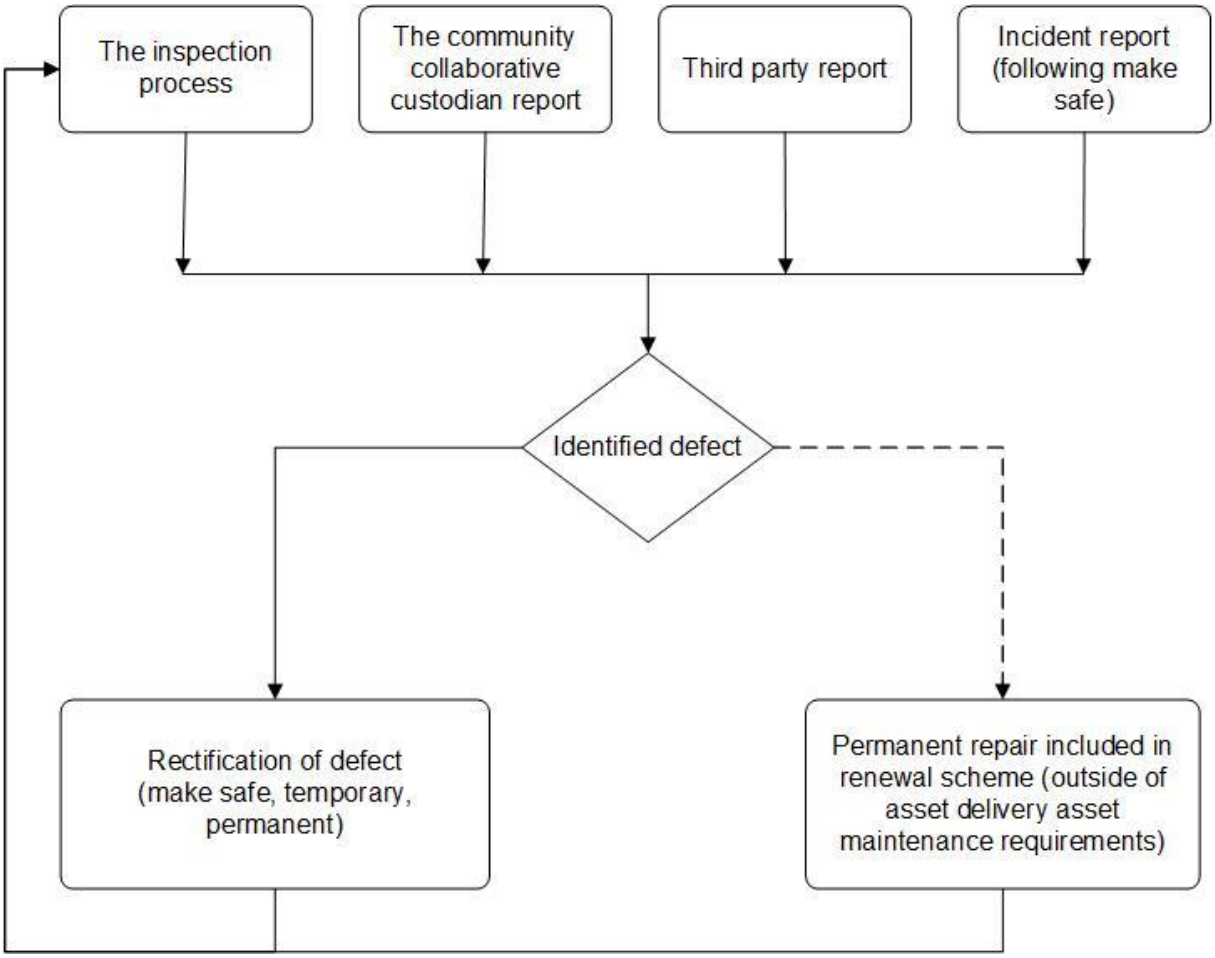
Figure E/1.15.1 Repair identification workflow



NOTE 1 *Rectification can range from making safe the defect to a permanent repair of the asset.*

NOTE 2 *Roadside technology defects are categorised based upon the risk that the reduced availability of the service which the asset provides has upon the operation of the network.*

Asset data sources

E/1.16 Asset data shall be recorded in accordance with the requirements set out in the Asset Data Management Manual (ADMM).

E/1.17 The asset data shall be utilised throughout the different activities and stages of the asset's life cycle.

NOTE *These activities and stages in the operate and maintain life cycle are as follows to ensure the asset functions as intended:*

1) *assuring maintenance operations are carried out appropriately;*
2) *defect reporting – recording and responding to asset defects;*
3) *maintenance management;*
4) *the processes, systems and information on the occurrence, effectiveness and costs of various regimes of maintenance applied to the infrastructure assets.*

E/1.18 When reviewing asset intelligence, the details of the sources of the intelligence including the identification of any asset gaps and the mitigation of the gaps in intelligence shall be used to inform any variance of the cyclic frequency from the baseline maintenance requirements in Appendix E/A.

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E/1.19 To embed ILM, accurate and reliable asset data shall be used to determine the most effective maintenance regime and to enable the ongoing review and evolution of the MRP.

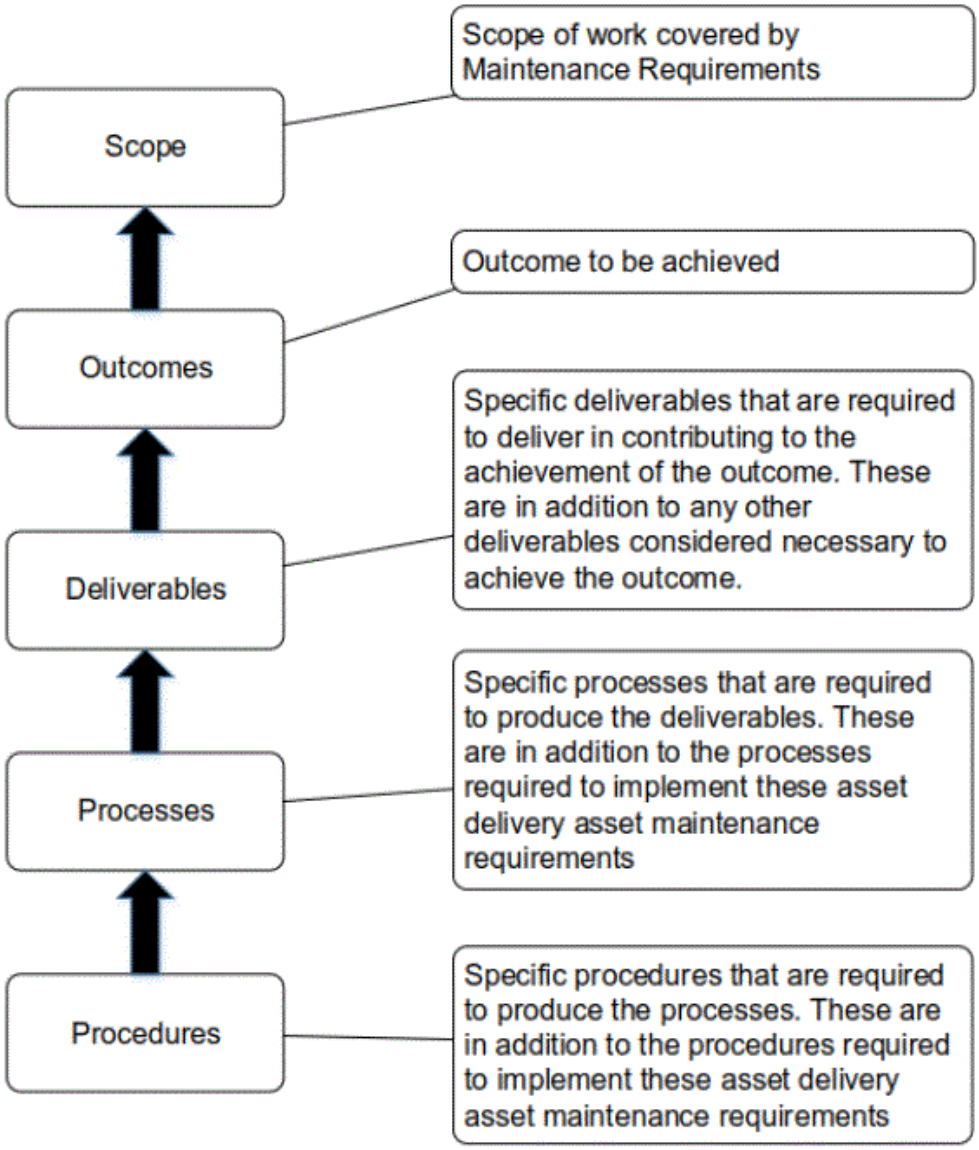
NOTE *The ongoing review of asset data ensures the most effective maintenance regime is in place and identifies areas where a scheme is required to reduce maintenance interventions further.*

E/1.20 When cyclic and repair maintenance is undertaken, feedback shall be captured to enable the continual review of asset needs / cyclic frequencies and the updating of the MRP.

Outcome based structure

E/1.21 The individual maintenance requirements for each asset shall be structured and detailed as scope, outcomes, deliverables, processes, and procedures in accordance with Figure E/1.21.

Figure E/1.21 Outcomes based structure



E/1.22 Deliverables, processes and procedures shall be established as required to meet the general principles and outcomes, and comply with all relevant legislation and standards.

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NOTE *The deliverables, processes and procedures detailed for each asset are not exhaustive and are the minimum requirements.*

E/1.23 Any failure to deliver an outcome, deliverable, process or procedure shall be deemed to be a nonconformity, and require root cause analysis and corrective action.

E/1.24 A failure to deliver an outcome shall not be a nonconformity if:

1) the relevant procedures and processes have been followed;
2) the deliverables have been completed and the root cause of the failure is due to circumstances that are wholly outside the control of an organisation experienced in highways maintenance and operations;
3) it could not reasonably have been foreseen.

Risk based methodology

E/1.25 Intelligence-led decisions shall be made in determining where and when maintenance activities are undertaken to ensure the affected property is managed and operated in accordance with the risk tolerance.

NOTE *In the context of these asset delivery asset management requirements, an intelligence-led approach means that when prioritising and targeting activities a risk assessment is required.*

E/1.26 All risks shall be controlled so that residual risk exposure for any person or to any asset is tolerable as per GG 104 [Ref 31.N] having regard to the regulatory framework, other obligations, policies and objectives.

E/1.27 Risks to the imperatives below (Clauses E1.28 to E/1.33 detailing safety, customer service and availability) shall be identified, assessed, evaluated and managed.

Risks to safety

E/1.28 Any risk to safety of road users and other parties shall be managed so that the residual risk exposure is as low as reasonably required.

E/1.29 When the road is taken out of normal operation, the residual risk exposure shall be as low as reasonably practicable for all risk populations.

E/1.30 Any risk to safety of road workers shall be managed so that the residual risk exposure is as low as reasonably practicable.

E/1.31 Risks to safety shall be controlled to ensure that the affected property is not dangerous to traffic.

NOTE *Evidence of having followed a risk based methodology supports the provision of a 'special defence' under Section 58 of the Highways Act 1980 Highways Act 1980 [Ref 10.N].*

Risks to customer service

E/1.32 Any risk to customer service shall be mitigated to ensure that the maintenance of the assets improve the services provided to its customers and includes:

1) minimising delay;
2) effectively and efficiently maintaining the assets; and
3) developing and maintaining sustainable relationships with customers and communities.

Risks to availability

E/1.33 Any risk to availability shall be mitigated, having regard to necessary obligations, policies and objectives, to secure the the expeditious movement of traffic on the affected property and facilitates the expeditious movement of traffic on road networks for which another authority is the traffic authority.

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Maintenance requirements plan

E/1.34 The MRP shall contain the baseline maintenance requirements and intelligence led maintenance requirements for any variances.

NOTE *The MRP details the cyclic and repair activities that contribute to the delivery of the outcomes as set out in the requirements of this document.*

E/1.35 The cyclic and repair maintenance requirements shall be set out in tabulated form as detailed in Table E/1.35:

Table E/1.35 Baseline maintenance requirements outline

Baseline maintenance requirement: Description of the maintenance requirement (from ADAMr)			
Scope: The specific assets covered by the requirement Out of scope: The specific assets not covered by the requirement			
	Cyclic maintenance: Scheduled activities that are required to be delivered to contribute to the outcomes		**Repair maintenance:**
Sub-as-set type	Activity: Specific maintenance activity to be undertaken	Baseline Frequency: Occurrence of activity that relates directly to the asset need	Activity: Specific repair maintenance activity to be undertaken

E/1.36 The baseline maintenance requirements shall be as per Appendix E/A.

E/1.37 The information used as a justification for decision making as part of intelligence led maintenance requirements shall be recorded.

E/1.38 Table E/1.38 shows the minimum fields that shall be required as part of the justification and audit trail for intelligence led decisions.

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Table E/1.38 Intelligence-led maintenance requirements

Intelligence-led maintenance:
Intelligence-led maintenance (ILM) is driven by network characteristics, asset intelligence and customer, safety and delivery needs.

Sub-asset type	Activity	Base-line fre-quency	Location	Justification: Justification for varying the baseline frequency, either up or down.							Residual risk and mitigation		
				Network ch-aracteristics	Asset in-telligence	Customer experience	Safety risk assess-ment	Delive-ry needs	Revised fre-quency	Trend	Safety	Custo-mer	Delivery (inc. availabil-ity)

NOTE

1) *location - location on the network to which the exception has been applied. Detailed enough to programme the work required;*
2) *network characteristics - rationale where the exception is justified by local network knowledge, including the new required frequency;*
3) *asset intelligence - rationale where the exception is justified by asset information, including the new required frequency;*
4) *customer experience - rationale where the exception is justified by customer experience (i.e. what the customer has encountered/identified) including the new required frequency;*
5) *safety risk assessment - assessment in accordance with GG 104 [Ref 31.N] principles, including the new required frequency and justification;*
6) *delivery need - rationale where the exception is justified by delivery needs, including the new required frequency;*
7) *trend - increase or decrease in cyclic frequency;*
8) *residual risk and mitigation - For key Highways England business risks (safety, customer services and delivery (including availability).*

E/1.39 Reference shall be made to the last maintained date, for each asset, to ensure the next maintenance intervention doesn't exceed either the baseline frequency or the revised frequency as determined in the MRP to ensure compliance with the statutory duties.

Roadside technology defect categories

E/1.40 The sub-asset defect descriptions and corresponding baseline defect category shall be included in tabulated form within the MRP in accordance with Table E/1.40.

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Table E/1.40 Baseline roadside technology defect categories

System / Sub-asset type	Scope	Defect category						
		TDC 1a - Urgent resolution defect	**TDC 1b - Urgent resolution tunnel defect**	**TDC 2a - Service affecting defect**	**TDC 2b - Service affecting defect**	**TDC 2c - Service affecting defect**	**TDC 3a - Other defect**	**TDC 3b - Other defect**
		Specific defect description	Specific defect description	Specific defect description	Specific defect description	Specific defect description	Specific defect description	Specific defect description

E/1.41 The roadside technology defect descriptions and baseline defect categories have been set out in Appendix E/B for all sub-assets and shall give the default restore service time.

NOTE *The technology defect descriptions are intentionally written at a high-level to provide easy identification of asset defects.*

E/1.42 Intelligence shall be applied to identify and demonstrate if an alternative defect category is more appropriate to deliver the required outcomes.

E/1.43 Where intelligence determines that a different defect category to the baseline is required, the information to justify the variance from the baseline shall be recorded in the MRP.

E/1.44 Table E/1.44 shows the minimum fields that shall be required as part of the justification and audit trail for intelligence led decisions when varying the roadside technology baseline defect categories for service restoration.

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Table E/1.44 Intelligence-led roadside technology defect categories

Intelligence-led roadside technology defect categories:
Intelligence-led roadside technology asset defect categories are driven by network characteristics, asset intelligence and customer, safety and delivery needs.

Sub-asset type	Defect description	Defect category	Location	Justification: Justification for varying the baseline defect category, either up or down							Residual risk and mitigation		
				Network characteristics	Asset intelligence	Customer experience	Safety risk assessment	Delivery needs	Revised defect category	Trend	Safety	Customer	Delivery (inc. availability)

NOTE

1) *location - location on the network to which the exception has been applied. Detailed enough to programme the work required;*
2) *network characteristics - rationale where the exception is justified by local network knowledge, including the new required defect category;*
3) *asset intelligence - rationale where the exception is justified by asset information, including the new required defect category;*
4) *customer experience - rationale where the exception is justified by customer experience (i.e. what the customer has encountered/identified) including the new required defect category;*
5) *safety risk assessment - assessment in accordance with GG 104 [Ref 31.N] principles, including the new required defect category and justification;*
6) *delivery need - rationale where the exception is justified by delivery needs, including the new required defect category;*
7) *trend - increase or decrease in defect category;*
8) *residual risk and mitigation - for key Highways England business risks (safety, customer services and delivery (including availability).*

E/1.45 Delivery of the MRP shall not in itself be determinative of compliance with the outcomes described in this document.

E/1.46 The following items shall be included in the MRP:

1) details from available sources of information about condition data, including the identification of asset data gaps and a mitigation approach;
2) detail of risk assessments of the affected property (refer to identify maintenance requirements quality process) and assumptions made about categorisation and prioritisation of defects;
3) response and repair timescales covering defect response and repair;
4) how work is packaged to minimise network occupancy (including road space booking requirements, traffic management requirements and temporary traffic regulation orders);
5) details of planned preventative maintenance including programme frequency of operations, timescales.

E/1.47 An overarching safety risk assessment in accordance with GG 104 [Ref 31.N] shall be completed for the MRP and updated as the MRP is reviewed.

E/1.48 The Regional Director shall be accountable for assuring delivery of the outcomes defined in ADAMr and for assuring the development and delivery of the MRP.

E/1.49 The Head of Planning and Development shall be responsible for the development of an MRP that meets the requirements of ADAMr.

E/1.50 The Head of Service Delivery shall be responsible for the delivery of all the activities specified in the MRP.

E/1.51 The MRP shall be reviewed at least annually and updated every time there is a need to change the maintenance frequency.

Major schemes

E/1.52 The maintenance and operation requirements relating to major schemes shall be in accordance with GG 182 [Ref 22.N].

E/1.53 For any sections of the network identified in the detailed local operating agreement (DLOA), where the responsibility for maintenance is transferred to a third party, the relevant sections of the existing MRP shall be provided detailing the current maintenance regime / frequencies.

E/1.54 Changes to the MRP shall be carried out in line with this ADAMr document.

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Sustainability requirements

E/1.55 The goals of sustainable development as set out in GG 103 [Ref 17.N] shall be adopted in the delivery of the requirements of this document.

Governance

E/1.56 A GG 104 [Ref 31.N] safety risk assessment and EqIA for the variance shall be completed to ensure that statutory duties are met.

NOTE When assessing network characteristics, asset intelligence and customer insight, safety risk and delivery needs to vary the baseline frequency, either up or down and justification for why that change has been made is to be recorded in the MRP against the location and asset type.

E/1.57 For any amendment to this document, including scope, outcomes, deliverables, processes and procedures, and baseline maintenance requirements, a departure shall be submitted in accordance with GG 101 [Ref 18.N].

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E/2. Asset maintenance requirements

E/2.1 The requirements for asset type 0300 - Fences, screens and environmental barriers shall be as follows:

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Table E/2.1 Fences, screens and environmental barriers maintenance requirement

Scope: All types of fences, screens and environmental barriers (as detailed in LD 119 [Ref 36.N]) within the affected property, inclusive of walls, stock proofing, netting and wildlife fences. Out of Scope: The structural maintenance of fences, walls, screens and environmental barriers classified as structures (to CG 300 [Ref 40.N]). All types of fences, screens and environmental barriers that are owned and maintained by third parties or adjacent landowners.
Outcomes: 1) Fences, screens and environmental barriers are safe and stable and fulfil their intended safety purpose. 2) Fences, screens and environmental barriers are managed to identify defects that would adversely impact upon their intended functional purpose. 3) Fences, screens and environmental barriers are maintained such that they are not breached by animals particularly in areas close to public spaces/ parks where pets are likely to be present.
Deliverables: 1) Prepare and instruct the implementation of the MRP with regards to fences, screens and environmental barriers. 2) Where inspections identify third parties or adjacent landowner's fences, screens or environmental barriers as defective, the responsible party are to be immediately informed of their obligation to rectify defects. 3) Rectification of defects which prevent the fence, screen or environmental barrier from fulfilling its intended safety purpose are to be undertaken. 4) Rectification of defects which impact on the safety or stability of the fence, screen or environmental barrier are undertaken.
Processes: 1) Work in accordance with the quality management system.
Procedures: 1) Record asset data as defined in the ADMM [Ref 1.N] 2) Ensure rectification of defects complies with specifications for the fences, screens and environmental barrier assets as set out in relevant parts of MCHW [Ref 26.N]

E/2.2 The requirements for asset type 0400 - Road restraint systems shall be as follows:

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Table E/2.2 Road restraint systems maintenance requirement

Scope: All vehicle restraint systems and pedestrian restraint systems within the affected property, including: vehicle safety barriers, safety barrier gates, crash cushions, terminals, transitions, pedestrian guard rails, vehicle parapets, combined vehicle and pedestrian parapets on bridges and other structures, arrester beds, cattle grids.
Outcomes: 1) Road restraint systems (vehicle and pedestrian) are managed and maintained to function in accordance with their intended design and performance requirements.
Deliverables: 1) Prepare and instruct the implementation of the maintenance requirements plan (MRP) with regards to road restraint systems maintenance requirements. 2) Rectification of defects to be undertaken.
Processes: 1) Work in accordance with the quality management system.
Procedures: 1) Record asset data as defined in the ADMM [Ref 1.N]. 2) Where defects result in a incident, a risk based approach is to be adopted for road restraint system repairs. 3) Rectification of defects in non-proprietary safety barrier systems in accordance with BS 7669-3 [Ref 45.N], BS EN 1317 [Ref 34.N] and BS 7818 [Ref 38.N]. 4) Rectification of defects in proprietary road restraint systems in accordance with the manufacturer's recommendations. 5) Maintain barrier tension in accordance with manufacturer's recommendations, or, in the absence of manufacturer's recommendations (e.g. on non-proprietary safety barrier systems), in accordance with BS 7669-3 [Ref 45.N]. Replace all post screws when re-tensioning tension corrugated beam (TCB) safety barriers. 6) Maintain safety gates, cattle grids and their bypasses in accordance with manufacturer's recommendations. 7) Arrester beds to function as per CD 377 [Ref 30.N].

E/2.3 The requirements for asset type 0500 - Drainage and service ducts shall be as follows:

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Table E/2.3 Drainage and service ducts maintenance requirement

Scope: The system within the affected property which removes water from trafficked surfaces, sub-layers and other parts of the highway asset, open surface channels, drainage within structures and any components from the point at which water drains from paved or other areas to the outfall. Out of Scope: Structural maintenance of culverts with a clear span or internal diameter greater than 0.9m (which are included in the structures maintenance requirements).
Outcomes: 1) The drainage system is managed and maintained to minimise the risk of flood events on trafficked surfaces, adjoining lands and third party land to remove standing water from trafficked surfaces within the affected property. 2) The drainage system is managed and maintained to remove sub-surface water to enhance the longevity of paved areas, associated earthworks and structures. 3) The drainage system is managed and maintained to minimise the risk of pollution to receiving surface and ground water.
Deliverables: 1) Prepare and instruct the implementation of the MRP drainage maintenance requirements. 2) MRP to include soakaways maintenance frequencies as determined in line with MCHW [Ref 26.N]. 3) Validate the risk status of priority drainage assets in descending order of priority from risk status A to D. Those culverts confirmed as priority A or B are mitigated, and those outfalls and soakaways confirmed as priority A, B or C are mitigated. 4) Nominate individual(s) to fulfil the roles of drainage liaison engineer and flood champion. 5) Record details of flood events in accordance with CD 535 [Ref 6.N]. 6) Identify and validate the risk status of flood hotspots identified in the drainage data management system (HADDM). Those flooding hotspots confirmed as risk status A1, A or B are mitigated 7) Make safe drainage system defects. 8) Ensure drainage system components are maintained in accordance with the MRP.
Processes: 1) Work in accordance with the quality management system.

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Table E/2.3 Drainage and service ducts maintenance requirement (continued)

Procedures:

1) Verify asset risk status in accordance with CD 535 [Ref 6.N].
2) The drainage liaison engineer to be key point of contact for drainage related matters, and to assume responsibility for drainage surveys, maintenance and renewals.
3) Comply with all specifications and requirements for the drainage asset as set out in the relevant parts of MCHW [Ref 26.N].
4) Manage the minimisation of pollution risk in accordance with LA 113 [Ref 32.N].
5) Ensure that drainage waste arisings are controlled such that they comply with legislation at the point of disposal.
6) Record asset data as defined in the ADMM [Ref 1.N].

E/2.4 The requirement for asset type 0600 - Geotechnical assets shall be as follows:

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Table E/2.4 Geotechnical assets maintenance requirement

Scope: Geotechnical assets within the affected property, comprising: embankment and cuttings on which the pavement and other assets are founded, and noise/landscape bunds. Out of Scope: Physical services (incl. surveys and renewals) beyond short term management of safety critical defects.
Outcomes: 1) Potential defects with geotechnical assets are identified. 2) Defects are managed to minimise risks to road users. 3) Defects are managed to minimise risk of damage to other assets.
Deliverables: 1) Prepare and instruct the implementation of the MRP with regards to geotechnical assets, which will include the Geotechnical Asset Management Plan (GeoAMP). 2) Develop and implement a GeoAMP. 3) The rectification of geotechnical asset defects which adversely affect the stability, integrity or operation of other assets, including but not limited to, paved areas, drainage, communications cables and soft estate.
Processes: 1) Work in accordance with the quality management system.
Procedures: 1) Undertake activities in accordance with CS 641 [Ref 25.N]. 2) Manage geotechnical risks in accordance with CD 622 [Ref 24.N]. 3) Record asset data as defined in the ADMM [Ref 1.N].

E/2.5 The requirement for asset type 0700 – Pavements and paved areas shall be as follows:

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Table E/2.5 Pavements and paved areas maintenance requirement

Scope: Paved areas, comprising: trafficked areas, hard shoulders, footways, cycle tracks, bridleways, footpaths, paved pedestrian areas, hard-standing paved areas, paved central reserves, traffic islands and cross-overs, gratings, frames, boxes, kerbs, edgings and preformed channels which fall within the affected property.
Outcomes: 1) The paved area provides a safe, comfortable and even surface for all road users.
Deliverables: 1) Prepare and instruct the implementation of the maintenance requirements plan with regards to paved areas. 2) Undertake activities to warn road users of the condition of the highway in relation to defects that could cause danger to users of the highway. 3) Rectification of defects
Processes: 1) Work in accordance with the quality management system.
Procedures: 1) The rectification of defects relating to the asphalt or concrete carriageways in accordance with MCHW [Ref 26.N], or CD 227 [Ref 4.N] respectively and the associated DMRB volume. Note that this includes response to diesel spillage. 2) The rectification of defects relating to asphalt or concrete footways and cycle tracks in accordance with CD 239 [Ref 8.N]. 3) The rectification of defects relating to statutory undertakers equipment is undertaken as per the NRSWA NRSWA 1991 [Ref 28.N]. 4) The implementation of warning of slippery conditions in accordance with CS 228 [Ref 37.N]. 5) Record asset data as defined in the ADMM [Ref 1.N].

E/2.6 The requirements for asset type 1200 - Traffic signs and road markings / studs shall be as follows:

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Table E/2.6 Traffic signs and road markings / studs maintenance requirement

Scope:
Traffic signs within the affected property, including all posts, supports, fastenings and fixings; non-illuminated bollards; mechanical variable message signs; and marker posts. Traffic signs mounted on structures within the scope of CS 450 [Ref 16.N] or lighting columns. Road markings and road studs in all materials within the affected property.

Out of Scope:

1) The lighting and electrical elements of road traffic signs, and illuminated bollards (which is included in lighting asset type).
2) Structural aspects of road traffic signs classified as structures in CS 450 [Ref 16.N] (which is included in structures asset type).
3) Management of soft estate to preserve road users' visibility of road traffic signs (which is included in the soft estate landscape asset type).
4) Regulatory and variable message signs associated with light signals and within the scope of TD 101 [Ref 42.N].
5) Light emitting variable message signs (which is included in roadside technology asset type), and
6) Proprietary motorway service area signs.

Outcomes:

1) Road traffic signs are safe and clear and maintained in order to preserve their original effectiveness as detailed in TSM Chapter 1 [Ref 43.N].
2) Regulatory road traffic signs give effect to regulatory provision.
3) Road markings and road studs are safe and visible during the day and night.

Deliverables:

1) Prepare and instruct the implementation of the MRP with regards to road traffic signs, road markings and road studs maintenance requirements.
2) The rectification of defects.
3) Manage deterioration of road markings and road studs such that they give effect to regulatory provision in the Traffic Signs Regulations and General Directions TSRGD [Ref 41.N].
4) Identify manufacturing faults or defects falling within a sign's warranty period and proactively pursue warranty claims.
5) Remove signs (and posts) ceasing to have effect and/or are obsolete.

Processes:

1) Work in accordance with the quality management system.

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Table E/2.6 Traffic signs and road markings / studs maintenance requirement (continued)

Procedures:

1) Regulatory provision for road traffic signs is given in the Traffic Signs Regulations and General Directions TSRGD [Ref 41.N] and includes those specially authorised by the Secretary of State under Section 64 and 65 of the Road Traffic Act Road Traffic Act 1988 [Ref 35.N]], signs ceasing to have effect as defined in Regulation 14, and those which are obsolete as defined in CM 125 [Ref 21.N].
2) Manage identified defects in accordance with CM 125 [Ref 21.N] and CS 126 [Ref 14.N].
3) Repair or replace signs in accordance with CM 125 [Ref 21.N].
4) Cleaning of signs in accordance with CM 125 [Ref 21.N] and manufacturers' instructions.
5) Record asset data as defined in the ADMM [Ref 1.N].

E/2.7 The requirement for asset type 1300 - Lighting shall be as follows:

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Table E/2.7 Lighting maintenance requirement

Scope:
Lighting equipment within the affected property, specifically:

1) Luminaires, including their internal control, photocells, central management system components, lamps, lenses, ballasts and drivers.
2) Belisha beacons and vertical wig wag signs at school or animal crossings.
3) Lighting columns, including but not limited to attached accessories such as embellishment kits, projection arms.
4) Road traffic sign lighting including illuminated bollards and pedestrian refuge lighting.
5) Other access lighting such as pedestrian walkways, cycle ways, subway and underpass lighting.
6) The electrical and optical elements of catenary lighting systems and high mast lighting systems in excess of 20m in height.
7) Electrical supplies, including ducting, chambers, cables, feeder pillars, associated switch gear, control equipment (including photocell, central management system components), monitoring equipment, heaters, thermostats, froststats.
8) Alternate energy sources such as solar panels or wind turbines etc. used for the purpose of road lighting or sign lighting.
9) Any energy saving equipment, i.e. midnight switch off equipment and / or dimming equipment.
10) Any power distribution cables downstream of the distribution network operator (DNO) connection point.
11) Additional points for maintenance including cables and ducting.
12) Asset label.

Out of Scope:

1) Lighting situated in road tunnels.
2) Road traffic control signals.
3) The non-electrical and structural elements of catenary lighting systems and high mast lighting systems (20m or more in height) which are classified as structures.
4) Management of soft estate to ensure illumination / lumination from lighting is not obscured (which is included in the soft estate landscape asset type).

Outcomes:

1) Lighting does not present a hazard to the road user, road worker or third parties.
2) Road lighting continues to fulfil its intended purpose as an accident reduction intervention.
3) Other lighting continues to fulfil its intended purpose: road traffic signs lighting to highlight the location of a road traffic sign, gantry lighting to highlight the presence of the sign and to help read the sign, and other lighting (subway & access) is to provide route guidance and hazard identification.

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Table E/2.7 Lighting maintenance requirement (continued)

Deliverables: 1) Prepare and instruct the implementation of the MRP with regards to lighting maintenance requirements. 2) In the MRP, develop and implement a risk based methodology to govern the frequency of: a) road lighting electrical testing interval (6 years maximum); b) road lighting structural inspection interval (6 years maximum starting 15 years after installation); c) road lighting optical maintenance (bulk lamp change and lens cleaning as a minimum - maximum frequency depending on lamp type as per Appendix E/A). 3) The rectification of defects. 4) Manage the maintenance of road lighting. Ensure correct lamp design life is used to ensure long term efficiency savings.
Processes: 1) Work in accordance with the quality management system.
Procedures: 1) Undertake an analysis using a risk based approach to undertaking of the painting of columns. 2) Record asset data and energy consumption data as defined in the ADMM [Ref 1.N]. 3) Maintain the energy consumption inventory in accordance with BSCP 520 [Ref 44.N]. 4) Maintain the effectiveness of energy saving equipment. 5) Re-use lamps with more than 25% of residual design life remaining. 6) Meet the unmetered energy user obligations to the district network operator. 7) Road lighting and road traffic sign lighting is maintained in accordance with TM 501 [Ref 33.N] and manufacturers' recommendations.

E/2.8 The requirement for asset type 1500 – Roadside technology shall be as follows:

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Table E/2.8 Roadside technology maintenance requirements

Scope:
Roadside technology within the affected property, including any power distribution cables downstream of the distribution network operator (DNO) connection point, associated electrical supplies, communication cables downstream of National Roads Telecommunication Services (NRTS) service delivery points, such as those between outstations and end devices, local ducting, chambers, cables, feeder pillars and technology cabinets and all switch gear, control equipment, heaters and thermostats therein.

Out of Scope:

1) ROC and NTOC in-station equipment.
2) Tunnel control management system
3) Technology trial equipment.
4) NRTS. Including the longitudinal duct network and cross carriageway ducts.

Outcomes:

1) Roadside technology equipment fulfils its intended purpose.
2) Roadside technology equipment operates efficiently and without premature reduction of equipment life.
3) Roadside technology equipment does not present a hazard to the road user, road worker or third parties.

Deliverable:

1) Nominate individual(s) to fulfil the role of Roadside Technology Asset Manager.
2) Prepare and instruct the implementation of the MRP with regards to roadside technology.
3) In the MRP develop and implement a risk-based methodology to govern the frequency of:
   a) roadside technology electrical periodic inspection and testing interval (6 years maximum) as defined within BS 7671 [Ref 29.N];
   b) Roadside technology equipment column structural inspection interval (5 years desirable, starting a maximum of 15 years after installation).
4) Monitor defects that have the potential for deterioration and could cause a risk to the achievement of the outcomes or cause a danger to the users of the highway.
5) Rectification of defects. This can be through the on-site repair / reset or the swapping out of modules.
6) Manage and maintain roadside technology to maximise the operational availability of individual assets.

Processes:
Work in accordance with the quality management system.

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Table E/2.8 Roadside technology maintenance requirements (continued)

Procedures:

1) In the MRP detail the roadside technology defect categories for all sub-asset defect descriptions and issue to the TOC centre.
2) Ensure that all technology spares are obtained in accordance with stores operational procedures or via Highways England Service Level Agreement (SLA) with manufacturers.
3) Equipment is appropriately calibrated such that it operates within the manufacturers stated tolerances and meets the performance criteria for which it has been installed.
4) Any asset disposal is completed in line with applicable legislation in place at the time, including the WEEE directive WEEE 2003 [Ref 46.N], where appropriate .
5) Record asset data as defined in the ADMM [Ref 1.N]

E/2.9 The requirement for asset type 1700 - Structures shall be as follows:

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Table E/2.9 Structures maintenance requirement

Scope: A structure (as contained in CG 300 [Ref 40.N]) within the affected property, situated under, over or adjacent to motorways and all-purpose trunk roads. Out of Scope: 1) Transmission stations.
Outcomes: 1) Structures and their constituent parts are managed and maintained to minimise risks to road users.
Deliverables: 1) Implement the Maintenance Requirements Plan (MRP) with regards to structures maintenance requirements. 2) Execute inspections in accordance with CS 450 [Ref 16.N] 3) Identify where a need for special inspections exists. 4) Make safe defects. 5) Review and update interim measures for the management of substandard structures.
Processes: 1) Work in accordance with the quality management system.
Procedures: 1) Execute inspections in accordance with CS 450 [Ref 16.N] 2) Manage sub-standard structures in accordance with CS 470 [Ref 23.N] 3) Undertake maintenance in accordance with appropriate parts of DMRB, manufacturers' instructions, and the relevant structures maintenance manual or structures file. 4) Record asset data as defined in the ADMM [Ref 1.N].

E/2.10 The requirement for asset type 2200 – Tunnels shall be as follows:

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Table E/2.10 Tunnels maintenance requirement

Scope: Tunnels within the affected property, including associated mechanical and electrical equipment, and supervisory control and data acquisition (SCADA) systems as set out in CD 352 [Ref 5.N]. Out of Scope: Roadside technology equipment as defined in the scope of the technology management and maintenance manual.
Outcomes: 1) Tunnels are managed, maintained and operated to ensure that they are safe in normal operational and emergency situations and are structurally sound.
Deliverables: 1) Prepare and implement the MRP with regards to tunnels maintenance requirements. 2) Operation and maintenance of the tunnel in accordance with the operation and maintenance manual (O&MM). 3) Review and update the tunnel's O&MM to include specific requirements for the operation, emergency response, safe evacuation during an emergency, service activities, and to identify safety critical components and ensure that these specifically operate as intended. Ensure O&MM revisions and updates include operational risk assessments which will determine the minimum safe operational requirements and associated minimum intervention times when defects are identified. Update the O&MM following a serious or disruptive Incident. 4) The rectification of defects which pose a hazard to road users. 5) The cleaning and maintenance of tunnel surfaces to maintain light reflectance, and avoid accumulation of toxic, corrosive and flammable deposits.
Processes: 1) Work in accordance with the quality management system.
Procedures: 1) Manage, maintain and operate tunnels in accordance with CS 452 [Ref 15.N], CM 430 [Ref 20.N] and CD 352 [Ref 5.N]. 2) Manage pollutant levels within the tunnel in accordance with exposure limits set out in the O&MM and CD 352 [Ref 5.N]. Note that exposure limits for oxides of nitrogen (NOx) given in CD 352 [Ref 5.N] are no longer applicable following withdrawal by HSE of mandatory exposure limits relating to this pollutant. Instead, there is a requirement to control exposure. 3) Comply with the road tunnels safety regulations 2007 in addition to CS 452 [Ref 15.N] where they apply (i.e. to tunnels over 500m in length and which form part of the trans-european road network). 4) Record tunnels asset data in accordance with the ADMM [Ref 1.N]. 5) Conduct electrical inspection and testing in accordance with BS 7671 [Ref 29.N] – requirements for electrical installations.

E/2.11 The requirement for asset type 3000 – Landscape and ecology shall be as follows:

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Table E/2.11 Landscape and ecology maintenance requirement

Scope: The semi-natural, improved / semi-improved and landscaped parts within the affected property, including biodiversity, cultural heritage assets and hard landscaping areas. This includes existing landscape, amenity, screening functions and/or other commitments where these have been raised by existing public inquiries, planning consents, protected habitats / species, designated sites (international, national) or cultural heritage assets.
Outcomes: 1) Soft estate landscape condition is managed and maintained to minimise risks to road users, road workers and adjacent affected parties. 2) Soft estate is managed and maintained to protect designated sites, protected species and habitats. 3) Soft estate is managed and maintained to ensure that all European and UK designated sites and their constituent habitats and species meet the requirements and objectives for which they were designated. 4) Soft estate is managed to ensure the status of the improved / semi-improved / landscaped parts. 5) Soft estate is managed and maintained to meet legislative requirements and existing commitments to public inquiries, planning consents, third parties, protection of designated sites (international, national), or protected habitats / species, and not at the detriment of its aesthetic value. 6) Soft estate is managed and maintained to maximise the affected property to link with the wider landscape and habitats. 7) Affected property is managed and maintained in order to benefit the species, habitats and sites of nature conservation importance. 8) Affected property is managed and maintained in order to contribute to the establishment of coherent ecological networks and delivery of the Highways England biodiversity plan.

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Table E/2.11 Landscape and ecology maintenance requirement (continued)

Deliverables:

1) Develop and annually update the Environmental Management Plan (EMP) in accordance with LA 120 [Ref 7.N].
2) Prepare and implement the MRP to execute the requirements of the EMP with regards to soft estate maintenance requirements.
3) Maintain the soft estate to ensure vegetation is removed from the central reserve.
4) Maintain road users' sight lines and stopping distance, this includes but is not limited to junctions, access points, curves, bends and central reserve.
5) Maintain road users' visibility of road traffic signs and signals.
6) Ensure illumination / lumination from lighting is not obscured.
7) Maintain CCTV camera operational visibility splays.
8) Maintain soft estate to minimise risk of fire hazards.
9) Manage the soft estate by removing any obstructions that prevents safe access, inspection and maintenance of technology equipment. This includes, but is not limited to, the roadside equipment cabinets and cable joint chambers, cable troughs, CCTV camera sites, message sign sites and meteorological equipment.
10) Manage the soft estate by removing of obstructions that prevents the use of customer facilities. This includes, but is not limited to, emergency roadside telephones and emergency refuge areas.
11) Manage the soft estate by removing any obstructions that prevents safe access to and use of footways, footpaths, cycle tracks, bridle ways and paved pedestrian areas. This includes, but is not limited to, the removal of vegetation and weeds.
12) Minimise the risk of trees or vegetation falling that could represent any safety risk, obstruction or nuisance. This includes but is not limited to trafficked or pedestrian areas and adjacent property.
13) Manage the soft estate by instructing activities to control the spread or increase of instances of injurious, invasive non-native species.
14) Manage the soft estate by instructing activities to minimise the risk of adversely affecting the stability, integrity or operation of other highway assets.
15) Manage the soft estate by instructing activities to meet existing landscape, amenity, screening functions and/or other commitments where these have been raised by existing public enquiries, planning consents, protected habitats / species or designated sites (international, national).
16) Maintain and update knowledge and records of semi-natural assets, improved / semi- improved, landscaped, protected habitats / species present or likely to be present within the soft estate in accordance with GG 184 [Ref 39.N].
17) Manage the soft estate to ensure that a strip from each edge of the carriageway remains unobstructed by vegetation throughout the year.
18) Manage the soft estate to maintain the integrity of amenity areas and ensure that they remain unobstructed by vegetation throughout the year.
19) Maintain habitats and species within the soft estate in accordance with EMP.
20) Maintain designated wildlife and landscape areas in accordance with the EMP.

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Table E/2.11 Landscape and ecology maintenance requirement (continued)

Processes: 1) Work in accordance with the quality management system. 2) The MRP defines the execution of EMP to deliver the outputs.
Procedures: 1) Record asset data as defined in the asset data management manual ADMM [Ref 1.N] 2) The EMP is developed in accordance with LA 120 [Ref 7.N], LD 117 [Ref 19.N] and Highways England environment strategy and managing our approach to environmental performance.

E/2.12 The requirement for asset type 4000 - Sweeping and cleaning shall be as follows:

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Table E/2.12 Sweeping and cleaning maintenance requirement

Scope:

1) Sweeping and cleaning of all motorways and their surrounds within the affected property.
2) Sweeping and cleaning of APTR and their surrounds for which the responsibility lies with Highways England, as detailed in the litter strategy HE Litter Strategy [Ref 11.N].
3) Sweeping and cleaning of APTR and their surrounds through agreement with the local authority.
4) Cleaning and servicing of amenity facilities within the affected property.
5) Removing graffiti within the affected property.
6) Removing fly tipping within the affected property for which responsibility lies with Highways England.
7) The management of animal fatalities within the affected property.
8) Vermin and pest management / control.

Out of Scope:

1) Initial response to Incidents involving or giving rise to debris, detritus or animal carcasses (see Incident management requirements HE IMR [Ref 12.N]).
2) Sweeping and cleaning of APTRs and their surrounds where no local authority agreement exists.

Outcomes:

1) The affected property is predominantly free from litter, refuse and detritus and fly tipping.
2) Amenity facilities are safe and serviceable.
3) The functionality of the affected property is not impeded by litter, debris, refuse, detritus, fly tipping or animal carcasses.
4) All graffiti is managed to ensure that the adverse impact on our customers' experience of the affected property is minimised.
5) Animal fatalities discovered within the affected property are removed, identified, stored and the owners sought and informed of the fatalities .

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Table E/2.12 Sweeping and cleaning maintenance requirement (continued)

Deliverables:

1) Prepare and instruct the implementation of the MRP with regards to sweeping and cleaning maintenance requirements.
2) Implementation of a risk based sweeping and cleaning intervention regime to mitigate adverse affects of litter, fly-tipping, refuse, or detritus on the appearance, stability, integrity or operation of highway assets.
3) Implementation of a risk based sweeping and cleaning intervention regime to mitigate adverse affects of debris, bird droppings and animal carcasses on the stability, integrity or operation of highway assets.
4) Removal from sight of all graffiti within the affected property and its surrounds.
5) The maintenance of paved areas (carriageway, paved verges and paved central reservations of motorways and APTRs) to Grade A as defined in the DEFRA Code of Practice on Litter and Refuse Litter CoP [Ref 3.N].
6) Maintenance of paved areas (motorway and APTR roundabouts and lay-bys, approach and slip roads) to Grade A as defined in the DEFRA Code of Practice on Litter and Refuse Litter CoP [Ref 3.N].
7) Maintenance of all other parts of the affected property (non paved) to grade B as defined in the Code of Practice on Litter and Refuse Litter CoP [Ref 3.N].
8) Implement a risk based intervention regime to manage, maintain and clean amenity facilities.
9) Notify other duty bodies responsible for sweeping and cleaning on APTRs where no local agreement exists, where it is apparent that they are not maintaining their sections of the affected property to an acceptable grade of cleanliness.
10) The deployment of a sweeping and cleaning rapid response as required.
11) Sweeping and cleaning rapid response includes the removal of offensive graffiti where that falls within the affected property.
12) The emptying of litter bins prior to them over spilling.
13) The clearance of any incidence of fly-tipping.
14) The recovery, identification, recording, storing and disposal of animal fatalities discovered within the affected property.
15) Identify and inform the owner of any domesticated animal fatality, including and not limited to utilising, collar/tags, ear tattoos and by scanning for microchips. Owners to be given an opportunity to their collect animal/pet remains from the storage depot.
16) Report all canine fatalities to the local authority dog warden and/or police. In situations where no positive identification can be made of a canine fatality, a description will be provided.
17) Place all animals, where appropriate, in cold storage prior to disposal. In instances of unidentified canine fatalities, following notification to the dog warden and/or police, if the owner does not come forward within a seven-day period the remains can be disposed of.
18) Record all animal fatalities, including but not limited to date, animal type and location, and any trends.

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Table E/2.12 Sweeping and cleaning maintenance requirement (continued)

Processes: 1) Work in accordance with the quality management system. 2) Animal fatalities will be recovered separately from other litter, debris, refuse, detritus or fly tipping.
Procedures 1) Develop the MRP to manage sweeping and cleaning to comply with the standards of cleanliness given in the DEFRA Code of Practice on Litter and Refuse Litter CoP [Ref 3.N]. 2) Assess affected property acceptable grade of cleanliness as described in the DEFRA Code of Practice on Litter and Refuse Litter CoP [Ref 3.N] . 3) The sweeping and cleaning rapid response will incorporate all sweeping, cleaning, fly-tipping or litter picking required to restore the specific area identified to Grade A cleanliness for paved areas, and Grade B cleanliness for all other parts of the affected property (as described in the DEFRA Code of Practice on Litter and Refuse Litter CoP [Ref 3.N]). Note that sweeping and cleaning rapid response includes removal of all graffiti where that falls within the specified area. 4) Animal fatalities involving, farm stock, wild animals or game animals, are managed in accordance with guidance provided by the Department for the Environment, Food & Rural Affairs and the animal and plant health agency. 5) Establish and execute measures to manage any occurrence of fly-tipping on the network so that it is removed. Details of fly-tipping occurrences is recorded to enable action to be taken against offenders. 6) Record asset data as defined in the ADMM [Ref 1.N].

E/3. Normative references

The following documents, in whole or in part, are normative references for this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Ref 1.N	Highways England. ADMM, 'Asset Data Management Manual'
Ref 2.N	Highways England. GS 801, 'Asset delivery asset inspection requirements'
Ref 3.N	Defra. Litter CoP, 'Code of Practice on Litter and Refuse'
Ref 4.N	Highways England. CD 227, 'Design for pavement maintenance'
Ref 5.N	Highways England. CD 352, 'Design of road tunnels'
Ref 6.N	Highways England. CD 535, 'Drainage asset data and risk management'
Ref 7.N	Highways England. LA 120, 'Environmental management plans'
Ref 8.N	Highways England. CD 239, 'Footway and cycleway pavement design'
Ref 9.N	Highways England. MCH 2584, 'Guidance for the calibration and optimisation of Smart Motorway systems'
Ref 10.N	The National Archives. legislation.gov.uk. Highways Act 1980, 'Highways Act 1980'
Ref 11.N	Stationary Office. Highways England. HE Litter Strategy, 'Highways England Litter Strategy'
Ref 12.N	Highways England. HE IMR, 'Incident management requirements'
Ref 13.N	The National Archives. legislation.gov.uk. Infrastructure Act 2015, 'Infrastructure Act 2015 Chapter 7'
Ref 14.N	Highways England. CS 126, 'Inspection and assessment of road markings and road studs'
Ref 15.N	Highways England. CS 452, 'Inspection and records for road tunnel systems'
Ref 16.N	Highways England. CS 450, 'Inspection of highway structures'
Ref 17.N	Highways England. GG 103, 'Introduction and general requirements for sustainable development and design'
Ref 18.N	Highways England. GG 101, 'Introduction to the Design Manual for Roads and Bridges'
Ref 19.N	Highways England. LD 117, 'Landscape design'
Ref 20.N	Highways England. CM 430, 'Maintenance of road tunnels'
Ref 21.N	Highways England. CM 125, 'Maintenance of traffic signs'
Ref 22.N	Highways England. GG 182, 'Major schemes: Enabling handover into operation and maintenance'
Ref 23.N	Highways England. CS 470, 'Management of sub-standard highway structures'
Ref 24.N	Highways England. CD 622, 'Managing geotechnical risk'
Ref 25.N	Highways England. CS 641, 'Managing the maintenance of highway geotechnical assets'
Ref 26.N	Highways England. MCHW, 'Manual of Contract Documents for Highway Works'
Ref 27.N	Highways England. HE NOR, 'Network occupancy requirements'

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Ref 28.N	The National Archives. legislation.gov.uk. NRSWA 1991, 'New Roads and Street Works Act 1991'
Ref 29.N	BSI. BS 7671, 'Requirements for Electrical Installations, IET Regulations'
Ref 30.N	Highways England. CD 377, 'Requirements for road restraint systems'
Ref 31.N	Highways England. GG 104, 'Requirements for safety risk assessment'
Ref 32.N	Highways England. LA 113, 'Road drainage and the water environment'
Ref 33.N	Highways England. TM 501, 'Road lighting (maintenance)'
Ref 34.N	BSI. BS EN 1317, 'Road restraint systems.'
Ref 35.N	The National Archives. legislation.gov.uk. Road Traffic Act 1988, 'Road Traffic Act 1988'
Ref 36.N	Highways England. LD 119, 'Roadside environmental mitigation and enhancement'
Ref 37.N	Highways England. CS 228, 'Skidding resistance'
Ref 38.N	BSI. BS 7818, 'Specification for pedestrian restraint systems in metal '
Ref 39.N	GG 184, 'Specification for the use of Computer Aided Design'
Ref 40.N	Highways England. CG 300, 'Technical approval of highway structures'
Ref 41.N	The Stationery Office. TSRGD, 'The Traffic Signs Regulations and General Directions 2016'
Ref 42.N	Highways England. TD 101, 'Traffic signalling systems (design)'
Ref 43.N	The Stationery Office. TSM Chapter 1, 'Traffic Signs Manual Chapter 1 - Introduction'
Ref 44.N	Elexon. BSCP 520, 'Unmetered supplies registered in SMRS'
Ref 45.N	BS 7669-3, 'Vehicle restraint systems. Guide to the installation, inspection and repair of safety fences'
Ref 46.N	Her Majesty's Stationary Office. WEEE 2003, 'Waste Electrical and Electronic Equipment Regulation 2003'
Ref 47.N	HMSO. DEFRA. Weeds Act 1959, 'Weeds Act 1959'
Ref 48.N	The Stationery Office. W&C Act 1981, 'Wildlife and Countryside Act 1981'

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Appendix E/A. Baseline maintenance requirements

E/A1 Introduction

Highways England's role is to operate, maintain, and modernise the Strategic Road Network on behalf of the Secretary of State for Transport. Our strategic business plan, in response to the government's road investment strategy, sets out our main activities and strategic outcomes, describing how we will go about delivering the investment plan and meeting of our performance specification requirements.

The strategic business plan outlines how we will improve capacity and performance of the network through better and more efficient modernisation, maintenance and operation, all of which will contribute to our three imperatives:

1) Safety;
2) Customer service;
3) Delivery.

Efficient maintenance of the asset and responding to defects in a safe and timely manner will make a significant contribution to the delivery of the strategic outcomes.

Highways England's requirements for the delivery of routine maintenance to the assets are set out in this document.

E/A2 Approach to routine maintenance

The ADAMr provides for an intelligence-led approach to routine maintenance activities, under which network characteristics, asset intelligence and customer insight, safety risk or delivery needs can be used to vary the baseline cyclic maintenance requirements, as appropriate.

These baseline maintenance requirements provide a framework under which the level of service required to deliver the ADAMr can be established. It outlines the approach to routine maintenance (cyclic maintenance activities and frequencies along with defect repair prioritisation assumptions) and operational considerations.

Taking the baseline maintenance requirements and overlaying with the locations where intelligence has varied the maintenance frequency determines the area specific maintenance requirements plan (MRP) which is issued to the contractor for delivery.

The contractor carries out its activities as instructed and in a manner that supports Highways England in providing a 'special defence' under Section 58 of the Highways Act 1980 [Ref 10.N].

Environmental and other legislative constraints frame the planning and delivering of any routine maintenance activity.

It should be noted that the undertaking of any cyclic and repair activity to one sub-asset can not affect the integrity and / or operation of any other sub-asset.

This document sets the high-level requirements of Highways England. The procedures add information about the requirements, but this document does not attempt to reproduce the full specification, method of work or item coverage for each Item. It should be read in conjunction with DMRB, MCHW, other standards, requirements and guidance.

E/A2.1 Intelligence-led maintenance

Intelligence-led maintenance (ILM) is driven by network characteristics, asset intelligence and customer, safety and delivery needs.

The application of ILM can deliver cyclic and repair maintenance activities on all assets.

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The baseline cyclic maintenance frequencies for each sub-asset activity are set out below.

Intelligence is applied to identify and demonstrate if an alternative frequency is more appropriate.This is achieved by taking the outcomes of the ADAMr along with the baseline frequencies below and assessing those for each location and sub asset, on the network, to determine if the cyclic maintenance frequency should be varied, from the baseline.

If intelligence determines that a different frequency to the baseline is required, the exception and justification for the variance is recorded in the MRP. The MRP is to be updated when conditions change and at least annually.

The application of intelligence could result in a maintenance intervention changing from a cyclic activity to a repair activity.

When the contractor undertakes routine maintenance, it is essential that the feedback and data, from the contractor, is captured to enable future development of the asset needs / cyclic frequencies to be continually reviewed, health and safety to be managed, and to inform the ongoing evolution of the area specific MRP.

E/A2.2 Cyclic maintenance

Cyclic maintenance covers activities that are carried out on individual sub-assets to maintain the integrity of the asset. The cyclic frequency is driven by the asset needs using the intelligence gained from above to deliver the outcomes from the ADAMr. The MRP determines the actual cyclic maintenance frequency at each location on the network against each sub-asset to enable the work to be programmed.

Utilising the MRP the contractor programmes the cyclic activities throughout the year to meet the maintenance requirements and in accordance with the network occupancy requirements HE NOR [Ref 27.N]. Where an activity is required to be undertaken a predefined number of times per year, the contractor plans the delivery at the most appropriate times to provide the optimum performance of the asset.

E/A2.3 Repair maintenance

Repair maintenance covers activities that are a result of a defect identified by the Highways England's inspection requirements, incidents, third party reports or those identified through the collaborative custodianship of the affected property. Repair activities are always instructed by Highways England and specify a corresponding repair period which the contractor uses to programme the works. Rectification can range from making safe the defect to a permanent repair of the asset.

E/A3 Operational considerations

The network occupancy requirements set out how the contractor will support Highways England's management of network occupancy. In turn this will contribute to the delivery of the performance requirements by minimising disruption to customers and efficiently optimising occupancy.

Highways England's objectives, which are set out in the network occupancy requirements, are that:

1) all occupancy is managed to secure the expeditious movement of traffic on the network and facilitate the expeditious movement of traffic on road networks for which another authority is the traffic authority;
2) works layout and timing are optimised;
3) works are coordinated with other works to minimise occupancy demand;
4) coordination requirements should be subject to cost and programming scrutiny;
5) data is provided as required to enable the correct population of NOMS.

Achieving these objectives will provide timely and accurate data for road users and other stakeholders and provide details of how occupancy opportunities will be identified to the contractor for cyclic and repair maintenance activities.

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Throughout the occupancy booking process Highways England will ensure that all activities have been optimised and co-ordinated with other activities/works on the area network and amend the programme as Highways England deems necessary. The contractor is required to facilitate this in accordance with the spirit of collaboration required throughout the contract.

There is a requirement that all the contractor activities and occupancy should be identified proactively and will be collaboratively delivered to take place with other activities/works on the affected property whenever this offers an opportunity to reduce the impact on the road users, as well as reducing risk to road workers.

E/A4 Maintenance requirements

E/A4.1 Asset type 0300 – Fences, screens and environmental barriers

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Table E/A.1 Maintenance requirements: Asset type: 0300 - Fences, screens and environmental barriers

Scope:
All types of fences, screens and environmental barriers (as detailed in LD 119 [Ref 36.N]) within the affected property, inclusive of walls, stock proofing, netting and wildlife fences.

Out of Scope:
The structural maintenance of fences, walls, screens and environmental barriers classified as structures (to CG 300 [Ref 40.N]). All types of fences, screen and environmental barriers that are owned and maintained by third parties or adjacent landowners.

	Cyclic maintenance: Scheduled activities that the client requires delivering to contribute to the client outcomes		Repair maintenance: Repair activity to be instructed by Highways England
Sub-asset Type	Activity: Specific maintenance activity to be undertaken	Baseline frequency: Occurrence of activity that relates directly to the asset need	Activity: Specific repair maintenance activity to be undertaken
Fences, walls, netting and environmental barriers	N/A	N/A	Rectify defects as instructed

Procedures:

1) Ensure rectification of defects complies with specifications for the fences, screens and environmental barrier assets as set out in relevant parts of MCHW [Ref 26.N].
2) Provide fences, walls, screens and environmental barriers repair maintenance activity data to demonstrate / evidence the services in accordance with the requirements of the asset data management manual ADMM [Ref 1.N].
3) In delivering fences, walls, screens and environmental barriers cyclic or repair maintenance activities, report problems or potential problems of the asset type and of other asset types to the client for consideration.
4) Make recommendations to the client to optimise the delivery of the fences, walls, screens and environmental barriers repair maintenance activities in order to minimise non-value adding elements.

E/A4.2 Asset type 0400 - Road restraint systems

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Table E/A.2 Maintenance requirements: Asset type: 0400 - Road restraint systems

Scope: All vehicle restraint systems and pedestrian restraint systems within the affected property, including: vehicle safety barriers, safety barrier gates, crash cushions, terminals, transitions, pedestrian guard rails, vehicle parapets, combined vehicle and pedestrian parapets and pedestrian parapets on bridges and other structures, arrester beds and cattle grids.			
	Cyclic maintenance: Scheduled activities that the client requires delivering to contribute to the client outcomes		Repair maintenance: Repair activity to be instructed by Highways England
Sub-asset type	Activity: Specific maintenance activity to be undertaken	Baseline Frequency: Occurrence of activity that relates directly to the asset need	Activity: Specific repair maintenance activity to be undertaken
Road restraint systems, and all barrier systems (excl. concrete barriers)	Tighten or replace screws and bolts and re-tension barrier	Entire network every 2 years (50% per year)	Rectify defects as instructed
All restraint systems	N/A	N/A	

Procedures:

1) Where defects result from a incident, a risk based approach is adopted for road restraint system repairs.
2) Rectify defects (as instructed) and maintain barrier tension of non-proprietary road restraint systems in accordance with BS 7669-3 [Ref 45.N].
3) Rectify defects (as instructed) and maintain barrier tension of proprietary road restraint systems in accordance with manufacturer's recommendations.
4) Maintain barrier tension in accordance with manufacturer's recommendations, or, in the absence of manufacturer's recommendations (e.g. on non-proprietary safety barrier systems), in accordance with BS 7669-3 [Ref 45.N], BS EN 1317 [Ref 34.N] and BS 7818 [Ref 38.N]. Replace all post screws when re-tensioning tension corrugated beam (TCB) safety barriers.
5) Maintain safety gates, cattle grids and their bypasses in accordance with manufacturer's recommendations.
6) Maintain arrester beds to CD 377 [Ref 30.N].
7) Provide road restraint systems cyclic and repair maintenance activity data in accordance with the requirements of the ADMM [Ref 1.N].
8) In delivering road restraint systems cyclic or repair maintenance delivery activities, report problems or potential problems of the asset type and of other asset types to the client for consideration.
9) Make recommendations to the client to optimise the delivery of the road restraint systems cyclic and repair maintenance activities in order to minimise non-value adding elements.

E/A4.3 Asset type 0500 – Drainage and service ducts

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Table E/A.3 Maintenance requirements: Asset type: 0500 - Drainage and service ducts

Scope: The system within the affected property which removes water from trafficked surfaces, sub-layers and other parts of the highway asset, open surface channels, drainage within structures and any components from the point at which water drains from paved or other areas to the outfall. Out of Scope: Structural maintenance of culverts with a clear span or internal diameter greater than 0.9m (which are included in the structures maintenance requirements).			
	Cyclic maintenance: Scheduled activities that the client requires delivering to contribute to the client outcomes		Repair maintenance: Repair activity to be instructed by Highways England
Sub-asset type	Activity: Specific maintenance activity to be undertaken	Baseline Frequency: Occurrence of activity that relates directly to the asset need	Activity: Specific repair maintenance activity to be undertaken
Gullies	Gully emptying including clearing of covers	Every 2 years	Rectify defect as instructed
Gully covers	Gully covers cleared	N/A	
Linear drainage systems	Low pressure / high volume combined kerb and drainage system jetting and proving	Every 2 years	
	Clear slot drains	Every 2 years	
	Sweep / clear concrete 'V' channel	Every 2 years	
Grips and counterfort drains	Clear/re-cut grips and counterfort drains, clear weed growth and debris	Every 2 years	
Catch pits	Clear/empty silt and debris from catch pits	Annually	
Ditches	Clear ditches by removing all material that could impair operation	Every 5 years	

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Table E/A.3 Maintenance requirements: Asset type: 0500 - Drainage and service ducts (continued)

Outfalls, including infiltration tanks/stilling basins and/or settlement	Clear outfalls by removing all material that could impair operation	Every 5 years	Rectify defect as instructed
Interceptors	Clean / empty trapped material from interceptors	N/A	
Soakaways (lagoon/ infiltration, pond, borehole and trench)	Clean priority soakaways	N/A	
	Clean non-priority soakaways	N/A	
Manholes	Clear manholes by removing all material that could impair operation	N/A	
Culverts	De-silt and remove all material that could impair operation	Every 5 years	
Filter drains	Edge scrapes and cut back and remove all build up from edge of carriageway through to filter material that could impair operation	Every 5 years (Apr-Jun)	
	Weed spray	Every 2 years	
Balancing / attenuation ponds	Clear silt and all material that could impair operation	Every 10 years	
	Cycle isolation valves	N/A	
Vortex grit separator	N/A	N/A	
Geocellular tanks	N/A	N/A	
Service ducts and chambers	N/A	N/A	
Ancillary items (PCDs, siphons, trash screens, penstocks)	Clear all material that could impair operation and ensure fit for operation	Every 2 years	

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Table E/A.3 Maintenance requirements: Asset type: 0500 - Drainage and service ducts (continued)

Swales	Remove any litter, debris and sediment that could impair operation	2 times per annum (Oct & April)	Rectify defect as instructed
	Undertake a grass cut of the swale to maintain the grass sward between 100 mm and 200mm in height	3 times per annum	
Basins	Remove any litter, debris and sediment that could impair operation	Annually	
	Undertake a grass cut of the grassed areas of the basin to maintain the grass sward between 100mm and 200mm in height	3 times per annum	
Grassed surface water channel	Undertake a grass cut of all areas of the grassed surface water drainage system to maintain the grass sward at a maximum of 75mm in height	3 times per annum	
	Remove any litter, debris and sediment that could impair operation prior to grass cutting	3 times per annum	
Reservoir pavements for drainage attenuation (with pervious surface)	Clean surface by hydro mechanical means – (high pressure rotating water jets and powerful suction to recover disturbed silt)	Annually	
Wetlands for drainage purposes (Wetlands for habitat are covered in Asset type 3000)	Remove any accumulated silt that is impairing the drainage operation.	Third of the wetland every three years. Seek guidance of an ecologist.	

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Table E/A.3 Maintenance requirements: Asset type: 0500 - Drainage and service ducts (continued)

Procedures:

1) Comply with specifications for the drainage asset as set out in relevant parts of MCHW [Ref 26.N].
2) Minimise pollution risk in accordance with GS 801 [Ref 2.N] and LA 113 [Ref 32.N].
3) Contractor to control drainage waste arisings such that they comply with legislation at the point of disposal.
4) Provide drainage and service ducts cyclic and repair maintenance delivery of activity data in accordance with the requirements of the ADMM [Ref 1.N].
5) In delivering a drainage and service ducts cyclic or repair maintenance activity, report problems or potential problems of the asset type and of other asset types to the client for consideration.
6) Make recommendations to the client to optimise the delivery of the drainage and service ducts cyclic and repair maintenance activities in order to minimise non-value adding elements.

E/A4.4 Asset type 0600 - Geotechnical assets

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Table E/A.4 Maintenance requirements: Asset type: 0600 - Geotechnical assets

Scope:
Geotechnical assets within the affected property, comprising: embankments and cuttings on which the pavement and other assets are founded, and noise / landscape bunds.

Out of Scope:
Physical services (incl. surveys and renewals) beyond short term management of safety critical defects.

	Cyclic maintenance: Scheduled activities that the client requires delivering to contribute to the client outcomes		Repair maintenance: Repair activity to be instructed by Highways England
Sub-asset type	Activity: Specific maintenance activity to be undertaken	Baseline frequency: Occurrence of activity that relates directly to the asset need	Activity: Specific repair maintenance activity to be undertaken
Embankments, cuttings and bunds	N/A	N/A	Rectify defect as instructed

Procedures:

1) Undertake activities in accordance with CS 641 [Ref 25.N].
2) Provide geotechnical repair maintenance activity data to demonstrate / evidence the services in accordance with the requirements of the ADMM [Ref 1.N].
3) In delivering a geotechnical cyclic or repair maintenance activities, report problems or potential problems of the asset type and of other asset types to the client for consideration.
4) Make recommendations to the client to optimise the delivery of the geotechnical cyclic and repair maintenance activities in order to minimise non-value adding elements.

E/A4.5 Asset type 0700 - Paved areas

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Table E/A.5 Maintenance requirements: Asset type: 0700 - Pavements / paved areas

Scope:
Paved areas, comprising: trafficked areas, hard shoulders, footways, cycle tracks, bridleways, footpaths, paved pedestrian areas, hard-standing paved areas, paved central reserves, traffic islands and cross-overs, gratings, frames, boxes, kerbs, edgings and preformed channels which fall within the affected property.

	Cyclic maintenance: Scheduled activities that the client requires delivering to contribute to the client outcomes		Repair maintenance: Repair activity to be instructed by Highways England
Sub-asset type	Activity: Specific maintenance activity to be undertaken	Baseline frequency: Occurrence of activity that relates directly to the asset need	Activity: Specific repair maintenance activity to be undertaken
Pavement and paved areas	N/A	N/A	Rectify defect as instructed
Ironwork	N/A	N/A	
Covers, gratings, frames and boxes	N/A	N/A	
Kerbs and edgings	N/A	N/A	
Footways and cycle tracks	N/A	N/A	

Procedures:

1) Rectify defects relating to carriageways in accordance with the MCHW [Ref 26.N], or CD 227 [Ref 4.N] respectively and the associated DMRB volume. Note that this includes response to diesel spillage.
2) Rectify defects relating to footways and cycle tracks in accordance with CD 239 [Ref 8.N] respectively and the associated DMRB volume.
3) Implement warnings of slippery conditions in accordance with CS 228 [Ref 37.N].
4) Provide pavements / paved area repair maintenance activity data to demonstrate / evidence the services in accordance with the requirements of the ADMM [Ref 1.N].
5) In delivering a pavements / paved area cyclic or repair maintenance activities, report problems or potential problems of the asset type and of other asset types to the client for consideration.
6) Make recommendations to the client to optimise the delivery of the pavements / paved area cyclic and repair maintenance activities in order to minimise non-value adding elements.

E/A4.6 Asset type 1200 - Traffic signs and road markings / studs

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Table E/A.6 Maintenance requirements: Asset type: 1200 - Traffic signs and road markings / studs

Scope:
Traffic signs within the affected property, including all posts, supports, fastenings and fixings; non-illuminated bollards; mechanical variable message signs; and marker posts. Traffic signs mounted on structures within the scope of CS 450 [Ref 16.N] or lighting columns. Road markings and road studs in all materials within the affected property.

Out of scope:

1) The lighting and electrical elements of road traffic signs, and illuminated bollards (which is included in lighting asset type);
2) Structural aspects of road traffic signs classified as structures in CS 450 [Ref 16.N] (which is included in structures asset type);
3) Management of soft estate to preserve road users' visibility of road traffic signs (which is included in the soft estate landscape asset type);
4) Regulatory and variable message signs associated with light signals and within the scope of TD 101 [Ref 42.N].
5) Light emitting variable message signs (which is included in roadside technology asset type); and,
6) Proprietary motorway service area signs.

	Cyclic maintenance: Scheduled activities that the client requires delivering to contribute to the client outcomes		Repair maintenance: Repair activity to be instructed by Highways England
Sub-asset type	Activity: Specific maintenance activity to be undertaken	Baseline Frequency: Occurrence of activity that relates directly to the asset need	Activity: Specific repair maintenance activity to be undertaken
Traffic signs	Clean all traffic sign faces and reference numbers.	Every 2 years	Rectify defects as instructed
Marker posts	Clean all post faces and reference numbers.	Every 2 years	
Bollards	Clean bollards	Annually	
Road markings	N/A	N/A	
Road studs	N/A	N/A	

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Table E/A.6 Maintenance requirements: Asset type: 1200 - Traffic signs and road markings / studs (continued)

Procedures:

1) Rectify defects in accordance with CM 125 [Ref 21.N] and CS 126 [Ref 14.N].
2) Where repair or replacement of signs, road markings or studs is instructed this will be in accordance with CM 125 [Ref 21.N] and CS 126 [Ref 14.N].
3) Clean signs in accordance with CM 125 [Ref 21.N] and manufacturers' instructions.
4) Provide traffic signs cyclic and repair maintenance activity data in accordance with the requirements of the ADMM [Ref 1.N].
5) In delivering a traffic signs cyclic or repair maintenance activities, report problems or potential problems of the asset type and of other asset types to the client for consideration.
6) Make recommendations to the client to optimise the delivery of the traffic signs cyclic and repair maintenance activities in order to minimise non-value adding elements.

E/A4.7 Asset type 1300 - Lighting

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Table E/A.7 Maintenance requirements: Asset type: 1300 - Lighting

Scope:
Lighting equipment within the affected property, specifically:

1) Luminaires, including their internal control, photocells, central management system components, lamps, lenses, ballasts and drivers.
2) Belisha beacons and vertical wig wag signs at school or animal crossings.
3) Lighting columns, including but not limited to attached accessories such as embellishment kits, projection arms.
4) Road traffic sign lighting including illuminated bollards and pedestrian refuge lighting.
5) Other access lighting such as pedestrian walkways, cycle ways, subway and underpass lighting.
6) The electrical and optical elements of catenary lighting systems and high mast lighting systems in excess of 20m in height.
7) Electrical supplies, including ducting, chambers, cables, feeder pillars, associated switch gear, control equipment (including photocell, central management system components), monitoring equipment, heaters, thermostats, froststats.
8) Alternate energy sources such as solar panels or wind turbines etc. used for the purpose of road lighting or sign lighting.
9) Any energy saving equipment, i.e. midnight switch off equipment and / or dimming equipment.
10) Any power distribution cables downstream of the distribution network operator (DNO) connection point.
11) Additional points for maintenance including cables and ducting.
12) Asset labels.

Out of Scope:

1) Lighting situated in road tunnels.
2) Road traffic control signals.
3) The non-electrical and structural elements of catenary lighting systems and high mast lighting systems (20m or more in height) which are classified as structures.
4) Management of soft estates to ensure illumination / lumination from lighting is not obscured (which is included in the soft estate landscape asset type);

	Cyclic maintenance: Scheduled activities that the client requires delivering to contribute to the client outcomes		Repair maintenance: Repair activity to be instructed by Highways England
Sub-asset type	Activity: Specific maintenance activity to be undertaken	Baseline Frequency: Occurrence of activity that relates directly to the asset need	Activity: Specific repair maintenance activity to be undertaken

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Table E/A.7 Maintenance requirements: Asset type: 1300 - Lighting (continued)

SWITCHED lamps (PL-L, PL-S, SOX)	Bulk lamp clean and change	Every 2 years	Rectify defect as instructed
UNSWITCHED lamps (PL-L, PL-S, SOX)	Bulk lamp clean and change	Annually	
SWITCHED lamps (CDM-T, CDO, SON/T, CPO, MCF/U, MBF/U)	Bulk lamp clean and change	Every 6 years	
UNSWITCHED lamps (CDM-T, CDO, SON/T, CPO, MCF/U, MBF/U)	Bulk lamp clean and change	Every 3 years	
SWITCHED lamps (GLS)	Bulk lamp clean and change	N/A	
UNSWITCHED lamps (GLS)	Bulk lamp clean and change	N/A	
(LED) for road lighting	Bulk clean	Every 6 years	
(LED) for illuminated signs and bollards	Clean translucent surfaces	Every 2 years	
Other lamp type not covered elsewhere	N/A	N/A	
Network cabling and electrical components including feeder pillars	Electrical testing	Every 6 years	
Lighting columns (<20m in height)	Structural testing from 15 years old	Every 6 years	

Procedures:

1) Input into the energy consumption inventory in accordance with BSCP 520 [Ref 44.N].
2) During electrical testing check and clean identification markers on lighting equipment.
3) Road lighting and road traffic sign lighting is maintained in accordance with TM 501 [Ref 33.N] and manufacturers' recommendations
4) Provide lighting cyclic and repair maintenance activity data in accordance with the requirements of the ADMM [Ref 1.N].
5) In delivering a lighting cyclic or repair maintenance activities, report problems or potential problems of the asset type and of other asset types to the client for consideration.
6) Make recommendations to the client to optimise the delivery of the lighting cyclic and repair maintenance activities in order to minimise non-value adding elements.

E/A4.8 Asset type 1500 - Roadside technology

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Table E/A.8 Maintenance requirements: Asset type 1500 - Roadside technology

Scope:
Roadside technology within the affected property, including any power distribution cables downstream of the distribution network operator (DNO) connection point, associated electrical supplies, communication cables downstream of NRTS service delivery points, such as those between outstations and end devices, local ducting, chambers, cables, feeder pillars and technology cabinets and all switch gear, control equipment, heaters and thermostats therein.

Out of Scope:

1) ROC and NTOC in-station equipment.
2) Tunnel control management system.
3) Technology trial equipment.
4) National roads telecommunication services (NRTS). Including the longitudinal duct network and cross carriageway ducts.

	Cyclic maintenance: Scheduled activities that the client requires delivering to contribute to the client outcomes		Repair Maintenance: Repair activity to be instructed by Highways England
Sub-asset type	Activity: Specific maintenance activity to be undertaken	Baseline frequency: Occurrence of activity that relates directly to the asset need	Activity: Specific repair maintenance activity to be undertaken
CCTV HSM cameras	Replenish washer bottle fluid	Annually	Rectify defect as instructed
	Clean camera housing window	Annually	
CCTV fixed cameras	N/A	N/A	
CCTV PTZ cameras	N/A	N/A	
CCTV roadside equipment	N/A	N/A	
CCTV mast ancillary equipment	Inspect winch and mast rope, grease winch mechanism and check mast breaking system where required	Annually	
APTR telephones	Clean telephone internally and externally	Every 2 years	Rectify defect as instructed
Emergency roadside telephone (ERT)	Clean telephone internally and externally	Every 2 years	
Environmental sensor stations (ESS)	Test and calibrate sites pre-winter season and mid-winter season	Twice per year	Rectify defect as instructed
Meteorological sites	Clean fog sensors	Annually	

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Table E/A.8 Maintenance requirements: Asset type 1500 - Roadside technology (continued)

Advanced motorway indicator (AMI)	N/A	N/A	Rectify defect as instructed
MS1, MS2, MS3, MS4, enhanced message signs, lane control signs	N/A	N/A	
Fixed text message signs	Check, clean and grease where required motor assemblies and rotate prisms	Twice per year	
Remotely operated temporary traffic management signs	Change batteries	5 years	
	Inspect and clean battery connectors	Annually	
	Clean sign face	Annually	
Midas outstations and detectors	Optimisation of MIDAS detectors (loops and radar) in accordance with MCH 2584 [Ref 9.N]	Annually	Rectify defect as instructed
ANPR roadside controller and camera	N/A	N/A	Rectify defect as instructed
TAME and TMU outstations and loops	N/A	N/A	
Over height and high vehicle detectors	N/A	N/A	Rectify defect as instructed
Tidal flow traffic system equipment	N/A	N/A	Rectify defect as instructed
Road traffic signals (RAG)	Check alignment and condition of site and operation of any rotating tactile devices	Annually	Rectify defect as instructed
	Inspections undertaken in accordance with TD 101 [Ref 42.N]	Annually	
Ramp metering traffic light signals	Check alignment and condition of site	Annually	Rectify defect as instructed
Traffic detector equipment	N/A	N/A	Rectify defect as instructed
Barrier systems	N/A	N/A	Rectify defect as instructed
Electrical supplies, components and distribution cables	Inspection and test in accordance with BS 7671 [Ref 29.N]	6 years	Rectify defect as instructed
	RCD operation and visual inspection of cable terminations	Annually	

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Table E/A.8 Maintenance requirements: Asset type 1500 - Roadside technology (continued)

Procedures:

1) Highways England technology maintenance stock management operating procedures apply to the maintenance delivery of technology roadside assets.
2) Ensure that all technology asset equipment is maintained with parts obtained in accordance with Highways England stores operational procedures or via Highways England service level agreement (SLA) with manufacturers.
3) Record all technology asset equipment maintenance activities within Highways England's asset management database in accordance with ADMM [Ref 1.N]. This includes but is not limited to: the date and time the item delivery took place to each individual asset, category, type, variant used and any relevant test data.
4) Ensure that all technology assets have identification markers, for logging within the IT service management (ITSM) system, that are clearly located and clearly visible and legible. The identification details included within the ITSM system should also contain the correct asset information at all times.
5) Technology is maintained in accordance with manufacturers' instructions.
6) Equipment is appropriately calibrated such that it operates within the manufacturers stated tolerances and meets the performance criteria for which it has been installed.
7) In delivering a technology cyclic or repair maintenance activities, report problems or potential problems of the asset type and of other asset types to the client for consideration.
8) If an ERT is faulty or non-operative, the ERT should be covered with a "NOT IN USE" bag.
9) Make recommendations to Highways England to optimise the delivery of the technology cyclic and repair maintenance activities in order to minimise non-value adding elements and to minimise whole life cost of ownership.
10) Any asset disposal is completed in line with applicable legislation in place at the time, including the WEEE directive WEEE 2003 [Ref 46.N], where appropriate.

E/A4.9 Asset type 1700 - Structures

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Table E/A.9 Maintenance requirements: Asset type: 1700 - Structures

Scope:
A structure (as contained in CG 300 [Ref 40.N]) within the affected property, situated under, over or adjacent to the motorway or all-purpose trunk road.

Out of Scope:

1) Transmission stations.

	Cyclic Maintenance: Scheduled activities that the client requires delivering to contribute to the client outcomes		Repair maintenance: Repair activity to be instructed by Highways England
Sub-asset type	Activity: Specific maintenance activity to be undertaken	Baseline frequency: Occurrence of activity that relates directly to the asset need	Activity: Specific repair maintenance activity to be undertaken
Structures and constituent parts	Carry out maintenance activities as per structures asset database	As per structures asset database	Rectify defect as instructed

Procedures:

1) Maintain sub standard structures in accordance with CS 470 [Ref 23.N].
2) Undertake maintenance in accordance with appropriate parts of DMRB, manufacturers' instructions, and the relevant structures maintenance manual or structures file.
3) Provide structures cyclic and repair maintenance activity data in accordance with the requirements of ADMM [Ref 1.N].
4) In delivering structures cyclic or repair maintenance activities, report problems or potential problems of the asset type and/or of other asset types to the client for consideration.
5) Make recommendations to the client to optimise the delivery of structures cyclic and repair maintenance activities in order to minimise non-value adding elements.

E/A4.10 Asset type 2200 - Tunnels

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Table E/A.10 Maintenance requirements: Asset type: 2200 - Tunnels

Scope:
Tunnels within the affected property, including associated mechanical and electrical equipment, and supervisory control and data acquisition (SCADA) systems as set out in CD 352 [Ref 5.N].

Out of Scope: Roadside technology equipment as defined in the scope of the technology management and maintenance manual.

	Cyclic Maintenance: Scheduled activities that the client requires delivering to contribute to the client outcomes		Repair maintenance: Repair activity to be instructed by Highways England
Sub-asset type	Activity: Specific maintenance activity to be undertaken	Baseline frequency: Occurrence of activity that relates directly to the asset need	Activity: Specific repair maintenance activity to be undertaken
Tunnel surfaces	Remove toxic, corrosive and flammable deposits and maintain light reflectance.	N/A	Rectify defect as instructed
Electrical components	Electrical testing	N/A	

Procedures:

1) Maintain tunnels in accordance with CM 430 [Ref 20.N] and CD 352 [Ref 5.N].
2) Comply with the road tunnels safety regulations 2007 where they apply (i.e. to tunnels over 500m in length and which form part of the trans-European road network).
3) Conduct electrical inspection and testing in accordance with BS 7671 [Ref 29.N] – Requirements for electrical installations.
4) Provide tunnels cyclic and repair maintenance activity data in accordance with the requirements of the ADMM [Ref 1.N].
5) In delivering tunnel cyclic or repair maintenance activities, report problems or potential problems of the asset type and/or of other asset types to the client for consideration.
6) Make recommendations to the client to optimise the delivery of tunnel cyclic and repair maintenance activities in order to minimise non-value adding elements.

E/A4.11 Asset type 3000 - Landscape and ecology

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Table E/A.11 Maintenance requirement: Asset type: 3000 – Landscape and ecology

Scope: The semi-natural, improved / semi-improved and landscaped parts within the affected property, including biodiversity, cultural heritage assets and hard landscaping areas. This includes existing landscape, amenity, screening functions and / or other commitments where these have been raised by existing public inquiries, planning consents, protected habitats / species, designated sites (international, national) or cultural heritage assets.			
	Cyclic maintenance: Scheduled activities that the client requires delivering to contribute to the client outcomes		Repair maintenance: Repair activity to be instructed by Highways England
Sub-asset type	Activity: Specific maintenance activity to be undertaken	Baseline frequency: Occurrence of activity that relates directly to the asset need	Activity: Specific repair maintenance activity to be undertaken

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Table E/A.11 Maintenance requirement: Asset type: 3000 – Landscape and ecology (continued)

Shrubs / trees	N/A	N/A	Rectify defects as instructed
Hedgerows (General)	Trim hedgerows, maintain and preserve clear carriageway width, sight lines and stopping distance, including junctions, access points, curves and bends	N/A	
Woodland	Thin / coppice	Every 7 years	
Grass and vegetation	Maintain and preserve sight lines and stopping distance, including junctions, access points, curves, bends and central reserve.	3 times per year (Apr- Sep)	
	Maintain and preserve CCTV camera operational visibility splays.	Annually (Apr-Sep)	Rectify defects as instructed
	Maintain and preserve road users visibility of road traffic signs and signals.	Annually (Apr-Sep)	
Grass and vegetation	Ensure illumination / lumination from lighting is not obscured.	Annually (Apr-Sep)	
	Remove obstructions and / or maintain vegetation to facilitate safe access for inspection and maintenance of feeder pillars and technology equipment.	Annually (Apr-Sep)	
	Remove obstructions and maintain vegetation to provide safe access to and use of footways, cycle tracks, bridleways, footpaths and paved pedestrian areas.	Annually (Apr-Sep)	Rectify defects as instructed
Grass and vegetation	Undertake amenity cut of amenity grass areas, including gate way features, village verges and special landscape features.	8 times per year (Mar - Oct)	Rectify defects as instructed
	Undertake 2m wide swathe cut of all highway verges to ensure strip remains unobstructed by vegetation throughout the year (in addition to visibility splay maintenance).	Annually (Apr-Sep)	
	Grass cut the central reserve.	Annually (Apr-Sep)	

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Table E/A.11 Maintenance requirement: Asset type: 3000 – Landscape and ecology (continued)

Grass and vegetation	Remove obstructions and/or maintain vegetation to facilitate safe use of customer facilities. This includes but not limited to emergency roadside telephones and emergency refuge areas.	N/A	Rectify defects as instructed
	Remove vegetation affecting the stability, integrity or operation of structures or other affected property assets.	N/A	
Injurious weeds	Maintain affected property to control the spread or increase of identified instances of injurious weeds	Annually (May-Sep)	Control spread of previously unidentified populations of injurious weeds
Invasive plant species	Maintain affected property to control the spread or increase of identified instances of invasive plant species.	Annually (May-Sep)	Control spread of previously unidentified populations of invasive plant species
Grassland (Open Grassland)	Maintain habitat integrity, including removal of scrub encroachment.	Every 5 years	Rectify defects as instructed
Heath and moorland	Maintain habitat integrity, including removal of scrub encroachment and tree saplings throughout.	Every 5 years (Sept - Feb)	
Conservation grassland / wildflower grassland	Maintain habitat integrity including removal of scrub encroachment and undesirable weed species	Annually (Sept, Oct)	
Rock scree	Removal of scrub encroachment.	Every 3 years	Rectify defect as instructed to meet existing commitments

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Table E/A.11 Maintenance requirement: Asset type: 3000 – Landscape and ecology (continued)

Shrubs (General)	Maintain habitat integrity, including removal of scrub encroachment.	Every 3 years (Sept - Feb)	Rectify defects as instructed
Shrubs (Ornamental)	Maintain design requirements / amenity function.	Annually (Sept - Feb)	
Woodlands – highways management	Maintain in line with EMP.	Annually (Sept - Feb)	
Woodlands and trees, including veteran trees	Maintain habitat integrity, including removal of scrub encroachment	Every 5 years (Sept - Feb)	
Hedgerows (Habitat)	Maintain habitat integrity, including removal of undesirable species.	Every 3 years	
Waterbodies- attenuation/ highways management	Maintain in line with current guidance, seek guidance of an ecologist.	Annually (Sept - Feb)	
Waterbodies and wetlands – inc reedbeds, marsh and wet grassland	Maintain habitat integrity, vegetation clearance to the maximum level of water storage, seek guidance of an ecologist.	Thin a third every three years.	
Wildlife structures and tunnels	Remove all material that could impair operation.	Every 1 year	
Protected habitats or designated sites	Maintain in line with current statutory body requirements	Every 1 year	
Protected species	Maintain in line with current species-specific legislation and current mitigation guidance	Every 1 year	
Nature improvement areas	N/A	N/A	

Procedures:

1) Carry out woodland thin / coppice according to objectives of the specific plots as detailed in the client's systems.
2) Instances of Invasive animal species are reported to the client.
3) Undertake all cyclic activities commensurate with the particular species present and the appropriate seasonal requirements for each species.
4) Provide soft estate cyclic and repair maintenance delivery activity data in accordance with the requirements of the ADMM [Ref 1.N].
5) In delivering soft estate cyclic or repair maintenance activities, report problems or potential problems of the asset type and of other asset types to the client for consideration.
6) Make recommendations to the client to optimise the delivery of the soft estate cyclic and repair maintenance activities in order to minimise non-value adding elements.

E/A4.12 Asset type 4000 - Sweeping and cleaning

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Table E/A.12 Maintenance requirements: Asset type: 4000 - Sweeping and cleaning

Scope:

1) Sweeping and cleaning of all motorways and their surrounds within the affected property;
2) Sweeping and cleaning of APTR and their surrounds for which the responsibility lies with Highways England, as detailed in the litter strategy.
3) Sweeping and cleaning of APTR and their surrounds through agreement with the local authority.
4) Cleaning and servicing of amenity facilities within the affected property.
5) Removing graffiti within the affected property.
6) Removing fly tipping within the affected property for which responsibility lies with Highways England..
7) The management of animal fatalities within the affected property.
8) Vermin and pest management / control.

Out of Scope:

1) Initial response to incidents involving or giving rise to debris, detritus or animal carcasses (see incident response requirements).
2) Sweeping and cleaning of APTRs and their surrounds where no local authority agreement exists.

	Cyclic maintenance: Scheduled activities that the client requires delivering to contribute to the client outcomes		Repair maintenance: Repair activity to be instructed by Highways England
Sub-asset type	Activity: Specific maintenance activity to be undertaken	Baseline frequency: Occurrence of activity that relates directly to the asset need	Activity: Specific repair maintenance activity to be undertaken
Running lanes	Full sweep	N/A	Rectify defect as instructed
Paved non-running areas	Full sweep	2 times per year	
Carriageway, paved areas and paved central reservations of motorways and APTRs	Litter pick to maintain to grade A	Annually	
Motorway and APTR roundabouts and lay-bys, approach and slip roads	Litter pick to maintain to grade A	Annually	

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Table E/A.12 Maintenance requirements: Asset type: 4000 - Sweeping and cleaning (continued)

Verges, non-paved central reservations and amenity grass areas, including gate way features, village verges and special landscape features.	Litter pick to maintain to grade A	Annually	Rectify defect as instructed
All other parts of the affected property (non-paved, excluding amenity areas)	Litter pick to maintain to grade B	N/A	
Amenity areas	Litter pick to maintain to grade A	Annually	
Toilet blocks	Clean and maintain toilet blocks	Daily	

Procedures:

1) Comply with the standards and grades of cleanliness given in the code of practice on litter and refuse (DEFRA, 2006) Litter CoP [Ref 3.N].
2) Animal fatalities involving, farm stock, wild animals or game animals, are managed in accordance with guidance provided by the Department for the Environment, Food & Rural Affairs and the Animal and Plant Health Agency.
3) When domesticated animal fatalities are being recovered the following information is required: Date, location recovered from the network, animal type, colour, details of any collars / tags / ear tattoos and scanned for microchips with details recorded, location the animal has been recovered to and submitted to the client. The animal is placed in cold storage and disposed of when instructed.
4) Provide sweeping and cleaning cyclic and repair maintenance activity data in accordance with the requirements of the ADMM [Ref 1.N]
5) In delivering a sweeping and cleaning cyclic or repair maintenance activities, report problems or potential problems of the asset type and/or of other asset types to the client for consideration.
6) Make recommendations to the client to optimise the delivery of the sweeping and cleaning cyclic and repair maintenance activities in order to minimise non-value adding elements.

Appendix E/B. Roadside technology baseline defect categories

E/B1 Introduction

Baseline technology defect categories are attributed to each roadside technology asset and sub-asset defect description. These defect categories set out the restore times which in effect define the prioritisation of the defect. The defect descriptions are intentionally written as high level to provide easy identification of technology asset defects.

These roadside technology baseline defect categories set the baseline requirements for reactive repair of roadside technology of the strategic road network.

Roadside technology defects are to be restored in accordance with their baseline defect category or an alternative intelligence-led defect category as identified and justified by network characteristics, asset intelligence and customer, safety and delivery needs.

Table E/B.1 Roadside technology defect categories and corresponding restore time

Technology defect category	Restore service time
TDC 1a - Urgent resolution defect	Restore service within 2 hours
TDC 1b - Urgent resolution defect	Restore service within 4 hours
TDC 2a - Service affecting defect	Restore service within 12 hours
TDC 2b - Service affecting defect	Restore service within 24 hours
TDC 2c - Service affecting defect	Restore service within 48 hours
TDC 3a - Other defect	Restore service within 7 days
TDC 3b - Other defect	Restore service within 56 days

E/B2 Baseline technology defect categories

Baseline technology defect categories are as follows:

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Table E/B.2 Closed circuit television and mast ancillary equipment

System / Sub-asset type	Scope	Technology defect category						
		TDC 1a - Urgent resolution defect	TDC 1b - Urgent resolution defect	TDC 2a - Service affecting defect	TDC 2b - Service affecting defect	TDC 2c - Service affecting defect	TDC 3a - Other defect	TDC 3b - Other defect
CCTV HSM (hard shoulder monitoring) cameras	Including but not limited to camera, housing and associated cabling and connections	CCTV failure within 1km of a tunnel portal (both directions)	CCTV failure within a tunnel	N/A	N/A	1. Cannot view a stable or valid image. 2. Camera alignment is incorrect and prevents hard shoulder from opening as a running lane.	All other defects	N/A
CCTV fixed Cameras	Including but not limited to camera, housing and associated cabling and connections			N/A	N/A	Cannot view a stable or valid image.		N/A
CCTV PTZ Cameras	Including but not limited to camera, housing and associated cabling and connections			N/A	N/A	1. Cannot view a stable or valid image. 2. Cannot operate camera correctly.		N/A
CCTV roadside equipment	Including but not limited to housing and associated cabling and connections			N/A	N/A	Cannot communicate		N/A
CCTV mast ancillary equipment	Including but not limited to associated cabling, winch systems, pan/tilt/zoom mechanisms and mountings associated with ANPR cameras and CCTV (PTZ and fixed and AID) cameras			N/A	N/A	Equipment failure affecting movement of camera and image.		N/A

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Table E/B.3 Emergency roadside telephones (ERT) & all-purpose trunk road (APTR) phones

System / Sub-asset type	Scope	Defect category						
		1a - Urgent resolution defect	1b - Urgent resolution defect	2a -Service affecting defect	2b -Service affecting defect	2c - Service affecting defect	3a - Other defe-ct	3b - Other defe-ct
APTR phones	Including but not limited to handset, housing and associated cabling	1. ERT failure within 1km of a tunnel portal - both directions. 2. ERT failure at two or more consecutive ERTs in a single direction.	ERT Failure within a Tunnel	N/A	N/A	All ERT (including those in a place of relative safety (PRS)) that do not allow caller to communicate with call handler.	All other de-fects	N/A
Emergency roadside telephone (ERT)	Including but not limited to handset, housing and associated cabling			N/A	N/A			N/A

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Table E/B.4 Weather monitoring equipment

System / Sub-asset type	Scope	Defect category						
		1a - Urgent resolution defect	1b - Urgent resolution defect	2a - Service affecting defect	2b - Service affecting defect	2c - Service affecting defect	3a - Other defect	3b - Other defect
Environmental sensor stations (ESS)	Including but not limited to control room equipment pertaining to the communication and presentation of weather information.	N/A	N/A	N/A	N/A	1. The only forecasting site within a domain is affected. 2. Primary forecasting site is affected within the same domain as a failed secondary forecasting site. 3. Secondary forecasting site is affected within the same domain as a failed primary forecasting site. 4. Any Met sensor failure.	All other de-fects	N/A
Meteorlogical (MET) sensors	Also including but not limited to housing and associated cabling.	N/A	N/A	N/A	N/A			N/A

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Table E/B.5 Matrix signals

System / Sub-asset type	Scope	Defect category						
		1a - Urgent resolution defect	**1b - Urgent resolution defect**	**2a - Service affecting defect**	**2b - Service affecting defect**	**2c - Service affecting defect**	**3a - Other defect**	**3b - Other defe-ct**
Advanced motorway indicator (AMI)	Including but not limited to matrix signal (LED and optical fibre), signal drivers, signal structures installed at the roadside and associated cabling	N/A	Tunnel matrix signal failure	N/A	N/A	1. AMI defect that prevents the dynamic hard shoulder being opened as a running lane. 2. Cannot display required mandatory speed. 3. Cannot display required advisory speed. 4. Cannot display "red X" or "lane divert". 5. Cannot display "green arrow"	All other defects	N/A
Matrix indicator		N/A	N/A	N/A	N/A			N/A
Enhanced matrix indicator (EMI) forming the signal elements of a motorway signal mark 2/3 fitted to a cantilever		N/A	N/A	N/A	N/A			N/A
Controlled motorway indicator (CMI)		N/A	N/A	N/A	N/A			N/A

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Table E/B.6 Message signs and associated equipment

System / Sub-asset type	Scope	Defect category						
		1a - Urgent resolution defect	1b - Urgent resolution defect	2a - Service affecting defect	2b - Service affecting defect	2c - Service affecting defect	3a - Other defect	3b - Other defect
Message sign MS1	Including but not limited to message sign (LED, flip- dot, optical fibre and fixed text), message sign drivers, message sign structures at the roadside and associated cabling.	N/A	N/A	N/A	N/A	1. Cannot display required advisory speed. 2. Cannot display required "wicket signs"	All other defects	N/A
Message sign MS2		N/A	N/A	N/A	N/A	1. Cannot display a legend. 2. Cannot display required legend.	All other defects	N/A
Message sign MS3		N/A	N/A	N/A	N/A	1. Cannot display required legend. 2. Cannot display required diversion message at critical location.	All other defects	N/A
Message sign MS4		N/A	N/A	N/A	N/A	1. MS4 defect that prevents the dynamic hard shoulder being opened as a running lane. 2. Cannot display required speed. 3. Cannot display required advisory speed. 4. Cannot display required legend. 5. Cannot display required "wicket signs". 6. Cannot display required "Fog" legend.	All other defects	N/A

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Table E/B.6 Message signs and associated equipment (continued)

System / Sub-asset type	Scope	Defect category						
		1a - Urgent resolution defect	**1b - Urgent resolution defect**	**2a - Service affecting defect**	**2b - Service affecting defect**	**2c - Service affecting defect**	**3a - Other defect**	**3b - Other defect**
Enhanced message signs (EMS)	Including but not limited to message sign (LED, flip- dot, optical fibre and fixed text), message sign drivers, message sign structures at the roadside and associated cabling.	N/A	N/A	N/A	N/A	1. Cannot display required speed. 2. Cannot display required "wicket signs". 3. Cannot display required diversion message at critical location.	All other defects	N/A
Fixed text message signs (FTMS)		N/A	N/A	N/A	N/A	1. FTMS defect that prevents the dynamic hard shoulder being opened as a running lane. 2. Cannot display required legend.	All other defects	N/A
Lane control signs (LCS)		N/A	N/A	N/A	N/A	1. Cannot display required advisory speed. 2. Cannot display "red X" or "lane divert". 3. Cannot display "green arrow".	All other defects	N/A

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Table E/B.6 Message signs and associated equipment (continued)

System / Sub-asset type	Scope	Defect category						
		1a - Urgent resolution defect	**1b - Urgent resolution defect**	**2a - Service affecting defect**	**2b - Service affecting defect**	**2c - Service affecting defect**	**3a - Other defect**	**3b - Other defect**
Remotely operated temporary traffic management signs (ROTTM)	Including but not limited to message sign (LED, flip- dot, optical fibre and fixed text), message sign drivers, message sign structures at the roadside and associated cabling.	N/A	N/A	N/A	N/A	1. Cannot display required "wicket signs". 2. Cannot display required speed. 3. Cannot display required legend. 4. Cannot display required diversion message at critical location. 5. Cannot communicate.	All other defects	N/A
Portable variable message sign (VMS)		N/A	N/A	N/A	N/A	N/A	All defects	N/A
FTMS controllers		N/A	N/A	N/A	N/A	1. FTMS controller defect that prevents the dynamic Hard Shoulder being opened as a running lane. 2. Cannot communicate	All other defects	N/A

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Table E/B.7 Motorway Incident Detection and Automatic Signalling (MIDAS)

System / Sub-asset type	Scope	Defect category						
		1a - Urgent resolution defect	1b - Urgent resolution defect	2a - Service affecting defect	2b - Service affecting defect	2c - Service affecting defect	3a - Other defect	3b - Other defect
MIDAS detectors	Including but not limited to inductive loops, radar detectors, and equipment installed in the carriageway or at the roadside and associated cabling	N/A	N/A	N/A	N/A	1. Cannot measure detector occupancy. 2. Cannot measure speed or flow.	1. MIDAS not sufficiently calibrated for NTIS needs. 2. All other defects.	Loop Re-cut
MIDAS outstation	Including but not limited to motorway incident detection and automatic signalling (MIDAS) system, cabinets and associated cabling	N/A	N/A	N/A	N/A	1.Cannot process detector data. 2. Cannot communicate.		N/A

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Table E/B.8 Automatic number plate recognition (ANPR) cameras

System / Sub-asset type	Scope	Defect category						
		1a - Urgent resolution defect	1b - Urgent resolution defect	2a - Service affecting defect	2b - Service affecting defect	2c - Service affecting defect	3a - Other defect	3b - Other defect
ANPR roadside controller	Including but not limited to housing and associated cabling	N/A	N/A	N/A	N/A	N/A	All defects	N/A
Automatic number plate recognition cameras	Including but not limited to camera, housing and associated cabling	N/A	N/A	N/A	N/A	N/A		N/A

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Table E/B.9 Traffic appraisal monitoring and economics (TAME)

System / Sub-asset type	Scope	Defect category						
		1a - Urgent resolution defect	**1b - Urgent resolution defect**	**2a - Service affecting defect**	**2b - Service affecting defect**	**2c - Service affecting defect**	**3a - Other defect**	**3b - Other defect**
Traffic appraisal monitoring and economics (TAME) loops	Including but not limited to TAME count sites installed in the carriageway or at the roadside.	N/A	N/A	N/A	N/A	N/A	All defects	Loop re-cut
TAME outstation	Including but not limited to associated cabling.	N/A	N/A	N/A	N/A	All defects	N/A	N/A

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Table E/B.10 Traffic monitoring unit (TMU)

System / Sub-asset type	Scope	Defect category						
		1a - Urgent resolution defect	1b - Urgent resolution defect	2a - Service affecting defect	2b - Service affecting defect	2c - Service affecting defect	3a - Other defect	3b - Other defect
Traffic monitoring unit (TMU) loops	Including but not limited to cabinets, optical equipment, detector loops, push button or tactile facilities.	N/A	N/A	N/A	N/A	N/A	All defects	Loop re-cut
TMU outstation	Including but not limited to associated cabling.	N/A	N/A	N/A	N/A	All defects	N/A	N/A

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Table E/B.11 Over height and high vehicle detectors

System / Sub-asset type	Scope	Defect category						
		1a - Urgent resolution defect	1b - Urgent resolution defect	2a - Service affecting defect	2b - Service affecting defect	2c - Service affecting defect	3a - Other defect	3b - Other defect
Vehicle presence detectors	Including but not limited to associated equipment and cabling installed at the roadside.	N/A	N/A	N/A	N/A	All defects	N/A	N/A
Height detectors		N/A	N/A	N/A	N/A		N/A	N/A
High vehicle detectors		N/A	N/A	N/A	N/A		N/A	N/A
Over height vehicle detectors		N/A	N/A	N/A	N/A		N/A	N/A
Structure incident detectors		N/A	N/A	N/A	N/A		N/A	N/A
Controller		N/A	N/A	N/A	N/A		N/A	N/A

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Table E/B.12 Tidal flow traffic system equipment

System / Sub-asset type	Scope	Defect category						
		1a - Urgent resolution defect	**1b - Urgent Resolution defect**	**2a - Service affecting defect**	**2b - Service affecting defect**	**2c - Service affecting defect**	**3a -Other defect**	**3b -Other defect**
Tidal flow traffic system roadside equipment	Including but not limited to tidal Flow traffic system equipment, and associated roadside equipment.	Cannot communicate	N/A	N/A	N/A	N/A	All other defects	N/A
Message signs	Including but not limited to message sign (LED, flip-dot, optical fibre and fixed text), message sign drivers, message sign structures at the roadside and associated cabling.	1. Cannot display required legend 2. Cannot display required "wicket signs".	N/A	N/A	N/A	N/Aa		N/A

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Table E/B.13 Road traffic control signals

System / Sub-asset type	Scope	Defect category						
		1a - Urgent resolution defect	1b - Urgent resolution defect	2a - Service affecting defect	2b - Service affecting defect	2c - Service affecting defect	3a - Other defect	3b - Other defect
Traffic light signals (RAG)	Including but not limited to road traffic signals, traffic signal controller (and any other equipment located inside the controller case) and any other case forming part of the site, detector cases, roadside transmission cabinets, miscellaneous equipment	1. All traffic signal failure within 1km of a tunnel portal (both directions). 2. All traffic signal failure at a roundabout. 3. All traffic signal failure at a junction.	All traffic signal failure within a tunnel.	N/A	N/A	All other defects. This includes all traffic signal loop failure that still allow the junction to run in fail mode. Where this facility is not availability, PC2 defects that would fully prevent service should be treated as PC1.	N/A	Loop re-cut

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Table E/B.14 Ramp metering system equipment

System / Sub-asset type	Scope	Defect category						
		1a - Urgent resolution defect	1b - Urgent resolution defect	2a - Service affecting defect	2b - Service affecting defect	2c - Service affecting defect	3a - Other defect	3b - Other defect
Ramp metering on-slip detectors / mainline MIDAS	Including but not limited to associated cabling	N/A	N/A	N/A	N/A	Cannot measure detector occupancy	All other defects	Loop re-cut
Ramp metering outstation	Including but not limited to associated cabling	N/A	N/A	N/A	N/A	Cannot communicate		N/A
Traffic light signals (RAG)	Including but not limited to road traffic signals, traffic signal controller (and any other equipment located inside the controller cabinet) and any other case forming part of the ramp metering site, detector cases, roadside transmission cabinets, miscellaneous equipment	N/A	N/A	N/A	N/A	Lanterns cannot display. Lanterns cannot display required aspect.		

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Table E/B.15 Traffic detector equipment

System / Sub-asset type	Scope	Defect category						
		1a - Urgent resolution defect	1b - Urgent resolution defect	2a - Service affecting defect	2b - Service affecting defect	2c - Service affecting defect	3a - Other defect	3b - Other defect
Traffic detectors	Including but not limited to associated cabling.	N/A	N/A	N/A	N/A	1. Cannot measure detector occupancy. 2. Cannot measure speed or flow.	All other defects	Loop re-cut
Stopped vehicle detectors (SVD)	Including but not limited to associated equipment and cabling installed at the roadside.	N/A	N/A	N/A	N/A	Cannot detect stopped vehicle		

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Table E/B.16 Ambient light monitor equipment

System / Sub-asset type	Scope	Defect category						
		1a - Urgent resolution defect	1b - Urgent resolution defect	2a - Service affecting defect	2b - Service affecting defect	2c - Service affecting defect	3a - Other defect	3b - Other defect
Ambient light monitor (ALM)	Including but not limited to housing and associated cabling.	N/A	N/A	N/A	N/A	N/A	All defects	N/A

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Table E/B.17 Barrier systems

System / Sub-asset type	Scope	Defect category						
		1a - Urgent resolution defect	1b - Urgent resolution defect	2a - Service affecting defect	2b - Service affecting defect	2c - Service affecting defect	3a - Other defect	3b - Other defect
Motorway access barriers	Including but not limited to barriers for access/egress at HGV yards, tunnel approaches, motorway access from compounds / access roads	N/A	N/A	N/A	N/A	Barrier defect that prevents correct operation	All other defects	N/A
Sign / signal barriers	Including but not limited to barriers which affect signals or message signs or could be controlled or affected by HATMS / CHARM	N/A	N/A	N/A	N/A			N/A
Other barriers	Technology controlled barriers	N/A	N/A	N/A	N/A	N/A	All defects	N/A
	Snow Gates							

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General Principles and Scheme Governance
Maintenance & Operation

GM 701
Northern Ireland National Application Annex to GM 701 Asset delivery asset maintenance requirements

Revision 0

Summary
There are no specific requirements for Department for Infrastructure Northern Ireland supplementary or alternative to those given in GM 701.

Feedback and Enquiries
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Contents

Release notes **2**

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Release notes

Version	Date	Details of amendments
0	Nov 2019	Department for Infrastructure Northern Ireland National Application Annex to GM 701.

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Design Manual for Roads and Bridges

General Principles and Scheme Governance
Maintenance & Operation

GM 701
Scotland National Application Annex to GM 701 Asset delivery asset maintenance requirements

Revision 0

Summary
There are no specific requirements for Transport Scotland supplementary or alternative to those given in GM 701.

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Release notes **2**

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Release notes

Version	Date	Details of amendments
0	Nov 2019	Transport Scotland National Application Annex to GM 701.

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Llywodraeth Cymru
Welsh Government

General Principles and Scheme Governance
Maintenance & Operation

GM 701
Wales National Application Annex to GM 701 Asset delivery asset maintenance requirements

Revision 0

Summary
There are no specific requirements for Welsh Government supplementary or alternative to those given in GM 701.

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Release notes

Version	Date	Details of amendments
0	Nov 2019	Welsh Government National Application Annex to GM 701.

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